Coping Profiles Differentiate Psychological Adjustment in Chinese Women Newly Diagnosed With Breast Cancer

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Abstract

Objective. The study aimed to explore latent profiles of coping in Chinese women newly diagnosed with breast cancer and examine the differences of psychological distress, demographic, and medical characteristics across profiles. *Methods.* Latent profile analysis was used to identify 3 classes of copers based on data from 618 Chinese women newly diagnosed with breast cancer who completed questionnaires assessing their coping strategies and psychological distress. *Results.* "Adaptive coper," reporting most use of adaptive cognitive coping strategies, behaviors of acceptance and shifting attention, and least use of maladaptive cognitive coping strategies, had the best psychological adjustment. "Negative coper," characterized by most use of maladaptive cognitive coping strategies, least use of adaptive cognitive coping strategies except "putting in perspective," and median levels of medical coping behaviors, had the worst psychological adjustment. "Inconsistent coper," with great use of all cognitive coping strategies, and most behaviors of fighting against the disease, and fewest behaviors of attention shift, had relatively high levels of psychological distress. Younger age, less education, shorter time since diagnosis, widowed, living in rural areas, and undergoing chemotherapy are possible markers for patients with less adaptive coping patterns. *Conclusions.* Interventions should be developed according to the different coping profiles of patients, and the key group to target is "negative copers," who may benefit from cognitive behavioral approaches that combine emotion, cognition and behavior, which could help them more effectively appraise and cope with stressful events.

Keywords

Introduction

Breast cancer has become the most frequently diagnosed cancer in Chinese women.[1] In 2008, the age-standardized incidence rate and mortality rate was 21.6/100 000 and 5.7/100 000, respectively, in China, accounting for 12.2% of all newly diagnosed breast cancers and 9.6% of all deaths from breast cancer worldwide.[2]

Women often display significant stress responses after being informed of the diagnosis of breast cancer. A set of such patients suffer from clinically significant levels of depression and anxiety.[3,4] In the study by Burgess et al,[5] nearly 50% of the women with early breast cancer experienced distress in the year after diagnosis, and 15% even in the fifth year, and their physiological function[6,7] and quality of life were negatively affected.[8] Whereas some patients suffered from distress, some other patients reported positive psychological adjustment and better mental health.[9]

Previous studies found that a large part of the differences of psychological responses among patients were due to their different ways of coping.[10,11]

According to Monat and Lazarus,[12] coping is "an individual's efforts to manage the internal and external demands

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that are appraised (or perceived) as exceeding or taxing his or her resources." It is a multidimensional construct, encompassing both cognitive and behavioral regulatory processes. Individuals differ in their coping styles when dealing with stressful situations. These differences are reflected not only in a single coping strategy[13-15] but also in coping profiles.[16,17] Researchers define a coping profile as the simultaneous deployment of multiple strategies by individuals.[18] Adopting the typological approach, some studies revealed that effective copers and less effective copers coexist in many populations, and identified 3 to 4 major coping profiles in general adult population[19-22] and 2 to 4 in the clinical community.[23-25] Variability in coping profiles was found to be associated with individual differences in psychological and somatic outcomes. Individuals who were effective in coping, compared with those less effective in coping, tended to report lower anxiety and depression level, fewer psychosomatic symptoms, and higher level of quality of life.[19,26,27]

Previous studies, mostly taking a dichotomous view of coping (such an approach has neglected the multivariate nature of coping and the possibility that patients may use more than one coping strategy during a stressful situation), showed that coping strategies among women with breast cancer differed on some demographic variables such as age, education, and the time since diagnosis.[28,29] And only 2 studies, to our knowledge, considering multiple coping strategies in women with breast cancer by traditional person-oriented methods, found that there were 3 different profiles of coping strategies (named low cognitive avoiders and moderate approachers, high cognitive avoiders and low approachers, and moderate cognitive avoiders and high aproachers in the study by Hack and Degner[30]) and further found that patients with different coping profiles showed significantly different distress changes across time.[31]

