

# Fatalism as a Mediator of the Association Between Family Resilience and Self-Management Among Patients with Chronic Wounds in China

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**Purpose:** The purpose of this study was to examine how fatalism acts as a mediator in the correlation between family resilience and self-management among patients with chronic wounds in China.

**Participants and Methods:** This study used a cross-sectional research design. A total of 269 adult patients (18–94 years old) with chronic wounds residing in Wuxi, China participated in this study. Participants completed the Chinese version of the Walsh Family Resilience Questionnaire, 16-item Chinese version of the Fatalism Scale, and Self-Management Scale of Chronic Wound Patients. We conducted correlation and mediation analyses using SPSS 27.0 and PROCESS 4.0.

**Results:** The results indicated family resilience was a significant positive predictor of self-management ( $\beta = 0.7101$ ,  $p < 0.0001$ ), and the pathway between family resilience and self-management was partially mediated by fatalism (Effect = 0.1432, 95% confidence interval [0.0625, 0.2341]).

**Conclusion:** The results indicated that incorporating spiritual interventions into future person-centered self-management programs could align with the motivation of patients with chronic wounds and their families, and reduce the negative impact of fatalism on health outcomes.

**Keywords:** chronic wounds, fatalism, family resilience, self-management, mediation

## Introduction

In clinical practice, chronic wounds (CW), which are caused by various factors, are wounds that fail to progress toward healing within four weeks of applying standard care,<sup>1</sup> such as diabetic foot ulcers, arterial or venous leg ulcers, and pressure injuries.<sup>2</sup> With the increase in the aging population, obesity, diabetes, and other medical conditions, the incidence of chronic wounds has shown a concomitant increase. In China, compared with the results of an epidemiological investigation on chronic wounds in 1998, the current study<sup>3</sup> showed that the average age of patients with CW has increased by 15.8 years, and the composition ratio of patients with chronic wounds during the years 2013–2017 was 2.4–3.9%, which was higher than the global prevalence rate of 2.21% estimated by Martinengo et al.<sup>4</sup> Chronic wounds are often complicated by comorbidities and varying etiologies leading to complex wound management and a prolonged course of treatment, which results in decreased quality of life and substantial economic and psychosocial costs.<sup>5,6</sup>

There is a consensus that care for chronic wounds needs to be simplified so that it can be patient-administered or provided by the family, and self-management has become an increasingly important part of the long-term management of chronic wounds since the start of the pandemic.<sup>1,7</sup> Managing oneself is essential for the successful treatment of chronic diseases<sup>8</sup> and is defined as the ability of a patient to control the symptoms of a disease through their own behavior, thereby reducing the impact of the disease on their health, psychosocial status, and lifestyle.<sup>9</sup> Proper self-care can decrease instances of medical attention and cut down on medical costs, while also allowing patients to become more

independent and enhance their overall wellbeing and health literacy.<sup>10–12</sup> Previous research has indicated that individuals suffering from chronic wounds have various gaps in self-care knowledge and practice, and their self-management behaviors are often insufficient.<sup>13,14</sup> Qualitative and quantitative studies have revealed that the self-care capacity of individuals with CW is linked to demographic factors (eg, age), physical factors (eg, wound size), psychological factors (eg, disgust), socioeconomic factors (eg, access to services and resources), and spiritual factors (eg, beliefs).<sup>8,15–18</sup> Studies have also underscored the significance of family support in ensuring treatment compliance and concordance with self-care behaviors in individuals with CW.<sup>19,20</sup>

Family resilience, which is the capacity, procedure, and adaptation of a family to confront hardship, is considered an important factor in facilitating family caregivers' implementation of long-term care for patients with chronic diseases.<sup>21,22</sup> The concept of family resilience has its roots in the exploration of individual psychological resilience. However, more and more researchers were recognizing that the process of dealing with adversity on an individual level could apply to a process that involves the entire family system, which was reflected in their increasing emphasis on the importance of family support in disease management. Therefore, the research perspective gradually expanded from the individual level to the family level.<sup>23,24</sup> For patients with CW, the primary dilemmas they confront are the direct and indirect repercussions of disease symptoms, treatment, and management, including ulcer and treatment-related pain; stigma and social isolation due to odor and exudate; activity restrictions (physical and social recreational activities) due to skin ulceration and wound dressing; dependence on family due to reduced self-care ability; anxiety about non-healing wounds; and fear of amputation.<sup>25–27</sup> Although no previous studies have explored the family resilience of patients with CW, relevant studies on family support of patients with CW suggest that family resilience has an impact on self-management of patients with CW, because family resilience has been conceptualized as shared beliefs and support, strong family organization and positive interactions, and utilization of social resources, which are indicative of family support.<sup>28</sup> Wantonoro et al<sup>19</sup> concluded that strengthening the family support system for the management of diabetic ulcer care, such as improving family caregivers' knowledge and self-efficacy through interdisciplinary education, can positively affect the self-care of patients with wounds both physically and psychologically. A recent systematic review by Huang et al<sup>29</sup> suggested that home-based patient or informal caregivers' interventions in managing chronic wounds at home can be effective in improving patient outcomes and changing self-care behavior. Hence, a connection exists between family factors and self-management in individuals with CW, and the impact of family resilience on the self-management among patients with CW needs further quantitative research investigation.

