

Factors Predicting Caregiver Contributions to Self-care in Patients with Heart Failure¹

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Extended Abstract

Introduction Caregivers play an important role in contributing to self-care in patients with heart failure (HF). To date, knowledge regarding factors associated with caregiver contributions to self-care remains limited, particularly in Thai patients with HF.

Objective This study aimed to 1) describe caregiver contributions to self-care, and 2) examine factors predicting caregiver contributions (self-care maintenance, symptom perception, self-care management) of patients with HF.

Design This correlational predictive study was guided by a situation-specific theory of caregiver contributions to heart failure self-care.

Methodology The study included 128 caregivers of patients with heart failure, who were purposively selected based on the following inclusion criteria: aged at least 18 years, unpaid for their caregiving tasks, and living with the patients who attended the heart failure clinic and general internal medicine clinic at an outpatient department of a super-tertiary hospital from April to August 2023. Data collection was conducted using questionnaires and record forms, and the data were analyzed using descriptive statistics, simple linear regression, and multiple linear regression.

Results The majority of the participants were female (75.78%), with an average age of 46.10 years (SD = 13.74). Caregiver contributions (CC) to symptom perception and self-care maintenance were found to be adequate, with means of 73.38 (SD = 14.83) and 72.72 (SD = 13.75), respectively. In contrast, self-care management was deemed inadequate, with a mean of 68.83 (SD = 16.56). Multiple linear regression analysis revealed that health perception and self-efficacy together predicted CC for symptom perception, explaining 35.20% of the variance. Health perception, self-efficacy, and positive aspects of caregiving together predicted CC to self-care maintenance, explaining 31.50% of variance. Self-efficacy and comorbidities in patients together predicted CC to self-care management, explaining 21.20% of variance. While the status of caregivers to patients was not a statistically significant predictor of all three dimensions of CC to self-care in the patients with HF in this study.

Recommendation The results of this study can be utilized to develop specific programs aimed at enhancing caregiver contributions to the self-care of patients with HF, particularly in promoting self-efficacy, positive aspects of caregiving, caregivers' health perception, and managing the comorbidities of the patients.

Keywords: caregiver / heart failure / contributions to self-care / self-efficacy / health perception

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ปัจจัยที่มีผลต่อการสนับสนุนของผู้ดูแลเพื่อการดูแลตนเองในผู้ป่วยหัวใจล้มเหลว¹

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บทคัดย่อขยาย

บันทึกว่า ผู้ดูแลเมืองทบทวนหลักคุณต่อการสนับสนุนการดูแลแทนเงื่อนไขของผู้ป่วยทั่วไป จับบันความรู้เกี่ยวกับปัจจัยที่มีผลต่อการสนับสนุนของผู้ดูแลเพื่อการดูแลแทนเงื่อนไขของผู้ป่วยยังมีจำกัด โดยเฉพาะอย่างยิ่งในผู้ดูแลผู้ป่วยทั่วไปในประเทศไทย

วัตถุประสงค์การวิจัย เพื่อศึกษาการสนับสนุนของผู้ดูแลเพื่อการดูแลตนเองในผู้ป่วยหัวใจล้มเหลว และปัจจัยที่มีผลต่อการสนับสนุนการดูแลตนเอง (ด้านการดำเนินการพุทธิกรรมการดูแลตนเอง ด้านการรับรู้อาการ และด้านการจัดการอาการกำเริบ) ของผู้ป่วยหัวใจล้มเหลว

การออกแบบการวิจัย การศึกษาความล้มพันธ์เชิงท่านาย โดยใช้ทฤษฎีระดับปฏิบัติการเกี่ยวกับการสนับสนุนของผู้ดูแลเพื่อการดูแลตนเองในผู้ป่วยทั่วไปมีผล