However, existing research only tried to find what coping strategies were used commonly by Chinese women with breast cancer and explore the relationships between distress and a single strategy.[32,33] The coping profiles considering both the cognitive and behavioral components of coping in Chinese women with breast cancer remain unstudied. It is important to overcome that lack of knowledge, as the adaptational significance of any given coping strategy is highly context dependent. For any coping strategy, it can be beneficial for individuals if used under some conditions, and harmful if used under others. Sideridis[34] has argued that the adoption of more than one coping strategy at a given time may be more adaptive than that of a single strategy.[34] Thus, to arrive at meaningful conclusions, studies on the relationship between coping and distress should therefore not focus on a single coping strategy but on multiple coping strategies simultaneously. We also need to explore the predictive factors of coping profiles in patients shortly after diagnosis. Therefore, the first purpose of the current study was to explore profiles of coping in women newly diagnosed with breast cancer. The second purpose was to examine if psychological distress (anxiety and depression) would differ across coping profiles. The third purpose was to test demographic and medical characteristics of patients with different coping profiles. The study would provide a deeper understanding of how different women newly diagnosed with breast cancer cope with the specific situation, and allow us to identify targeted groups that need psychological help most, and therefore may help tailor interventions.

Methods

The study was conducted from January 2011 to June 2012 and approved by the Ethics Committee of the Second Xiangya Hospital, Central South University.

Participants

Women newly diagnosed with breast cancer at 2 hospitals in Changsha, Hunan Province, China, were invited to participate in this study. Eligible patients met the following criteria: (1) diagnosed with and informed of stage I or II breast cancer within a month (by biopsy) and (2) ability to speak Chinese. Patients with the following conditions were excluded: (1) breast cancer recurrence, (2) known untreated or unstable major medical condition other than breast cancer, (3) known major psychiatric or neurological disorder that would interfere with completion of the measures, and (4) history of substance abuse.

The final sample included 618/684 (90.4%) patients who participated in the study; 5 patients declined participation after being informed of the study aims and procedure, 5 patients met one or more exclusion criteria, and 56 patients did not complete all the questionnaires.

Data Collection

After participants provided informed consent, trained psychology students administered structured questionnaires in face-to-face interviews to collect information on sociodemographic and medical characteristics, cognitive emotion regulation strategies, medical coping strategies, depressive and anxiety symptoms from participants.

Measures

The following demographic and medical data (external variables) were collected: age, years of education, long-term area of residence (urban/rural), marital status, employment status, stage of disease, time since diagnosis and therapy type.

Cognitive Emotion Regulation Strategies. The 36-item Cognitive Emotion Regulation Questionnaire (CERQ) was the first instrument developed to explicitly measure cognitive strategies that individuals may use in response to threatening or stressful life events.[35] It can be used to measure

general coping style (trait) or response to a specific event (state). The CERQ contains 9 conceptually distinct subscales: 5 for adaptive strategies (acceptance, positive refocusing, refocusing on planning, positive reappraisal, and putting into perspective) and 4 for maladaptive strategies (self-blame, rumination, catastrophizing, and blaming others). Each subscale consists of 4 items, for example, self-blame (eg, "I think that basically the cause must lie within myself"), acceptance (eg, "I think that I must learn to live with it"), rumination (eg, "I dwell upon the feelings the situation has evoked in me"), positive refocusing (eg, "I think about pleasant experiences"), refocus on planning (eg, "I think about a plan of what I can do best"), positive reappraisal (eg, "I look for the positive sides to the matter"), putting into perspective (eg, "I tell myself that there are worse things in life"), catastrophizing (eg, "I continually think how horrible the situation has been"), and blaming others (eg, "I feel that basically the cause lies with others"). Item responses are structured by a 5-point Likert-type scale ranging from 1 [(almost) never] to 5 [(almost) always]. Subscale scores are obtained by summing component item scores (range, 4-20), with higher scores indicating greater use of a certain cognitive coping strategy. The CERQ can be used to measure general coping style (trait) or response to a specific event (state). The CERQ and the Chinese version of this instrument (CERQ-C) have shown good reliability and validity.[35,36] The CERQ-C was used in the present study, and the subscales had good internal consistency, with Cronbach's α coefficients ranging from .76 (putting into perspective) to .97 (blaming others).

