



Self-stigma and quality of life among Chinese American breast cancer survivors: A serial multiple mediation model

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Funding information

National Cancer Institute, Grant/Award Number: CA180896

Abstract

Objective: Despite the increasing scholarly attention toward self-stigma among Asian breast cancer survivors, research is limited about the underlying psychological mechanisms by which self-stigma may influence quality of life for this population. The present study investigated how self-stigma is associated with quality of life among Chinese American breast cancer survivors by examining the serial mediating effects of concerns about breast cancer, self-efficacy for coping with cancer, and depressive symptoms.

Methods: Chinese American breast cancer survivors ($n = 112$) completed a questionnaire packet assessing self-stigma related to breast cancer, concerns about breast cancer, self-efficacy for coping with cancer, depressive symptoms, and quality of life. Path analysis was conducted to test the hypothesized serial multiple mediation model.

Results: The hypothesized model was supported: self-stigma was negatively associated with quality of life through concerns about breast cancer, self-efficacy, and depressive symptoms. After the mediators were controlled for, the direct effect of self-stigma on quality of life was no longer significant.

Conclusions: Our findings suggest that concerns about breast cancer, self-efficacy for coping, and depressive symptoms are important pathways through which self-stigma may influence quality of life among Chinese American breast cancer survivors. Healthcare practitioners should be aware of survivors' self-stigma and make efforts to alleviate survivors' excessive cancer concerns, facilitate their self-efficacy, and offer emotional support to improve quality of life for this population.

KEYWORDS

cancer, Chinese American, oncology, Psycho-Oncology, quality of life, stigma

1 | BACKGROUND

The past decade has witnessed an attenuation of stigma of breast cancer because of the successful pink ribbon campaigns,¹ but stigma of breast cancer is still prevalent in Chinese culture.² Self-stigma occurs when breast cancer survivors endorse and internalize the

negative beliefs toward themselves.³ Research has indicated that Asian American cancer survivors have poorer quality of life (QOL) compared with non-Hispanic white cancer survivors.⁴ Although numerous studies have demonstrated the negative effect of self-stigma on QOL among individuals with mental illness,⁵ research is rather limited for cancer survivors. Chinese Americans are one of the

Data analysis of the present study was performed when Dr. Qiao Chu was a postdoctoral fellow at The University of Texas MD Anderson Cancer Center.

fastest growing groups in the United States,⁶ and breast cancer has the highest incidence rate among Asian American women.⁷ Thus, more studies are needed to deepen our understanding of the association between self-stigma and QOL for Chinese American breast cancer survivors. The present study aimed to investigate how self-stigma is associated with QOL among Chinese American breast cancer survivors by examining the mediating effects of concerns about breast cancer, self-efficacy for coping with cancer, and depressive symptoms.

1.1 | The psychological responses to self-stigma among Chinese American breast cancer survivors

In Chinese culture, cancer is often regarded as a contagious disease or death sentence for immoral behaviors committed by the individuals or their ancestors.^{2,8} Research has revealed that such cancer stigma is widely endorsed and internalized by Chinese American breast cancer survivors, who perceive themselves as undesirable people who bring shame and burden to their families.^{8,9} Research has found that self-stigma related to breast cancer results in poor QOL among Chinese American breast cancer survivors^{10,11}; however, the underlying psychological mechanisms are understudied.

Hatzenbuehler's Integrative Mediation Framework of Group-Specific and General Psychological Processes of Stigma¹² outlines the psychological responses to self-stigmatization. According to the theory, internalized stigma may lead to emotional disorders through its impact on cognitive processes. These cognitive processes include concerns and pessimistic beliefs about one's life in the future, and negative views of the self. These negative beliefs about the self and life may, in turn, lead to internalizing psychopathology, such as depression and anxiety. Drawing upon the cognitive processes depicted in Hatzenbuehler's framework, breast cancer survivors' self-stigma may increase concerns about various domains of life and diminish self-efficacy for coping with cancer. The heightened concerns and lowered self-efficacy may then lead to emotional distress, which may ultimately result in poor QOL.