วิธีดำเนินการวิจัย กลุ่มตัวอย่างจำนวน 128 คน เป็นผู้ดัดแปลงป้ายหัวใจล้มเหลว คัดเลือกกลุ่มตัวอย่างแบบเจาะจงตามเกณฑ์การคัดเข้าโดยมีอายุตั้งแต่ 18 ปีขึ้นไป ทั้งชายและหญิง ทำหน้าที่เป็นผู้ดัดแปลงไม่ได้ค่าตอบแทน และอาศัยอยู่กับผู้ป่วยที่มารับการรักษาที่คลินิกหัวใจล้มเหลวและ คลินิกอายุรกรรมหัวใจ แผนกผู้ป่วยนอก โรงพยาบาลตื้ดภูมิขั้นสูงแห่งหนึ่ง ตั้งแต่เดือนเมษายน - สิงหาคม 2566 เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามและแบบบันทึกข้อมูล วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา และการวิเคราะห์ทดสอบเชิงเส้นแบบพหุ

ข้อเสนอแนะ ผลการศึกษาสามารถนำไปพัฒนาโปรแกรมที่มีความเฉพาะต่อการส่งเสริมการมีส่วนร่วมของผู้ดูแลเพื่อสนับสนุนการดูแลตนเองของผู้ป่วยหัวใจล้มเหลว โดยเน้นที่การเสริมสร้างการรับรู้สุ่มภัยและต้นเอง มองหาความช่วยเหลือ การรับรู้ภาวะลุพภาระของผู้ดูแล และการควบคุมภาวะโรคร่วมของผู้ป่วย

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คำสำคัญ ผู้ดูแล หัวใจล้มเหลว การสนับสนุนการดูแลตนเอง การรับรู้สัมมารณะตอนเอง การรับรู้ภาวะสุขภาพ วันที่ได้รับ 11 มี.ค. 67 วันที่เก็บไว้ความเสร็จ 7 พ.ค. 67 วันที่รับตีพิมพ์ 30 พ.ค. 67

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Introduction

Heart Failure (HF) is a complex clinical syndrome causing insufficient heart pumping, which results in an inadequate supply of blood to meet the body's requirements.¹ It is estimated that 64.34 million people worldwide are currently living with HF.² In Thailand, the Ministry of Public Health reported that the number of patients with HF over the past five years has increased from 147.99 to 178.04 per 100,000.³ To improve health outcomes for patients with HF, the concept of caregiver contributions (CC) to self-care has emerged as a key strategy addressed by various international guidelines, including those in Thailand.⁴⁻⁵

Caregiver contributions to self-care in patients with HF refers to the allocation of time, effort, and support from another person by advising, helping, or acting on behalf of the patients. Contributions to self-care of patients with HF involve three aspects including self-care maintenance, the actions that maintain physiologic stability such as consuming a low-salt diet, and exercise; symptom perception, through monitoring the symptoms, recognizing, and interpreting symptoms related to HF; and self-care management, directing the management of those symptoms.⁶ Literature reviews have indicated that most caregivers' contributions to self-care for patients with HF were insufficient across all three dimensions.^{7,8}

It is evident that many caregivers of patients with HF have poor self-perception of their physical and mental health.² Additionally, the perception of health status among caregivers of patients with chronic kidney failure has been found to correlate with the caregivers' quality of life.⁹ The psychological quality of life of the caregiver was also positively associated

with CC for self-care maintenance.¹⁰ These contributions are a critical part of supporting self-care in patients with heart failure HF.

The caregiver's contributions can be influenced by several factors, including caregiver factors, caregiver confidence, cultural context, social norms, the relationship between patients and caregivers, and patient factors. This study applied the situation-specific theory of caregiver contributions to heart failure self-care to investigate the predicting factors within the Thai cultural context. The study variables included health perception, self-efficacy, positive aspects of caregiving, caregiver's status to the patient, and comorbidities of the patients.