Medical Coping Strategies. The 19-item Medical Coping Modes Questionnaire (MCMQ)[37] was designed to assess 3 coping strategies that individual may use when facing life-threatening illnesses: confrontation, avoidance and acceptance-resignation. The Chinese version of MCMQ (MCMQ-C) contains 20 items (1 item was added in order to maintain the original meaning of the questionnaire when it was translated into Mandarin Chinese).[38] For each item, participants choose the response from the 4 options that best represents his or her experience (1 = none at all; 2 = a few; 3 = quite a few; 4 = a lot). Eight of the 20 items are reverse-scored. Subscale scores are obtained by summing component item scores (range = 8-32 for confrontation; 7-28 for avoidance; 5-20 for acceptance-resignation). Higher scores indicate that individual has more behaviors described by that specific coping scale when dealing with medical events. The MCMQ-C was used in the present study, and the subscales had good internal consistency, with Cronbach's α coefficients as follows: confrontation, .74; avoidance, .73; acceptance-resignation, .83.

Anxiety and Depressive Symptoms. The 14-item Hospital Anxiety and Depression Scale (HADS) is a self-report screening scale that was originally developed to indicate the possible presence of anxiety and depressive states in the setting of a medical outpatient clinic.[39] The HADS contains two 7-item scales: one for anxiety and one for depression both with a score range of 0 to 21. The Chinese version of HADS (HADS-C) keeps all the items and the 2-factor structure of the original scale.[40] The HADS-C was used in the present study, and Cronbach's α coefficient was .88 and .90 for anxiety subscale and depression subscale, respectively.

Data Analyses

G*Power 3[41] was used for estimation of sample size in this study. Sample size was calculated using a 1-way analysis of variance (ANOVA) test with the parameters α = 5% (2-sided), 1 − β = 95% and a medium effect size (f = 0.25). The number of groups was set as three according to the result of previous study.[30,31] These calculations indicated that the smallest sample size needed for the present study was 252 participants.

Analyses were performed using SPSS 18.0 and Mplus 7.1 software.[42,43] Latent profile analysis (LPA) was used to identify profiles of coping based on scores of the 9 subscales of the CERQ-C and the 3 subscales of the MCMQ-C after transforming scores into standardized z-scores. LPA is a technique that uses maximum likelihood estimation to classify individuals who are similar on several observed variables, with the assumption that the patterns of values are determined by latent person profiles or groupings. LPA assigns membership on the basis of probabilities and is able to take uncertainty of membership, or error, into account.[44] LPA is better than traditional person-oriented methods, such as cluster analysis, as it is model-based and has more rigorous criteria for identifying the number of profiles. Determination of best model fit was assessed by Akaike information criterion (AIC), Bayesian information criterion (BIC), adjusted Bayesian information criterion (adjusted BIC), the entropy criterion and Lo-Mendell-Rubin adjusted likelihood ratio test (LMRT). Lower AIC and BIC values indicate better optimal model fit. Entropy is an index that determines the accuracy of classifying individuals into different profiles or classes, with higher values indicating better class solution. Finally, $P < .05$ of the LMRT indicates that the "higher class" solution fits better (eg, 2-class better than 1-class). $P > .05$ indicates that the "lower class" solution fits better.

Differences in coping strategies and psychological distress across classes were analyzed by means of ANOVA. The chi-square test and ANOVA were used to examine the associations between coping profiles and demographic and medical characteristics. Bonferroni correction was used for multiple comparison correction; η^2 was used as the effect size of ANOVA.

Table 1. Demographic and Medical Data of the Study Sample.