1.2 | The mediating effect of concerns about breast cancer

Qualitative studies have indicated that self-stigma related to breast cancer may increase concerns about various domains of life.^{8,9} Driven by the internalized stigma that breast cancer is a punishment for immoral behaviors, survivors may associate life difficulties (e.g., cancer recurrence, financial crisis, or marriage issues) with the "punishment" and thus feel more hopeless and become more concerned about the possible negative impact of breast cancer on their future life. Moreover, in comparison to survivors with low self-stigma, highly self-stigmatized survivors may have additional concerns about other domains of life. For example, the internalized stigma that breast cancer represents bad luck or that breast cancer is

a contagious disease elicits worries about being rejected by family and friends.^{8,9} Additionally, Chinese culture dictates that women place a greater value on nurturing their family than on their own well-being.¹³ The self-stigma that breast cancer survivors are a burden to their families may drive survivors to worry about not fulfilling their roles as a caregiver.⁸ These concerns may, in turn, lead to emotional distress and worse QOL. Spencer et al.¹⁴ found that breast cancer survivors' concerns about various life domains predicted greater depressive symptoms and poorer QOL. In another study on cancer survivors with children, worries about the impact of cancer on their children (e.g., that cancer may strain the emotional relationship between their children and themselves) was associated with increased anxiety and depression.¹⁵ Moreover, research has found that worry about cancer recurrence is associated with worse QOL and poorer physical and mental health among breast cancer survivors.¹⁶

1.3 | The mediating effect of self-efficacy for coping with cancer

Self-stigma can also result in lowered self-efficacy for coping with cancer, which may affect emotional well-being and QOL. According to Corrigan's progressive model of self-stigma, stigmatized individuals who endorse the stigma may apply the stigma to their self-perceptions and experience reduced self-efficacy for managing the challenges of the disease and pursuing life goals.¹⁷ Supporting this theory, studies on individuals with mental illness have documented a negative relationship between self-stigma and self-efficacy for coping.¹⁸ Therefore, we would expect that breast cancer survivors who endorse the stigma of breast cancer may regard themselves as unworthy and hopeless, resulting in lowered self-efficacy for coping with cancer. The lowered self-efficacy may then lead to greater emotional distress. Bandura posited that individuals with lower self-efficacy for coping are less able to regulate their behaviors to manage pressures in life, and are thus more vulnerable to depression during a life crisis.¹⁹ In line with this theory, a meta-analysis has demonstrated that lower self-efficacy for coping with cancer is strongly associated with more severe depressive symptoms and lower QOL.²⁰ Thus, it is likely that when breast cancer survivors' self-stigma leads to lower self-efficacy for coping; they may be more vulnerable to the stress caused by cancer, resulting in greater emotional distress.

1.4 | Depressive symptoms as an emotional predictor of QOL

Longitudinal studies have indicated that depression is a major psychological factor predicting later QOL among breast cancer survivors. One study found that over 14 months after surgery, breast cancer survivors' depressive symptoms persistently predicted poorer QOL in various dimensions.²¹ Another study found that breast cancer survivors diagnosed with higher levels of depression after surgery

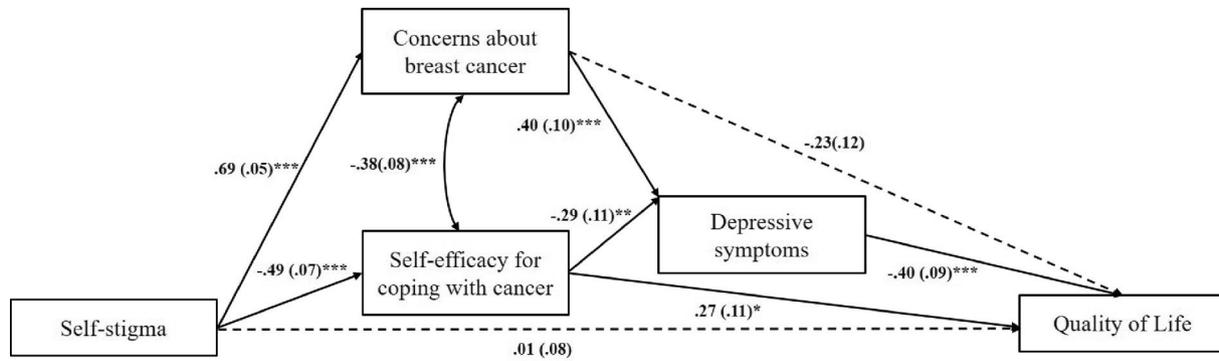


FIGURE 1 The serial mediation model with standardized parameter estimates and standard errors in parentheses. Solid lines indicate significant paths at $p < 0.05$. Dashed lines indicate nonsignificant paths. Controlled covariates (i.e., annual household income and chemotherapy) were omitted in the figure for simplicity. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

displayed worse QOL at 1-year follow-up.²² Based on these findings, we expected that depressive symptoms may mediate the association between concerns/self-efficacy for coping and QOL among breast cancer survivors.