The impact of family resilience on self-management among patients with CW may not be immediate but could also have an indirect effect through fatalism. Accompanied by chronic diseases, patients and their families, in the long-term coping process, infer a variety of beliefs, cognitions, and understandings that are embedded in the family background. In the face of similar chronic diseases and different family patterns, the path of resilience often is not simply in response to the disease but indicates the cultural and social metaphors behind certain strategies to cope with distress.<sup>30</sup> With changes in the medical model, psychological and social support for patients have gained increased attention, and researchers began focusing on patients' perspectives, beliefs, and autonomy, and recommending the construction of patient-centered holistic care.<sup>31,32</sup> Atkin et al<sup>33</sup> noted that the major driver of success in managing chronic wounds was that patients followed the agreed upon care path with their health care professionals. In other words, health professionals must fully understand the patient's belief system to tailor the plan in a way that they believe will be effective.

Fatalism is a common worldview in society, and fatalistic individuals believe life is the result of fate and that what happens in life is not controlled by personal behavior.<sup>34</sup> They are often inactive, tend to have a negative outlook on future occurrences, and are more likely to disregard preventive measures.<sup>35</sup> A sense of fatalism may develop with disease progression and have an impact on patients' self-management behaviors. For example, Kamath et al<sup>36</sup> found that fatalism was a negative determinant of self-care behavior among individuals suffering from chronic heart failure. Rustveld et al<sup>37</sup> conducted focus groups with Latino men with diabetes on their belief systems and attitudes related to diabetes self-care. The participants expressed a strong sense of fatalism regarding the course of their disease, lacked motivation to adhere to self-care behaviors especially for long-term dietary control, and had strong negative attitudes toward changing their traditional dietary patterns. Their findings imply that fatalism, as a culturally influenced belief that could be embedded in family-level understandings of illness, may affect the self-care behaviors of patients with CW and be supported by the family. Masson

et al<sup>38</sup> pointed out that when implementing a patient-centered care plan for patients with CW, it is necessary to track the fatalism that may arise in patients from poor wound healing. However, there is a dearth of studies investigating the correlation between fatalism and self-management in individuals with CW, and no studies have examined whether fatalism plays a role in the relationship between family resilience and self-management among individuals with CW.

Social cognitive theory posits there is a dynamic interaction between one's behavior, cognitions, and environment in which individual cognition is the core of the interaction.<sup>39</sup> Therefore, this study aimed to elucidate the relationships between family resilience (environment), fatalism (cognition), and self-management (behavior) among patients with CW from the perspective of social cognitive theory. The results of the study would contribute to the development of self-management interventions for patients with CW consistent with a person-centered holistic care plan.

Based on the above, we examined the following hypotheses.

H1: Family resilience would be positively related to self-management.

H2: Family resilience would be negatively related to fatalism.

H3: Fatalism would be negatively related to self-management.

H4: The relationship between family resilience and self-management would be mediated by fatalism.

## Materials and Methods

### Participants and Procedures

This study was designed as a cross-sectional survey. A total of 269 inpatients and outpatients with chronic wounds in the Burn and Trauma Treatment Center of the Affiliated Hospital of Jiangnan University in Wuxi, China participated in the study. Patients were recruited from April 2023 to September 2023 using convenience sampling. The inclusion criteria were as follows: meet the diagnostic criteria for chronic wounds in the Guidelines for the Diagnosis and Treatment of Chronic Wounds (revised 2011),<sup>40</sup> including diabetic foot ulcers, traumatic wounds, arterial leg ulcers, venous leg ulcers, pressure injuries, and Infectious wounds; over 18 years old; able to communicate effectively; and able to complete the questionnaire independently or with the help of the investigator. The exclusion criteria were patients with mental illness, cognitive impairment, hearing dysfunction, or speech dysfunction. The research protocol was approved by the Jiangnan University Medical Ethics Committee (approval number: JNU20221201IRB16) and conducted in compliance with the ethical guidelines of the Declaration of Helsinki.

### Data Collection

First, wound care nurses in the clinic, primary nurses on the ward, and three nursing graduate students were trained by the head nurse of the burn and trauma treatment center on patient recruitment. They were instructed on the inclusion and exclusion criteria and the consistent format to use when presenting the purpose of the study and content of the questionnaire to patients. Second, using the convenience sampling method, upon their first visit to the burn and trauma treatment center, patients who agreed to participate were assessed by one of the investigators on the team for inclusion in the study without filling the survey again in the future. The purpose of the study was communicated to each patient, and if the patient met the criteria, written informed consent was obtained at that time. Then, the participant completed the questionnaire under the guidance of the investigator. The investigator responded to any questions that the participant had regarding the questionnaire items or study. Third, after the exclusion of questionnaires that had missing or incomplete responses, three nursing graduate students input the data into EpiData Software 3.0 and double-checked the questionnaires to ensure the correctness of all data entry.

