การดูแลตนเองกับปัจจัยทางจิตวิทยาในคนไข้ชาวจีนที่ใช้โคลอสโตมีแบบถาวร: โมเดลสมการโครงสร้าง
Self-care and Psychological Factors in Chinese Patients with Permanent Colostomy: A Structural Equation Modeling

ลองยัน เบียน[1,2], พรชัย จุลเมตต์[2]*, ชนัญชิดาดุษฎี ทูลศิริ[2] และ พูลพงศ์ สุขสว่าง[2]

[1] คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา อ.เมือง จ.ชลบุรี 20131
[2] คณะพยาบาลศาสตร์ มหาวิทยาลัยการแพทย์เจียงซู หยานเชง เจียงซู 224005 ประเทศจีน

* Corresponding author: pornchai@buu.ac.th

Longyan Bian[1,2], Pornchai Jullamate[2]*, Chanandchidadussadee Toonsiri[2] and Poonpong Suksawang[2]

[1] Faculty of Nursing, Burapha University, Muang, Chonburi 20131 Thailand
[2] School of Nursing, Jiangsu Vocational College of Medicine, Yancheng, Jiangsu 224005, China

* Corresponding author: pornchai@buu.ac.th

บทคัดย่อ

วัตถุประสงค์: เพื่อทดสอบความสัมพันธ์ระหว่างการดูแลตนเองกับตัวแปรทาง จิตวิทยา ได้แก่ อคติต่อโรค ความเชื่อมั่นในความสามารถแห่งตน และภาวะ ซึมเศร้า ในคนไข้ที่ใช้ถุงโคลอสโตมีแบบถาวร ในประเทศจีน **วิธีการศึกษา:** คนไข้ 250 รายที่ใช้ถุงโคลอสโตมีแบบถาวรที่รับการรักษาที่คลินิกของโรค พยาบาลในเมืองหยานเชงประเทศจีนถูกเลือกโดยวิธีสุ่มหลายขั้นตอนในช่วง ตุลาคม 2565 ถึงเมษายน 2566 แล้วตอบแบบสอบถามด้านประชากรศาสตร์ ด้าน ผลกระทบทางสังคม ความเชื่อมั่นแห่งตนต่อการดูแลตนเอง ภาวะซึมเศร้า และ และการดูแลตนเองของคนไข้ที่ใช้ถุงโคลอสโตมี ทดสอบความสัมพันธ์ด้วยโมเดล สมการโครงสร้าง (structural equation modelling; SEM) **ผลการศึกษา:** โมเดลที่ ตัดแปลงแล้วแสดงว่าภาวะซึมเศร้า (β = -0.66, P-value < 0.001) และความ เชื่อมั่นแห่งตน (β = 0.42, P-value < 0.001) ผลอิทธิพลโดยตรงต่อการดูแล ตนเอง ในขณะที่อคติต่อโรคสัมพันธ์ทางอ้อมกับการดูแลตนเอง โมเดลนี้อธิบาย ความแปรปรวนได้ร้อยละ 59.1 **สรุป:** ผลการศึกษาสามารถนำไปสนับสนุนการ ดูแลตนเองได้โดยการประเมินปัจจัยทางจิตวิทยา เช่น อคติต่อโรค ความเชื่อมั่น แห่งตน และภาวะซึมเศร้า

Keywords: การดูแลตนเอง; ปัจจัยทางจิตวิทยา; ถุงโคลอสโตมีแบบถาวร; มะเร็ง ลำไส้ใหญ่ทวารหนัก; โมเดลสมการโครงสร้าง