1.5 | The present study

The present study aimed to investigate the psychological mechanisms underlying the association between self-stigma and QOL among Chinese American breast cancer survivors. Based on the existing theoretical frameworks and empirical studies, we proposed a serial multiple mediation model. Specifically, we hypothesized that self-stigma would be associated with greater concerns and lower self-efficacy for coping with cancer; greater concerns and lower self-efficacy for coping would be associated with more severe depressive symptoms, which, in turn, would be associated with lower QOL (see Figure 1 for the hypothesized model).

2 | METHODS

2.1 | Participants and procedure

The present study utilized the baseline data of a larger longitudinal study that aimed to investigate stress coping and psychological well-being among Chinese American breast cancer survivors.²³ The study received approval from the institutional review boards of University of Texas MD Anderson Cancer Center (protocol number: 2019-1012) and University of Houston (protocol number: STUDY00000065). Written informed consent was obtained from all participants enrolled in the study. The recruitment and screening were conducted by our community partner, Herald Cancer Association, who is experienced in facilitating support groups for Chinese American breast cancer survivors. Potential participants were contacted through phone calls, emails, instant messaging apps, and face-to-face recruitment. All communication and questionnaires were administered in Chinese.

In total, 112 Chinese American breast cancer survivors were recruited from local communities in the Southern California, New York, and Dallas metropolitan areas. Inclusion criteria were Chinese American breast cancer survivors who can read and write in Chinese. All enrolled participants completed a questionnaire packet in the mail that included assessment of demographic information, clinical characteristics, and variables of interest. Completed questionnaires were mailed back to the research team through a prepaid envelope. Participants were between 39 and 90 years old ($M_{\text{age}} = 58.89$, $SD = 9.48$). Among the participants, 74.1% were married, and 60.7% had some college-level education or more. The majority of the participants (65.2%) had an annual household income below \$45,000. Participants' breast cancer diagnoses ranged from Stage 0 to Stage III. The average months since diagnosis was 7.00 ($SD = 5.91$). All of the enrolled participants were foreign-born immigrants. Table 1 presents the detailed sample characteristics.

Post-hoc power analysis using the Monte Carlo approach²⁴ was conducted to estimate the power of testing the proposed mediation effects. First, the hypothesized model is defined by fixing the parameters to the best guess of the population parameter values, and data are generated from the defined population. Second, a number of samples are drawn from this population, with the indirect effect estimated for each sample. The proportion that the indirect effect reaches significance at 0.05 level across all replications represents the power estimate. Results of 10,000 simulations with medium effect size for the path coefficients (0.36)²⁵ indicated that the current sample of 112 participants yielded 87.3% power to detect a significant indirect effect of stigma through concerns and depressive symptoms, and 89.8% power to detect a significant indirect effect of stigma through self-efficacy and depressive symptoms.

2.2 | Measures

2.2.1 | Self-stigma

Self-stigma associated with breast cancer was measured using the nine-item Self-Stigma Scale-Short Form (SSS).²⁶ The original SSS

TABLE 1 Demographic and clinical characteristics of participants ($n = 112$)

Variables	Percentage/mean (SD)
Age (years) ^a	58.89 (9.48)
Time since diagnosis (years) ^a	7.00 (5.91)
Highest education	
Below high school	13.4
Some high school	2.7
High school graduate	22.3
Some college	25.9
College degree	20.5
Postgraduate degree	14.3
Employment status	
Full-time	15.2
Part-time	14.3
Unemployed/retired/housewife	67.9
Annual household income	
Less than \$15,000	25.9
\$15,000–\$45,000	39.3
\$45,000–\$75,000	16.1
More than \$75,000	11.6
Personal monthly income	
Less than \$1500	50.9
\$1500–\$4500	27.7
\$4500–\$7500	4.5
More than \$7500	1.8
Marital status	
Never married/divorced/ separated/widowed	25.0
Married	74.1
Stage of breast cancer	
0	11.6
I	29.5
II	41.1
III	16.1
Treatments received ^b	
Surgery	81.3
Chemotherapy	61.6
Radiation	56.3

Note: Percentages may not add up to 100% due to missing data.

^aMean (SD).