### Measures and Variables

The survey instrument covered four primary sections: participant sociodemographic and clinical data, family resilience, fatalism, and self-management of chronic wounds. A questionnaire created by the investigator was utilized to acquire sociodemographic and clinical information, which comprised of gender, age, marital status, education level, religion,

occupation, household, number of children, residence, monthly household income, smoking status, drinking status, number of comorbidities, type of wounds, number of wounds, wound size, wound duration, and Visual Analogue Scale (VAS) score.

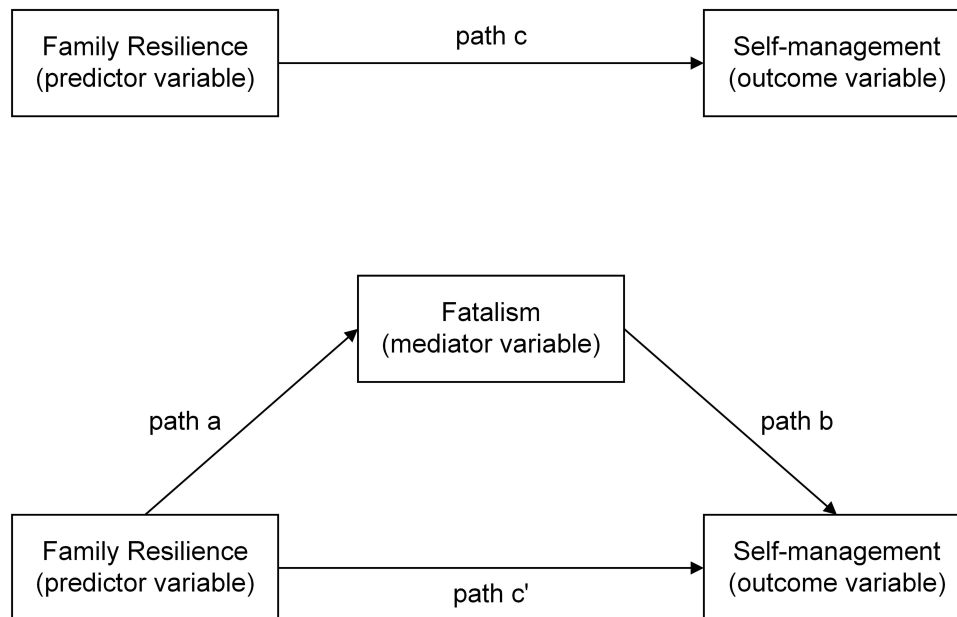
The Walsh Family Resilience Questionnaire (WFRQ)<sup>41,42</sup> was used to assess family resilience. We used the Chinese version of the WFRQ (WFPQ-C) which was translated by Wang et al.<sup>28</sup> This scale has 26 items that comprise three dimensions: family belief system; organization, communication, and problem solving; and utilization of external resources. Items are responded to using a 5-point Likert scale, with a total score range of 26–130. Higher total scores reflect greater family resilience. Wang et al.<sup>43</sup> reported a Cronbach's  $\alpha$  of 0.97, of 0.962 in this study.

The 16-item Chinese version of the Fatalism Scale<sup>43</sup> was used to measure fatalism. The translated scale is based on the Multidimensional Fatalism Scale for General Life Events, which was developed by Shen et al.<sup>44</sup> and revised by Piña-Watson et al.<sup>45</sup> This 5-point Likert scale has 16 items and assesses the three dimensions of predetermination, luck, and pessimism, with higher ratings signifying a higher level of fatalism. The scale demonstrated good reliability ( $\alpha = 0.84$ ) and validity in the original study.<sup>44</sup> The Cronbach's  $\alpha$  was 0.921 in our study.

The Self-Management Scale of Chronic Wound Patients developed by Chen<sup>15</sup> has 26 items and five dimensions: wound management, nutrition management, life management, basic disease management, and emotion management. Items are responded to using a 5-point Likert scale, with 1 = none and 5 = always. Total scores range from 26–130, with higher scores indicating higher levels of self-management ability. The original instrument yielded a Cronbach's  $\alpha$  value of 0.899.<sup>15</sup> Cronbach's  $\alpha$  was 0.950 in our study.

## Statistical Analysis

Statistical analysis was performed using SPSS 27.0. Descriptive statistics were employed to analyze all data and scale scores. The chronic wound self-management level by diverse characteristics was assessed using a one-way ANOVA or *t*-test. After controlling for covariates, a partial correlation analysis was conducted to examine the correlations among the target variables. The prediction of self-management was investigated through the implementation of hierarchical multiple regression analysis, focusing on the impact of family resilience and fatalism. Ultimately, a bias-corrected bootstrapping analysis (5000 resamples) utilizing the PROCESS 4.0 was carried out to verify the mediating effect of fatalism.<sup>46</sup> As shown in Figure 1, three regression models were performed to verify the mediating effect. Model 1 (path c) is the effect of family resilience, excluding fatalism, on self-management. Model 2 (path a) is the effect of family resilience on fatalism. Model 3 (paths b and c') is the effect of fatalism and family resilience on chronic wound self-management. The mediating effect



**Figure 1** Diagram of paths in the mediation model.

(path  $a*b$ , also known as the indirect effect) was deemed statistically significant if the 95% bootstrap confidence interval (CI) of the indirect effect did not exhibit a value of zero.<sup>47,48</sup> Statistical significance was determined by a  $p$ -value  $< 0.05$ .

