

Research Article

Social Support and Posttraumatic Growth among Postoperative Patients with Breast Cancer: A Latent Profile and Moderated Mediation Analysis

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Received 12 February 2023; Revised 3 August 2023; Accepted 16 October 2023; Published 27 October 2023

Academic Editor: Mohammad Al Qaderi

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Objectives. Only a few studies have explored the association between social support and resilience, coping style, and posttraumatic growth (PTG) in breast cancer. The current research aimed to identify the latent subtypes of social support in patients with breast cancer (BC) who underwent surgery. Moreover, the mediating role of resilience and the moderating role of coping style were investigated. **Methods.** This cross-sectional study enrolled 115 patients from Be Resilient to Breast Cancer between September 2021 and April 2022 using the convenience sampling method. Then, the Perceived Social Support Scale, Connor–Davidson Resilience Scale, Medical Coping Modes Questionnaire, and Posttraumatic Growth Inventory were utilized. A latent profile analysis and a moderated mediation analysis were performed. **Results.** Three subtypes of social support were identified as low (16.5%), middle (53.0%), and high (30.4%). Social support, resilience, and coping style were found to be positively associated with PTG ($r = 0.373$, $P < 0.01$; $r = 0.427$, $P < 0.01$; $r = 0.218$, $P < 0.05$). Resilience played a significant role in mediating the association between social support and PTG ($P < 0.05$). However, coping style did not significantly moderate the association between resilience and PTG ($P > 0.05$). **Conclusions.** Heterogeneous subgroups of social support have been identified in patients with BC. Resilience significantly mediates the association between social support and PTG. Meanwhile, coping style does not significantly moderate the association between resilience and PTG.

1. Introduction

Previous research [1, 2] has shown that breast cancer (BC) is one of the most common cancers in women, and it accounts for nearly 420,000 new cases in China in 2020. China has the highest incidence of BC worldwide. Moreover, the incidence rate of BC has increased by 49.8% from 2000 to 2018, leading to 310,000 deaths globally in 2018 [3–5]. The number of survivors of BC is increasing. Patients diagnosed with BC present with physical pain and psychological distress, thereby resulting in reduced treatment compliance, medical satisfaction, and quality of life [6, 7].

The attitudes of people toward traumatic events, such as cancer diagnosis, have gradually changed, which leads to the development of positive psychology. They believe that traumatic events affect them negatively. However, people also experience positive changes, including posttraumatic growth (PTG) [8], defined as positive psychological changes resulting from mental struggles due to crisis events and challenging experiences [9].

Previous reports have found that approximately 60%–80% of patients with BC who underwent surgery have significant PTG. Several studies have shown that PTG helps patients with cancer focus less on the negative perception of traumatic

events and physical pain, thereby improving mental status and quality of life [10–12]. However, the PTG level of Chinese patients with BC is insufficient. Thus, interventions are required [13].

Social support is defined as a belief that individuals are cared for, loved, and highly esteemed and that they share a mutual obligation with a social network [14]. Some studies have reported that a high level of social support was associated with a low incidence of depression and increased PTG levels in patients with BC [15–17]. Further, social support could also promote long-term PTG in patients with cancer, even 8 years after cancer diagnosis [18]. Meanwhile, social support was positively correlated with resilience, which is the strongest predictor of PTG [19, 20]. However, current studies examining the mediating role of resilience in the association between social support and PTG are limited.

Finally, coping style may influence the extent to which a person who survives BC experiences this type of growth [21]. It was significantly associated with PTG and other negative emotions such as depression and anxiety [22, 23]. Thus, this variable should be further explained.