^bParticipants may have received more than one type of treatments if applicable.

was developed and validated to assess self-stigmatization among concealable minorities, such as immigrants or individuals with mental illness. In the present study, we replaced the description of minority identity with “breast cancer survivor.” Sample items are “My identity as a breast cancer survivor is a burden to me” and “I estrange myself from others because I am a breast cancer survivor.” Participants rated the degree to which they agreed with each statement on a 4-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*). A higher mean score indicates a higher level of self-stigma. The SSS has been validated among Chinese immigrant women in Hong Kong.²⁶ The present study indicated good internal reliability for the scale (Cronbach's $\alpha = 0.95$).

2.2.2 | Concerns about breast cancer

The Profile of Concerns about Breast Cancer (PCBC)¹⁴ was used to measure concerns about breast cancer. The scale includes 28 items that describe issues in various life domains that breast cancer survivors may be concerned about. Example items include “that your friends will avoid you,” and “that you won't see your children grow up.” Participants rated the degree of their concern about each item using a 5-point scale from 1 (*not at all*) to 5 (*extremely*). A higher sum score indicates higher levels of concerns. The scale had good internal reliability in the present study (Cronbach's $\alpha = 0.95$).

2.2.3 | Self-efficacy for coping with cancer

Self-efficacy for coping with cancer was assessed using the 12-item Brief Form of the Cancer Behavior Inventory.²⁷ Sample items are “maintaining independence” and “coping with physical changes.” Participants were asked to rate their confidence in coping with various domains on a 7-point scale ranging from 1 (*not confident at all*) to 7 (*totally confident*). A higher sum score indicates a higher level of self-efficacy for coping with cancer. The scale had high internal reliability in the present study (Cronbach's $\alpha = 0.95$).

2.2.4 | Depressive symptoms

Depressive symptoms were measured using the six-item depression subscale of the Brief Symptom Inventory (BSI).²⁸ Participants rated the extent to which they were bothered by the symptoms described in each item over the past week on a 5-point scale from 0 (*not at all*) to 4 (*extremely*). The reliability and validity of the BSI have been established in previous research with Chinese drug users.²⁹ The scale had good internal reliability in the current study (Cronbach's $\alpha = 0.90$).

2.2.5 | Quality of life

The 27-item Chinese version of the Functional Assessment of Cancer Therapy general scale (FACT-G)³⁰ was used to measure participants' QOL for the past week, including physical, social, emotional, and functional well-being. Participants rated the extent to which they agreed with each statement on a 5-point scale from 0 (*not at all*) to 4 (*very much*). The scale has been validated among Chinese breast cancer survivors.³¹ A higher sum score indicates better QOL. The scale indicated good internal reliability in the present study (Cronbach's $\alpha = 0.95$).

2.3 | Data analysis plan

First, descriptive statistics and correlations were performed in SPSS 24.0. The associations of the outcome variable (i.e., QOL) with demographic and clinical characteristics were examined to identify potential covariates. To test the hypothesized serial multiple mediation model, path analysis was conducted in Mplus 7.0. Model fit was assessed using chi-square goodness-of-fit statistic, the comparative fit index (CFI), the Tucker–Lewis index (TLI), and the root-mean-square error of approximation (RMSEA). A model with a CFI and TLI greater than 0.95 and an RMSEA less than 0.05 indicates a good fit with the data.³² Indirect effects were assessed using the bootstrap procedure with bias-corrected 95% CIs. An absence of zero in the 95% CI suggests a significant indirect effect. Full information maximum likelihood (FIML) estimation was used to handle missing data.

3 | RESULTS

3.1 | Descriptive statistics and correlations

Table 2 presents the means, standard deviations, and zero-order correlations among the variables of interest. Self-stigma was positively associated with concerns and depressive symptoms, and negatively associated with self-efficacy for coping with cancer and QOL. Among the demographic and clinical variables, previously having received chemotherapy and annual household income were significantly associated with QOL (both $p < 0.05$) and were thus controlled for as covariates in subsequent analyses.