## Results

### Participants' Characteristics and Self-Management

Table 1 displays the descriptive statistics pertaining to participant sociodemographic and clinical characteristics. The participants ages ranged from 18–94 and included 169 (62.8%) men and 100 (37.2%) women. Most participants were older adults ( $\geq 60$  years old, 76.6%), married (88.5%), and irreligious (88.8%). Almost half (46.5%) reported having a primary school education or below. There were significant differences in self-management according to age, education level, occupation, number of children, residence, household, monthly household income, number of comorbidities, type of wounds, wound size, wound duration, and VAS score (Table 1). No significant differences in self-management were observed according to gender, marital status, religion, smoking status, drinking status, and the number of wounds.

### Descriptive Characteristics and Correlations Among the Target Variables

Descriptive statistics and correlations among the target variables are shown in Table 2. The mean score on the WFPQ-C was  $91.53 \pm 14.50$  with a mean item score of  $3.52 \pm 0.56$  (range is 1–5), indicating a medium level of family resilience. The mean Fatalism Scale score was  $43.10 \pm 10.36$  with a mean item score of  $2.69 \pm 0.65$  (range is 1–5), indicating a low to medium level of fatalism. The mean score on the Self-Management Scale of Chronic Wound Patients was  $95.62 \pm 13.21$ . The mean item score was  $3.68 \pm 0.51$  (range is 1–5), indicating a medium level of self-management ability.

**Table 1** Participant Sociodemographic and Clinical Characteristics, Differences in Self-Management by Characteristics (N=269)

Variables		n (%)	Self-Management		
			M $\pm$ SD	t/F	p
Gender	Male	169 (62.8)	94.72 $\pm$ 13.58	-1.464	0.144
	Female	100 (37.2)	97.15 $\pm$ 12.48		
Age, years	18~44	22 (8.2)	102.64 $\pm$ 11.70	3.235	0.023
	45~59	41 (15.2)	98.10 $\pm$ 11.70		
	60~74	118 (43.9)	94.40 $\pm$ 13.14		
	75~94	88 (32.7)	94.35 $\pm$ 13.80		
Marital status	Single, divorced, widowed	31 (11.5)	91.74 $\pm$ 16.73	-1.408	0.168
	Married	238 (88.5)	96.13 $\pm$ 12.64		
Educational level	Primary school and below	125 (46.5)*	91.50 $\pm$ 13.16	21.710	<0.001
	Lower secondary	97 (36.1)*	95.04 $\pm$ 11.52		
	Upper secondary	24 (8.9)*	106.29 $\pm$ 9.04		
	College or above	23 (8.6)*	109.35 $\pm$ 8.14		
Are religious?	No	239 (88.8)	96.14 $\pm$ 12.82	1.835	0.068
	Yes	30 (11.2)	91.47 $\pm$ 15.60		
Occupation	Retired or unemployed	218 (81.0)	94.60 $\pm$ 13.35	-2.659	0.008
	Employed or self-employed	51 (19.0)	100.00 $\pm$ 11.75		

(Continued)

Table 1 (Continued).

Variables		n (%)	Self-Management		
			M±SD	t/F	p
Residence	Rural	57 (21.2)	91.70±13.38	8.709	<0.001
	Towns	121 (45.0)	94.17±12.12		
	Urban	91 (33.8)	100.00±13.43		
Household	Living alone	31 (11.5)*	89.35±15.56	4.488	0.012
	With spouse	179 (66.5)*	96.89±12.43		
	With children and (or) parents	59 (21.9)*	95.05±13.45		
Number of children	0	8 (3.0)	105.50±14.59	5.710	0.004
	1	148 (55.0)	97.13±12.47		
	≥2	113 (42.0)	92.95±13.53		
Monthly household income, yuan	≤3000	12 (4.5)	85.50±14.68	30.110	<0.001
	3001~5000	56 (20.8)	86.96±12.36		
	5001~7000	123 (45.7)	94.81±11.44		
	>7000	78 (29.0)	104.67±10.28		
Smoking status	Never smoked	130 (48.3)	96.98±13.65	1.633	0.104
	Current smoker or ex-smoker	139 (51.7)	94.35±12.70		
Drinking status	Never drunk	169 (62.8)	96.71±13.11	1.765	0.079
	Current drinker or ex-drinker	100 (37.2)	93.78±13.25		
Number of comorbidities	None	21 (7.8)*	104.14±11.19	4.273	0.006
	1~2	145 (53.9)*	96.08±12.01		
	3~5	94 (34.9)*	93.12±14.05		
	≥6	9 (3.3)*	94.44±19.36		
Variables		n (%)	CW Self-Management		
			M±SD	t/F	p
Type of wounds	Diabetic foot ulcers	87 (32.3)*	96.31±11.44	12.809	<0.001
	Traumatic wounds	53 (19.7)*	102.36±10.90		
	Arterial/Venous leg ulcers	35 (13.0)*	96.77±10.63		
	Pressure injuries	49 (18.2)*	85.45±15.08		
	Infectious wounds	45 (16.7)*	96.53±12.59		
Number of wounds	1	205 (76.2)	96.58±12.90	2.907	0.056
	2	34 (12.6)	94.24±11.91		
	≥3	30 (11.2)	90.63±15.66		

