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Benefits of a psychosocial intervention on Positive Affect and Posttraumatic Growth for Chinese American breast cancer survivors: A pilot study

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Abstract

Breast cancer survivors report persistent psychological and physical symptoms, which affect their quality of life and may challenge the recovery process. Due to social, cultural, and linguistic barriers, culturally-sensitive care is largely unavailable for Chinese Americans, and their psychological needs are not often addressed. We aimed to investigate whether the Joy Luck Academy (JLA), a psychosocial intervention providing both information and peer support, was associated with positive adjustment among Chinese American breast cancer survivors. Thirty-nine Chinese American breast cancer survivors participated in a pilot psychosocial intervention. The educational materials and lectures were delivered in the participants' native language of Chinese. All of the educators and mentors shared the same linguistic and cultural background with the participants. The program utilized a community-based participatory research (CBPR) approach to further enhance the cultural sensitivity of the intervention. Participants' post-traumatic growth and positive affect were assessed before and after the intervention. The JLA showed an improvement in positive affect, and they had a greater appreciation for life. The intervention was found to be feasible, well-accepted, and beneficial for this population. Chinese American breast cancer survivors reported improved psychological health after attending the intervention. These findings encourage the development and implementation of psychosocial interventions for Chinese breast cancer survivors. Similar programs could be integrated into other ethnic or cultural communities.

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Keywords

Chinese Americans; peer support; education; pilot studies

Introduction

Among Asian American women, breast cancer is the most prevalent form of cancer, and its incidence in some subgroups is rising ¹. However, this population has received little research attention, and their psychological needs have gone largely unmet ². Breast cancer survivors report persistent psychological and physical symptoms which in turn can affect the overall quality of life and may challenge the recovery process ³. Previous evidence has shown that psychosocial interventions can reduce distress among non-Hispanic Caucasian, African American and Latino/Hispanic cancer survivors ^{4–6}. However, only a few studies have investigated the effect of psychosocial interventions (e.g., expressive writing intervention) for Chinese American breast cancer survivors ⁷. Acknowledging this gap, the study aimed to investigate the benefits of a pilot psychosocial intervention for Chinese American breast cancer survivors.

Educational and informational support

Chinese American breast cancer survivors express beliefs that their cancer was incurable and meant imminent death ⁸. These beliefs may be due to a lack of knowledge about breast cancer and its treatment. Education may help to modify these negative beliefs and encourage more positive views towards their cancer experience, which therefore can lead to better psychological health. Past interventions have found that an educational component can be effective at providing informational support to women with breast cancer ⁹. Breast cancer survivors who received an educational support program enjoyed better emotional, functional, and social/family well-being than those who did not ¹⁰. Educational interventions increase psychological and physical health largely by enhancing self-esteem, instilling a positive body image, and reducing disturbing intrusive thoughts about the illness ¹¹. The health benefits of education for breast cancer survivors can even have long-term effects years later ¹². In light of this evidence, an educational component was included in the current psychosocial intervention to encourage more understanding and positive views towards Chinese American women's cancer experience, resulting in better psychological health.

Social and peer support

Compared to their non-Hispanic Caucasian counterparts, Asian American breast cancer survivors report lower levels of social support and difficulty with psychosocial services and support ¹³. For example, limited English proficiency, lack of culturally competence, and limited insurance coverage can be barriers to survivorship communication and services ¹⁴. Furthermore, these women tend to have smaller social networks and limited sources of support ¹³. It is well-established that social support is crucial to breast cancer recovery; breast cancer survivors who perceive more social support from family and friends have better coping and adjustment ¹⁵. Higher levels of psychosocial resources, including social support, predict better outcomes for breast cancer survivors in well-being, depression, and

health perceptions¹⁶. Breast cancer survivors who are without social support or socially isolated are at a greater risk of mortality¹⁷.

Several previous studies report the health benefits of social support interventions for cancer patients and survivors¹⁸. Social support interventions have been shown to benefit breast cancer survivors, especially if they do not have sufficient support¹⁹. A common method to introduce and provide additional social support in these interventions is through peer mentors. Peer mentors provide a flexible means to support people with illnesses, potentially for both those getting the support and those offering it²⁰. Peer mentoring programs allow experienced cancer survivors to offer social support and guidance to new survivors. Mentors provide these women with an opportunity to express their feelings, talk about fears, and ask questions of someone who has gone through similar experiences. They are also able to share knowledge and experience that others, including many healthcare professionals, often cannot understand²⁰. Accordingly, the piloted intervention employed peer mentors to confer additional informational and social support to Chinese American breast cancer survivors to improve their psychological health.

Cultural factors

It is noteworthy that cultural factors play a crucial role in the perception and utilization of informational and social support of the breast cancer survivors^{21,22}. In Chinese society, there is a personal responsibility attached to cancer along with widespread cancer-related social stigma²³. Cancer is commonly thought to be due to some immoral behavior conducted by the individual or an ancestor, and, therefore, it is the result of karma or bad luck. Chinese women may not be willing to share their diagnosis with other people and seek out resources because they feel ashamed or that their cancer was deserved²³. These perceptions make this group especially vulnerable, and an effective intervention is warranted to increase their knowledge and provide support.