3.2 | Path analysis

The hypothesized model indicated good fit, $\chi^2(5) = 6.13$, $p = 0.29$; CFI = 0.996, TLI = 0.985, RMSEA = 0.045, 95% CI (0.000, 0.145). The total effect (standardized estimate = -0.45 , 95% CI_{bc} = -0.59 to -0.29) and total indirect effect of self-stigma on QOL (standardized estimate = -0.46 , 95% CI_{bc} = -0.62 to -0.32) were both

significant. Consistent with our hypothesis, the specific indirect effect of self-stigma through concerns and depressive symptoms (standardized indirect effect = -0.11 , 95% CI_{bc} = -0.23 to -0.05) and the specific indirect effect of self-stigma through self-efficacy for coping with cancer and depressive symptoms (standardized indirect effect = -0.06 , 95% CI_{bc} = -0.12 to -0.02) were both significant. As shown in Figure 1, self-stigma was associated with greater concerns ($\beta = 0.69$, $p < .001$) and lower self-efficacy for coping with cancer ($\beta = -0.49$, $p < .001$); the latter two were associated with higher levels of depressive symptoms ($\beta = 0.40$ and -0.29 , respectively, both $p < 0.01$), which were, in turn, associated with lower QOL ($\beta = -0.40$, $p < 0.001$).

Additional significant indirect effects were observed. First, self-efficacy for coping was a significant standalone mediator in the association between self-stigma and QOL, controlling for concerns and depressive symptoms (standardized indirect effect = -0.13 , 95% CI_{bc} = -0.25 to -0.03). Second, depressive symptoms mediated the relationship between concerns and QOL (standardized indirect effect = -0.16 , 95% CI_{bc} = -0.31 to -0.07) and the relationship between self-efficacy and QOL (standardized indirect effect = 0.12 , 95% CI_{bc} = 0.04 – 0.23). Controlling for the mediators, the direct effect of self-stigma on QOL was no longer significant (standardized estimate = 0.01 , 95% CI_{bc} = -0.14 – 0.18). The serial multiple mediation model accounted for 59.4% of the variance in QOL.

Due to the cross-sectional design of the present study, alternative causal models are plausible. Following the recommendation of Fiedler et al.³³ we tested the reverse mediation models, by switching the outcome variable and the mediators. Specifically, two reverse mediation models were tested: (a) self-stigma → QOL → concerns and self-efficacy → depressive symptoms; and (b) self-stigma → concerns and self-efficacy → QOL → depressive symptoms. Results indicated inadequate fit of the two reverse mediation models (for both models, TLI < 0.75, RMSEA > 0.1).¹

4 | DISCUSSION

The present study investigated the relationship between self-stigma and QOL among Chinese American breast cancer survivors and the underlying psychological mechanisms. Consistent with our hypothesis, concerns about breast cancer, self-efficacy for coping with cancer, and depressive symptoms may act as important pathways through which self-stigma may strain QOL.

The current study confirmed the negative association between self-stigma and QOL found in the limited empirical studies on Chinese American breast cancer survivors.^{10,11} Moreover, our findings suggest that self-stigma may activate maladaptive cognitive (e.g., concerns about breast cancer and diminished self-efficacy) and affective processes (e.g., depressive symptoms), which threaten QOL.

Previous qualitative research on Chinese American breast cancer survivors suggests a linkage between self-stigma and heightened

	Mean	SD	1	2	3	4	5
1. Self-stigma	16.45	7.13	-	0.69**	-0.50**	0.51**	-0.50**
2. Concerns about breast cancer	60.92	22.62		-	-0.60**	0.57**	-0.63**
3. Self-efficacy for coping with cancer	58.34	15.04			-	-0.54**	0.63**
4. Depressive symptoms	3.55	4.40				-	-0.68**
5. Quality of life	77.74	18.97					-

** $p < 0.01$.

TABLE 2 Descriptive statistics and bivariate correlations for the variables of interest

concerns about future life with cancer. For example, driven by the endorsed stigma that breast cancer is contagious and result from moral wrongdoing, survivors are sensitive to avoidance behaviors and tend to attribute the avoidance behaviors to their identity as a breast cancer survivor.⁸ Some survivors also characterize themselves as a shame to the family, and express worries that the disease may render their family to be disdained in the community.² The present study provides quantitative evidence that complimented and extended the qualitative research findings, and indicate that Chinese American breast cancer survivors' concerns mediate the association between self-stigma and depressive symptoms.

Our findings also offered support for Corrigan's progressive model of self-stigma.¹⁷ The internalized breast cancer stigma may diminish individuals' self-concept and perceived controllability over their life; this may render survivors more vulnerable to the stress caused by cancer, and lead to more emotional distress and worse QOL.²⁰ Consistent with the literature, our results indicated that self-efficacy is a standalone mediator in the association between self-stigma and QOL, suggesting that survivors' confidence in maintaining control over their life while living with cancer may be an essential factor affecting their QOL.

