



# Perceived Social Support Mediates the Longitudinal Relations between Ambivalence over Emotional Expression and Quality of Life among Chinese American Breast Cancer Survivors

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## Abstract

**Purpose** The present study examined perceived social support as a mediator of the longitudinal link between ambivalence over emotional expression (AEE) and quality of life among a sample of Chinese breast cancer survivors.

**Methods** Ninety-six Chinese breast cancer survivors recruited from Southern California completed four surveys in total: (1) a baseline survey (T1), 1-month follow-up (T2), 3-month follow-up (T3), and 6-month follow-up (T4). Participants filled out a paper-pen questionnaire containing the Ambivalence over Emotional Expression Questionnaire (AEQ), the Functional Assessment of Cancer Therapy-General (FACT-G), and the Medical Outcomes Study Social Support Scale (MOS-SSS).

**Results** Higher T1 AEE was associated with lower T1 social support ( $B = -0.01$ ,  $SE = 0.004$ ,  $p < 0.01$ ) which in turn was associated with lower quality of life at T2 ( $B = 2.98$ ,  $SE = 0.64$ ,  $p < 0.01$ ), T3 ( $B = 2.14$ ,  $SE = 0.54$ ,  $p < 0.01$ ), and T4 ( $B = 2.08$ ,  $SE = 0.68$ ,  $p < 0.01$ ).

**Conclusions** These results suggest that the harmful effect of AEE on quality of life is explained by reduced social support. Given the detrimental effects of AEE on social support and quality of life, future research on interventions that facilitate emotional disclosure is needed. Implications for the effects of Chinese culture on AEE are discussed.

**Keywords** Perceived social support · Ambivalence over emotional expression · Quality of life · Chinese · Asian American

## Introduction

Although breast cancer incidence has declined for non-Hispanic Whites in the USA, it has steadily increased among Chinese individuals over the past two decades [1, 2]. As more Chinese individuals are diagnosed with breast cancer, more research aimed at understanding the psychosocial predictors of quality of life among this population is needed. Breast cancer can elicit intense negative emotions that persist long after the end of treatment [3]. How individuals regulate these emotions have

implications for their well-being. For instance, individuals can experience ambivalence over emotional expression (AEE) when they have difficulty expressing emotions related to cancer.

AEE refers to experiences of emotional conflict when there is a lack of ability to comfortably express feelings or the regret of having expressed emotions [4]. AEE distinguishes between individuals who have similar levels of suppressed emotions but whose underlying ambivalence differs (e.g., relaxed and quiet vs. repressed and tense) [4]. High levels of AEE are associated with greater depressive symptoms and poorer interpersonal functioning in both healthy individuals [5, 6] and clinical samples [7–9]. These findings, however, are limited by cross-sectional designs and have rarely examined the mechanism through which AEE is associated with maladjustment. Furthermore, these constructs have rarely been examined with Chinese American breast cancer survivors, whose cultural backgrounds may influence their experience of AEE [10]. In Chinese culture, high levels of emotional restraint are encouraged to preserve group harmony [11]. Chinese individuals, then, may be especially conflicted with expressing their emotional distress to others and thus experience higher levels of AEE than European Americans [12]. To address

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these gaps in the literature, we examined the link between AEE and quality of life and whether this association is mediated by social support in a longitudinal study with Chinese breast cancer survivors.

Because cancer experiences can lead individuals to experience a sense of personal inadequacy [13], having strong perceived social support (henceforth referred to as social support) is vital for successful cancer adjustment [14]. Social support refers to the *perceptions* of the availability and quality of support, which is different from the extent to which patients receive *actual* support [15]. Positive associations between social support and well-being among cancer survivors have been well-documented [16]. The social networks for Chinese breast cancer survivors tend to be smaller, and their support tends to come from their immediate family (i.e., not from colleagues or friends) [17]. Members of their social network are often expected to anticipate the needs of Chinese breast cancer survivors so that they do not have to explicitly ask for support or care. Chinese breast cancer survivors also experience pressure to protect the face of their immediate family by suppressing their calls for help from outside of the family (because requesting for support from others might suggest that the immediate family was unable to provide adequate care) [17, 18].

