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Gauging the Effects of Self-efficacy, Social Support, and Coping Style on Self-management Behaviors in Chinese Cancer Survivors

KEY WORDS

Cancer survivors

Coping style

Self-efficacy

Self-management behavior

Social support

Background: Better self-management control in cancer survivors would benefit their functional status, quality of life, and health service utilization. Factors such as self-efficacy, social support, and coping style are important predictors of self-management behaviors of cancer survivors; however, the impact of these factors on self-management behaviors has not yet been empirically tested in Chinese cancer survivors. **Objectives:** The aim of this study was to examine how self-efficacy, social support, and coping style affect specific self-management behaviors. **Methods:** A secondary data analysis was completed from a cross-sectional study. A total of 764 cancer survivors were recruited in the study. Validated instruments were used to assess patients' self-efficacy, social support, and coping style. Structural equation modeling (SEM) was used to test the hypothesis. **Results:** The SEM model fits the data very well, with root mean square error of approximation (RMSEA) of 0.034; close-fit test cannot reject the hypothesis of root mean square error of approximation of 0.05 or less, comparative fit index of 0.91, Tucker-Lewis index of 0.90, and weighted root mean square residual of 0.82. For the measurement models in the SEM, all items loaded highly on their underlying first-order factors, and the first-order factors loaded highly on their underlying second-order factors (self-efficacy and social support, respectively).

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The model demonstrated that self-efficacy and social support directly and indirectly, via coping style, affect 3 self-management behaviors (ie, communication, exercise, and information seeking). **Conclusion:** Our results provide evidence that self-efficacy and social support impose significant direct effects, as well as indirect effects via coping style, on the self-management of cancer survivors. **Implications for Practice:** Our findings may help nurses to further improve their care of cancer survivors in terms of their self-management behaviors, specifically communication, exercise, and information seeking.

Cancer continues to be an enormous public health issue because of a growing and aging population and an increasing prevalence of unwholesome lifestyles. In 2012, there were approximately 14.1 million new cancer cases and 8.2 million cancer-related deaths worldwide, a huge burden both in developed and developing countries.[1] Based on the national estimates of cancer in China, cancer incidence and mortality are increasing, making cancer the leading cause of death since 2010 and a major public health problem.[2] Almost 22% of global new cancer cases and close to 27% of global cancer deaths occur in China.[3] Self-management (SM) could be viewed as a model that enables patients and families to achieve their own goals of care.[4] Self-management is described as those tasks that individuals undertake to deal with the medical, role, and emotional management of their health condition to monitor and manage disease symptoms and minimize the influence of illness on social function, emotional health, and interpersonal interaction, to gain a sense of control over their lives and enjoy a better quality of life.[5,6] Studies have described positive effects of SM interventions on improving functional status, health service utilization, and overall quality of life among cancer patients.[7–9] Self-management behavior in cancer patients varies because of different personal characteristics and disease adaptation levels. Factors, including physical and socioeconomic status, such as self-efficacy, social support, and coping style are important factors associated with SM behaviors of cancer survivors.

Self-efficacy is a psychological concept derived from Bandura's social cognitive theory[10] and is defined as "the conviction that one can successfully execute the relevant self-care behaviors in particular situation."[11] Self-efficacy has been identified as a powerful mediator of health-promoting behaviors. Previous studies showed that patients with higher self-efficacy are more likely to engage in effective strategies and demonstrate greater persistence in trying to achieve desired psychosocial and medical outcomes.[12] Self-management can be seen as a broad set of strategies developed to enable people to cope effectively and reduce the long-term impact of the illness. It is characterized by informed, activated patients collaborating with proactive health providers.[13]

Some research reports confirmed the relationship between self-efficacy and SM behavior. Liang et al[14] identified a positive link between self-efficacy and opioid adherence and offered some insights into the complex issues associated with patient SM of pain medication. The results of Curtin and colleagues'[15] study on chronic kidney disease showed that higher perceived self-efficacy scores were significantly associated with increased communication, partnership, self-care, and medication adherence behaviors. Sarkar et al[16] reported that self-efficacy was associated with SM behaviors in patients with diabetes, across both race/ethnicity and health literacy levels. In Lila's study, higher levels of self-efficacy were associated with more positive patient-centered communication.[17] In summary, although the relationship between self-efficacy and SM behavior was documented in multiple chronic diseases, there is limited research focusing on these constructs in cancer survivors in a Chinese population. Therefore, the magnitude of the associations between self-efficacy and SM behaviors deserves studying among patients with cancer in China.