Characteristic	n	%
Age, years, mean (SD)	45.56 (6.41)	
Years of schooling, mean (SD)	10.14 (3.29)	
Place of residence		
Urban	298	48.2
Rural	320	51.8
Marital status		
Married	581	94.0
Widowed	12	1.9
Divorced	25	4.0
Employment status		
Employed	477	77.2
Housewife	112	18.1
Retired	29	4.7
Stage of disease		
I	513	83.0
II	105	17.0
Weeks since diagnosis, mean (SD)	1.73 (1.40)	
Therapy type		
Mastectomy	209	33.8
Chemotherapy	87	14.1
Mastectomy with chemotherapy	322	52.1

Results

Descriptive Characteristics

The demographic and medical characteristics of the 618 women newly diagnosed with breast cancer who participated in this study are shown in Table 1. The patients' age ranged from 26 to 66 years (mean = 45.56 years, SD = 6.41) years. Patients who were from urban and rural areas, respectively, accounted for 48.2% and 51.8% of the total sample. Most (94.0%) patients were married, 4.0% were divorced, and 1.9% were widowed. They had received a mean of 10.14 years (SD = 3.29) of education. Most (77.2%) patients were employed, 18.1% were housewives, and 4.7% were retired. The time since diagnosis for patients ranged from 1 to 4 weeks. All patients were receiving medical treatment at the time of study participation. Thirty-four percent of the patients had just undergone mastectomy and were still receiving postoperative anti-inflammatory therapies, 14.1% had been undergoing chemotherapy, and 52.1% had been undergoing chemotherapy after mastectomy.

The scores on CERQ-C, MCMQ-C, and HADS-C of patients are presented in Table 2. For the cognitive coping strategies, refocusing on planning and acceptance had the highest mean score (13.70 and 13.53 respectively, both >12.00), whereas blaming others had the lowest mean score (9.53). In terms of behavioral coping strategies, whereas confrontation and resignation were reported as being used more often (mean scores > the half range), avoidance was reported as being used less often (mean scores < the half range). Patients' scores on the HADS-C ranged widely, from 0 to 17 and 0 to16 for anxiety subscale and depression subscale, respectively. Anxiety subscale scores were 8 to 10 for 13.4% of breast cancer patients and ≥11 for 19.7% of patients; 19.2% and 12.9% of patients had depression subscale scores of 8 to 10 and ≥11, respectively.

Latent Profile Analysis

The plausibility of 1-, 2-, 3-, and 4-class solutions were investigated. Classes were added iteratively to determine the best model fit for the data according to both statistical and interpretive perspectives. As shown in Table 3, the 2-class solution was better than the 1-class solution due to lower AIC and BIC values and a significant LMRT value. The 3-class solution, though with a lower Entropy value, was considered better than the 2-class solution, as evidenced by both lower AIC and BIC values as well as the significance of the LMRT value. The 4-class solution, despite having the lower AIC and BIC values and a higher Entropy value than the 3-class solution, was not statistically different from the 3-class solution in terms of the LMRT value. As a result, the 3-class solution was the best-fitting model.

The descriptive statistics and comparisons of each strategy across the 3 coping profiles were presented in Table 4. Also, the classes expressed in standardized scores were showed in Figure 1. Based on the means of scores, the 3 identified classes were (1) "Adaptive coper," accounting for 28.5% (n = 176) of the sample, was characterized by most use of the adaptive cognitive coping strategies and least use of the maladaptive cognitive coping strategies. This class displayed the most behaviors related to acceptance of the disease and attention shift. (2) "Inconsistent coper," accounting for 36.2% (n = 224) of the sample, used all cognitive coping strategies greatly (both adaptive and maladaptive). This class of patients had most behaviors related to fighting against the disease and fewest behaviors of attention shift. (3) "Negative coper," accounting for 35.3% (n = 218) of the sample, used the maladaptive cognitive coping strategies most intensely and the adaptive cognitive coping strategies least intensely except the strategy of "putting in perspective." This class had the median levels of medical coping behaviors.