(Continued)

**Table 1** (Continued).

Variables		n (%)	Self-Management		
			M±SD	t/F	p
Wound size, cm <sup>2</sup>	<4	77 (28.6)*	99.13±12.74	6.094	<0.001
	4~16	106 (39.4)*	97.42±11.12		
	16.1~36	44 (16.4)*	91.75±13.37		
	36.1~80	19 (7.1)*	88.89±15.00		
	>80	23 (8.6)*	88.57±16.17		
Wound duration, month	1~2	170 (63.2)	97.66±12.74	5.697	<0.001
	2~6	62 (23.0)	93.77±12.84		
	6~12	18 (6.7)	85.72±13.29		
	>12	19 (7.1)	92.79±13.88		
VAS score	None, 0	19 (7.1)	81.37±10.97	15.215	<0.001
	Mild, 1~3	193 (71.7)	98.38±12.45		
	Moderate, 4~6	36 (13.4)	92.92±13.01		
	Extreme, 7~10	21 (7.8)	87.81±10.09		

**Notes:** t, values of t-test; F, values of ANOVA; \*Because only one decimal is retained in the numerator of the percentages, the percentages of patients of different educational levels, households, numbers of comorbidities, types of wounds, and wound sizes do not add up to 100%, but the total number of patients is 269 in all cases.

**Abbreviations:** M, mean; SD, standard deviation; VAS, Visual Analogue Scale.

**Table 2** Descriptive Statistics and Correlations Among the Target Variables (N=269) #

Variables	Scale Score		Item Score		Correlation Matrix		
	M	SD	M	SD	1	2	3
<b>1. Family Resilience</b>	91.53	14.50	3.52	0.56	1		
<b>2. Fatalism</b>	43.10	10.36	2.69	0.65	-0.796**	1	
<b>3. Self-management</b>	95.62	13.21	3.68	0.51	0.823**	-0.775**	1

**Notes:** #Controlling potential confounders: age, education level, occupation, number of children, residence, household, monthly household income, number of comorbidities, type of wounds, wound size, wound duration, and VAS score; \*\*p < 0.01, two-tailed tests.

**Abbreviations:** M, mean; SD, standard deviation.

The correlation analysis showed that family resilience had a positive correlation with self-management ( $r = 0.823$ ,  $p < 0.01$ ) and a negative correlation with fatalism ( $r = -0.796$ ,  $p < 0.01$ ). Fatalism also negatively related to self-management ( $r = -0.775$ ,  $p < 0.01$ ). The regression analysis results are presented in Table 3. Family resilience was a significant positive predictor of self-management, making up 36.5% of the variance. Fatalism was a significant negative predictor of self-management, explaining an extra 1.7% of the variance. The findings suggested that fatalism was as a partial mediator and the association between family resilience and self-management decreased from 0.710 to 0.553 when fatalism incorporated into the model.



**Table 3** The Hierarchical Multiple Regression Analyses of Self-Management (N=269)

	Self-Management		
	Model 1	Model 2	Model 3
<b>Block 1: Sociodemographic and clinical</b>			
Age	0.018	-0.044	-0.051
Educational level	0.197**	0.039	0.019
Occupation	-0.058	-0.009	-0.013
Residence	0.045	0.091*	0.077*
Household	-0.024	-0.017	-0.006
Number of children	-0.080	-0.030	-0.038
Family income	0.345***	0.102*	0.079
Number of comorbidities	-0.076	-0.052	-0.039
Type of wounds	-0.118*	-0.049	-0.035
Wound size	-0.186***	-0.120***	-0.104**
Wound duration	-0.065	0.001	0.017
VAS	-0.116*	-0.034	-0.024
<b>Block 2: Family Resilience</b>		0.710	0.553***
<b>Block 3: Fatalism</b>			-0.233***
<b>R<sup>2</sup></b>	0.372	0.737	0.754
<b>Adjusted R<sup>2</sup></b>	0.343	0.724	0.741
<b>ΔR<sup>2</sup></b>	0.372	0.365	0.017

Notes: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001, two-tailed tests.

Abbreviation: VAS, Visual Analogue Scale.