Abstract

Objective: To examine the interrelations among self-care and psychological factors including disease stigma, self-efficacy, and depression in individuals with a permanent colostomy in China. **Methods:** With a multi-stage random sampling, 250 patients with a permanent colostomy attending the clinics of general hospitals in Yancheng, China, were recruited between October 2022 and April 2023. Participants completed the questionnaires of demographic characteristics, Social Impact Scale (SIS), Ostomy Self-care Self-efficacy Scale, Self-rating Depression Scale (SDS), and Ostomy Self-Care Index (OSCI). Associations were tested using structural equation modelling (SEM). **Results:** The final modified model's outcomes indicated that depression (β = -0.66, P-value < 0.001) and self-efficacy (β = 0.42, P-value < 0.001) directly influenced self-care, whereas disease stigma was indirectly correlated with self-care. This model accounted for 59.1% of the total variance. **Conclusion:** To enhance self-care among patients with a permanent colostomy, comprehensive interventions that address psychological factors such as disease stigma, self-efficacy, and depression are essential.

Keywords: self-care; psychological factors; permanent colostomy; colorectal cancer; structural equation modelling

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Introduction

Colorectal cancer (CRC) constitutes a significant proportion of the global cancer burden, accounting for nearly 10% of all cancer cases worldwide[1]. The primary treatment modality for colorectal cancer is surgical intervention, with a substantial number of patients requiring a permanent colostomy. Approximately 35% of individuals undergoing surgery for colorectal cancer are estimated to have a permanent colostomy [2]. In China, the population of permanent colostomy patients was projected to surpass one million by 2015, with expectations of continued growth according to statistical analyses [3]. The establishment of a colostomy markedly impacts the psychological well-being of affected individuals. Evidence suggests that psychological difficulties can significantly hinder a patient's adaptation and self-care capabilities for managing a colostomy [4].

Within the framework of the Middle Range Theory of Self-care in Chronic Illness (ScCI) proposed by Riegel, self-care is conceptualised as a naturalistic decision-making process. This process involves interactions with others, including family members, friends, and healthcare professionals, to monitor behaviours, maintain physiological and psychological equilibrium, and respond appropriately to symptoms (management) with the objective of health promotion [5]. Effective self-care is associated with improved clinical and patient-centred outcomes in individuals with chronic conditions. Those who are more adept at self-care

exhibit enhanced quality of life[6], reduced rates of hospitalization[7], and decreased mortality compared to those with poor self-care practices [8]. In the context of patient recovery, self-care plays a pivotal role[9]. Nonetheless, the level of self-care among patients with a permanent colostomy is often less than optimal[10], and the recognition and comprehension of self-care practices pose significant challenges for healthcare providers globally.

Several studies have explored the influence of psychological factors on self-care. Evidence suggests that individuals with a permanent colostomy may experience a pronounced sense of stigma due to perceived changes related to effluent odour, sound, and alterations in body shape consequent to a fecal stoma [11]. Dhakal [12] considered disease stigma and social exclusion were closely related, and social exclusion was a form of stigma to reject one from interpersonal interactions. The study of Logie et al.[13] found that disease stigma was associated with economic insecurity using SEM. According to Barta's[14] study, higher levels of chronic illness-related stigma were associated with greater internalized shame. Sharac et al. proposed that stigma results in discrimination and social isolation, which hinders a person's capacity to work and recover from their disease[15].Such stigma may adversely impact the self-care practices of the individual. Du et al. examined the relationship between Chinese patients with permanent colostomies' quality of life, stigma, and self-care capacity using structural equation modelling and discovered that stigma negatively affected patients' self-care abilities (β = -0.21, $p < 0.05$)[16]. Additionally, a significant association between depression and stigma has been documented [17]. Raguram investigated, via interviews with patients receiving therapy at an outpatient psychiatry clinic and diagnosed with depression, the relationship between stigma and the severity of depression in South India, finding that the severity of depression was correlated with perceived stigma levels[18]. Furthermore, individuals experiencing higher levels of stigma exhibited reduced self-efficacy to confront challenges and engage in self-care [19].