Health perception refers to a person's opinion and understanding of their health and assessment of health status.¹¹ Evidence suggests that many caregivers of patients with HF have a negative self-perception of their physical and mental health.² Furthermore, the psychological quality of life of the caregiver was positively associated with contributions to self-care maintenance.¹⁰ Self-efficacy refers to the belief of caregivers in their ability to assist patients with HF self-care.⁶ Several studies found that self-efficacy had positive correlations with CC to self-care maintenance and self-care management.^{7,12}

Positive aspects of caregiving refer to caregivers' perception that the patient care experience is satisfying and worthwhile.¹³ Research conducted in Thailand revealed that focusing on the positive aspects of caregiving helped caregivers of patients with dementia achieve better outcomes and avoid negative consequences.¹⁴ Most of patients with HF live with and received care from family members⁷⁻⁸ such that the context of Thailand should be investigating the association between aspects of caregiving and CC to self-care in patients with HF.

Status of the caregiver to the patient refers to the status between caregivers and patients that is with, and without, a consanguinity relationship. Most caregivers for Thai patients with HF are their adult children.¹⁵ Within their relationship, family members felt a bond of love and care for each other, felt concerns about the health status of the patients, and that caregiving was their responsibility.¹⁶ On the contrary, several studies in western culture reported caregivers were more likely to be married couples of the patients.^{2,8} Caregiver status with patients was found to be a predicting variable to caregiving contribution to self-care management as well.¹⁷

Comorbidities in patients refers to the presence and severity of medical conditions beside HF. Generally, patients with HF often develop more than one illness which may affect the prognosis of their heart disease,^{7,17} as well as extending the scope of caregiving. Caregivers may experience difficulty in making decisions, whether the symptoms were caused by HF or other co-morbidities. There is evidence that the severity of comorbidities in HF patients can reduce CC in self-care management.¹⁷

The issues related to self-care promotion among patients with HF are receiving increased attention, and the focus is highly on the concept of CC to self-care. Of the limited extant literature, there is still a lack of research examining predicting factors of the CC, especially in the Thai context. Identifying key predictors of caregiver contributions is important for designing programs aimed at improving the quality of life and well-being of both caregivers and patients.

Research objectives

The objective of this study was twofold: firstly, to describe caregiver contributions to self-care, and secondly, to investigate factors predicting caregiver contributions (self-care maintenance, symptom

perception, self-care management) of patients with heart failure (HF). The predicting factors included health perception, self-efficacy, positive aspects of caregiving, the status of the caregiver to the patient, and comorbidities of the patient toward the CC to self-care in patients with HF.

Research hypothesis

Health perception, self-efficacy, positive aspects of caregiving, the status of the caregiver to the patient, and comorbidities of the patient could together predict CC to self-care in patients with HF.

Conceptual framework

A situation-specific theory of caregiver contributions to HF self-care⁶ focuses on three major factors: caregiver contributors to HF self-care, caregiver confidence as the mediator and direct affect, and caregiver cultural values, that affect the process of CC to HF self-care leading to caregivers' and patients' outcomes. The contributors to HF self-care factor consist of three substructures related to caregivers, patients, and caregiver-patient dyads. The process of CC to self-care is the central focus of the theory and includes the sub-concepts of CC to self-care maintenance, symptom perception, and self-care management. The outcomes are related to positive or negative caregivers' and patients' outcomes.

The independent variables in this study are selected from knowledge gaps including: 1) Contributors to the HF self-care factor: health perception, comorbidities of the patient, and the status of the caregiver to the patient; 2) Caregiver confidence: self-efficacy; and 3) Caregiver cultural values: positive aspects of caregiving towards the CC to self-care in patients with HF, as illustrated in Figure 1