According to the Life Crisis and Personal Growth Model developed by Schaefer and Moos [24], if a crisis event occurs, the individual's personal system and external resources affected event-related factors together and prompted them to adjust their cognitive evaluation and coping styles and, ultimately, help achieve a positive outcome. External resources and personal systems are interrelated and have a direct impact on positive outcomes. Based on this theory, patients with BC combined their personal systems (resilience) and external resources (social support), thereby applying coping style to achieve positive outcomes (PTG). Hence, social support, resilience, and coping style might be independent factors of PTG. However, the association between them remains unclear. Therefore, the current study aimed to evaluate the association between social support, resilience, and coping style and PTG in Chinese patients with BC who underwent surgery. Furthermore, the mediating effects of resilience and the moderating effects of coping style were investigated. The following hypotheses were made (Figure 1):

H1: several social support subtypes in patients with BC can be identified via latent profile analysis (LPA)

H2: social support is positively correlated with PTG

H3: resilience plays a mediating role between social support and PTG

H4: coping style plays a moderating role in the association between resilience and PTG

2. Methods

2.1. Study Design and Participants. This cross-sectional study enrolled 115 patients from Be Resilient to Breast Cancer (BRBC) between September 2021 and April 2022 using the convenience sampling method [25–31]. The researchers collected data on the third day after surgery. The following tools were used: the demographic and clinical questionnaire,

the Perceived Social Support Scale (PSSS), Connor–Davidson Resilience Scale (CD-RISC), Medical Coping Modes Questionnaire (MCMQ), and Chinese version of Posttraumatic Growth Inventory (C-PTGI).

The inclusion criteria were as follows: patients diagnosed with BC via pathological examination who underwent surgery, female individuals aged ≥ 18 years, those who could speak, read, and understand Mandarin, and those who volunteered to participate in the research and signed the informed consent form. The exclusion criteria were as follows: patients with severe mental illness, those with metastatic tumors, and those whose conditions were concealed from them by family members.

2.2. Sample Size. The sample size was calculated according to the number of study variables. We take 5–10 times the number of variables to determine the sample size. The current study had 14 variables (3 in the PSSS, 3 in the CD-RISC, 3 in the MCMQ, and 5 in the C-PTGI). Calculated as 5 times the number of variables, and the sample size of this study was 70. Considering a sample loss rate of 20%, the minimum sample size was 84. In total, 123 patients who were contacted were recruited. Finally, 115 questionnaires were received, and the effective recovery rate was 93.5%.

2.3. Survey Items

2.3.1. Demographic and Clinical Characteristics of the Patients. Data on the demographic and clinical characteristics of the patients were collected using the questionnaire designed by the researchers. The questionnaire includes two parts: demographic and clinical information. Data on demographic characteristics were provided by the patients. Meanwhile, clinical information was collected by the researchers from the hospital information system. It included questions on sex, age, nationality, hometown, place of residence, religion, marriage, fertility, education, occupation, medical insurance, operative time, treatment types, pathological typing, stages, presence of metastasis, and surgical approach.

2.3.2. Social Support. The PSSS was originally developed by Zimet [32] in 1987 and was used to assess the association between social support and type A character, perceived social support ability, and coronary artery disease. It was translated into Mandarin by Qianjin Jiang [33] in 1999 and was used to evaluate various sources of social support perceived by individuals, including family, friends, and others. The total score indicated the level of social support felt by the individual. The scale includes 12 items in 3 dimensions (4 items for family support, 4 items for friend support, and 4 items for others). Each item was evaluated using a 7-point Likert scale (1–7), which ranges from strongly disagree to strongly agree. The total score ranges from 12 to 84, and a higher total score indicated a higher level of social support perceived by individuals. In the

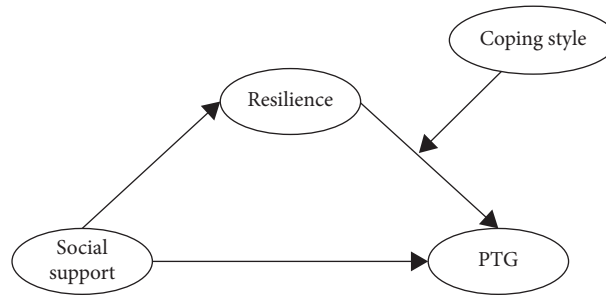


FIGURE 1: The hypothesized model.

current study, the overall Cronbach α coefficient of the scale was 0.824, and the Cronbach α coefficients of the three dimensions ranged from 0.698 to 0.826.

2.3.3. Resilience. The Chinese version of the CD-RISC was translated by Nan Xiao. It contains 25 questions, and the four subscales were power (8 items), tough (13 items), and optimism (4 items). Every item was assessed using the 5-point Likert scale (0–4). The sum of all scores ranged from 0 to 100, and a higher score indicated greater resilience. The Cronbach α value for the overall reliability of the CD-RISC was 0.925, and the Cronbach α coefficients of the three dimensions ranged from 0.812 to 0.853. Thus, it had good reliability and validity and was widely applied in clinical settings [34].