From the literature review, it emerged that depression directly and adversely influenced self-care in patients, thereby potentially diminishing their capacity for self-care activities [20]. Patients with permanent colostomies frequently experience mental health issues, notably depression, stress, and anxiety, which can exacerbate their condition and impair

their self-care abilities[4]. Further research has elucidated that colostomy self-efficacy can lessen depression and promote the use of adaptive emotion-focused coping strategies[21]. Although the study about the relationship among self-efficacy, depression, and self-care understudied in patients with ostomies is few, it has been demonstrated in other chronic conditions. For example, structural equation modelling conducted to explore the interplay between self-efficacy, depression, and self-care activities in Jordanian adults with diabetes revealed self-efficacy acted as a mediator in the indirect relationship between self-care activities and depression[22]. Moreover, multiple linear regression analysis identified self-efficacy as a pivotal factor influencing depression among the study population of heart failure.[23]

Self-efficacy, the belief in one's capability to execute specific actions and surmount challenges in given circumstances [24], has been identified as a key determinant of self-care decisions and behaviours in patients with a permanent colostomy [25]. According to ScCI, self-efficacey is one of the factors affecting self-care, and self-efficacy in performing self-care acts as a moderator in the relationship between self-care and clinical outcomes, underscoring its importance across all phases of the self-care continuum[5]. It suggested there was positive correction between self-efficacy and self-care.

While existing studies have predominantly concentrated on a limited number of factors affecting self-care, with a focus on patients with diabetes and heart failure, the interrelations between various determinants of self-care, particularly in patients with a permanent colostomy in China, remain underexplored. Therefore, this study aims to assess the relationships between self-care and psychological determinants, including depression, self-efficacy, and disease stigma, among patients with a colostomy in China, employing structural equation modelling. The findings of this study provided professional nurses with an understanding of the current psychological status and self-care level of permanent colostomy patients in China. Meanwhile, it unraveled the psychological factors associated with self-care and their interrelationships in colostomy patients, which might be helpful for professional nurses to adopt effective interventions to improve patients' self-care abilities.

Research hypotheses

According to the conceptual framework of the study and the literature review, three hypotheses were tested (Fig 1):

H1: Disease stigma negatively influences self-care both directly and indirectly through its impact on self-efficacy and depression.

H2: Depression exerts a negative impact on self-care directly, as well as indirectly by affecting self-efficacy.

**H3:** Self-efficacy positively affects self-care directly.
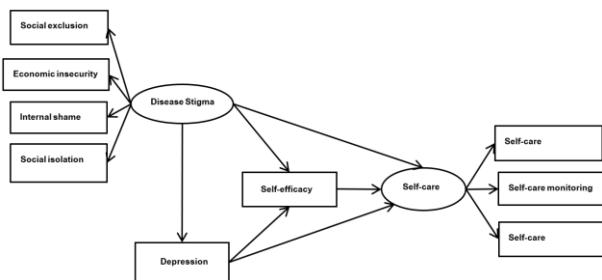
Figure 1 . The hypothesized model.

Methods

2.1 Sample and setting

This investigation utilised a cross-sectional descriptive study design, conducted in general hospitals within Yancheng city, China, from October 2022 to April 2023. Structural equation modelling (SEM) typically recommends sample sizes between 200 and 400 to adequately test the model[26]. Given that the study aimed to estimate 21 free parameters, a ratio of 10 respondents per parameter was adopted. To account for an anticipated 10% rate of abnormal and missing data[27,] a sample size of 250 was deemed sufficient.