Social support has a positive effect on health promotion behaviors in patients with cancer, thus resulting to a better health status. Social support is a major factor positively affecting patients' self-efficacy and SM behavior. Collie and colleagues[18] demonstrated that breast cancer patients who had higher social support for coping with stresses reported fewer difficulties in medical interactions. Schiøtz et al[19] reported social support to be significantly associated with health-promoting behaviors and well-being among patients with type 2 diabetes. According to Lee and Wang,[20] social support was positively correlated with self-care behaviors in hemodialysis patients. Amir et al[21] emphasized that the quality of life of patients with epilepsy could be improved by reinforcing their self-efficacy and that social support was a mediator between disease severity and self-efficacy.

Coping style is a person's characteristic strategies used in response to life situations. Coping is a dynamic process and consists of cognitive and behavioral effects to manage specific demands that are exceeding the resources of the person. Coping has 2 functions: (1) emotion focused (aiming at ameliorating the negative emotions associated with the stressor) and (2) problem focused (implying efforts to practically manage the cause of the stressor).[22] In coping with the threat of cancer, 2 important styles have been distinguished. The first concerns the degree to which an individual cognitively confronts herself/himself with the upcoming threat, and the second pertains to the degree to which an individual makes use of cognitive avoidance.[23,24] The process of coping with emotional and physical demands involves developing strategies for dealing with either immediate or possible problems and applying methods to handle the negative emotions that accompany the problem.[25,26] Zuuren and Dooper's study[23] demonstrated that coping style was significantly, although modestly, related to health promotion behaviors. Although in Mohamed's[27] research, coping style (active coping, accommodation,

and avoidance coping) was identified as having a mediating role with self-efficacy and social support in patients with cancer, it is far from clear how psychological coping style affects SM behaviors in patients with cancer.

From the previously mentioned findings, it is clear that self-efficacy, social support, and coping strategies are the 3 major variables affecting SM behaviors in patients with cancer. However, previous studies tend to consider the simple associative relationship between 2 variables or studied the variables as a single item instead of one with multiple dimensions.[21,28] Because there is a lack of research investigating in detail interrelationships among different domains of the 3 major variables, we analyzed these variables in a large sample of Chinese adults to address this issue. A systematic review revealed additional health behavior measures, such as physical exercises, communication with their physicians, and adherence to doctors' recommendations.[29] In this study, we focus on three of these specific measures of SM behaviors: communication with physicians, exercises activities, and information seeking.

The theoretical framework of this study is derived from Behaviour Change Wheel.[30] This framework wheel was composed of a 3-layer ring structure covering 7 policy categories, 9 intervention functions, and 3 essential conditions from outer to inside. The hub of this framework is a behavior system called COM-B, involving capability, opportunity, and motivation that interact to generate behavior that in turn influences these components. Capability is defined as the individual's skills to engage in the activity of focus. Coping style is related to the concept of capability based on cancer patients' knowledge and technical self-care. Motivation is defined as brain processes that energize and direct behavior. The core concept of a person's self-efficacy is the self-confidence to do something to promote SM behaviors, referring to communication, exercise, and information seeking in this study. Opportunity is defined as all the factors that lie outside the individual that make the behavior possible or prompt it. Social support from patients' families and the society prompts a more active behavior. Guided by the COM-B and previous research findings, we sought to examine how self-efficacy, social support, and coping style affected specific SM behaviors among Chinese adult cancer patients.

■ Methods

Study Design and Participant

We did a secondary data analysis in this study from a cross-sectional survey with a convenience sample of 764 cancer patients recruited from 6 oncology and general hospitals in Shanghai, Shandong, and Jiangsu Provinces of China during the period of February to October 2010. Sample size is determined by the minimum numbers needed to conduct structural equation modeling (SEM).[31] Approval of the study was received from the ethics committee of the Second Military Medical University (approval file number 2010LL008). Patients were included if they were (1) diagnosed with cancer, (2) 18 years or older, (3) willing to

be interviewed, (4) at least 6 months after the diagnosis of cancer, and (5) informed of their cancer diagnosis. Patients were excluded if they had a diagnosed mental disorder or cognitive impairment. Detailed information on recruitment approaches, eligibility criteria, ethical review, and data collection procedures are available in a previously reported study.[32]

■ Measures

Demographic and Disease-Related Measures

Demographic data collected included age, gender, marital status, education, lifestyle, and employment status. The type of cancer was also collected.