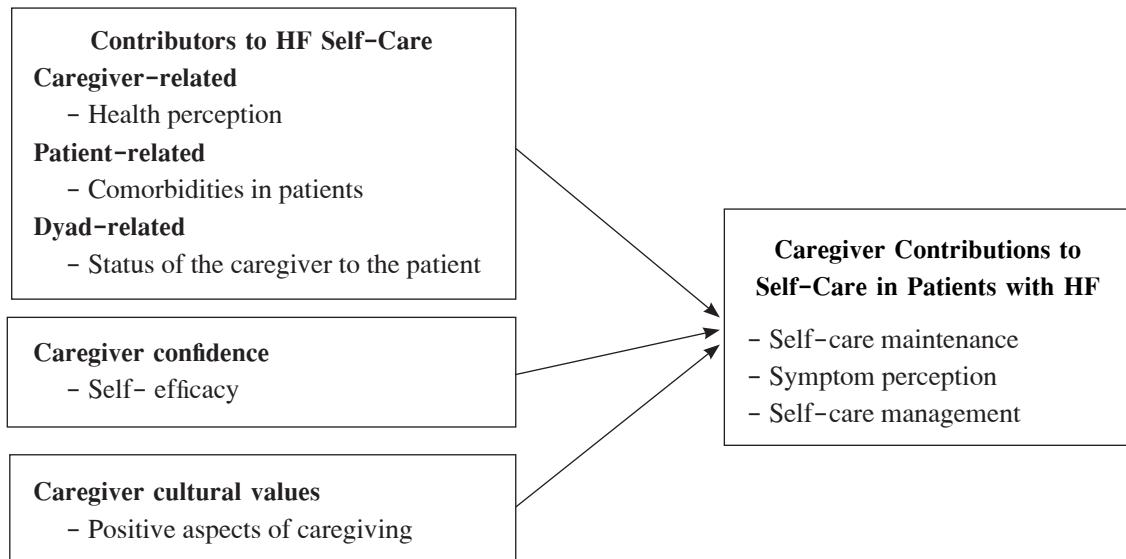


Figure 1 Conceptual Framework

Methods

Study design This study employed a correlational predictive design.

Sampling and setting The sample was selected through a purposive sampling technique according to the following inclusion criteria: 1) both males and female aged 18 years and older, 2) living with the patients with HF who were attending the HF clinic, and general internal medicine clinic, an outpatient department of a super-tertiary hospital in Bangkok between April and August 2023, 3) performing caregiver role without paid, and 4) caregivers aged 60 years and older with Mini-Cog assessment scores of at least 3. The sample size was calculated using the G*power 3.1.9.7 program with the correlation value (r) greater than .309, based on a previous study.¹² The effect size (f²) was determined to be .105, with a significance level of .05 and a statistical power of .80.¹⁸ The calculation resulted in a total sample of 128 participants.

Instruments

The instruments used in this study consisted of two parts.

Part 1: Instruments for screening

The Thai version of the Mini-COG cognitive assessment was used to screen the cognitive impairment of caregivers of patients with HF aged 60 years and over. The tool was developed by Borson et al.¹⁹ and translated into the Thai by Trongsakul et al.²⁰

Part 2: Instruments for data collection

There were seven questionnaires used in this study.

1) Personal Information Questionnaire was developed from a literature review by the researchers including 13 items: age, gender, religion, education level, occupation, sufficiency of income, relationship with patient, underlying diseases, duration of caregiving, hours of care per day, having an assistant, receiving care information from the health team,

and need for additional care information from the health team.

2) Health Perception Questionnaire This visual analog scale was used to measure the self-perception of the caregivers towards their general health status, developed by Longpasuk et al.²¹ It consists of a single item with a horizontal line of 10 cm, ranging from 0 at the left end to 10 at the right end, demonstrating the worst imaginable health status and the best health status respectively. The score ranges from 0 to 10, with higher scores indicating a better perceived level of health status. Interpretation was divided into three levels: poor (1-3), moderate (4-6), and good (7-10).²¹ In this study, the reliability of the tool was tested, revealing a test-retest reliability, with a correlation coefficient of .86.

3) Caregiver Self-Efficacy in Contribution to Self-Care Scale (CSE-CSC) This instrument was used to measure caregiver contributions to self-care in chronic conditions, developed by De Maria et al.²² and translated into Thai by Suwanno et al.²³ It includes a 10-item rated on a 5-point Likert scale, ranging from 1 (not confident) to 5 (very confident). In accordance with the instrumental guide, the obtained raw scores were standardized on a scale of 0 to 100, where higher scores mean higher caregiver self-efficacy in contributing to the self-care of the patient with HF. A score below 70 indicates lower perceived efficacy for the caregiver in contributing to self-care, while a score of 70 or above indicates high perceived efficacy.²² Reliability testing of the instrument yielded a Cronbach's alpha coefficient (r) of .89.