2.3.4. Coping Style. The MCMQ was applied to investigate which coping strategy was more likely to be used (face, avoid, and yield) in illness treatment. It was developed by Feifel et al. [35] in 1987, and it comprised the following parameters: face (8 items), avoidance (7 items), and yield (5 items). There were 20 items in the three dimensions. The Cronbach α coefficients of the internal consistency of the three dimensions ranged from 0.60 to 0.76, and the test-retest reliability was $ICC=0.64-0.85$. The scale has been validated in the Chinese population [36]. The Cronbach α coefficients for the different dimensions of MCMQ in the current study were satisfied (0.803, 0.854, and 0.872, respectively). The 4-point Likert scale was used, with 1–4 points assigned for never to always. The total score was 20–80. The score of each dimension can reflect the coping strategy of patients receiving treatment.

2.3.5. Posttraumatic Growth. The C-PTGI was developed by Tedeschi. It is used to assess the level of PTG in patients who underwent traumatic events [8]. It was first translated by Professor Wang into Mandarin in 2011 [37]. The scale includes 5 dimensions with 20 items, which were as follows: appreciation of life (6 items), personal strength (3 items), new possibilities (4 items), relating to others (3 items), and spiritual change (4 items). The 6-point Likert scale was used, with scores ranging from 0 (no change at all after the traumatic event) to 5 (extremely evident change after the traumatic event). Higher scores indicated a greater level of PTG. In this study, Cronbach's α value of the C-PTGI was 0.912, and the Cronbach α coefficients of the five dimensions ranged from 0.867 to 0.890.

2.4. Data Collection. Patients were enrolled in BRBC between September 2021 and April 2022. If the patient agreed to participate in the study, they were instructed to sign the informed consent forms, and the research was started. The researchers introduced the same contents and administered the questionnaires. Furthermore, the patients were provided with reminders to finish the forms independently. The researchers answered any of the participant's questions. In addition, the staff does not provide any hints that could influence the patient's answer.

2.5. Ethical Considerations. This study was approved by the Ethics Committee of Guangdong Provincial People's Hospital (KY-N-2021-057-02). Before the survey, the researchers provided detailed information about the study to the patients to ensure full disclosure. All details provided by the patients were kept confidential. However, the patients could withdraw from the study at any time.

2.6. Statistical Analysis. First, data on the demographic and clinical characteristics of the patients were presented as frequencies (n) and proportions (%), respectively. Second, the Pearson correlation coefficient was selected to analyze the associations between social support, resilience, coping style, and PTG. Third, in the model evaluation, LPA was performed to identify the subtypes of social support and different fitting indexes including log-likelihood, Akaike information criteria, Bayesian information criteria (BIC), sample-size-adjusted (ABIC), entropy, the Lo–Mendell–Rubin likelihood ratio test, and the bootstrap likelihood ratio test [38–44]. Fourth, analysis of variance was used to compare the level of PTG and its five dimensions among patients with BC with different social support subtypes. Fifth, the mediation role of resilience was assessed between the subtypes of social support (category variable) and PTG (continuous variable). Sixth, the moderation role of coping style was evaluated between resilience and PTG. All data were analyzed using the Statistical Package for the Social Sciences software (version 22.0) and MPLUS (version 8.3). A P value of <0.05 was considered statistically significant.

3. Results

3.1. Characteristics of Patients with BC. Of the 115 patients with BC, 81.7% were aged 35–59 years. Furthermore, 46.0% of patients achieved tertiary education, and 31.3% were from

the countryside. Approximately 50% had stage II disease. Furthermore, 19.1% of patients presented with lymph node metastases, and 73.9% underwent modified radical surgery. Around 41.7% of patients received neoadjuvant chemotherapy, and 83.5% had invasive carcinoma. Table 1 shows the other characteristics of the patients.