Due to social, cultural, and linguistic barriers, culturally-sensitive care is largely unavailable for Asian American breast cancer survivors. Chinese breast cancer survivors are often uninformed about their treatment and prognosis⁸. Shame and stigma associated with cancer in Chinese culture also prevent them from seeking social support^{2,23}. Consequently, the informational and psychosocial needs of Chinese breast cancer survivors are not addressed¹⁴. To address these unmet needs and improve the physical and psychological outcomes of Chinese breast cancer survivors, we developed a culturally-sensitive educational and social support program called the “Joy Luck Academy” (JLA).

Psychological benefits

The present study explored whether the JLA had the potential for psychological benefits for Chinese breast cancer survivors. To do this, changes in posttraumatic growth and positive affect were examined. Following a traumatic event (i.e., cancer diagnosis and treatment), people can experience positive psychological change as a result of the struggle with highly challenging life circumstances or stressful event (also known as posttraumatic growth)²⁴. According to the posttraumatic growth model^{24,25}, growth does not occur as a direct result of trauma, but it is the individual’s struggle with the new reality in the aftermath of trauma

that is crucial in determining the extent to which posttraumatic growth occurs. Both qualitative and quantitative studies have found that Chinese breast cancer survivors to report positive changes, or growth, during the adaptation to cancer (e.g., stronger relationships with family and others, feeling more able to appreciate everyday life, refocusing life priorities)^{26,27}. Several coping strategies (e.g., active coping, religious coping, seeking social support) have been shown to be associated with higher posttraumatic growth among cancer patients^{28,29}. Social support has been linked to greater post-traumatic growth among Chinese American breast cancer survivors⁸. In light of this evidence, we expect the JLA to promote posttraumatic growth as it could encourage the development of coping strategies and social support.

It has been suggested that what makes a traumatic experience transformative, or necessary for posttraumatic growth, is an affective component so that the benefit finding is not merely intellectual reflections²⁴. For that reason, we examined the potential affective benefit of the JLA. According to the Broaden-and-Build Theory³⁰, positive and negative affect function differently to influence well-being. Positive affect broaden people's scopes of thought and build resources for coping, which can enhance well-being. The linkage between positive affect and Chinese cancer survivors' quality of life has also been documented^{31,32}. Therefore, we expected that the JLA would foster more positive affect as it may engender more thought and coping. Furthermore, social support was also associated with higher positive affect among Chinese cancer survivors in China³³.

The present study

The broad aim was to investigate the potential benefits of the JLA, i.e., the psychosocial intervention designed for Chinese breast cancer survivors. An educational component was developed to provide patients with informational support. We expected this component would reduce feelings of uncertainty and confusion associated with the illness, modify these negative beliefs, and encourage more positive views about their cancer experience¹⁰. A peer mentor component was included to provide survivors with additional informational support as well as emotional support. Emotional support could enhance their self-esteem, improve body image, feel a sense of belonging, and reduce intrusive thoughts about cancer^{10,34}. Educational and peer support programs can buffer the impact of cancer-related stress on health and improve coping in survivors^{10,12}. Accordingly, the JLA incorporated both educational and social support (i.e., peer mentors) components to enhance adjustment of Chinese American breast cancer survivors.

We sought to evaluate possible psychological benefits of the JLA so changes in positive affect and post-traumatic growth were examined in this pilot study. Supported by previous evidence, we hypothesized that the JLA (having a major component in peer mentor support and possibly encouraging coping) would be associated with improvements in positive affect and PTG. These findings will provide initial evidence that a culturally-sensitive psychosocial intervention could improve the psychological health of Chinese American breast cancer survivors and be used to inform a larger randomized control trial of the intervention.

Methods

Study design

Preliminary findings regarding the feasibility of the JLA has been reported in the first cohort of participants in the pilot study (October 2009 - March 2010) ³⁴. This paper focused on psychological benefits associated with the JLA among the first three cohorts, conducted in 2009–2010, 2010–2011, 2011–2012 respectively. The three cohorts varied in length for education sessions (10, 6, and 8 weeks, respectively) but covered similar content. Each cohort used a one-group, repeated measures design to investigate the change in outcomes.

A community-based participatory research (CBPR) approach was adopted to reach this minority group and learn more about this understudied population. CBPR is “a collaborative approach to research that equitably involves...community members, organizational representatives, and researchers in all aspects of the research process” ³⁵. By adopting this approach, the possibility of distrust of research in this community is reduced, cultural gaps between partners are addressed, the culture within the community is incorporated into the study, and in communities that have been marginalized, CBPR is essential ³⁵.

For this pilot work, we worked with the Herald Cancer Association (HCA), which is a non-profit organization and is a subsidiary of Chinese Christian Herald Crusades (CCHC). It provides cancer education, services, and support to large communities of Chinese Americans. HCA worked closely with the researchers to recruit, iteratively develop, and implement the intervention. The JLA program facilitator who led the activities was an HCA staff member who contributed to the development of the intervention and received trial implementation training. The study protocol was approved by the University of Houston Institutional Review Board (IRB).