4) The Positive Aspects of Caregiving (PAC)

Questionnaire This instrument consisted of 9 items used to assess caregivers' view of their caregiving, developed by Tarlow et al.¹³ and translated into Thai by Pankong et al.²⁴ It contained a 5-point Likert scale, ranging from 1 to 5. The total scores of PAC ranged from 9 to 45, with higher scores indicating stronger positive views of their caregiving.¹³ It was divided into three levels: strong (9.00-21.00), moderately strong (21.01-30.00), and strong (30.01-45.00).²⁵ In this study, the Cronbach's alpha coefficient of the instrument was .91.

5) Caregiver Contributions to Self-Care of HF Index Version 2 (CC-SCHFI v.2) The instrument was developed by Vellone et al.²⁶ and back-translated into Thai with permission by Autchariya Poungkaew using a back-translation process.²⁷ The CC-SCHFI v.2 consisted of 29 items divided into three subscales measuring self-care maintenance, symptom perception, and self-care management. The Self-Care Maintenance scale included 10 items measured in terms of frequency, ranging from 1 (never) to 5 (always). The Symptom Perception scale consisted of 11 items, with 9 items assessing the frequency of behaviors and 2 items evaluating how quickly HF symptoms were recognized and identified. The response for these 2 items ranged from 0 (not applicable/ no symptoms/ not recognized) to 5 (recognized very quickly). The Self-Care Management scale comprised 8 items. Seven items were used to measure HF symptom control, with responses ranging from 1 (not likely) to 5 (very likely). One item asked about managing HF exacerbation,

ranging from 0 (did not do anything), 1 (not sure), to 5 (very sure).

The three subscale scores were calculated separately and then standardized from 0 to 100, with a higher score indicating better caregiving contribution to patient self-care.²⁶ A cutoff score of 70 or above was interpreted as indicating that caregivers were providing adequate contributions to patient self-care.²⁶ In this study, the Cronbach's alpha coefficients for the three subscales of CC-SCHFI v.2 in the dimensions of self-care maintenance, symptom perception, and self-care management were .77, .89, and .81, respectively.

6) Charlson Comorbidity Index (CCI)

The CCI was a standard tool developed by Charlson et al.²⁸ for predicting the outcome and risk of death from many comorbid diseases. The scope of comorbidities in this study covered 22 comorbidities excluding HF, with total scores ranging from 0 to 42. Comorbidity severity was classified into four stages: no severity (0), low severity (1-2), moderate severity (3-4), and high severity (> 4).²⁸

7) The Illness Record Form This form was developed by the researchers and comprised of 5 items, including The New York Heart Association (NYHA) Functional Class, Left Ventricular Ejection Fraction (LVEF), period of diagnosis, history of hospital admission, and medications taken.

The Personal Information Questionnaire, the Health Perception Questionnaire, Caregiver Self-Efficacy in Contribution to Self-Care Scale, the Positive Aspects of Caregiving Questionnaire, and Caregiver Contributions to Self-Care of HF Index Version 2 were evaluated for content validity

by three experts, including a cardiovascular specialist, a nursing instructor specializing in the cardiovascular system, and a cardiovascular specialist nurse. The questionnaire was refined in collaboration with the thesis advisor based on the recommendations of the experts before its use with the sample. The Thai version of the Mini-COG cognitive assessment and the Charlson Comorbidity Index were standard tools.

Ethical consideration

The study was approved by the Human Research Ethics Committee, Faculty of Nursing, and the Human Research Ethics Committee, Faculty of Medicine Siriraj Hospital (Research Project Certificate No. MU-MOU CoA No. IRB-NS2023/747.0202). The rights of participants in this study were based on key principles of respect for individuals, benefit, and justice. The ethical considerations towards the participants were protected throughout the study. The participants were informed about the study and written consent was obtained.