A multi-stage random sampling process was used for picking the sample. Initially, a simple random sampling was employed to choose 4 out of 9 general hospitals from a numerically arranged list. The selected facilities were Yancheng No.1 People's Hospital, Yancheng No.3 People's Hospital, Dafeng People's Hospital, and Dongtai People's Hospital. Eligible participants were identified based on the following inclusion criteria: aged 40 years or older, literate in Chinese, residing in Yancheng, diagnosed with colorectal cancer, and having undergone permanent colostomy surgery at least one month prior to discharge. The study excluded patients having a history of mental illness, psychiatric disorders, severe chronic diseases, familial hereditary diseases, and communication problems. The

researcher randomly recruited 250 patients who visited the clinics of these hospitals and expressed willingness to participate in the study. Subsequently, the researcher distributed questionnaires to these patients, providing guidance on how to complete them. All participants, regardless of the hospital from which they were recruited, met the same inclusion criteria.

2.2 Measurements

2.2.1 The demographic questionnaire

Demographic information, including age, gender, marital status, level of education, living arrangements, monthly family income, employment status, presence of complications, and duration since surgery, was gathered.

2.2.2 Social Impact Scale

Disease stigma is defined by WHO as the "hidden burden of disease," affecting psychologically, physically, and socially[28]. The Social Impact Scale (SIS) was utilised to quantify disease stigma. Developed initially for assessing the stigmatization experienced by individuals with HIV/AIDS or cancer, the SIS has been translated into Chinese by Pan[29]. The instrument encompasses four domains: social exclusion, economic insecurity, internal shame, and social isolation, comprising a total of 24 items. Responses are rated on a 4-point scale, where 4 means 'strongly agree' and 1 means 'strongly disagree' leading to a maximum possible score of 96. Higher scores signify greater perceived disease stigma. The internal consistency of the scale was calculated by Cronbach's alpha at 0.85, with a correlation coefficient for each domain of 0.85.

2.2.3 Self-rating Depression Scale

Depression refers to a mental state characterized by feelings of guilt and low self-worth, and by decreased happiness and enjoyment[30]. The Self-rating Depression Scale (SDS) was developed by William W.K. Zung [31] to assess the severity and variation in depressive symptoms. This scale has been translated into Chinese, is widely accepted by clinical psychiatrists, and has demonstrated robust reliability and validity. The SDS is a 20-item Likert scale that evaluates psychological and physiological symptoms identified in factor analytic studies of depression. A score range of 20 to 80 is calculated by responding to each item based on their experience over the previous week on a scale of 1 (a little of the time) to 4 (all of the time). Completion typically takes between 5 to 10 minutes. Scores of 50-59, 60-69, and beyond 70 are the cutoff values for mild

to moderate depression, moderate to severe depression, and severe depression, respectively. The scale's Cronbach's alpha is 0.845, with a validity coefficient of 0.837.

2.2.4 Ostomy self-care self-efficacy

Self-care self-efficacy refers to an individual's capacity to effectively engage in self-care activities and maintain persistence in doing so, even when faced with obstacles[32]. The Ostomy Self-care Self-efficacy Scale, a component of the Ostomy Self-Care Index (OSCI), assesses the self-efficacy levels of colostomy patients [32]. This scale, translated into Chinese by Li, Wang [33], consists of 10 items rated on a 5-point Likert scale ranging from 1 (never) to 5 (always), where the higher the score, the greater the self-care self-efficacy. The scale's Cronbach's alpha is reported to be 0.962.

2.2.5 Ostomy Self-Care Index

Self-care involves engaging in social interactions, monitoring behaviors, maintaining physiological and psychological balance, and appropriately responding to symptoms with the aim of promoting health[5]. The OSCI was employed to gather data regarding self-care practices among patients with colostomies and has been translated into the Chinese version by Li, Wang[33]. The OSCI assesses several dimensions of self-care: maintenance, monitoring, and management. The instrument uses a 5-point Likert scale with responses ranging from 'Never' to 'Always'. Based on the guidelines of the Ostomy Self-Care Index, the raw score of each item is transformed to a 0-100 scale, with the calculation method consistent with that of the Ostomy Self-care Self-efficacy scale. Higher scores denote superior self-care. The OSCI is a valid and reliable instrument for assessing self-care in ostomates, It shows a high degree of internal consistency for the total scale (α = 0.975). The Cronbach's α of the maintenance, monitoring, and management subscales is 0.965, 0.953, and 0.930, respectively.