Self-efficacy

Self-efficacy was assessed using the Chinese version of the Strategies Used by People to Promote Health (C-SUPPH). The original scale, developed by Lev and Owen,[33] is a 29-item self-report measure of confidence in performing self-care strategies among patients with cancer and includes 3 subscales: positive attitude (16 items), stress reduction (10 items), and making decisions (3 items); a 5-point Likert scale is used, ranging from 1 (not at all confident) to 5 (highly confident). Higher scores indicate higher self-efficacy. The 3 subscales have good internal consistency, with coefficient α values of .92, .89, and .83, respectively.[34] The C-SUPPH contains 28 items (2 items with similar Chinese meaning combined into one) and the same 3 subscales, with Cronbach's α coefficients ranging from .849 to .970.[35]

Social Support

Social support was measured by the Social Support Rating Scale (SSRS), which was developed by Chinese scholar Xiao from the Mental Health Institution of the Hunan Medical University in 1986 and revised in 1994.[36] The 10-item scale measures 3 factors: objective support (3 items), subjective support (4 items), and use of support (3 items). Items 1 to 4 and 8 to 10 are rated on a 4-point Likert scale from 1 to 4, with 1 corresponding to the least amount of support and 4 corresponding to the greatest amount of support. Items 5 to 7 are measured on assigned actual numbers (eg, "take the initiative to participate and be active" is equal to 4 points). Therefore, the higher the scores, the higher is the degree of social support. A total score less than 33 represents low social support, a score of 33 to 45 represents moderate social support level, and a score greater than 45 represents high social support. The scale and 3 subscales are internally consistent, with Cronbach's αs ranging from .89 to .94.[37]

Coping Style

Coping style was self-assessed using the Brief Coping Orientation to Problems Experienced Scale developed by Carver.[38] This tool covers 14 distinct coping strategies as potential responses

to stressors, such as acceptance, positive reinterpretation, use of humor, denial, behavior disengagement, and avoidance strategies,[39] and the Guttman coefficient was 0.86.[40] We used 3 items responding to the cancer patients' coping strategies (confrontation, avoidance, and giving up)[41] and a dichotomous variable (1, face positively; 0, avoid or give up) for the study.

SM Behaviors

COMMUNICATION WITH PHYSICIANS

Communication with physicians was measured using the Communication with Physicians Scale (CPS). The Communication with Physicians Scale was developed by Lorig et al.[42] The 3 items of the scale were measured by asking the following questions when a participant visited his/her doctor: how often do you do the following: (1) prepare a list of questions for your doctor, (2) ask questions about the things you want to know and things you do not understand about your treatment, and (3) discuss any personal problems that may be related to your illness. A higher score indicates better communication with physicians. The Cronbach's α was .73. The Chinese version of the scale has been evaluated in the Chronic Disease Self-Management Program in Shanghai by Fu et al.[43] This scale was used to determine whether the behaviors regarding communication with healthcare providers varied among patients with different levels of self-efficacy and social support. In the current study, a 3-level ordinal measure was generated based on the composite score of the 3 items: 1, poor (score < 6); 2, medium (6 ≤ score ≤ 10); and 3, good (10 < score ≤ 15).

EXERCISES ACTIVITIES

Exercise activities were measured based on patients' responses to the following questions: (1) "Do you usually exercise (yes vs no)?" and (2) "How often do you exercise?", in which a 4-level ordinal measure of exercise was generated: 1, never; 2, less than once a week; 3, 1 to 3 times a week; and 4, more than 3 times a week.

INFORMATION SEEKING

Information-seeking behavior was measured by checking whether a patient ever attended the health education lecture or not (1, yes; 0, no).