3.2. Mean Scores for Social Support, Resilience, Coping Style, and PTG. The mean scores for social support, resilience, coping style, and PTG were 67.36 (10.93), 64.03 (18.51), 43.63 (5.62), and 64.01 (19.59), respectively. The PTG subscale scores were as follows: relating to others, 10.01 (3.63); new possibilities, 11.51 (4.37); personal strength, 9.90 (3.58); spiritual change, 11.22 (5.03); and appreciation of life, 21.37 (6.01). Table 2 depicts the mean scores of other variables.

3.3. Pearson Correlation Analysis of Social Support, Resilience, Coping Style, and PTG. The Pearson correlation coefficients of social support, resilience, coping style, and PTG were $r = 0.373$, $P < 0.01$; $r = 0.427$, $P < 0.01$; and $r = 0.218$, $P < 0.05$, respectively. Hence, there was a positive correlation between social support, resilience, coping style, and PTG. Figure 2 shows the correlation among other variables.

3.4. LPA of Social Support. LPA showed that type 3 was better than type 2 ($P < 0.05$) for relatively small AIC, BIC, and ABIC. Type 4 was not significant. Hence, the type 3 solution was selected. The subtypes of social support were referred to as low (16.5%), middle (53.0%), and high (30.4%), as shown in Figures 3(a) and 3(c). Figures 3(b) and 3(d) present the levels of PTG and its five dimensions in three types.

3.5. Mediation Analysis of Resilience between Social Support and PTG. As shown in Figure 4(a), type 1 was considered as reference, and the mediation effects of resilience between types 2, 3, and PTG were -0.909 and 1.370 (95% confidence intervals: -2.227 to -0.196 , 0.184 to 3.002), respectively. Hence, there was a significant mediation effect (excluding zero). Apart from the path of “high support \rightarrow resilience \rightarrow relating to others,” other paths had similar findings. Therefore, resilience played a role in mediating the association between social support and PTG.

As depicted in Figures 4(b) and 4(c), the total effect of social support on the five dimensions of PTG were as follows: appreciation of life ($B = 0.199$, $SE = 0.05$, $P < 0.000$), personal strength ($B = 0.090$, $SE = 0.029$, $P < 0.002$), new possibility ($B = 0.123$, $SE = 0.037$, $P < 0.001$), relating to others ($B = 0.123$, $SE = 0.026$, $P < 0.000$), and spiritual change ($B = 0.135$, $SE = 0.041$, $P < 0.001$). Further, the significant mediation effect of resilience between social support and PTG included the following: personal strength ($B = 0.054$, $SE = 0.021$, 95% CI: 0.019 – 0.101), new possibility ($B = 0.072$, $SE = 0.025$, 95% CI: 0.033 – 0.137), and spiritual change ($B = 0.070$, $SE = 0.032$, 95% CI: 0.017 – 0.141).

TABLE 1: Demographic characteristics of the patients with breast cancer.

Variables	<i>n</i>	%
<i>Sociodemographics</i>		
Age (years)		
18–34	6	5.2
35–59	94	81.7
≥ 60	15	13.0
Han nationality	115	100
Residence place		
Urban	79	68.7
Rural	36	31.3
Education level		
Primary and below	13	11.3
Secondary	49	42.6
Tertiary	53	46.0
<i>Clinical characteristics</i>		
Illness stage		
0	17	14.8
I	5	4.3
II	64	55.7
III	27	23.5
IV	2	1.7
Lymph node metastases		
Yes	22	19.1
No	93	80.9
Surgery		
Modified radical mastectomy	85	73.9
Skin-sparing mastectomy	11	9.6
Breast-conserving surgery	19	16.5
Neoadjuvant chemotherapy	48	41.7

3.6. Moderated Meditation Analysis Combining Resilience and Coping Style. As shown in Figure 4(d), the association between resilience and coping style was insignificant ($B = 0.029$, $SE = 0.018$, 95% CI: -0.006 to 0.064 , $P = 0.105$). Therefore, the association between resilience and PTG was not moderated by coping style ($R^2 = 0.018$, $F = 2.667$, $P = 0.105$).

4. Discussion

This research aimed to evaluate the association between social support, resilience, coping style, and PTG in Chinese patients with BC who underwent surgery. In addition, the mediating effects of resilience and the moderating effects of coping style were investigated. Previous research on post-traumatic growth has focused on variable-centered research paths, aiming to explore the association between variables. However, this study is individual-centered, dividing the population into several subgroups, giving practitioners more effective tools to investigate and develop intervention strategies, and facilitating categorical management.

