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What is This?
Affect mediates the association between mental adjustment styles and quality of life among Chinese cancer survivors

Nelson CY Yeung and Qian Lu

Abstract
This study examined the association between mental adjustment styles and quality of life, and affect as a mediator among 238 Chinese cancer survivors. Regression analysis showed that quality of life was positively associated with fighting spirit and negatively associated with fatalism. Path analysis showed that greater fighting spirit was associated with more positive affect, which in turn was associated with higher quality of life. Greater fatalism was associated with less positive affect and more negative affect, which in turn was associated with lower quality of life. Findings suggest that positive affect and negative affect are important in understanding mental adjustment styles and its health implications.

Keywords
affect, cancer survivors, Chinese, mental adjustment style, quality of life

Introduction
Cancer is a major public health concern as the incidence of various types of cancer continues to increase (American Cancer Society, 2011, 2013). With advances in medical treatments, cancer is now more likely to be a chronic rather than a terminal illness. Patients’ adaptation to cancer and quality of life (QOL) thus become important issues in cancer care (Jacobsen and Jim, 2011). Researchers have explored the psychosocial factors associated with QOL in order to provide recommendations for future interventions for cancer patients (e.g. Clarke et al., 2011; Floyd et al., 2010). Previous studies showed that patient’s mental adjustment styles were associated with their QOL (e.g. Johansson et al., 2011; Rottmann et al., 2010; Schou et al., 2005). Mental adjustment is defined as a person’s cognitive and behavioral responses to a cancer diagnosis (Greer et al., 1989). It comprises both the appraisal (perception of the implications of cancer) and the ensuing reactions (thoughts and behavior to reduce the threat). Two mental adjustment styles, fighting spirit and fatalism, have received considerable attention in the literature (e.g. Anagnostopoulos University of Houston, USA

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et al., 2006; Johansson et al., 2011; Schou et al., 2005; Whitford and Olver, 2012). However, the majority of studies have been conducted in Western countries and only a few have examined factors explaining the link between mental adjustment styles and health outcomes. This study aimed to examine the association between fighting spirit, fatalism, and QOL among Chinese cancer survivors. It also aimed to investigate the factors mediating these associations.

**Fighting spirit and fatalism**

Fighting spirit is defined as an optimistic attitude with a realistic appraisal of the illness (Greer and Watson, 1987). It is a coping style that involves maintaining hope when facing difficult situations (Cordova et al., 2003). Patients with high fighting spirit view the cancer diagnosis as a challenge, have an optimistic view of the future, and believe it is possible to exert control over the illness (Greer et al., 1989). The function of fighting spirit may be explained by the Theory of Cognitive Adaptation (Taylor, 1983). The theory proposes that successful adjustment to a life-threatening event depends on the search for meaning in the experience of having cancer, the attempt to regain mastery over the event and over life, and the effort to restore self-esteem and an optimistic outlook on life. As an adaptive mental adjustment style, fighting spirit has been found to be associated with self-efficacy (Merluzzi et al., 2001), optimism (Schou et al., 2004), and self-esteem (Bjorck et al., 1999) among cancer patients.

Fatalism originated from the concept of “stoic acceptance” (Greer and Watson, 1987). It is defined as acknowledging the diagnosis without seeking further information unless new symptoms develop (Greer et al., 1979). Patients with fatalism believe that it is impossible to exert any control over cancer so that they often ignore the illness as far as possible and carry on normal life (Morrey and Greer, 1989). Generally viewed as maladaptive, fatalism has been shown to be positively associated with external locus of control and cognitive avoidance (Grassi et al., 1993) and negatively associated with self-efficacy (Straughan and Seow, 1998) among cancer patients.

**The relationship between fighting spirit, fatalism, and QOL**

Evidence regarding the relationship between fighting spirit and QOL is fairly consistent in the literature. A positive association between fighting spirit and QOL has been found among patients with breast cancer (e.g. Anagnostopoulos et al., 2006; Rottmann et al., 2010; Schou et al., 2005), cervical cancer (Nair, 2000), and those with mixed cancer diagnoses (Whitford et al., 2008). Only a few studies reported mixed findings (Johansson et al., 2011) or did not find a significant correlation between fighting spirit and QOL (Anagnostopoulos et al., 2010; Cotton et al., 1999).

In contrast, mixed findings have been documented between fatalism and QOL. Some studies showed that fatalism was negatively associated with QOL (Schou et al., 2005; Whitford et al., 2008), while others showed a positive (Anagnostopoulos et al., 2006, 2010) or nonsignificant correlation (Rottmann et al., 2010) between fatalism and QOL.