The quality of social support is often dependent on an individual's ability to communicate their needs [19]. The lack of communication about emotions from an individual high in AEE may reduce relationship closeness. Similarly, the lack of emotional disclosures among individuals high in AEE may prevent others from detecting their need for support, thereby resulting in lower satisfaction with life [20]. AEE is associated with poorer interpersonal functioning [7] and lower social support [5, 20]. Thus, we hypothesized that the link between AEE and quality of life would be mediated by social support among Chinese breast cancer survivors.

Extant research so far has documented the cross-sectional associations between AEE and maladjustment, but the present study is among the first to examine the longitudinal associations between AEE and quality of life. We further evaluated social support as a potential mediator underlying the relation between AEE and quality of life in a sample of Chinese breast cancer survivors. We hypothesized that the experience of AEE would be associated with lower social support, which in turn would be associated with lower quality of life at 1-, 3-, and 6-month follow-ups.

## Methods

### Participants

The present study involves the secondary analyses of a randomized controlled trial of expressive writing among Chinese breast cancer survivors [21]. The participants were 96 Chinese

breast cancer survivors ( $M_{age} = 54.54$ ,  $SD = 7.91$ ) who have been living in the USA for an average of 19.02 years ( $SD = 9.52$ ). Fourteen percent were diagnosed with breast cancer at stage 0, 31% were diagnosed at stage 1, 42% were diagnosed at stage 2, and 14% were diagnosed at stage 4. The average number of months since their diagnosis was 19.24 ( $SD = 10.93$ ). Eight percent were never married, 72% were married, 2% were widowed, 3% were separated, and 15% were divorced. Twenty-seven percent reported an annual household income of less than \$15,000, 27.1% between \$15,000 and 45,000, 18.8% between \$45,000 and 75,000, and 14.6% greater than \$75,000 (12.5% did not answer the question). Lastly, 15% had less than high school education, 4% had some high school education, 29% graduated from high school, 25% had some college education, 23% graduated from college, and 3% had a post-graduate degree. Twenty-four participants, one participant, and two participants were lost to follow-up at T2, T3, and T4, respectively.

### Procedure

All aspects of the study were carried out in Chinese. Participants were told that the purpose of the study was to understand their cancer experience. Participants were contacted and screened by Chinese American community organizations in Southern California via telephone. Once verbal consent was provided, consent forms and paper-pen surveys were mailed. After completing the baseline survey, participants completed three writing sessions. After the writing sessions, participants completed three follow-up surveys mailed to their homes (1-month follow-up (T2), 3-month follow-up (T3), and 6-month follow-up (T4). Participants were compensated with \$90, and this study was approved by the Institutional Review Board. Additional information on enrollment rates (CONSORT chart) and effects of writing sessions is reported elsewhere [21].

### Measures

**Ambivalence over Emotion Expression** AEE was assessed by the Ambivalence over Emotional Expressiveness Questionnaire (AEQ) [4]. In the original AEQ, there were 28 items. However, in the present study, four items (e.g., "I try to control my jealousy concerning my boyfriend/girlfriend even though I want to let them know I'm hurting") were removed from the questionnaire due to feedback from a focus group that these items were incompatible with them. Thus, participants rated 24 items (e.g., "I want to express my emotions honestly, but I am afraid that it may cause me embarrassment or hurt") on a 5-point Likert scale (1 = *Strongly Disagree*, 5 = *Strongly Agree*). We translated the AEQ into Chinese following established protocol on cross-cultural research [22]. The AEQ has been utilized with other illness and cancer

populations, such as rheumatoid arthritis [7] and gastrointestinal cancer patients [23]. In the present study, the Cronbach's  $\alpha$  for T1 AEE was 0.95. A higher score reflects higher levels of AEE.

**Perceived Social Support** Social support was assessed with the Chinese version [24] of the Medical Outcomes Study Social Support Scale (MOS-SSS) [25]. The MOS-SSS contains five factors, including emotional, informational, tangible, affectionate support, and positive social interaction. Like the scale validation study [25], we created a social support composite variable by summing across each factor. Participants rated 19 items (e.g., “Someone you can count on to listen to you when you need to talk”, “Someone to help you if you were confined to bed”) on a 5-point Likert scale (1 = *None of the time*, 5 = *All of the time*). The psychometric properties of the scale with medical populations have been established [25]. In the present study, social support was assessed only at T1. The Cronbach's  $\alpha$  for T1 social support was 0.98, and a higher score reflects higher levels of social support.