2.3 Data collection

The researcher and assistants collected the data. Enterostomal Therapists (ETs) from the selected hospitals were trained as the research assistants. The training content contained human subject protection, rights, questionnaires, data collection, and unified guidance words. The data collection procedures were performed by the researcher and the research assistants. When the out-patients who had colostomy after surgery for more than one month and come to the follow-up visit or to buy colostomy products at Ostomy Wound Clinic from the general hospitals, the research assistant who worked in Ostomy Wound Clinic of hospital communicated with them introducing the purpose of the study, their right to withdraw or participate, confidentiality, risks, and benefit of the study for the patients with colostomy who met the inclusion criteria. If patients were willing to participate in the study, they would be invited to a quiet room. Consent forms were signed by patients willing to participate. The researcher and assistants distributed questionnaires and instructed the patients to fill in the questionnaire and each participant was rewarded with a gift valued at 5 RMB upon completion.

Ethical approval

The Institutional Review Board (IRB) for Graduate Studies at the Faculty of Nursing, Burapha University, Thailand (G-HS058/2565), as well as the Human Research Ethics Committees of the involved general hospitals, granted ethical approval.

Data analysis

It was performed using SPSS software (Version 27, SPSS, Lisence No. 62003458, Faculty of nursing, Burapha University) and AMOS statistical package (Version 28.0) to analyze the data, following an iterative process of changing significant pathways and removing non-contributory variables to improve the model's fit. Structural Equation Modelling was applied to examine path coefficients and the causal relationships between variables. In SEM, the root mean square error of approximation (RMSEA) <0.08, Tucker-Lewis index (TLI) > 0.90, normed ft index (NFI) > 0.90, and comparative ft index (CFI) > 0.90 indicate good model fit [34].

Results

More than half of the participants were male (58.5%). Ages of participants ranged from 40 to 92, with a mean age of 69.00 years (SD = 10.28). A significant proportion (78.4%, n = 196) were aged over 60 years. Nearly half of the participants (48.4%, n = 121) had attained primary school education, followed by those with middle school education (32.0%, n = 80). Forty-two percent lived with their spouse,

and 39.6% with their spouse and children. 49.6% of participants reported a monthly family income between 6,001 and 10,000 RMB. Prior to their illness, one-third (32.4%) were farmers, followed by workers (24.0%) and businessmen (6.8%). Complications were reported by 34.4% of participants. Post-surgical treatment durations varied, with 21.6% being 3-6 months post-surgery, 20.0% between 2-5 years, and 18.0% between 1-3 months (Table 1).

Table 1 Demographic characteristics of the participants (N = 250).

Participant's characteristic	N	%
Gender		
Male	147	58.8
Female	103	41.2
Age (year)(M = 69.00, SD = 10.28, Range = 40~92)		
≤60	54	21.6
61~70	91	36.4
≥71	105	42.0
Education level		
Primary school	121	48.4
Middle school	80	32.0
High school	31	12.4
College or higher	18	7.2
Living with		
Spouse	105	42.0
Children	36	14.4
Spouse and children	99	39.6
Alone	10	4.0
Family income (Yuan/month)		
≤2,000	4	1.6
2,001~4,000	20	8.0
4,001~6,000	55	22.0
6,001~10,000	124	49.6
≥10,000	47	18.8
Occupation (prior to illness)		
Farmer	81	32.4
Worker	60	24.0
Businessman	17	6.8
Public officer	12	4.8
Other	5	2.0
Complication		
No	164	65.6
Yes	86	34.4
Duration after surgical treatment		
1 ~ 3 months	45	18.0
> 3 months to 6 months	54	21.6
> 6 months to 1 year	36	14.4
> 1 year to 2 years	42	16.8
> 2 years to 5 years	50	20.0
> 5 years	23	9.2

3.2 Descriptive statistics

The mean, standard deviations (SD), as well as ranges of the variables utilised in this research model are presented in Table 2. For each variable investigated, the kurtosis and skewness values were within the threshold of ± 1.96 (Table 2), indicating compliance with the assumption of normal distribution.[35]

Table 2 Descriptive statistics and test for normality of variables (N = 250).