Most of the studies exploring the relationship between mental adjustment styles and cancer patients’ health outcomes are primarily conducted among Western populations. Therefore, whether the same relationships could be applied to Asian cancer patients has yet to be explored. Scholars argue that fatalism may be beneficial to adaptation among Asian populations (Kang et al., 2008) because fatalism implies the acceptance of the inevitable reality, which is not necessarily maladaptive. However, no studies have empirically examined the relationship between fighting spirit/fatalism and QOL among Asians. The first goal of this study was to clarify the associations of fighting spirit and fatalism with QOL among Chinese cancer patients.
Affect as a mediator

Accumulating evidence suggests the relationship between mental adjustment style and health outcomes, but few studies have attempted to explain why such an association exists. The second goal of the study aimed to examine factors mediating the link between mental adjustment styles and QOL. As mental adjustment styles are cognitive and behavioral responses to cancer, these responses may further provoke affective responses. According to the Broaden-and-Build Theory (Fredrickson, 2001), positive and negative affect function differently to influence well-being. Positive affect can broaden people’s scopes of attention and cognition and build resources for future coping, which can initiate upward spirals for better well-being. In contrast, negative affect tends to narrow people’s thought-action repertoires and thus reduces personal resources to cope with adversity, which in turn decreases well-being. Fighting spirit may facilitate positive affect toward cancer, which helps build resources to cope with cancer and improve QOL, while fatalism may bring out negative affect, which limits resources to cope with cancer and reduces QOL.

Researchers have started to explore the mediating role of affect in the literature. A recent study has shown that depression mediates the relationship between sense of coherence and QOL among lung cancer patients (Floyd et al., 2010). Although affect has not been directly examined as a mediator between mental adjustment styles and QOL, previous studies have supported the mediating role of affect by finding significant associations between mental adjustment styles and affect, as well as between affect and QOL. Fighting spirit is negatively correlated with negative affect and mood disturbances (Cordova et al., 2003; Hodges and Winstanley, 2012). Fatalism is positively correlated with depression, anxiety, and mood disturbances (Akechi et al., 2000; Cayrou et al., 2003). As a domain of positive affect, vigor is positively correlated with fighting spirit (Schnoll et al., 1995) and negatively correlated with fatalism (Akechi et al., 2000). Several studies have also shown that QOL is positively associated with positive affect and negatively associated with negative affect among cancer patients (Kessler, 2002). Based on the literature, we hypothesized that affect would mediate the relationship between mental adjustment styles and QOL.

Research goals and hypotheses

This study aimed to address existing knowledge gaps in two aspects. First, we investigated the association between mental adjustment styles and QOL among Chinese cancer survivors. We hypothesized that fighting spirit would be positively associated with QOL and fatalism would be negatively associated with QOL. We also proposed affect as a mediator to explain the association between mental adjustment styles and QOL. We hypothesized that positive and negative affect would mediate the relationships between fighting spirit/fatalism and QOL. A higher level of fighting spirit would be associated with a higher level of positive affect and a lower level of negative affect, which in turn would be associated with a higher level of QOL. A higher level of fatalism would be associated with a lower level of positive affect and a higher level of negative affect, which in turn would be associated with a lower QOL.

Methods

Participants were recruited from cancer associations in Beijing, China. Chinese cancer patients who were able to read Chinese were eligible for the study. Prospective participants were introduced to the study. They were ensured that participation was completely voluntary and their responses would be kept confidential. After giving informed consent, participants received an envelope with a questionnaire packet distributed by the staff in the cancer associations. After completing at home, participants then returned it in a sealed envelope. The questionnaire took approximately 40
minutes to complete. Out of the 280 distributed questionnaires, 238 were returned, yielding a response rate of 85 percent. Relevant Institution Review Board approval was obtained.

Measurements

All scales were translated and back-translated by two bilingual psychology graduate students. The original English version was translated into Chinese by one student and back-translated by the other student. The two translated versions of the scales were compared. Points of divergence were discussed. The scales were modified to make the finalized version reflect the intended meanings of the items in the English original version.

**QOL–Cancer Survivors Instrument (QOL-CS)**

On a 6-point Likert scale (0 = feeling very bad, 5 = feeling very good), participants were asked to report their current well-being in four dimensions (physical, psychological, social, and spiritual). The sum score of all items indicated their overall level of QOL, with higher score representing better QOL. Ferrell et al. (1995) showed that this 41-item scale was reliable and correlated with the general version of Functional Assessment of Cancer Therapy–General (FACT-G). Good psychometric properties of the scale were also reported among Korean and American cancer patients (Ersek et al., 1997; Lim and Zebrack, 2008).