Differences in Anxiety and Depression Between Classes

The results of ANOVAs indicated that depression and anxiety differed significantly (P < .001) across the 3 coping profiles. Table 4 presents the results of post hoc comparison using Tukey's HSD (honestly significant difference). The adaptive copers had the lowest levels of anxiety symptoms

Table 2. Scores on CERQ-C, MCMQ-C, and HADS-C of the Patients.

	Mean	SD	Range
CERQ-C			
Self-blame	11.22	3.564	4-20
Acceptance	13.53	3.067	8-20
Rumination	10.16	3.339	4-20
Positive refocusing	10.58	3.339	4-20
Refocus on planning	13.70	3.055	4-20
Positive reappraisal	11.81	3.214	4-20
Putting in perspective	10.12	2.258	4-20
Catastrophizing	10.58	3.409	4-20
Blaming others	9.53	3.250	4-20
MCMQ-C			
Confrontation	20.22	1.698	14-26
Avoidance	13.70	2.222	9-21
Resignation	13.93	1.279	9-19
HADS-C			
Anxiety	6.02	4.067	0-17
Depression	5.31	4.233	0-16

Abbreviations: CERQ-C, Cognitive Emotion Regulation Questionnaire–Chinese version; MCMQ-C, Medical Coping Modes Questionnaire–Chinese version; HADS-C, Hospital Anxiety and Depression Scale–Chinese version.

Table 3. Model Fit Indices for the 1-, 2-, 3-, and 4-Class Solution.

	AIC	BIC	Adjust BIC	Entropy	LMRT
1-Class	35766.379	35872.614	35796.419		
2-Class	34776.917	34940.697	34823.228	0.803	<.001
3-Class	34537.361	34758.686	34599.945	0.775	<.001
4-Class	34377.730	34656.599	34456.585	0.820	.199

Abbreviations: AIC, Akaike information criterion; BIC, Bayesian information criterion; LMRT, Lo-Mendell-Rubin adjusted likelihood ratio test.

and depressive symptoms, followed by the inconsistent copers, and the negative copers had the highest levels of psychological distress.

Differences in External Variables Between Classes

The age, years of education, and weeks since diagnosis were significantly different across 3 coping profiles (Table 4). The adaptive copers were oldest and have received the longest years of education. The negative copers were youngest, have received the shortest years of education and had the shortest time since diagnosis. The results of profile (3) × residence (2) chi-square test of association indicated significant differences between urban and rural areas among the 3 coping profiles ($\chi^2_{(2)} = 50.833$, $P < .001$); the adaptive copers mainly consisted of patients living in the urban areas whereas the maladaptive copers mainly consisted of patients living in the rural areas. The chi-square test between profile and marital status/ therapy type showed the three coping profiles were significant different in marital status ($\chi^2_{(4)} = 10.386$, $P < .05$) and therapy type ($\chi^2_{(4)} = 48.051$, $P < .001$); compared with maladaptive copers, the adaptive copers consisted of more patients who were divorced and still receiving postoperative anti-inflammatory therapies, and less patients who were widowed and had been undergoing chemotherapy. No differences were found in employment status ($\chi^2_{(4)} = 6.896$, $P > .05$) and disease stage ($\chi^2_{(2)} = 1.849$, $P > .05$) between profiles (Table 4).