■ Statistical Analysis

Structural equation modeling was used to test the hypothesis. All analyses were completed using the Mplus 7.0. Both self-efficacy and social-support are treated as second-order factors/latent variables. The first-order factors of stress reduction, decision-making, positive attitude, subjective and objective social support, and use of social support were treated as indicators of the latent variables, respectively. Self-management behaviors (ie, communication, exercise, information seeking) and coping are either ordinal or binary measures (see Measures section); the data were not normally distributed, so they were recoded accordingly, and the robust weighted least squares estimator was used for

model estimation by default in Mplus.[44] As such, the path coefficients linked to those endogenous variables are all Probit slope coefficients, representing the effects of predictors on the latent continuous variables of the observed ordinal and binary endogenous variables. Statistical significance was set as $P < .05$.

■ Results

Half of the sample was women (50.8%). The mean (SD) age of participants was 54.0 (15.1) years (median, 54.0 years). Approximately 48.3% of the sample had less than a high school education, 33.9% completed high school, and 17.8% had a college degree. Patients diagnosed with stomach or colorectal cancer accounted for approximately one-third of the sample (34.4%), and the remainder were diagnosed with lung cancer (20.3%), gynecological cancer (29.7%), and other cancers (15.6%), respectively (Table 1). Approximately 21.5% of the sample could not confront their disease status. Only 32.1% of the participants reported good communication with their physicians, and a very small portion of the sample (12.8%) reported doing physical exercise 3 times or more per week. In regard to information seeking, less than one-third of the participants (31.8%) reported information seeking (Table 2).

Table 3 shows the descriptive statistics of self-efficacy (C-SUPPH) by item and subscale. The reliabilities of the subscales (stress reduction, decision-making, and positive attitude) were estimated by Cronbach's α, ranging from .83 to .97, and the reliability for the overall C-SUPPH scale was 0.98. The corresponding figures for the subscale and scales of social support (SSRS) are shown in Table 4. The Cronbach's αs were .55 for use of social support, .64 for objective social support, and .68 for subjective social support. However, the α for the overall SSRS was .75. The Cronbach's αs of all the 3 subscales of SSRS were smaller than the cutoff point of .70, indicating large measurement errors in the scale item responses. Fortunately, measurement errors can be readily handled in SEM.

Based on model fit indices, 1 error covariance in the self-efficacy measurement model and 3 error covariances in the social support measurement model are specified as free parameters (Figure). The effects of the 2 second-order factors on SM behaviors (ie, communication, exercise, and information seeking) are tested with coping as a mediating variable. The SEM fits the data: root mean square error of approximation (RMSEA) of 0.034 (90% confidence interval, 0.031–0.036), close-fit test cannot reject the hypothesis of RMSEA of 0.05 or less ($P > .05$), comparative fit index of 0.91, Tucker-Lewis index of 0.90, and weighted root mean square residual of 0.82. For both self-efficacy (C-SUPPH) and social support (SSRS), all items highly loaded to their underlying first-order factors, and the first-order factors highly loaded to their underlying second-order factors (see the top panel of Table 5). The path coefficient estimates of the SEM are shown in the bottom panel of Table 5. Coping style has a significant positive effect on both communication (0.272, $P < .001$) and information seeking (0.183, $P = .004$) but no significant effect on exercise (−0.075, $P = .146$). Self-efficacy had significant positive effects on coping (0.262, $P < .001$)

Table 1 • Demographic and Disease-Related Characteristics of Cancer Patients

Variable	n (%)	Variable	n (%)
Gender		Cancer diagnosis	
Male	376 (49.21)	Lung cancer	155 (20.29)
Female	388 (50.79)	Uterine cancer	98 (12.83)
Age, mean (SD)	54.03 (15.13)	Gastric cancer	80 (10.47)
Employment status		Colorectal cancer	68 (8.9)
Full time	118 (15.45)	Breast cancer	65 (8.51)
Unemployed	237 (31.02)	Ovarian cancer	64 (8.38)
Retired	409 (53.53)	Hepatobiliary cancer	59 (7.72)
Marital status		Esophagus cancer	44 (5.76)
Married	645 (84.42)	Bone marrow neoplasms	34 (4.45)
Single	50 (6.54)	Bone neoplasms	16 (2.09)
Divorced or separated	69 (9.03)	Nose throat cancer	15 (1.96)
Educational level		Urinary neoplasms	15 (1.96)
No education at all	45 (5.89)	Pancreatic cancer	12 (1.57)
Primary school	141 (18.46)	Brain tumor	9 (1.18)
Secondary school	183 (23.95)	Others	30 (3.93)
High school	259 (33.90)		
College or higher	136 (17.80)		