The current study had several findings. First, there were three social support subtypes (low (16.5%), middle (53.0%), and high (30.4%)) in patients with BC. Hypothesis 1 was confirmed. That is, 50% of the patients with BC have moderate levels of social support, and patients with low support levels deserved more attention. All three classes had the highest score for family support. The mean ages of the three classes were 50.58 ± 8.15 (low support), 49.31 ± 10.28 (middle

TABLE 2: Mean scores of social support, resilience, coping style, and PTG.

Variables	Subcategories	Mean scores <i>M</i> (<i>SD</i>)
Social support	Total	67.36 (10.93)
	Family support	23.67 (3.91)
	Friend support	21.47 (4.52)
	Other support	22.22 (4.25)
Resilience	Total	64.03 (18.51)
	Power	22.27 (5.60)
	Optimism	8.90 (3.18)
	Tenacity	32.86 (10.80)
Coping style	Total	43.63 (5.62)
	Face	20.49 (3.85)
	Avoid	15.31 (3.14)
	Yield	7.83 (2.35)
Posttraumatic growth	Total	64.01 (19.59)
	Appreciation of life	21.37 (6.01)
	Personal strength	9.90 (3.58)
	New possibility	11.51 (4.37)
	Relating to others	10.01 (3.63)
	Spiritual change	11.22 (5.03)

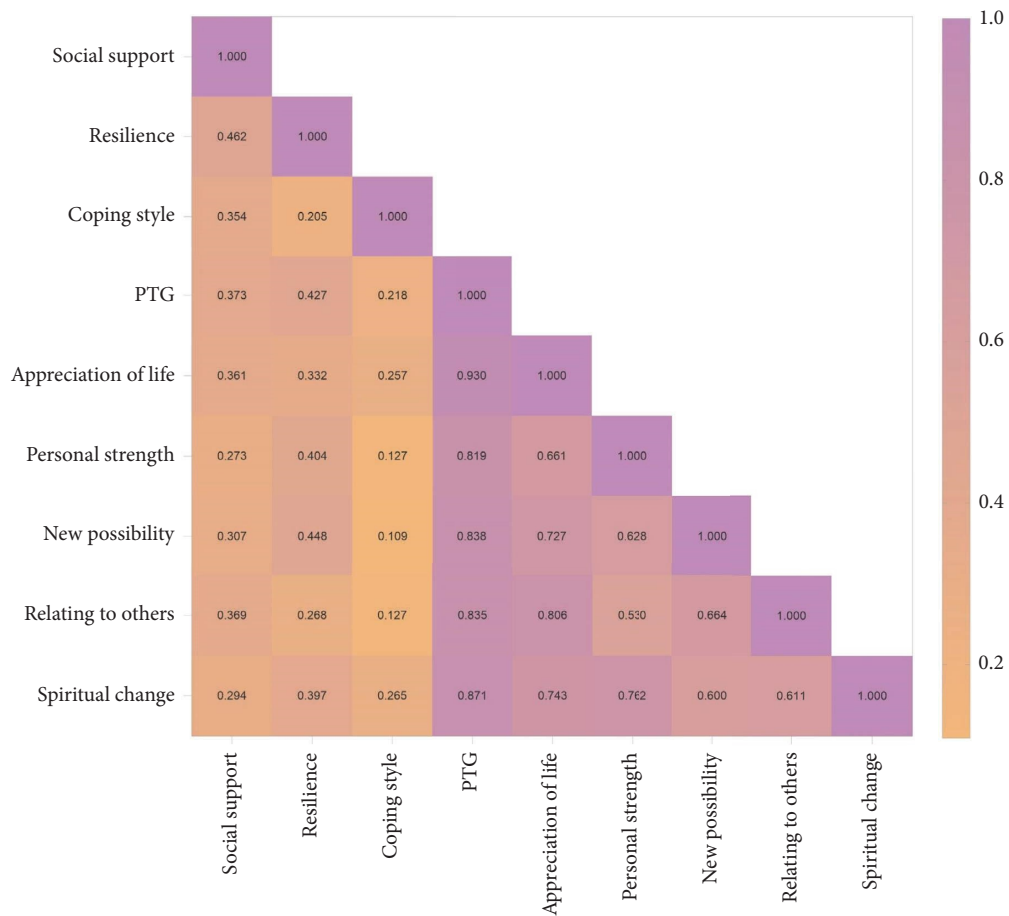


FIGURE 2: Pearson correlation heatmap among social support, resilience, coping style and PTG.