Variables	Mean ± SD	Range	Skewness	Kurtosis
Disease stigma	57.33 ± 9.77	24 - 87	-0.57	1.90
Social Exclusion	19.12 ± 4.13	9 - 32	-0.14	1.44
Economic Insecurity	8.06 ± 1.90	3 - 12	-0.02	0.49
Internalized Shame	12.60 ± 2.85	5 - 20	-0.70	0.67
Social Isolation	18.10 ± 3.25	7 - 28	-1.01	1.8
Depression	57.11 ± 6.46	33 - 75	0.09	1.35
Self-efficacy	70.15 ± 13.59	25 - 100	-1.04	1.26
Self-care	70.15 ± 13.59	25 - 100	-0.29	1.10
Self-care maintenance	73.98 ± 15.25	25 - 100	-0.08	1.07
Self-care monitoring	69.65 ± 15.94	25 - 100	0.35	0.67
Self-care management	63.86 ± 15.91	10 - 100	0.55	1.32

3.3 Testing the structural model of self-care in patients with permanent colostomy

3.3.1 Hypothesized model testing

Analysis of the structural equation model, incorporating the hypothesized variables, yielded the following goodness-of-fit indices: χ^2 (CMIN) = 148.75 (p < 0.001, df = 23), CMIN/df = 6.47, TLI = 0.91, NFI=0.94, CFI = 0.94, and RMSEA = 0.119. These results indicated a poor fit between the proposed model and the observed data, with the model accounting for 67.8% of the total variance.

3.3.2 The model modification

Given the inadequate fit of the hypothesised model to the empirical data, a revision was necessary to improve the model's congruence with the data, entailing model modification [36]. The revised model's analysis revealed improved fit indices: χ^2 (CMIN) = 43.93 (p < .001, df = 19), CMIN/df = 2.31, TLI =0.97, NFI = 0.98, CFI = 0.98, and RMSEA = 0.058. This model elucidated 59.1% of the total variance (Figure. 2).
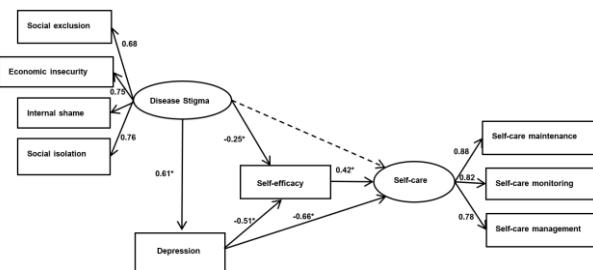
Figure 2 Path diagram for the revised model. χ^2 = 43.93 (P-value < 0.001, df = 19), CMIN/df = 2.31, TLI = 0.97, NFI = 0.98, CFI = 0.98, RMSEA = 0.058, * P-value < 0.001.

3.3.3 Analysis of the modified model

The analysis of the revised model (Fig. 2) identified statistically significant paths: from depression to self-care (β = -0.66, p < .001), from self-efficacy to self-care (β = 0.42, p < .001), from disease stigma to self-efficacy (β = -0.25, p < .001), from depression to self-efficacy (β = -0.51, p < .001), and from disease stigma to depression (β = 0.61, p < .001). However, the path from disease stigma to self-care showed no statistical significance, and it was removed. Modification indices for other paths were all <10.0, indicating no further paths required reevaluation.