## Mediation Analyses

The results of the mediation analysis are shown in Table 4. Age, education level, occupation, number of children, residence, household, monthly household income, number of comorbidities, type of wounds, wound size, wound

**Table 4** Mediating Effects of Fatalism on the Relationship Between Family Resilience and Self-Management (N=269) #

	B	SE	β	t	p
<b>Model 1</b>					
Family Resilience	0.6470	0.0344	0.7101	18.8025	<0.0001
<b>Model 2</b>					
Family Resilience	-0.4828	0.0296	-0.6757	-16.3109	<0.0001
<b>Model 3</b>					
Family Resilience	0.5038	0.0477	0.5530	10.5726	<0.0001
Fatalism	-0.2966	0.0705	-0.2326	-4.2046	<0.0001

Notes: B, unstandardized regression coefficient; SE, standard error; β, standardized regression coefficient; # controlling potential confounders: age, education level, occupation, number of children, residence, household, monthly household income, number of comorbidities, type of wounds, wound size, wound duration, and VAS score.



duration, and VAS score were covariates in the models. In Model 1, family resilience positively predicted self-management ( $\beta = 0.7101$ ,  $p < 0.0001$ ). In Model 2, family resilience negatively predicted fatalism ( $\beta = -0.6757$ ,  $p < 0.0001$ ). Model 3 revealed a strong correlation between self-management and both family resilience and fatalism, with the standardized regression coefficient for family resilience dropping to 0.5530.

The findings of the mediating effect are presented in Table 5. The bootstrapped 95% CI for the indirect path was [0.0625, 0.2341], thereby validating the notion that the influence of family resilience, mediated by fatalism, had an indirect impact of 0.1432. 22.13% of the variance in the relationship between family resilience and self-management was due to fatalism. These findings corroborate our hypothesis that the relationship between family resilience and self-management would be mediated by fatalism. The final mediation model, along with the standardized path coefficients (a, b, c, c'), is displayed in Figure 2.

## Discussion

The findings of this study indicated that the participants had a medium level of self-management ability, which is similar to the mean score reported in Zhang<sup>12</sup> but lower than the mean reported in Chen.<sup>15</sup> Thus, the self-management ability of patients with CW in our study needs to be improved. Since the pandemic, the self-management of patients with CW has gradually become the preferred model of care with some patients being required to perform self-management passively under limited resources; however, many patients have not qualified for self-care, which suggests an urgent need for adjustment and innovation in the model of care.<sup>11</sup> There is a consensus that self-management models need to be patient-centered, making decisions with the patient to better fit the definition of positive health and empower the patients to face physical, mental, and social challenges.<sup>9</sup> Therefore, we explored the internal and external factors that influence the level of self-management in patients with CW, consistent with previous qualitative and quantitative studies.<sup>17,49</sup>

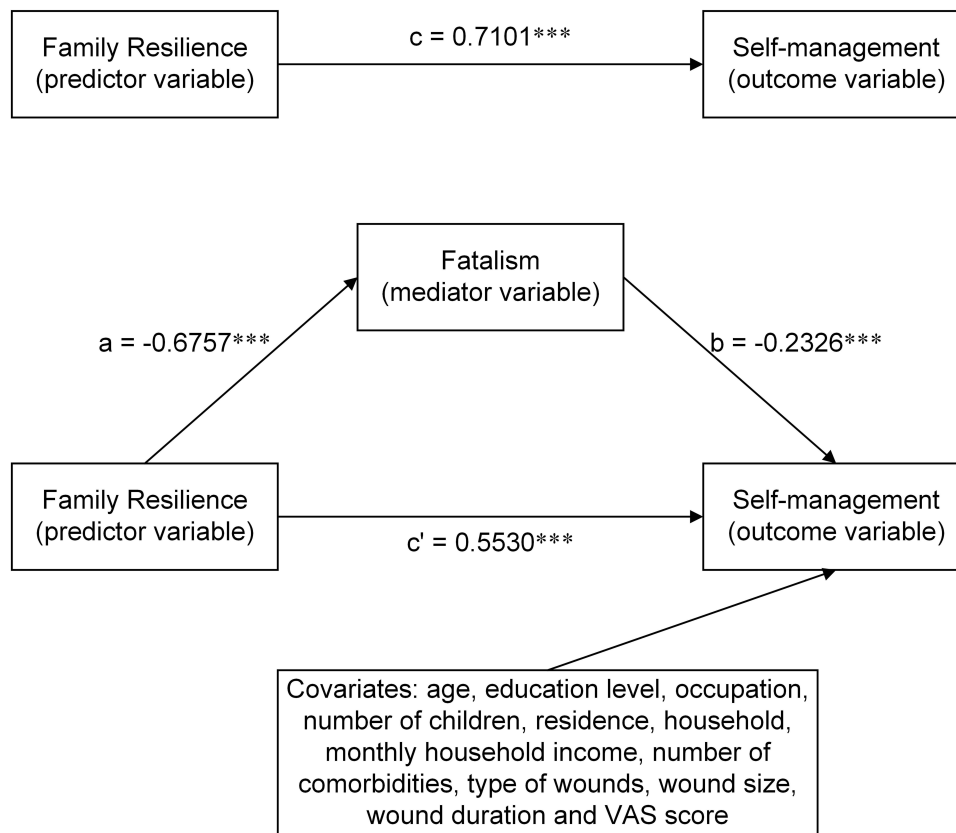
The findings of this study indicated that patients with CW who had attained a higher level of education were more likely to possess greater self-management ability. It is possible that the disparity is due to the fact that more educated patients have higher levels of health literacy in processing, understanding, and acquiring health information for successful self-management.<sup>50</sup> Furthermore, those with a higher level of education tend to have a greater sense of self-efficacy, and therefore may be more confident in self-management and the pursuit of independence.<sup>7</sup> Some other internal factors that affected self-management were age, comorbidity, and wound condition. With regard to external factors, socioeconomic circumstances were associated with the ability of patients to take care of themselves to attain health outcomes. For instance, a prior research revealed that individuals residing in rural regions encountered transportation difficulties with relatively little access to wound care services, resulting in a postpone engagement in proper self-care.<sup>17</sup> Our study confirmed the association of different places of residence with level of self-management ability. Additionally, family factors, such as living status, number of children, and monthly household income, were shown to be associated with self-management among patients with CW in our study.