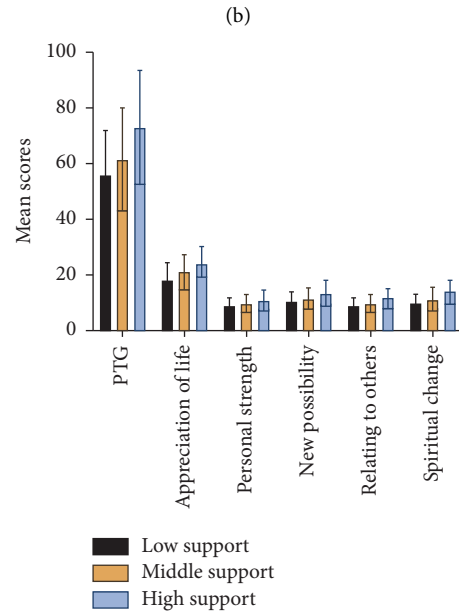
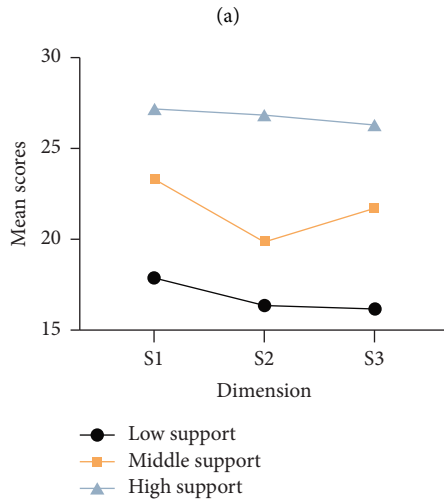
support), and 45.86 ± 10.15 (high support). Approximately 77.14%, 68.85%, and 52.63% of the patients from the high, middle, and low support groups, respectively, were from the urban population. Moreover, 65.71% of patients in the high

support group had a college degree. Hence, patients with a higher education may have more social support.

Pearson correlation analysis showed that social support was positively associated with resilience, coping style, and

Index	Latent profile analysis model				
	Type-1	Type-2	Type-3	Type-4	Type-5
Fit statistics					
LL	-984.846	-926.448	-903.811	-892.093	-879.604
AIC	1981.691	1872.895	1835.622	1820.185	1803.209
BIC	1998.161	1900.345	1874.052	1869.594	1863.597
aBIC	1979.196	1868.737	1829.800	1812.699	1794.060
Entropy	1.000	0.859	0.868	0.844	0.916
LMR (P)	-	0.000	0.047	0.3338	0.1673
Group size	-	0.000	0.000	0.000	0.000
Type-1	115 (100%)	68 (59.1%)	19 (16.5%)	18 (15.7%)	1 (8.7%)
Type-2		47 (40.9%)	61 (53.0%)	46 (40%)	19 (16.5%)
Type-3			35 (30.4%)	21 (18.3%)	12 (10.4%)
Type-4				30 (26.1%)	48 (41.7%)
Type-5					35 (30.4%)

Variables	Type-1	Type-2	Type-3	F	P	η^2	Post-hoc
PTG	55.47±15.97	61.64±18.45	72.77±20.51	6.287	<0.05	0.100	3>2>1
Appreciation of life	18.26±5.90	20.80±5.85	24.03±5.38	6.883	<0.05	0.109	3>2>1
Personal strength	9.00±2.94	9.59±3.36	10.94±4.10	2.364	<0.05	0.040	3>2>1
New possibility	10.21±3.82	10.95±4.03	13.20±4.83	4.170	<0.05	0.069	3>2>1
Relating to others	8.90±2.90	9.28±3.67	11.88±3.26	7.590	<0.05	0.119	3>2>1
Spiritual change	9.11±4.47	11.01±4.73	12.71±5.43	3.431	<0.05	0.058	3>2>1