Data collection

After approval by the Human Research Ethics Committee, the researchers met with the head of the internal medicine examination unit and the head of the HF clinic to introduce the study and the data collection procedures. Permission was sought from the clinical nurses at the clinic to allow the researchers to proceed with the data collection. While patients and caregivers waited to see the physician, the researchers informed them about the study and protection of human rights. Upon obtaining consent, the participants were selected based on the inclusion

criteria on the day they attended the HF and general internal medicine clinic at the outpatient department, a super-tertiary hospital in Bangkok. The data collection process took 30–45 minutes for each participant through structured interview.

Data analysis

The data were analyzed using statistical computer programs. Descriptive statistics were used to analyze the CC to self-care in patients with HF. Pearson's correlation was utilized to identify the correlation among the study variables. The predictive power of health perception, self-efficacy, positive aspects of caregiving, status of caregiver to the patient, and patient comorbidities toward the CC to self-care in patients with HF, was assessed using Multiple linear regression analysis with ENTER-method. The status of the caregiver to the patient was coded as “0” for no blood relation and “1” for blood relation. Statistical significance was set at .05. The assumptions were met including 1) normality test using Kolmogorov Smirnov test, 2) linearity, 3) no multicollinearity (Tolerance = .600–.981 and Variance Inflation Factor (VIF) 1.019–1.668), 4) no autocorrelation (Durbin–Watson of CC to self-care maintenance, symptom perception and self-care management = 1.880, 1.922 and 1.798, respectively) and 5) homoscedasticity.

Results

The participants had a mean age of 46.10 years (SD = 13.74); 75.78% were female, and 96.87% identified as Buddhists. Half of them (50.00%) had at least a bachelor's degree; 77.34%

were employed and reported sufficient financial status, while 60.94% had savings. Many participants had consanguineous relationships with the patients (60.94%), among whom 44.53% were adult children; while 39.06% had no consanguineous relationship, primarily consisting of spouses (34.87%). Most of them had no underlying diseases (67.19%). Regarding the duration of care, 84.38% cared for 12 months or more, with 32.03% dedicating 2 to 4 hours daily. Additionally, 67.19% had helpers. Participants mainly received patient care information from healthcare providers, including medication (96.09%), diet (92.19%), disease progression and treatment (83.59%), symptom observation (77.34%), and symptom management (65.63%). Nearly half (47.66%) sought additional advice on patient care, especially observing abnormal symptoms (32.03%), managing relapse symptoms (30.47%), and dietary considerations (27.34%).

Results showed that 61.72% had adequate CC to self-care maintenance, 64.06% for CC to symptom perception, and 53.91% for CC to self-care management, with means of 72.72 (SD = 13.75), 73.38 (SD = 14.83), and 68.83 (SD = 16.56), respectively. Most participants had good health perception (82.81%), followed by moderate (13.28%) and poor (3.91%) levels, with a mean of 7.56 (SD = 1.63). Likewise, positive aspects of caregiving were at strong (84.38%) and moderate (15.62%) levels, with a mean of 39.16 (SD = 6.15). While half of the participants had low self-efficacy (50.78%), with a mean of 69.25 (SD = 14.62). Regarding

the severity of patients' comorbidity, participants had moderate (37.50%), low (35.94%), and high (25.78%) levels, with only 0.78% indicating no comorbidity severity. The mean severity score was 3.45 (SD = 2.15), with a median of 3.00.

The correlation matrix revealed significant correlations among health perception, self-efficacy,

positive aspects of caregiving and outcome variables including CC to self-care maintenance, CC to symptom perception, and CC to self-care management. Additionally, comorbidities in patients significantly correlated with CC to self-care management, while not with CC to self-care maintenance and CC to symptom perception. (Table 1).