Discussion

The study developed a typology of cognitive coping and behavioral coping by applying LPA to data from 618 Chinese women newly diagnosed with breast cancer. Based on multivariate coping responses on the CERQ-C and the MCMQ-C, patients represent a heterogeneous population with 3 distinctively different coping subtypes. Compared with inconsistent copers and negative copers, adaptive copers (similar to the findings of Doron et al[19]) reported more use of acceptance, positive refocusing, refocus on planning, positive reappraisal, avoidance and resignation, less use of self-blame, rumination, catastrophizing, and blaming others. Inconsistent copers (as mentioned in the study by Walker et al[26]) used a relatively high degree of most coping strategies, except for confrontation and avoidance. That is, inconsistent copers reported most use of confrontation and least use of avoidance among the 3 types of copers. Negative copers (definite as "avoidant copers" by Doron et al[19]) displayed most use of self-blame, rumination, catastrophizing, and putting in perspective; least use of acceptance, positive refocusing, refocus on planning and positive reappraisal, and relatively less medical coping behaviors among the three groups. It's worth noting that the effect sizes were relatively small for the MCMQ constructs, which implied that the differences in coping among women with breast cancer were mainly within the cognitive component; in other words, the similar behaviors showed by the patients were associated with completely different cognitive basis. Though previous cluster-analytic studies had examined coping strategies in terms of "profiles" among women with breast cancer,[27,45] results of our study brought additional insights to the coping literature among the population by providing a deeper understanding of the combined use of several cognitive and behavioral coping strategies to deal with life-threatening events.

Our study revealed that patients' anxiety and depressive symptoms differed significantly across coping profiles. Adaptive copers reported the best psychological adjustment, with the lowest levels of anxiety and depression

Table 4. Descriptive Statistics, Comparisons of Coping Strategies, and External Variables Across Classes.

	Class 1 (n = 176) Adaptive Coper		Class 2 (n = 224) Inconsistent Coper		Class 3 (n = 218) Negative Coper				
	Mean	SD	Mean	SD	Mean	SD	F	η^2	Tukey's HSD
Acceptance	15.56	2.05	14.39	2.56	11.01	2.47	198.696***	0.39	1 > 2 > 3
Positive refocusing	13.55	2.76	10.43	2.90	8.34	2.18	191.830***	0.38	1 > 2 > 3
Refocus on planning	16.56	2.00	13.30	2.87	11.81	2.12	197.112***	0.39	1 > 2 > 3
Positive reappraisal	15.14	2.28	11.58	2.30	9.35	2.16	326.105***	0.52	1 > 2 > 3
Putting in perspective	9.70	2.17	8.95	1.87	11.65	1.79	113.603***	0.27	3 > 1 > 2
Self-blame	9.49	3.54	10.97	3.00	12.88	3.39	52.333***	0.15	1 < 2 < 3
Rumination	8.23	3.14	9.73	3.04	12.15	2.66	90.426***	0.23	1 < 2 < 3
Catastrophizing	8.14	2.58	9.38	2.50	13.79	2.13	313.821***	0.51	1 < 2 < 3
Blaming others	7.28	2.69	10.76	2.86	10.09	3.13	76.746***	0.20	1 < 2, 3
Confrontation	20.06	1.99	20.46	1.66	20.12	1.46	2.487*	0.02	1, 3 < 2
Avoidance	14.37	2.30	13.01	1.95	13.86	2.23	20.594***	0.06	1 > 3 > 2
Resignation	14.27	1.13	13.83	1.40	13.75	1.22	9.124***	0.03	1 > 2, 3
Anxiety	3.87	3.60	5.22	3.71	8.59	3.38	94.053***	0.24	1 < 2 < 3
Depression	2.80	3.50	4.81	3.70	7.87	3.88	93.822***	0.23	1 < 2 < 3
Years of age	46.47	6.22	45.49	7.46	44.82	5.20	3.256*	0.01	1 > 3
Years of schooling	11.23	3.36	10.07	3.10	9.32	3.17	17.284***	0.05	1 > 2 > 3
Weeks since diagnosis	2.10	0.10	1.77	0.09	1.40	0.09	12.362***	0.04	1, 2 > 3