and exercise (0.193, $P < .001$). It also significantly influenced communication indirectly via coping (0.071, $P = .003$) (Table 5). Social support had a positive direct effect on both communication (0.345, $P < .001$) and exercise (0.302, $P < .001$), but its direct effect on information seeking was only marginal (0.133, $P = .069$). Social support also affected SM behaviors significantly via various indirect paths: positive indirect effect on exercise via self-efficacy (0.105, $P < .001$), positive indirect effect on communication (0.039, $P = .003$) via self-efficacy and coping, and positive indirect effect on information seeking (0.026, $P = .024$) via self-efficacy and coping. The total indirect effect and total effect of social support were positive and statistically significant on all the 3 SM behaviors (see the bottom panel of Table 5). In addition, social support also significantly affected coping style via self-efficacy (0.142, $P < .001$).

Table 2 • Recoded Measures of Self-management Behaviors and Coping Style (N = 764)

Variable	n (%)
Coping style	
0, avoid or give up	164 (21.47)
1, face positively	600 (78.53)
Communication	
1, poor	245 (32.07)
2, medium	466 (60.99)
3, good	53 (6.94)
Exercise	
0, never	273 (35.73)
1, less than once a week	203 (26.57)
2, 1–3 times per week	190 (24.87)
3, ≥3 times per week	98 (12.83)
Information seeking	
0, no	521 (68.19)
1, yes	243 (31.81)

Self-efficacy had a significant positive effect on coping style (0.262, $P < .001$). In regard to its effects on the SM behaviors, it directly affected exercise (0.193, $P < .001$) but indirectly affected communication (0.071, $P = .003$) and information seeking (0.048, $P = .023$) via coping style.

■ Discussion

In our study, most participants reported a positive response pattern toward cancer, although their SM behaviors involving exercise and communication with doctors need to be improved. The number of participants in this study who initiated seeking health education lecture was less than 40%. It was possible that they preferred to seek information in Web sites or on the Internet or just ask doctors or nurses directly. All these indicate a need for an intervention for improving patients' knowledge about treatment and self-care skills. In addition, the SEM results on SM behaviors verified the relationship between self-efficacy and self-care behavior in a Chinese cancer sample, and the results are also clear about the associations within the 2 second-order factors (social support and self-efficacy) via the mediating variable of coping style. This model assists us in understanding SM behaviors in adult Chinese cancer patients. The relationship framework based on our SEM findings serves as a guide and supplement to previous research about the relationships among self-efficacy, social support, coping, and SM.

Our findings are similar to previous studies involving different ethnic groups. Beckham et al[45] examined the relationship between self-efficacy and psychological adjustment in American cancer patients and that the patients with higher self-efficacy had better psychological adjustment than those with lower self-efficacy. Self-efficacy has been identified as a significant predictor of an active adjustment style and emotional well-being in patients with cancer in recent studies.[46,47] Our findings show that

Table 3 • Descriptive Statistics of Self-efficacy (C-SUPPH) by Item and Subscale

Item	Item #	Mean (SD)
Stress reduction		26.75 (8.02) (α = .94)
Excluding upsetting thoughts from my consciousness	SE1	2.87 (1.11)
Using relaxation techniques to decrease my anxiety	SE2	3.04 (1.04)
Finding ways of alleviating my stress	SE3	2.97 (1.06)
Doing things that helped me to cope with previous emotional difficulties	SE4	2.97 (1.06)
Practicing stress reduction techniques even when I'm feeling sick	SE5	2.96 (1.06)
Managing to keep anxiety about illness from becoming overwhelming	SE6	2.99 (1.11)
Thinking of myself as better off than people who became ill when they were younger than I am now	SE7	2.98 (1.08)
Focusing on something not associated with my illness as a way of decreasing my anxiety	SE8	2.97 (1.03)
Believing that using a technique to manage treatment stress will actually work	SE9	3.00 (1.06)
Making decisions		9.22 (2.93) (α = .83)
Choosing among treatment alternatives recommended by my physician the one that seems right for me	SE10	3.14 (1.08)
Making my own decision regarding treatment alternatives	SE11	3.02 (1.12)
Deciding for myself whether or not to have treatment	SE12	3.06 (1.18)
Positive attitude		48.10 (14.90) (α = .97)
Experiencing life's pleasures since I became ill	SE13	3.02 (1.15)
Doing special things for myself to make life better	SE14	3.12 (1.15)
Convincing myself I can manage the treatment stress	SE15	2.92 (1.13)
Helping other people going through illness and treatment	SE16	2.92 (1.14)
Convincing myself the treatment is not so bad	SE17	3.09 (1.09)
Keeping my stress within healthy limits	SE18	3.00 (1.09)
Appreciating what is really important in life	SE19	3.03 (1.08)
Believing I can find strength within myself for healing	SE20	3.02 (1.12)
Convincing myself I'll be O.K.	SE21	3.05 (1.16)
Finding a way to help me get through this time	SE22	3.00 (1.07)
Believing that I really have a positive attitude about my state of health	SE23	3.09 (1.11)
Doing things that helped me to cope with previous physical difficulties	SE24	2.97 (1.07)
Doing things to control my fatigue	SE25	2.86 (1.08)
Finding ways of helping myself feel better if I am feeling blue	SE26	2.99 (1.08)
Managing the side effects of treatment so that I can do things I enjoy doing	SE27	2.98 (1.12)
Dealing with the frustration of illness and treatment	SE28	3.03 (1.10)
Total score of self-care self-efficacy	SE1-SE28	84.11 (24.47) (α = .98)