We found that depressive symptoms significantly mediated the association between concerns/coping efficacy and QOL. These findings are in line with previous studies that found breast cancer survivors' concerns and lower coping efficacy were associated with greater depressive symptoms.^{14,15,20} Our findings also align with previous longitudinal studies that found that breast cancer survivors' depressive symptoms predict poor QOL over up to 14 months after surgery.^{21,22} Depressive symptoms may reduce survivors' perceived or actual support from their social network,³⁴ which may negatively affect QOL.

After controlling for the mediators, the direct effect of self-stigma on QOL was no longer significant. This finding indicates the important effect of breast cancer concerns, coping efficacy, and depressive symptoms in explaining the relationship between self-stigma and QOL. At the same time, this result should be interpreted with caution, as the nonsignificant direct effect does not preclude the possibility of additional mediators.³⁵ In particular, the few studies on Chinese American breast cancer survivors have reported the mediating effects of intrusive thoughts, posttraumatic growth, and perceived burden on the association between self-stigma and

QOL.^{10,11} Thus, future research is warranted to elucidate the relationships among these psychological constructs and to further our understanding about the mechanisms underlying the association between self-stigma and QOL for this population.

4.1 | Study limitations

The present study has limitations that suggest directions for future research. First, although the proposed serial multiple mediation model is based on theory and empirical evidence, the cross-sectional design of our study impedes drawing conclusions of causal relationship or temporal precedence. Future studies with longitudinal or experimental designs are needed to examine the causal relationships among the variables. Second, the sample is limited to Chinese-speaking breast cancer survivors; thus, whether our findings are generalizable to other ethnicities warrants future research. Third, our sample was restricted to foreign-born Chinese immigrants. Previous research has found that psychological sequelae of self-stigma depends on the acculturation level of Chinese American breast cancer survivors.³⁶ Thus, it calls for future studies to examine the generalizability of our findings to Chinese American breast cancer survivors who were US born.

4.2 | Clinical implications

The study findings have important implications for clinical practice and the design of intervention to reduce the negative health implications of self-stigma among Chinese American breast cancer survivors. Based on our findings, resources need to be allocated to alleviating survivors' excessive concerns and facilitating their self-efficacy for coping in order to improve QOL. For example, cognitive-behavioral therapy has shown promise for reducing cancer survivors' concerns and improving self-efficacy.^{37,38} In addition, healthcare providers may devote more time to inquiring about survivors' concerns and addressing these concerns through responsive and supportive communication. Research has found that empathic and supportive patient-centered communication during crucial medical encounters is effective for reducing anxiety and concerns in cancer patients.³⁹ Moreover, our results also suggest that interventions

targeting emotional distress would be effective for mitigating the detrimental effect of self-stigma on QOL. Culturally sensitive interventions, such as expressive writing, have demonstrated benefits in facilitating emotional well-being and QOL among Chinese American breast cancer survivors.⁴⁰

5 | CONCLUSIONS

In conclusion, the present study contributes to the limited literature about the association between self-stigma and QOL among Chinese American breast cancer survivors, and demonstrates the potential psychological mechanisms underlying this association. Our findings suggest that self-stigma may reduce QOL among Chinese American breast cancer survivors through increasing concerns about breast cancer, diminishing self-efficacy for coping, and worsening depressive symptoms. Psychosocial interventions and supportive care should focus on these cognitive and emotional processes to improve QOL for this population.

ACKNOWLEDGMENTS

This research was supported by National Cancer Institute (NCI) Grant CA180896 (principal investigator, Qian Lu).

CONFLICT OF INTEREST

The authors have no conflict of interests to report.

DATA AVAILABILITY STATEMENT

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

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ENDNOTE

¹ Due to the cross-sectional design of the present study, we also tested an alternative model with depressive symptoms and quality of life as parallel outcomes. Results indicated a good fit of this model, $\chi^2(4) = 3.85$, $p = 0.43$; CFI = 1.000, TLI = 1.003, RMSEA = 0.00, 95% CI [0.000, 0.140].

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How to cite this article: Chu Q, Wong CCY, Chen L, Shin LJ, Chen L, Lu Q. Self-stigma and quality of life among Chinese American breast cancer survivors: A serial multiple mediation model. *Psycho-Oncology*. 2020;1–8. <https://doi.org/10.1002/pon.5590>