	Class 1 (n = 176) Adaptive Coper		Class 2 (n = 224) Inconsistent Coper		Class 3 (n = 218) Negative Coper		
	n	%	n	%	n	%	χ^2
Place of residence							50.833***
Urban	117	66.5	114	50.9	67	30.7	
Rural	59	33.5	110	49.1	151	69.3	
Marital status							10.386*
Married	160	90.9	215	96.0	206	94.5	
Widowed	3	1.7	2	0.9	7	3.2	
Divorced	13	7.4	7	3.1	5	2.3	
Employment status							6.896
Employed	147	83.5	167	74.6	163	74.8	
Housewife	23	13.1	43	19.2	46	21.1	
Retired	6	3.4	14	6.3	9	4.1	
Stage of disease							1.849
I	144	81.8	192	85.7	177	81.2	
II	32	18.2	32	14.3	41	18.8	
Therapy type							48.051***
Mastectomy	58	33.0	101	45.1	50	22.9	
Chemotherapy	17	9.7	15	6.7	55	25.2	
Mastectomy with chemotherapy	101	57.4	108	48.2	113	51.8	

*P < .05; ***P < .001.

symptoms, whereas negative copers displayed the highest levels of both symptoms. Inconsistent copers, though displayed the most efforts to fight against the disease, experienced relatively high levels of psychological distress as indicated by higher mean scores of anxiety and depression than general outpatients.[46] In traditional studies, adaptive cognitive coping strategies such as acceptance, positive refocusing, and positive reappraisal were negatively associated with depression and anxiety symptoms,[35,47] while maladaptive strategies, such as self-blame, rumination and catastrophizing, were positively associated with these symptoms.[48] According to the theory of Carver et al,[49] employing a high number of strategies reflects an attempt to try anything to appraise the situation and plan the most appropriate response. In this study, the findings based on LPA indicated that patients who used combined adaptive and maladaptive forms of coping strategies when facing their conditions, which reflected an effort to stay engaged with the stressor, might expect decreased risk of anxiety and depression compared to totally using maladaptive coping
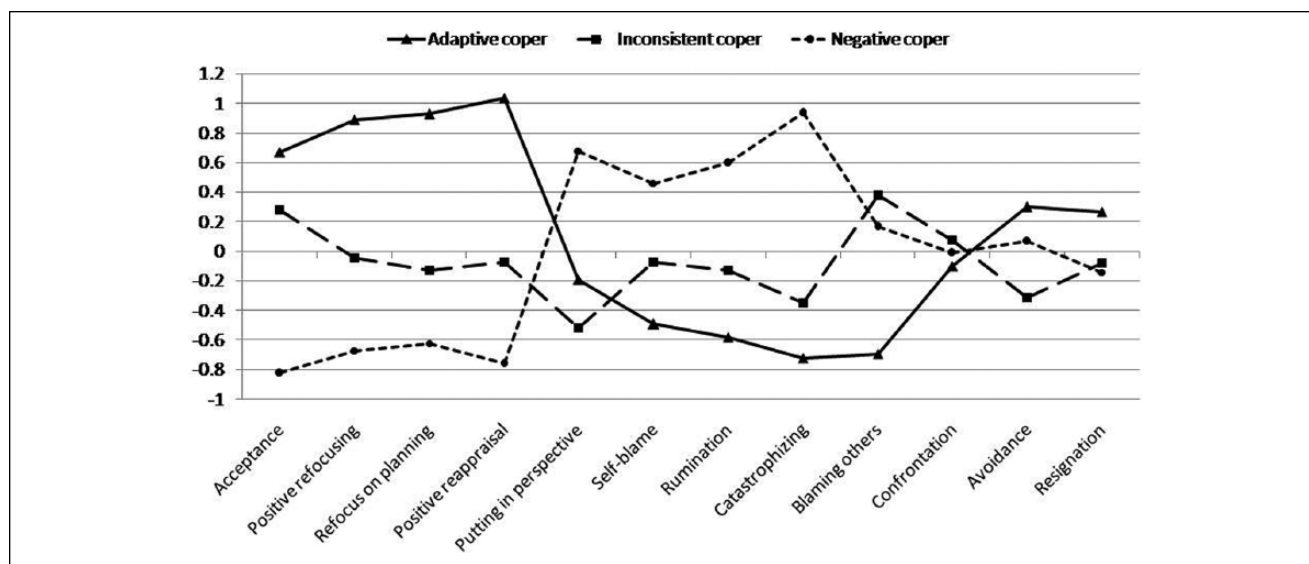
Figure 1. Standardized scores on coping strategies across classes.

strategies. However, it was difficult for these inconsistent copers to obtain successful adjustment to the illness experience,[50] because they could not plan the most appropriate response to the situation.