The mean score for family resilience suggested a medium level of family resilience in our sample, slightly lower than the mean reported by Wang et al<sup>28</sup> for Chinese community residents. With the development of positive psychology, family resilience as a family trait or a dynamic process that helps families relieve stress provides a new perspective for studying chronic diseases at the family level. Despite the lack of consensus among academics on the concept of family resilience, it is generally interpreted from three different angles. The competence-based perspective refers to the

**Table 5** Mediating Model Examination by Bootstrap

Effect	Family Resilience → Self-Management				
	B	SE	Bootstrap 95% CI	p	Effect Ratio
Total effect	0.6470	0.0344	[0.5792–0.7147]	<0.001	/
Direct effect	0.5038	0.0477	[0.4100–0.5977]	<0.001	77.87%
Indirect effect	0.1432	0.0431	[0.0625–0.2341]	/	22.13%

**Abbreviations:** B, unstandardized regression coefficient; SE, standard error; CI, confidence interval.



**Figure 2** Proposed models that investigate mediated effects.

**Notes:** \*\*\*The correlation is significant at 0.001 ( $p < 0.001$ ).

characteristics or ability of the family to adapt to stress and cope with a crisis.<sup>51,52</sup> The process perspective concerns the dynamic process by which families use resources to cope with adversity and to adapt and develop.<sup>41,53</sup> The outcome perspective focuses on the effects of family coping with a crisis and stress, manifested as the improvement of family relationships and abilities after experiencing adversity.<sup>54</sup> Several core characteristics of family resilience theory can be summarized as follows: (1) threatened by stressful events or crises (2) the use of strengths and resources, (3) having a positive outlook in the face of adversity or crisis, and (4) empowerment of the family in the ability to repair itself and grow from adversity.<sup>55</sup> We elucidated the result of an existing correlation between family resilience and self-management by resource utilization, positive perceptions, and empowerment. In terms of resource utilization, patients in families with high levels of resilience tend to be more able to utilize potential strengths and resources, including individual (eg, health literacy), family (eg, family support), and social (eg, leg clubs) resources.<sup>56–58</sup> In terms of positive perceptions, family resilience guides family cognition and behavior patterns,<sup>55</sup> and positive beliefs and family characteristics are protective factors in coping with stress.<sup>21</sup> Patients who possess strong strengths of family resilience tend to receive greater emotional support from family members, cope with the disease with a more optimistic attitude, and adopt more active and effective self-management behaviors.<sup>59</sup> In terms of empowerment, high-resilience families tend to have the knowledge and confidence to identify and establish family-friendly resources and utilize adaptive coping strategies,<sup>55</sup> and contribute to self-efficacy and posttraumatic growth.<sup>19,60</sup>

The goal of most family resilience interventions implemented by nurses for patients with CW is to assist empowerment,<sup>19,61</sup> that is, to promote family coping with the disease by providing external resources to enhance family well-being, support family functioning, and adjust family relationships. Family resilience is not only affected by the ability of family members, the availability of family resources and the strength of social support, but is also affected by macrosystems such as ethnic culture and beliefs.<sup>62</sup> The phenomenological study of Hassani et al<sup>63</sup> found that fatalism existed in the cognition of resilience among chronic patients, who believed that patience and trust in God was equal with

resilience. The findings of this research indicated a significant negative association between family resilience and fatalism. The family can be an important natural support system, and family resilience can positively affect the cognitive style and emotional experience of family members,<sup>59</sup> while the emergence of fatalism is closely related to the living environment and cognitive emotions of patients.<sup>64</sup> Studies have shown that family resilience is significantly negatively correlated with anxiety and depression,<sup>45,65</sup> consequently, family resilience may have an effect on the formation of fatalism by influencing anxiety and depression in patients with CW.