**Mental Adjustment to Cancer scale**

Two subscales of the Mental Adjustment to Cancer (MAC) scale (namely, fighting spirit and fatalism) were used to assess participants’ coping style for adjustment of cancer on a 4-point Likert scale (1 = definitely does not apply to me, 4 = definitely applies to me) (Watson et al., 1988a, 1988b). Sample items were “I believe that my positive attitude will benefit my health” (fighting spirit, 13 items) and “I feel that nothing I can do will make any difference” (fatalism, 8 items). Mean scores for the subscales were used in the analysis, with higher scores representing more use of the respective coping style (fighting spirit or fatalism). The subscales reported acceptable reliability (Watson et al., 1988a, 1988b). Fighting spirit was negatively associated with mood disturbance and with the hopeless/helplessness subscale of the MAC scale (Akechi et al., 2000; Nordin et al., 1999). In contrast, fatalism was positively associated with those variables (Akechi et al., 2000; Nordin et al., 1999; Watson et al., 1991). Comparable psychometric properties of the subscales were also demonstrated among Japanese and Australian cancer patients (Akechi et al., 2000; Osborne et al., 1999).

**Affect Balance Scale**

Positive affect and negative affect were measured by the 16-item extended version of Bradburn Affect Balance Scale (ABS) (Bradburn, 1969). On a 4-point Likert scale (1 = never, 4 = always), participants were asked to indicate how frequently they experienced the given situations in the past week. Sample items were “things were going your way” (positive affect, 9 items) and “very lonely or remote from other people” (negative affect, 7 items). A higher mean score indicated a high level of the particular affect. The scale was reliable and valid (Folkman, 1997). Positive affect was positively associated while negative affect was negatively correlated with positive states of mind (Folkman, 1997).

Demographic information (including gender, educational level, occupation, and income) and disease- and treatment-related variables (e.g., type of cancer, stage of cancer diagnosis, length of time since diagnosis, and previous treatments) were also recorded in the questionnaire.

**Participants**

The sample consisted of Chinese cancer survivors (73% female) with a mean age of 55.7
years (standard deviation (SD) = 9.1 years, ranging from 33 to 75 years). Over 80 percent of participants were retired and 45 percent had college education or above. A vast majority were married (90%). Over two-thirds (67%) of the participants were diagnosed at Stages I and II. The most common types of cancer were breast cancer (51.9%); uterine, cervical and ovarian cancer (11.6%); and colorectal and intestinal cancer (9.9%). Most of the participants (73.5%) survived for at least 2 years after diagnosis. A majority of them had undergone surgery (95%), chemotherapy (81.1%), and Traditional Chinese Medicine treatment (82.4%)

**Analytic plan**

Descriptive statistics were computed for major variables. Pearson correlation analysis was conducted to examine the associations among variables. A hierarchical regression was conducted to examine the variance of QOL explained by participants’ background characteristics and major psychological variables. SPSS 18.0 was used for these analyses. A path analysis was used to test how well the hypothesized model explained the associations among QOL and the independent variables. It was conducted by M-plus version 5.2 (Muthen and Muthen, 1998–2008) with observed variables and maximum likelihood estimation. The goodness-of-fit was evaluated using several indices indicating a good fit, including a Satorra–Bentler scaled chi-square value with a nonsignificant p-value (Kelloway, 1998), a root mean square error of approximation (RMSEA) with values ≤0.06 (Steiger, 1990), and Comparative Fit Index (CFI) and Tucker–Lewis Index (TLI) with values ≥0.90 (Hu and Bentler, 1999).

**Results**

**Descriptive statistics and correlations among major variables**

Participants generally reported a moderate level of QOL (mean = 124.53, SD = 24.73). As hypothesized, a higher level of fighting spirit \( (r = .40) \) and a lower level of fatalism \( (r = -0.47) \) were associated with a higher level of QOL. A higher level of positive affect \( (r = .45) \) and a lower level of negative affect \( (r = -0.52) \) were associated with a higher level of QOL \( (\text{all } ps < .01, \text{ Table 1}) \).