3.3.4 Effectiveness analysis of the modified model

The direct, indirect, and total effects of factors on the self-care of patients with colostomies are delineated in Table 3. Depression impacted self-care with a total effect of -0.82, encompassing both a direct effect (-0.61) and an indirect effect (-0.21). Disease stigma exhibited the most substantial indirect effect on self-care (-0.66), and self-efficacy showed the direct effect (0.42) on self-care.

Table 3 Direct, indirect, and total effects in the revised model of self-care of the participants (N = 250).

Variable	Self-care			R²
	Direct effect	Indirect effect	Total effect	
Disease stigma	-	-0.66*	-0.66*	-
Depression	-0.61*	-0.21*	-0.82*	0.36
Self-efficacy	0.42*	-	0.42*	0.48

* P-value < 0.001; The explanation rate of self-care was 59.1%.

Discussions and Conclusion

The objective of this research was to develop a hypothetical model and ascertain the significance of direct/indirect pathways and the model's fit in accordance with theoretical hypotheses positing that psychological factors, including disease stigma, depression, and self-efficacy, influence self-care in patients with permanent colostomies. Based on the three hypotheses, the test outcomes were as follows:

H1: Disease stigma negatively impacts self-care directly, and also indirectly through self-efficacy and depression.

This study revealed no significant direct but indirect effect of disease stigma on self-care, through self-efficacy (β = -0.25, p < .001). Empirical support was not adequate for this hypothesis. The mean score (57.33±9.77) of disease stigma suggested it was at middle level, indicating that patients with permanent colostomies may experience self-devaluation and harbour negative perceptions regarding their condition [37]. Consistently, previous research has identified there was no direct correlation between self-care and disease stigma but in other chronic disease, for example, in the studies of diabetes patients, which confirmed self-stigma played indirect role in self-care, and lowers self-esteem and self-efficacy[38-39]. According to ScCI theory, patients need to interact with others and have strong social support to enhance self-care. Disease stigma due to the stoma make patients feel shamed and isolated. They are reluctant to socialise with others, and do not receive enough emotional support from others, leading a lack of self-efficacy and a decline in self-care. Thus, professional nurses should design programmes to lower disease stigma, raise self-efficacy and promote self-care.

In line with expectations, the study showed that disease stigma was significantly associated with self-efficacy (β = -0.25, p < .001), indicating that patients with elevated levels of self-efficacy are likely to exhibit greater confidence in overcoming challenges, experience less stigma, and have more favourable outcomes than those with lower self-efficacy levels[40]. Active engagement in problem-solving and confidence in coping strategies can reduce perceived stigma. Higher levels of stigma have been correlated with reduced self-efficacy. Individuals with lower self-efficacy often exhibit stronger reactions to discrimination or exclusion. This finding aligns with prior research [41], underscoring the interrelated relationship between self-efficacy and stigma.

The study indicated a significant association between disease stigma and depression (β = 0.61, p < .001), thereby supporting this aspect of the hypothesis. Disease stigma is linked with adverse psychological outcomes, including depression[42]. This relationship can be understood patients with colostomies having to endure involuntary defecation, exposure of intestinal mucosa, stool leakage, and malodour, leading to profound feelings of shame. Consequently, these individuals often face significant psychological stress post-surgery, which correlates with increased depression. Prior research has demonstrated a positive correlation between disease stigma and depressive symptoms [43], suggesting that higher levels of disease stigma are associated with elevated depression in patients with stoma.

H2: Depression negatively affects self-care both directly and indirectly through its impact on self-efficacy.

This hypothesis found support, with the finding showing a significant negative association between depression and self-care (β = -.0.66, p < .001). Depression likely influences self-care adversely due to core symptoms such as fatigue, lack of energy, hopelessness, and reduced motivation, leading to a diminished interest in activities and health behaviours [44]. In the ScCI theory, depression cause lack of motivation which is one personal factor affecting individual's self-care[45]. It has been suggested that depression primarily affects self-care [46], highlighting depression as a common psychological manifestation in chronic conditions that impairs self-care behaviours. In this study, the depression levels (mean score 57.11±6.46) among most patients with colostomies ranged from mild to moderate, underscoring the need to identify patients with depression, as even mild symptoms can be associated with poor self-care behaviours [47].