self-efficacy has a significant direct positive effect on an important SM behavior—exercise. Such a positive correlation between self-efficacy and exercise behaviors has also been confirmed in diabetes,[48] dementia,[49] and heart disease[50] patients in Asia, Europe, and the United States. In summary, self-efficacy should be an important therapeutic target for clinical interventions to improve exercise behaviors among patients with cancer. There are programs that can be adopted to help patients achieve successful performance and desired behaviors through improving their self-efficacy.[5]

Table 4 • Descriptive Statistics of Social Support (SSRS) by Item and Subscale

Item	Item #	Mean (SD)
Subjective social support		25.63 (4.89) (α = .68)
How many friends do you have who can provide support and help to you?	SS1	3.13 (0.84)
How is your relationship with your neighbors?	SS3	3.07 (1.06)
How is your relationship with your colleagues?	SS4	3.14 (1.00)
How is the support you can get from family members (spouse, parents, children, brothers and sisters, others)?	SS5	16.30 (3.59)
Objective social support		10.36 (3.64) (α = .64)
How is your living situation in the past year?	SS2	3.67 (0.85)
What are your financial support resources when you are in emergency trouble?	SS6	3.10 (1.78)
What are your emotional support resources when you are in emergency trouble?	SS7	3.60 (1.93)
Use of social support		7.69 (2.10) (α = .55)
How do you usually talk about your trouble?	SS8	2.62 (0.98)
How do you usually ask for help when you are in trouble?	SS9	2.89 (0.97)
How do you engaged to social activities?	SS10	2.17 (0.95)
Total score of social support	SS1–SS10	43.68 (8.19) (α = .75)