**Hierarchical regression analysis**

A hierarchical regression was conducted with QOL as the dependent variable. Demographic variables and patients’ disease-related characteristics were entered in Block 1. Positive affect, negative affect, fighting spirit, and fatalism were entered in Block 2. In Block 1, only age, occupational status, the time since diagnosis, and the stage of cancer were significantly associated with QOL \( (\beta_s = .40, .17, .17, \text{ and } -0.15, \text{ respectively, all } ps < .05) \), indicating that participants who were older in age, employed, with a longer time since diagnosis, and with an earlier stage of cancer during diagnosis had a higher QOL. Block 1 explained 20.3 percent of variance of QOL. After controlling for patients’ background characteristics, all four major psychological variables were still significantly associated with QOL. As hypothesized, a higher level of positive affect \( (\beta = .26, p < .001) \) and fighting spirit \( (\beta = .21, p < .001) \) and a lower level of negative affect \( (\beta = -.31, p < .001) \) and fatalism \( (\beta = -.13, p < .05) \) were associated with a higher level of QOL. Block 1 and Block 2 variables altogether explained 53.9 percent of variance in QOL.

**Path analysis**

A path analysis was conducted to examine whether affect (positive and negative) mediated the relationship between mental adjustment styles (fighting spirit and fatalism) and QOL. The proposed model showed a good fit in predicting QOL (Model 1: \( \chi^2 (1) = 0.734, p > .05; \text{ CFI} = 1.00, \text{ TLI} = 1.019, \text{ RMSEA} = 0.00 \)). All proposed paths were statistically significant except for the path from fighting spirit to negative affect \( (\beta = -.11, p > .05) \). To test a more parsimonious model, we tested another model with the removal of the path from fighting spirit to negative affect.
Table 1. Correlations among major variables (N = 238).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Positive affect</th>
<th>Negative affect</th>
<th>Fighting spirit</th>
<th>Fatalism</th>
<th>Quality of life</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.10</td>
<td>-.07</td>
<td>.11</td>
<td>-.15</td>
<td>.35</td>
</tr>
<tr>
<td>Gender</td>
<td>.09</td>
<td>-.10</td>
<td>.09</td>
<td>-.07</td>
<td>-.04</td>
</tr>
<tr>
<td>Education</td>
<td>-.25**</td>
<td>.03</td>
<td>-.19**</td>
<td>-.15**</td>
<td>-.02</td>
</tr>
<tr>
<td>Marital status</td>
<td>-.26**</td>
<td>.04</td>
<td>-.19**</td>
<td>-.15**</td>
<td>-.02</td>
</tr>
<tr>
<td>Occupation status</td>
<td>.14**</td>
<td>.04</td>
<td>.09</td>
<td>.15**</td>
<td>.07</td>
</tr>
<tr>
<td>Time since diagnosis</td>
<td>.14**</td>
<td>-.04</td>
<td>.08</td>
<td>.01</td>
<td>-.03</td>
</tr>
<tr>
<td>Cancer type</td>
<td>.11</td>
<td>-.09</td>
<td>.12</td>
<td>.15**</td>
<td>.07</td>
</tr>
<tr>
<td>Cancer stage</td>
<td>.15**</td>
<td>-.02</td>
<td>-.19**</td>
<td>-.15**</td>
<td>.11</td>
</tr>
<tr>
<td>Cronbach's α</td>
<td>.85</td>
<td>.82</td>
<td>.79</td>
<td>.79</td>
<td>.93</td>
</tr>
</tbody>
</table>

Coding for variables: gender: male (1), female (2); education level: middle school or below (1), high school (2), college or above (3); marital status: not married (0), married (1); occupation status: not full-time employed (0), full-time employed (1); time since diagnosis: less than 1 year (1), 1–2 years (2), 2–5 years (3), more than 5 years (4); type of cancer: not breast cancer (0), breast cancer (1).

Discussion

Few studies have attempted to explain why mental adjustment styles influence health. Moreover, psychological adjustments among Chinese cancer patients have been understudied. This is the first study to explore affect as a mediator to explain the relationship between mental adjustment styles and QOL among Chinese cancer patients. Consistent with our hypotheses, QOL was positively associated with fighting spirit and negatively associated with fatalism. Greater fighting spirit was associated with more positive affect, which was in turn associated with better QOL. Greater fatalism was associated with less positive affect and more negative affect, which was in turn associated with worse QOL. Findings suggest that affect is an important factor in understanding mental adjustment styles and their health implications.