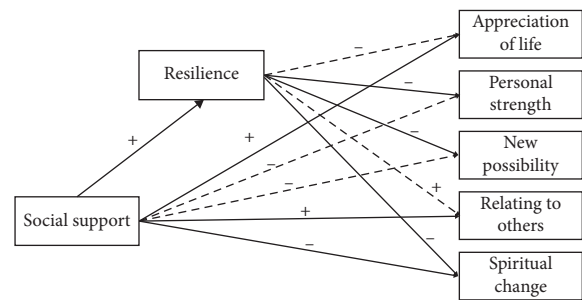


(c)

(d)

FIGURE 3: (a) The latent profile analysis models' fitting index and group size. Abbreviations: LL, log-likelihood; AIC, Akaike information criterion; BIC, Bayesian information criterion; ABIC, adjusted BIC; LMR, Lo-Mendell-Rubin likelihood ratio test; BLRT, bootstrap likelihood ratio test. (b) ANOVA of three subtypes between five dimensions of PTG. *Note.* post hoc comparisons were conducted using the Bonferroni multiple comparison test; η^2 = eta squared represents variance of a dependent variable by three LPA-based subgroups. (c) Parameters for the three types of patterns. (d) The level of PTG and its dimensions on three types of social support.

Indirect effect	Effect (95%CI) Low vs Middle	Effect (95%CI) Low vs High
PM-Resilience-Appreciation of life	-0.909 (-2.227, -0.196)	1.370 (0.184, 3.002)
PM-Resilience-Personal strength	-0.671 (-1.413, -0.178)	1.262 (0.460, 2.237)
PM-Resilience-New possibility	-0.892 (-1.875, -0.250)	1.625 (0.797, 2.745)
PM-Resilience-Relating to others	-0.388 (-1.117, -0.030)	0.496 (-0.173, 1.415)
PM-Resilience-Spiritual change	-0.950 (-2.209, -0.289)	1.713 (0.637, 3.095)



(a)

(b)

FIGURE 4: Continued.

Independent variable	Dependent variable	Total effect			Direct effect			Indirect effect			
		Estimate	SE	P	Estimate	SE	P	Estimate	SE	LLCI	ULCI
Social support	PTG	0.669	0.154	0.000	0.223	0.082	0.007	0.269	0.111	0.081	0.537
	Appreciation of life	0.199	0.05	0.000	0.264	0.087	0.002	0.053	0.033	-0.006	0.127
	Personal strength	0.090	0.029	0.002	0.110	0.097	0.258	0.054	0.021	0.019	0.101
	New possibility	0.123	0.037	0.001	0.127	0.096	0.188	0.072	0.025	0.033	0.137
	Relating to others	0.123	0.026	0.000	0.311	0.082	0.000	0.019	0.019	-0.016	0.057
	Spiritual change	0.135	0.041	0.001	0.141	0.101	0.164	0.070	0.032	0.017	0.141

(c)

Variables	Estimate	SE	t	P	LLCI	ULCI
Mediating variable model (Outcome variable: Resilience)						
Constant	-52.743	9.644	-5.469	0.000	-71.850	-33.636
Social support	0.783	0.141	5.540	0.000	0.503	1.063
Dependent variable model (Outcome variable: PTG)						
Constant	40.354	11.922	3.385	0.001	16.727	63.980
Social support	0.342	0.175	1.949	0.054	-0.006	0.690
Resilience	0.367	0.100	3.651	0.000	0.168	0.566
Coping style	0.123	0.325	0.380	0.705	-0.520	0.767
Resilience×Coping style	0.029	0.018	1.633	0.105	-0.006	0.064
Increase of R ² with interaction	R ²		F	P		
	0.018		2.667	0.105		

(d)

FIGURE 4: (a) The mediation effect of resilience on PTG (category variable). *Note.* PM = profile membership. (b) The mediating effect of resilience on PTG. (c) Total effect, direct effect, and indirect effect of social support on PTG. (d) The moderated mediating effect of coping style through resilience on social support and PTG.