**Quality of Life** Quality of life was assessed with the Chinese version [26] of the Functional Assessment of Cancer Therapy-General (FACT-G) [27]. The FACT-G contains four factors, including physical, emotional, functional, and social well-being. We created a quality of life composite variable by summing across each dimension. Participants rated 27 items (e.g., “I have a lack of energy”, “I am able to work”) on a 5-point Likert scale (0 = *Not at all*, 4 = *Extremely*). In the present study, the Cronbach's  $\alpha$  for quality of life was 0.88, 0.92, 0.94, and 0.93 for T1 to T4, respectively. A higher score reflects higher levels of quality of life.

### Data Analysis Plan

To test the proposed mediation model, the analyses were conducted using Mplus 7.4 [28]. Full-information maximum likelihood (FIML) was used to handle missing data. The mediation model tested included age and stage at diagnosis as covariates. Indirect effects were reported using the Model Indirect option in Mplus. Quality of life was controlled for at each timepoint. For example, T1 quality of life was controlled for T2 quality of life and T2 quality of life was controlled for T3 quality of life. We used the standard conventions for deciding good model fit (i.e., comparative fit index (CFI) > 0.95, root mean square error of approximation (RMSEA) < 0.08, and standardized root mean square residual (SRMR) < 0.08) [29].

### Results

Descriptive statistics and bivariate correlations are presented in Table 1. T1 AEE was associated with lower T1 social

support ( $r = -0.29$ ,  $p < 0.01$ ) and lower quality of life across all timepoints ( $r$ s range from  $-0.25$  to  $-0.32$ ,  $p$ s < 0.05). T1 social support was associated with greater quality of life across all timepoints ( $r$ s range from 0.37 to 0.53,  $p$ s < 0.001).

The model fits the data adequately, CFI = 0.94, RMSEA = 0.09, SRMR = 0.06, and  $\chi^2(10, N = 96) = 18.28$ ,  $p = 0.05$  (See Fig. 1). Three significant indirect paths were found: (1) T1 AEE  $\rightarrow$  T1 social support  $\rightarrow$  T2 quality of life (indirect effect =  $-0.036$ , SE = 0.015, Sobel's Z =  $-2.387$ ,  $p < 0.05$ ), (2) T1 AEE  $\rightarrow$  T1 social support  $\rightarrow$  T3 quality of life (indirect effect =  $-0.026$ , SE = 0.011, Sobel's Z =  $-2.28$ ,  $p < 0.05$ ), and (3) T1 AEE  $\rightarrow$  T1 social support  $\rightarrow$  T4 quality of life (indirect effect =  $-0.025$ , SE = 0.012, Sobel's Z =  $-2.06$ ,  $p < 0.05$ ). That is, higher T1 AEE was associated with lower T1 social support ( $B = -0.01$ , SE = 0.004,  $p < 0.01$ ) which in turn was associated with lower quality of life at T2 ( $B = 2.98$ , SE = 0.64,  $p < 0.01$ ), T3 ( $B = 2.14$ , SE = 0.54,  $p < 0.01$ ), and T4 ( $B = 2.08$ , SE = 0.68,  $p < 0.01$ ). The model explained 31% of the variance in T2 quality of life, 31% of the variance in T3 quality of life, and 34% of the variance in T4 quality of life.

### Discussion

While the detrimental effects of AEE have been well-documented [4, 20, 30], no extant study has examined the AEE and maladjustment link over time, nor with Chinese breast cancer survivors whose culture encourages emotion suppression. As such, the present study examined the longitudinal associations between AEE and quality of life and whether social support mediated this link among Chinese breast cancer survivors. Consistent with our hypothesis, high AEE was associated with lower social support, which in turn was associated with lower quality of life at 1-, 3-, and 6-month follow-ups. These findings add to a growing literature on emotion regulation and well-being among Chinese breast cancer survivors. Applied more broadly, our findings have implications for interventions designed to reduce AEE among Chinese breast cancer survivors.