Our results are in line with Western studies showing a positive association between fighting spirit and QOL and a negative association to negative affect. This revised model showed a good fit in predicting QOL (Model 2: $\chi^2 (2) = 3.779, p > .05$, CFI = 0.994; TLI = 0.971; RMSEA = 0.06) with a nonsignificant chi-square change from the proposed model ($\Delta \chi^2 (1) = 3.045, p > .05$), and was thus considered as the final model. The associations among the variables did not change even after controlling for age and the stage of cancer (significant demographic variables in Block 2 in hierarchical regression). In Model 2, fighting spirit and fatalism explained 29 and 17 percent of variances of positive affect and negative affect, respectively, and the model explained 47 percent of variance of QOL. Partial mediation effects of positive affect and negative affect were also supported. Specifically, the indirect effects from fighting spirit to QOL via positive affect ($\beta = .10, p < .001$), from fatalism to QOL via positive affect ($\beta = -.08, p < .001$), and from fatalism to QOL via negative affect ($\beta = -.14, p < .001$) were statistically significant (Figure 1).
between fatalism and QOL. Findings suggest that the adaptive role of fighting spirit and the maladaptive role of fatalism are applicable to both Western and Chinese cancer survivors.

Our findings regarding fatalism were in contrast to three studies conducted in Asia. Two studies (Ho et al., 2003, 2004) showed that fighting spirit and fatalism were positively correlated among 115 Hong Kong Chinese cancer patients. They speculated that both fighting spirit and fatalism implied a positive attitude for Chinese. Kang et al. (2008) found that fatalism was negatively associated with helpless/hopeless adjustment style among Korean cancer patients. These studies used the 5-item fatalism subscale in the Mini-MAC (Watson et al., 1994), whereas our study used the 8-item fatalism subscale from the original version of MAC scale. The Mini-MAC fatalism subscale contained 2 items which belonged to the fighting spirit subscale of the original MAC (“counting blessings” and “life is precious”). This may explain why these studies found positive associations among fatalism, fighting spirit, and adaptive psychological outcomes.

Consistent with our hypotheses, positive affect mediated the associations of both fighting spirit and fatalism with QOL, while negative affect mediated the association of fatalism with QOL. The findings further validate the Broaden-and-Build Theory in predicting the beneficial role of positive affect (Fredrickson, 2001). Positive affect could broaden people’s thought-action repertoires and build resources for coping, which could in turn facilitate better health outcomes. Similar to our findings, Voogt et al. (2005) showed that positive affect, but not negative affect, was associated with problem-focused coping among cancer patients. Similarly, Zautra et al. (1995) found that positive affect, but not negative affect, was related to adaptive coping among rheumatoid arthritis patients. These studies, together with ours, imply that positive affect may play a more important role than negative

Figure 1. Path model of the relationships among mental adjustment styles (fighting spirit and fatalism), affect (positive and negative) and quality of life. Values shown are standardized path coefficients. Solid lines represent significant paths in the hypothesized model (all ps < .01). The broken line indicates a nonsignificant path in the hypothesized model (p > .05), which was removed from the final model.
affect in building resources and facilitating positive adjustment to cancer.

This study was subject to several limitations. First, it was a cross-sectional study. The tested relationships were at best correlational, but not causal. Second, the MAC scale was originally developed in Western countries and may not accurately capture the concept of fatalism in Chinese culture. Third, the nonrandom sample and self-selection bias in participation might compromise the generalizability of the findings.

Several implications were provided. First, future studies should investigate the temporal and causal relationships among mental adjustment styles, affect, and QOL with longitudinal designs. Second, we found a negative association between fatalism and QOL among Chinese. Future studies may investigate how religious beliefs (e.g. Buddhism, Taoism) affect people’s interpretation of fatalism and life-threatening events among Chinese populations. Among Chinese, Taoism promotes that human should let nature be a virtue rather than fighting actively against fate. Buddhism suggests that current sufferings are consequences of past actions (karma) (Chan et al., 2001). These beliefs may affect Chinese people’s causal attribution to their disease and their subsequent coping responses. Third, fighting spirit was a protective factor for QOL. It is important to explore the antecedents of fighting spirit in future studies. Practically, we recommend future interventions focusing on the enhancement of positive affect and fighting spirit among Chinese cancer survivors, which in turn help to increase their QOL.

This study showed that fighting spirit was positively associated with QOL among Chinese cancer survivors, while fatalism was negatively associated with QOL. It contributed to the current literature by providing evidence to support the mediating role of affect in the association between mental adjustment styles and QOL. Specifically, positive affect served to be an explanatory variable between fighting spirit and QOL and a buffer between fatalism and QOL, while negative affect explained the association between fatalism and QOL. Increasing positive affect and fighting spirit of cancer survivors may help improve their QOL for better cancer survivorship.

Declaration of conflicting interests

None declared.

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