Table 1 The correlation matrix of the study variables (n = 128)

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-----------------------------------|--------|--------|--------|--------|---|---|---|
| 1. Health perception | 1 | | | | | | |
| 2. Self-efficacy | .391** | 1 | | | | | |
| 3. Positive aspects of caregiving | .136 | .500** | 1 | | | | |
| 4. Comorbidities in patients | .007 | -.053 | -.116 | 1 | | | |
| 5. CC to self-care maintenance | .399** | .500** | .405** | -.099 | 1 | | |
| 6. CC to symptom perception | .401** | .555** | .353** | -.162 | - | 1 | |
| 7. CC to self-care management | .214* | .403** | .355** | -.220* | - | - | 1 |

*p < .05, **p < .01, CC = caregiver contributions

Multiple linear regression analysis indicated that health perception and self-efficacy together predicted CC for symptom perception, explaining 35.20% of the variance (Table 2). Health perception, self-efficacy, and positive aspects of caregiving together predicted CC to self-care maintenance, explaining 31.50% of variance (Table 3). Self-efficacy and comorbidities in patients together predicted CC to self-care management, explaining 21.20% of variance (Table 4).

In addition, self-efficacy was a significant predictor for CC to symptom perception, self-care

maintenance, and self-care management, while status of caregivers to patients could not predict any of the three outcomes. Health perception could predict CC to symptom perception and CC to self-care maintenance, except for CC to self-care management. Positive aspects of caregiving could predict CC to self-care maintenance, but not CC to symptom perception and CC to self-care management. Comorbidities in patients could predict CC only to self-care management. (Table 2-4).

Table 2 Factors predicting caregiver contributions to symptom perception using Multiple regression analysis (n = 128)

| Variables | b | SE _b | β | t | p- value |
|-------------------------------------|--------|-----------------|---------|--------|----------|
| 1. Health perception | 1.201 | .399 | .240 | 3.011 | .003 |
| 2. Self-efficacy | .437 | .103 | .391 | 4.242 | <.001 |
| 3. Positive aspects of caregiving | .119 | .113 | .089 | 1.045 | .298 |
| 4. Status of caregivers to patients | .906 | 1.334 | .054 | .679 | .499 |
| 5. Comorbidities in patients | -.505 | .273 | -.133 | -1.849 | .067 |
| Constant | 12.714 | 4.593 | | 2.768 | .007 |

R = .614, R² = .378, Adjusted R² = .352, R² change = .378, df = 5, F_(5,122) = 14.797, p < .05

Table 3 Factors predicting caregiver contributions to self-care maintenance using Multiple regression analysis (n = 128)

| Variables | b | SE _b | β | t | p- value |
|-------------------------------------|--------|-----------------|-------|-------|----------|
| 1. Health perception | 1.117 | .346 | .265 | 3.231 | .002 |
| 2. Self-efficacy | .260 | .089 | .276 | 2.914 | .004 |
| 3. Positive aspects of caregiving | .235 | .098 | .210 | 2.394 | .018 |
| 4. Status of caregivers to patients | .497 | 1.156 | .035 | .430 | .668 |
| 5. Comorbidities in patients | -.199 | .237 | -.062 | -.843 | .410 |
| Constant | 10.098 | 3.980 | | 2.537 | .012 |

R = .585, R² = .342, Adjusted R² = .315, R² change = .342, df = 5, F_(5,122) = 12.678, p < .05

Table 4 Factors predicting caregiver contributions to self-care management using Multiple regression analysis (n = 128)

| Variables | b | SE _b | β | t | p- value |
|-------------------------------------|--------|-----------------|-------|--------|----------|
| 1. Health perception | .451 | .357 | .111 | 1.262 | .209 |
| 2. Self-efficacy | .210 | .092 | .231 | 2.274 | .025 |
| 3. Positive aspects of caregiving | .173 | .102 | .161 | 1.709 | .090 |
| 4. Status of caregivers to patients | 1.516 | 1.195 | .112 | 1.269 | .207 |
| 5. Comorbidities in patients | -.590 | .244 | -.192 | -2.414 | .017 |
| Constant | 11.183 | 4.114 | | 2.718 | .008 |

R = .493, R² = .243, Adjusted R² = .212, R² change = .243, df = 5, F_(5,122) = 7.833, p < .05