The present study extends previous knowledge by revealing social support as a mediator of the AEE and quality of life link among Chinese breast cancer survivors. Individuals high in AEE have been found to report difficulty with reading the emotions of others [5]. Not only do they struggle with identifying emotional cues, they also tend to infer the opposite emotion valence of the emotions that are conveyed. For example, Chinese breast cancer survivors with high AEE may interpret an empathetic look of concern mistakenly as a frustrated scowl. These impairments in emotion recognition may negatively influence the interpersonal relations between Chinese breast cancer survivors and members of their social network [20]. Second, individuals who are conflicted over their emotions tend to express less emotions [4]. This may result in

**Table 1** Correlations and descriptive statistics for each study variable

Variable	1	2	3	4	5	6	M (SD)
1. T1-Perceived Social Support	–						3.36 (0.95)
2. T1 AEE	–0.29**	–					48.73 (21.47)
3. T1 QoL	0.37***	–0.31**	–				19.01 (6.62)
4. T2 QoL	0.53***	–0.25*	0.29**	–			19.73 (6.04)
5. T3 QoL	0.41***	–0.32**	0.49***	0.27**	–		16.90 (4.84)
6. T4 QoL	0.41***	–0.28**	0.51***	0.37***	0.54***	–	17.03 (6.74)

AEE ambivalence over emotional experience, QoL quality of life

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

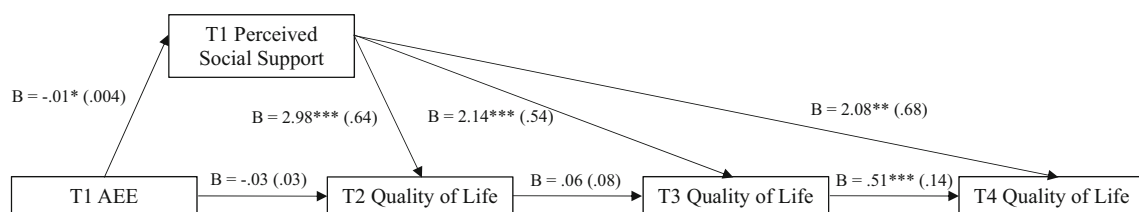
increased use of avoidant coping strategies, which has also been consistently linked with having fewer social resources [31]. The combination of greater utilization of avoidant coping strategies and reduced emotion expressions may lead individuals in their social network to underestimate the Chinese breast cancer survivors’ need for social support.

The similar strength of mediation across each time point suggests that the harmful effects of AEE are relatively stable over time. Moreover, the variances explained in quality of life across time by AEE through social support suggest that AEE is a robust predictor of well-being for Chinese cancer survivors. Consequently, interventions designed to reduce AEE are indicated. To our knowledge, no interventions have been designed to reduce the experience of AEE, but expressive writing interventions and activities combining exercise and meditation such as Tai Chi Chuan may be two examples of culturally relevant interventions for Chinese breast cancer survivors. First, both expressive writing interventions and Tai Chi Chuan are congruent with the Chinese cultural emphasis on emotional restraint. Because, first generation immigrants often experience stigma and lack the language ability to participate in interventions carried out in English; these interventions do not require negative interpersonal disclosure and circumvent potential language barriers that may be encountered in traditional psychosocial interventions [32]. Breast cancer survivors who were assigned to practice

Tai Chi Chuan for 12 weeks experienced significantly higher quality of life and self-esteem than the women who were assigned to participate in a 12-week support group [33].

The present study has several limitations. First, the sample consisted of Chinese breast cancer survivors and may not generalize to other Asian American subgroups and other cultural groups that encourage emotion expression (e.g., Latino Americans). Second, the study relied on self-report to assess quality of life and the experience of AEE. Although these measures are well validated, extant research among Asian Americans has documented cultural differences in the self-report of emotional distress [34]. The inclusion of other biomarkers of health (e.g., cortisol) in future research would complement the study findings. Lastly, social support was only assessed at baseline, and thus the prospective relations of social support over time was untestable. Future research that assesses the study variables at each time point would allow us to test the bidirectional nature between AEE, quality of life, and social support in a cross-lagged model.

Despite these limitations, the study focused on an understudied sample of Chinese breast cancer survivors and shed new light on the longitudinal relations and mechanism between AEE and quality of life. Even though AEE may be experienced more frequently among individuals from Chinese culture [12], our findings suggest that AEE is a harmful emotion regulation process that is associated with lower social



**Fig. 1** Social support mediates the relations between ambivalence over emotional expression and quality of life over time. Analyses controlled for age and stage of diagnosis. Numbers in the parentheses are standard errors. \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$



support, which in turn is associated with reduced quality of life.

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#### Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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