Additionally, the study demonstrated a significant negative relationship between depression and self-efficacy (β = -.0.51, p < .001), supporting this component of the hypothesis. This finding suggests that robust self-efficacy enhances personal accomplishment and well-being, thereby reducing stress and lowering susceptibility to depression. Patients exhibiting depressive symptoms often lack the self-efficacy required to manage physical and psychological stressors and to address interpersonal challenges. Self-efficacy embodies a proactive approach that motivates individuals to undertake beneficial actions to overcome difficulties and maintain well-being. Hence, higher self-efficacy in performing specific behaviours positively influences the ability to cope with depression[48]. Previous studies have consistently shown a negative correlation exists between patients' depression and self-efficacy; that is, higher levels of depression are connected with lower self-efficacy[49].

H3: Self-efficacy exhibits a positive direct impact on self-care.

This hypothesis received support, with the result indicating a significant positive association between self-efficacy and self-care (β = 0.42, p < .001). This finding suggests that self-efficacy in colostomy management— encompassing the confidence and capability to effectively initiate and modify motivations, cognitive resources, and

courses of action—is crucial for patients to proficiently manage their colostomy care. It has been established that low self-efficacy correlates with diminished confidence in self-care practices, leading to suboptimal self-care performance. Furthermore, previous research has demonstrated that self-efficacy directly influences the initiation and sustenance of self-care behaviours [50]. Within the theory of ScCI , self-efficacy is identified as a determinant of self-care[5], and individuals' self-care depends on their attitude and belief in their self-efficacy to achieve tasks and overpower obstacles. A notion corroborated by the findings of this study.

There were some limitations in this study. First, the recruitment for this study was conducted in Yancheng City, China, which may limit the generalisability of the findings to patients with permanent colostomies residing in other regions of China. Second, as a cross-sectional investigation, it was not possible to ascertain causative relationships with certainty. Future research would benefit from adopting a longitudinal study design to explore these relationships more conclusively. Third, we found gender, literacy, age, and time of discharge were related to self-care in other studies , and these variables could be added in later studies.

The findings from this investigation offer insights into the psychological factors that impact self-care among patients with permanent colostomies in China. These insights have profound implications for nursing practice. First, in this study, we explored the current psychological status of Chinese patients with permanent colostomies, and professional nurses would better understand the specific situations what is be beneficial for them to provide individualized care to patients. Second, the findings enable nurses and healthcare professionals to target perceived disease stigma, depression, self-efficacy, and self-care in Chinese patients with permanent colostomies, guiding the development and implementation of practical interventions aimed at enhancing patients' self-care capabilities. Third, the study encourages further research in varied communities and regions within China, enhancing the representativeness of samples and facilitating the generalization of results to broader contexts. Such research could extend to populations with other chronic diseases, contributing to the advancement of theoretical frameworks in this domain.

In conclusion, this research examined the determinants of self-care in Chinese patients with permanent colostomies,

developing a model to delineate both direct and indirect influences. The goodness-of-fit indices were within the recommended thresholds, affirming the structural model's validity. According to the model, disease stigma, depression, and self-efficacy accounted for 59.1% of the variance in self-care among colostomy patients. For professional nurses, these findings underscore the necessity of devising intervention programmes that effectively bolster self-efficacy and mitigate depression and disease stigma, thereby enhancing self-care practices among this patient cohort. In the future, it is recommended that expanding the study area beed and increasing the sample size to make the findings more representative. It is also suggested to add variables to the study in the model makes the study more comprehensive and in-depth.

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Conflicts of interest

The authors affirm that there are no conflicts of interest associated with this publication.

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