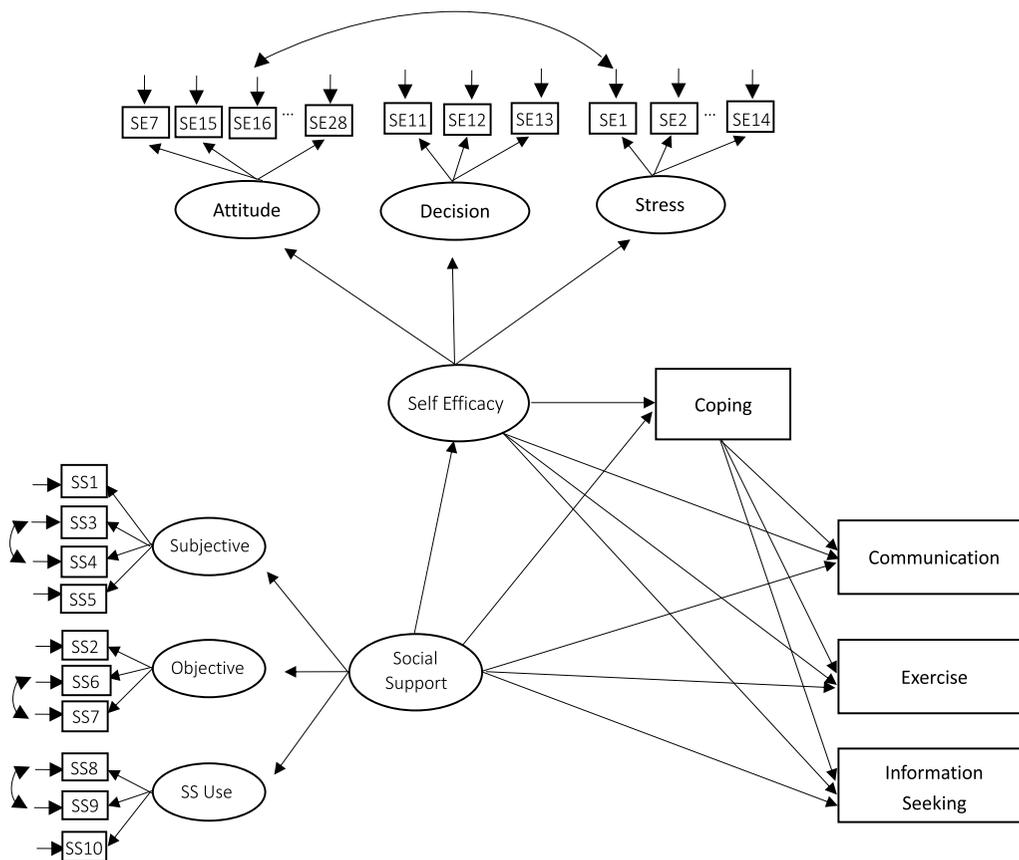Abbreviation: SSRS, Social Support Rating Scale.

Figure ■ Structure equation model on self-management behaviors.

The SEM results demonstrated that social support directly affected 2 SM behaviors (communication, 0.345, $P < .001$; and exercise, 0.302, $P < .001$). This finding was similar to studies conducted by Kamimura et al[51] and Chair et al,[52] where social support was an important factor in increasing exercise motivation among female free clinic patients and exercise efficacy among coronary artery disease patients. There is extensive research recognizing the importance of involving caregivers, spouses, or partners in educational and psychosocial interventions.[53] In supporting the effects of communication, Bartlett et al[54] found that good communication skills on the part of the physician played a positive effect on patients' satisfaction, recall, and adherence. Furthermore, Han et al[55] documented that breast cancer patients who received less social support from spouses, other family members, and friends were more likely to feel dissatisfied with their medical team and experience more interaction problems. These findings suggest the need to expand support sources through different strategies that promote patient communication with physicians or families, as well as engaging in exercises. We also conclude that good social support significantly and positively affects communication, information seeking, coping style, and exercise via self-efficacy. To better promote healthy behaviors, we need to enhance patients' self-efficacy and provide social support. Our results also show that the effects of social support on coping were positive and statistically significant. The complicated effect of social support on SM behaviors via coping style and self-efficacy is depicted in the theoretical framework of Behaviour Change Wheel, indicating that opportunities can influence capability

and motivation. Therefore, we can conclude that social support plays a vital role in promoting better SM behaviors.

Previous research on coping with cancer indicates that perceptions of control and active coping styles are associated with a more positive adjustment to cancer.[56] Some studies suggest that SM behaviors and self-care abilities tend to be positive coping styles.[57,58] The results of our study found that coping style significantly and positively affected communication and information seeking, although it did not affect exercise. Patients using confrontation coping style were more likely to communicate with the physician and seek disease-related information. This finding is similar to that of Collie and colleagues,[18] who reported that breast cancer women in rural communities who scored higher on the self-distraction subscale of the coping measure were less likely to report difficulties interacting with their healthcare providers. It seems that patients who actually seek information, distract self, or use other such strategies may have less difficulty in communicating or interacting with healthcare professionals. Our results demonstrated that self-efficacy had a significant indirect positive effect via coping on both communication and information seeking. Although coping style as a mediating factor was tested in our study, we would argue that improving coping style without improving self-efficacy is not sufficient to improve communication or self-care. Maliski et al[59] reported that prostate cancer patients with lower self-efficacy may have had lower confidence in their ability to communicate their concerns, ask questions, or express expectations for treatment, perhaps leading to diminished satisfaction. Of note, Mohamed[27] examined the effect of coping style on

Table 5 • Results of Structural Equation Model[a]

Measurement Model (First-Order Factor Loadings)