Discussion

The results revealed that more than half of the participants had caregiver contributions (CC) to symptom perception, self-care maintenance, and self-care management at an adequate level, with the highest mean in CC to symptom perception and the lowest in CC to self-care management. Additionally, 77.34% of participants received advice from healthcare providers regarding observing HF symptoms, likely enhancing their knowledge and understanding of HF symptoms and consequently improving treatment adherence. Moreover, the majority of participants were middle-aged with a relatively high level of education. Their ability to adhere to treatment and seek additional patient care information is likely independent. The majority remained employed without financial concerns,

indicating sufficient income and savings. Furthermore, the majority of caregivers are adult children of the patients, and in Thai contexts, gratitude, and an obligation to care for the benefactors are commonly cultivated.²⁹ However, caring for patients with HF at home becomes complex when comorbidities coexist with the manifestation of the illness. Most patients in this study had comorbidities, making it difficult to differentiate HF symptoms. This finding aligns with Bidwell et al.'s explanation¹⁷ for inadequate contributions to self-care management in this study.

In this study, self-efficacy emerged as a significant predictor for caregiver contributions to symptom perception, self-care maintenance, and self-care management. Based on the theory guiding the study, the hypothesis regarding predictive factors of caregiver contribution to self-care in Thai patients

with HF was largely supported. This is consistent with previous research by Vellone et al.,⁷ which also highlighted the positive association between caregiver self-efficacy and contributions to self-care maintenance and management.

Health perception predicted CC to self-care maintenance and symptom perception. A positive perception of health enables caregivers to fulfill their duties effectively. The participants in this study reported good health perception, suggesting it helps in optimal caregiving. However, it did not predict contribution to self-care management, likely due to complex symptoms in patients with moderate to severe comorbidities, hindering self-care. This aligns with previous research.¹⁷

Positive aspects of caregiving predicted contribution to self-care maintenance. Interestingly, this originates from family bonding with the patients who were their close and beloved ones. Prioritizing the caregiving importance can encourage their contribution, especially for self-care maintenance.¹⁶ However, this variable could not predict contributions to symptom perception and self-care management. This may be explained by the severity of comorbidities of the patients in moderate to severe levels. Identifying or differentiating between symptoms of comorbid illnesses and HF exacerbations is likely more complex and demands professional knowledge, skills, and higher confidence.^{7,12}

Comorbidities in patients predicted CC only to self-care management. This may be because each patient has different episodes and levels of severity of those comorbidities, resulting in different complexity of symptoms, as a result, requiring greater self-care management with different exacerbations. This is consistent with the previous study.¹⁷ However, when

it came to self-care maintenance and symptom perception, patient comorbidities were not a significant predictor. This may be because most patients in this study had mild to moderate levels of severity of comorbidities. Self-care maintenance and symptom perception would be affected when the comorbidity level was high.¹⁷

The status of caregivers to patients did not predict any of the three outcomes. Most caregivers in this study were unpaid family members who lived with and cared for patients with HF over a long period. In the context of Thai culture, it is a deeply ingrained familial duty to care for relatives during illness, irrespective of their specific familial link.¹⁶ The recent study also confirmed evidence that family caregivers wholeheartedly provided care to their loved ones.⁹

Limitation of the study

This study was conducted at a super-tertiary hospital in an urban area. Therefore, consideration should be given if applying the research findings to HF caregivers receiving healthcare in different contexts. Moreover, conducting separate analyses of correlated outcome dimensions may weaken the statistical conclusion validity.

Recommendations

Recommendations for nursing practices

1. Nurses and healthcare teams should assess caregiver self-efficacy, health perception, positive aspects of caregiving, and the severity of the patient's comorbidities to foster effective caregivers' contribution to self-care in patients with heart failure.
2. Given the study's findings highlight the importance of the self-efficacy of caregivers in

contributing to self-care. Nurses should develop programs aimed at promoting caregivers' self-efficacy.

Recommendations for nursing research

Future research could investigate factors predicting caregiver self-efficacy in caring for patients with heart failure and investigate other relevant factors influencing contributions to heart failure self-care management in caregivers, including age, gender, education level, income, and caregiving hours.

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