In previous studies, there were inconsistent results of the relationships between the strategy of putting in perspective and individual's psychological adjustment.[13,51,52] In this study, we found that negative copers, who applied most intensely the strategy of putting in perspective together with maladaptive strategies, had the highest levels of psychological distress. And adaptive copers using relatively more the strategy of putting in perspective combined with highest use of adaptive strategies had the lowest levels of psychological distress. These findings indicated that whether the strategy of putting in perspective is useful depends on the overall coping patterns of individual. Interestingly, contrary to putting in perspective, the strategies of avoidance and resignation (both not conducive to individual's psychological adjustment in previous studies)[53,54] in adaptive copers were positively associated with the emotional health among patients when facing the diagnosis of breast cancer. These findings underscore the importance of focusing on whole patterns of coping with life-threatening events.

In addition, results of this study showed that the external variables (age, education, place of residence, marital status, weeks since diagnosis and therapy type) were associated with coping profiles. These findings were partly consistent with previous studies. For example, Cortina et al,[17] Walker et al,[25] and Sun et al[53] found that age differed across coping profiles, while Doron et al[19] and Uliaszek et al[55] found that age was not associated with coping profiles; researches by Uliaszek et al[55] and Walker et al[26] indicated that high level of school education was related to effective coping, but the

study by Cortina et al[17] showed no education difference between coping profiles. In previous studies, coping profiles did not differ on marital status[26,55]; however, our study showed an opposite result. This inconsistency may be due to the different participants of studies. Walker et al[26] noticed that medical characteristics were associated with coping and similar results were obtained in this study, indicating that the treatments received by patients might have important influence on their use of coping strategies.

The following limitations should be considered when interpreting the results of this study. First, our classification results were based on data from women newly diagnosed with early breast cancer and needed to be replicated with a larger sample, including patients at different stages of disease to increase generalizability of these findings for clinical application. Second, the cross-sectional nature of the present study prevented us from drawing conclusions about the direction of the relationships of the external variables (especially the medical characteristics) and coping profiles. Thus, future research should improve the study design. Moreover, coping strategies were assessed by self-reported measures in this study, which may have increased the possibility of a method bias and in future studies, the inclusion of other assessments may be useful to validate these findings.

Conclusions

Despite the limitations, the findings of the present study provides support for the validity of our typology in describing three distinct and meaningful profiles of coping in a sample of Chinese women newly diagnosed with breast cancer. There is a considerable set of patients, who have a positive perception of the disease and pay less attention to

the related information, and can effectively cope with the distressing event. A set of patients, characterized by highest use of all the maladaptive cognitive coping strategies and putting in perspective, least use of acceptance, positive refocusing, refocus on planning, and positive reappraisal, and median levels of medical coping strategies, are at the greatest risk of anxiety and depression symptoms. Some patients, though, who allocate the most effort to fight against the disease, could not obtain better psychological adjustment because they are in a state of cognitive conflict in the situation. Patients, who are younger, less educated, at a shorter time since diagnosis, from rural areas, widowed and have been undergoing chemotherapy, to some extent, are more likely to adopt less adaptive coping patterns. These patients should be paid more attention in intervention programs as they seemingly have more difficulties in successfully dealing with their situations. For maladaptive copers, cognitive behavioral approaches that combine emotion, cognition and behavior may help them more effectively appraise and cope with stressful events; for inconsistent copers, adequate support and proper clinical education may help them to plan the most appropriate response to their situation. Longitudinal studies are required to confirm the effect of these intervention approaches in the future.

Declaration of Conflicting Interests

Funding

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