PTG in patients with BC. Further, patients with a high support level had a greater PTG level. However, patients with a low support level had the lowest PTG level. Therefore, hypothesis 2 was confirmed. This was consistent with the findings of other studies [45], which examined both general and BC-specific social support and stress as predictors of change in PTG among the survivors of BC. Results showed that BC-specific social support can predict increases in PTG during early treatment. Most patients had moderate levels of social support in our study, which was similar to patients in Korea [46] and Italy [47]. Hence, it is important to promote social support among patients with BC. In addition, the current study found that the level of support from family was the highest, followed by that from significant others and friends. This result is consistent with that of previous study [46, 47], which showed that family support is an important factor related to quality of life in patients with BC. The result has cross-cultural stability and is worth considering. Moreover, spouses play an integral role in providing support. Patients with BC have reduced self-care abilities after surgery and need more help from their families, particularly spouses. Hence, family support accounts for a higher proportion of social support [48]. Medical personnel can improve the PTG of patients with BC by encouraging spouses to actively participate in patient treatment.

Third, resilience played an important mediating role in the association between social support and PTG in patients with BC. Thus, hypothesis 3 was verified. This is similar to the study of Gori [49], which explored the association between resilience, coping, and personality and PTG in patients diagnosed with cancer. Results showed that the effect of resilience in PTG is partially mediated by a positive attitude, and resilience can predict the effect of trauma negatively with a partial mediation of avoidance strategies. In traditional Chinese culture, women consider their husbands as the main support system, and spousal-led family support can improve their ability to face stress and setbacks, overcome inner anxiety, and face reality calmly. Patients with BC who have a higher level of mental toughness can eliminate their negative emotions about the disease or the negative attitude caused by the disease. Hence, they can actively establish contact with the outside world and face it positively, thereby forming PTG [50]. Previous studies

have shown the influence of potential moderators between social support and PTG [51–54]. The mediators between them are less investigated. In addition, social support had a mediating role between PTG and other variables such as body image and depression [55]. The current study may identify another mechanism for the intervention of PTG.

Fourth, the moderating role of coping style between resilience and PTG was insignificant. Thus, hypothesis 4 was not verified. We identified a significant association between resilience and PTG. However, there was no significant association between resilience and coping style. A possible explanation for this lack of interaction effect may be attributed to the limited sample size.

This study had specific clinical references. First, social support was an important predictor of PTG. Second, resilience was one of the psychological paths between social support and PTG. Therefore, social support played a significant role in promoting PTG by affecting resilience. This study provided an important approach for PTG intervention. Third, coping style did not moderate the association between resilience and PTG due to the limited sample size.

4.1. Limitations. This study had several limitations. First, it had a limited sample size, causing time and geographical restrictions. In addition, it was cross-sectional in nature, and the trajectory of postoperative PTG in patients with BC was not evaluated. Hence, additional research with a sufficient sample size must be performed in the future. Second, due to challenges in patient enrollment during the coronavirus disease 2019 pandemic, treatment modalities such as chemotherapy, radiotherapy, and other adjunctive therapy and disease duration were not considered as confounders, which might have affected the associations between social support, resilience, and coping style and PTG. Thus, the findings should be further validated with a robust sample size.

5. Conclusion

The total PTG score was positively associated with social support, resilience, and coping style. Resilience had a mediating role on the association between social support and

PTG in patients with BC who underwent surgery. However, coping style did not moderate the association between resilience and PTG.

Data Availability

The raw data supporting the conclusions of this article will be made available from the corresponding author on request.

Ethical Approval

This study was approved by the Ethics Committee of Guangdong Provincial People's Hospital (KY-N-2021-057-02).

Consent

The patients/participants provided a written informed consent.

Disclosure

The funder had no role in any stage of the study, such as data collection and analysis.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

This research was funded by grants from National Natural Science Foundation of China (#72274043 and #71904033), Young Elite Scientists Sponsorship Program by CACM (#2021-QNRC2-B08), Humanity and Social Science Foundation of Department of Education of Guangdong Province (#2020WTSCX009), and the second batch of nursing research fund projects of Guangdong Provincial People's Hospital (DFJH201002). We would like to thank the patients for supporting our data collection and all participants for completing the surveys. We would like to acknowledge Bullet Edits Limited for their language editing and proof-reading services.

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