	Self-Efficacy				Social Support		
Item	Stress	Decision	Attitude	Item	Subjective	Objective	Use
SE1	0.81			SS1	0.61		
SE2	0.84			SS3	0.59		
SE3	0.82			SS4	0.73		
SE4	0.81			SS5	0.45		
SE5	0.82			SS2		0.26	
SE6	0.81			SS6		0.47	
SE8	0.79			SS7		0.52	
SE9	0.82			SS8			0.54
SE13	0.81			SS9			0.39
SE14	0.83			SS10			0.59
SE11		0.88					
SE12		0.81					
SE13		0.66					
SE7			0.70				
SE15			0.84				
SE16			0.81				
SE17			0.82				
SE18			0.85				
SE19			0.92				
SE20			0.82				
SE21			0.83				
SE22			0.84				
SE23			0.86				
SE24			0.86				
SE25			0.83				
SE26			0.83				
SE27			0.80				
SE28			0.85				

Measurement Model (Second-Order Factor Loadings)

Overall Self-Efficacy		Overall Social Support	
Stress	0.98	Subjective	0.97
Decision	0.81	Objective	0.87
Attitude	0.94	Use	0.89

Structural Model

	Self-Efficacy	Coping	Communication	Exercise	Information Seeking
Coping					
Direct effect			0.272 ($P < .001$)	−0.075 ($P = .146$)	0.183 ($P = .004$)
Social support					
Direct effect	0.543 ($P < .001$)	0.133 ($P = .086$)	0.345 ($P < .001$)	0.302 ($P < .001$)	0.133 ($P = .069$)
Specific indirect effect 1	→	0.142 ($P < .001$)	0.012 ($P = .685$)	0.105 ($P < .001$)	0.038 ($P = .287$)
Specific indirect effect 2		→	0.036 ($P = .066$)	−0.010 ($P = .309$)	0.024 ($P = .109$)
Specific indirect effect 3	→	→	0.039 ($P = .003$)	−0.011 ($P = .140$)	0.026 ($P = .024$)
Total indirect effect		0.142 ($P < .001$)	0.087 ($P = .005$)	0.084 ($P = .003$)	0.089 ($P = .017$)
Total effect		0.276 ($P < .001$)	0.432 ($P < .001$)	0.386 ($P < .001$)	0.222 ($P < .001$)
Self-efficacy					
Direct effect		0.262 ($P < .001$)	0.022 ($P = .686$)	0.193 ($P < .001$)	0.071 ($P = .285$)
Indirect effect		→	0.071 ($P = .003$)	−0.020 ($P = .139$)	0.048 ($P = .023$)
Total effect			0.093 ($P = .082$)	0.173 ($P < .001$)	0.119 ($P = .057$)

Model fit: RMSEA = 0.034 (90% CI, 0.031–0.036); close-fit test, $P = 1.000$
CFI = 0.91, TLI = 0.90, WRMR = 0.82

The arrow sign (→) indicates the mediating variable an indirect effect went through.
Abbreviations: CI, confidence interval; CFI, comparative fit index; TLI, Tucker-Lewis index; WRMR, weighted root-mean-square residual.
[a]Factor loadings and path coefficients reported in the table are from a standardized solution.

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self-efficacy and personal growth among cancer patients and found that direct effects of self-efficacy on personal growth were not significant when active coping was specified as a mediator between self-efficacy and personal growth. The mechanism of the interaction between self-efficacy and coping style in adjustment to cancer is by no means clear, and further investigations need to be conducted to provide evidence to clarify this interaction.

Our findings may help nurses to further improve their care of cancer survivors in terms of their SM behaviors, specifically communication, exercise, and information seeking. Future nursing interventions for promoting SM behaviors among cancer patients could be considered based on a comprehensive framework, including elements of self-efficacy, social support, and coping style.

■ Limitations

Structural equation modeling provided a more comprehensive view of the relationships of variables of social support, self-efficacy, and coping style with SM behaviors. However, our study was a cross-sectional investigation, limiting our ability to determine the causal pathways to illustrate the cause and effect among these variables.

■ Recommendations for Future Research

The process of Chinese cancer patents' coping with disease seems to be complicated. In this study, we enhanced our understanding of the effect of positive or negative coping style on social support, SM behaviors, and self-efficacy. Future research should focus on examining the coping mechanism directly.

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