Fatalism, as a world view affecting patients' cognition and coping behaviors with diseases, has been shown to be related to a variety of negative behaviors and adverse health outcomes.<sup>43</sup> The results of this study showed that fatalism was significantly negatively related to self-management. An ethnographic study by Sari et al<sup>66</sup> showed that Javanese patients were influenced by Islamic culture in their practice of diabetes self-management, believing that everything that happened was God's will and that diabetes was a trial from God, which reflected the predetermination dimension of the Fatalism Scale. This disease perception can lead patients to have a negative attitude toward medical treatment and doubt the value of self-management in managing disease symptoms. Stiffler et al<sup>67</sup> highlighted that self-management skills are not solely derived from the information provided, but rather from motivation and the aspiration to achieve better outcomes. Thus, it is crucial to take into account the internal motivation of patients with CW to uphold optimal self-management practices and prevent further complications when strategizing care for this demographic.<sup>17</sup> Spiritual beliefs are thought to be a buffer or coping strategy that can help people change their fatalism.<sup>68</sup> Studies have shown that spiritual interventions can reduce an individual's fatalism.<sup>69,70</sup> Thus, when developing a self-management plan for patients with CW, it is important to consider their cultural beliefs, such as fatalism, which could promote their motivation for self-management and improve their health outcomes.<sup>71</sup>

## Innovation and Limitations

This is the first study to find that fatalism plays a partial mediating role in the relationship between family resilience and self-management in patients with CW using a quantitative methodology. With the development of positive psychology, many studies have identified the benefits of enhancing psychological resilience in chronic disease management;<sup>72</sup> however, most studies have focused on individual psychological resilience.<sup>73,74</sup> Based on the dynamic interaction between the individual's behavior, cognitions, and environment posited in social cognitive theory,<sup>39</sup> this study considered the environmental factor of family-centered self-management of patients with CW,<sup>29</sup> focusing on family resilience, and analyzed the relationships between family resilience, fatalism, and self-management. Additionally, patients with CW have varied perceptions and beliefs about self-care that influence their self-care practices,<sup>31,75</sup> and identifying patient motivation and cultural context may improve the consistency of their self-management behaviors.<sup>20</sup> Therefore, we focused on fatalism as an individual cognition and variable for analysis. This research broadened our comprehension of fatalism and its association with the management of chronic illnesses, and provide new ideas for constructing person-centered self-management programs for patients with CW.

This study has certain limitations. First, this study utilized convenience sampling instead of random sampling, and the survey was only conducted in Wuxi, China where most residents were Han and had no religious affiliation. Thus, the generalizability of the results is limited. Second, the family resilience of patients' informal caregivers was not assessed. As family resilience has been found to be positively associated with the support of relatives,<sup>76</sup> the influence of informal caregivers on chronic disease management and their burden of long-term care cannot be ignored.<sup>7</sup> Future investigations should include the informal caregivers of patients with CW. Moreover, the adaptation of patients with CW to their disease seems to be a dynamic process of coping with fluctuating life changes, and the cross-sectional design of the study does not allow for investigation of how coping behaviors influenced by fatalism change over time. While there are studies suggesting that fatalism is an attitude that leads to negative health outcomes,<sup>77</sup> there are also some studies that have provided evidence of fatalism acting as a protective factor, helping individuals cope with illness in the context of specific cultural beliefs or resource constraints, and alleviating self-blame and other negative emotions.<sup>71,77</sup> For example, in the context of Chinese culture, patients may develop fatalistic voluntarism in their long-term adaptation to disease, helping them to reduce or avoid guilt caused by events beyond their control, cope with stressful situations, and bolster an optimistic perspective to pursue a brighter future.<sup>78</sup> However, the specific demographic and geographic focus of our study limited its generalizability due to China's

ethnic diversity and variations in cultural beliefs across different regions. Future researches should consider conducting longitudinal studies with diversified samples from multiple regions to enhance our understanding of the correlation between fatalism and self-management in patients with CW and their families.

## Conclusion

Patients with CW had a moderate level of self-management ability. There was a positive relationship between family resilience and self-management and a negative relationship between fatalism and self-management, and family resilience indirectly influenced self-management through fatalism. Treatment of patients with CW should involve considering the cultural and religious context of the patient, reducing the negative impact of their fatalism on health outcomes through spiritual interventions, and developing person-centered self-management programs consistent with the motivation of the patient and their family.

## Abbreviations

CW, chronic wounds; VAS, Visual Analogue Scale; WFRQ-C, the Chinese version of the Walsh Family Resilience Questionnaire.

## Data Sharing Statement

The data that support the findings of this study are available from the corresponding author.

## Ethics and Consent

The ethical consent was approved by the Jiangnan University Medical Ethics Committee (Approval number: JNU20221201IRB16). We confirm that a written informed consent was obtained from the study participants. The guidelines outlined in the Declaration of Helsinki were also followed.

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## Disclosure

The authors report no conflicts of interest in this work.

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