Sampling and Recruitment

A convenience sampling procedure was used to recruit participants with the aid of the community collaborator, HCA ³⁶. The study was advertised in local communities, and potential participants were contacted through Chinese community networks. Those survivors who were interested in the intervention were screened for eligibility. Any woman who was: (1) diagnosed with breast cancer (stage 0-III), (2) comfortable reading and speaking Chinese (Mandarin or Cantonese) and (3) completed her primary treatment (e.g., mastectomy, chemotherapy, radiation therapy, and reconstruction surgery) were invited to participate in the JLA. Participants who were no longer undergoing treatment for cancer were included because they faced unique challenges after the completion of treatment which were not always addressed (e.g., use of a prosthesis, rebuilding self-esteem, and depression) ¹⁴. We hoped to provide information that would reduce some potential side effects post-treatment and facilitate positive adjustment after the distress of a cancer diagnosis and treatment. Written informed consent was obtained from the participants if they were deemed eligible. In total, 52 breast cancer survivors were enrolled in the study, and 43 completed the JLA program (83% retention rate). Thirty-nine had completed data. The primary reasons for not attending and dropout were ill-health and time commitment. Thirty-nine participants completed all the measures over an 18-month period.

Intervention

The intervention (JLA) was designed to address informational, social, and emotional needs of Chinese-speaking breast cancer survivors by using education and peer mentoring. The JLA intervention consisted of two components: peer-mentoring and education. The intervention was iteratively designed and delivered in partnership with the community organization, HCA. Three-hour sessions were held every week. HCA staff facilitated each session by preparing the materials, setting up the venue, managing time, and overseeing the activities.

Education—A range of breast cancer-related topics was covered in each cohort, which included post-treatment self-care, exercise, diet, traditional Chinese medicine, emotional management, communication, and self-esteem. All of the topics were presented by qualified professionals (an oncologist, a Chinese traditional medicine doctor, a clinical psychologist, and a dietitian). A detailed outline of the topics covered is provided in Supplementary Table 1.

Peer mentor support—The peer mentor component was considered essential for social support in each cohort of the JLA. Chinese-speaking breast cancer survivors who completed treatment(s), self-reported to have good health and adjusted well, and had time to commit to being a mentor in the program were recruited to be a peer mentor in the JLA. Every mentor went through a 3-hour training workshop provided by experienced HCA leaders. The training taught mentors communication and caring skills to facilitate the emotional and social support. Mentors were assigned to participants using a matching system based on the stage of cancer diagnosis, treatment history, language, and origin of birth. Each mentor worked with one to three participants. In the later pilot studies, mentors were recruited from previous participants who had completed the intervention and were interested in becoming mentors. During the intervention session, mentors and participants met and discussed the lecture and their cancer-related experiences in small and large group settings for approximately an hour. Mentors also contacted the participants throughout the week to encourage them to attend the intervention and offer any support, if needed.

Additionally, a meal component was incorporated into the intervention to further encourage the development of social networks and peer support. These meals allowed for participants and mentors to talk informally and share their experiences each week. The meals also allowed for social interactions outside the structured group sharing activities and with participants and mentors not in the same assigned groups.

Cultural-sensitivity—To promote cultural-sensitivity, the educational materials and lectures were delivered in the participants' native language of Chinese. All of the educators and mentors shared the same linguistic and cultural background with the participants. Because the JLA peer mentors spoke the same language, shared the same culture, and had similar cancer coping experiences with the participants, this peer mentor component could enhance the cultural consonance of the intervention and identification with the mentor.

By utilizing a CBPR approach in partnership with HCA in the Chinese American community in Southern California, the cultural sensitivity of the intervention was further

enhanced. The community organization initially developed the program and played an active role in the development of the study materials. Their comments and remarks were incorporated into every facet of the intervention and study. This practice ensured that the content, lectures, and activities were appropriate and sensitive for this population.

Procedures and Data Collection

The aim of the psychosocial intervention was to improve the psychological health of Chinese American breast cancer survivors. Positive affect and PTG were measured to assess these outcomes, using questionnaires that were distributed before the start of the intervention (baseline) and immediately after the intervention (follow-up). Demographic information was collected in the baseline questionnaire and included participants' cancer stage and treatment history (mastectomy, chemotherapy, radiation therapy, and reconstruction surgery) were self-reported. Follow-up questionnaires were distributed immediately after the completion of the intervention (i.e., 10, 6, and 8 weeks after baseline collection, respectively for the JLA 1, 2, and 3). The questionnaires were administered in Chinese.

Positive Affect—Positive affect was assessed using a 10-item subscale from Positive and Negative Affect Schedule (PANAS) ³⁷. This scale contained words that described different emotions and feelings (e.g., interested or proud). Participants indicated to what extent they felt that way in the past week using a 5-point Likert scale ranging from 1 (not at all or very slightly) to 5 (extremely). Higher mean scores indicated greater positive affect. The Chinese version of the scale has been found reliable and valid among Chinese breast cancer survivors ^{7,38}. Cronbach's alpha in this sample was .90.

Post-Traumatic Growth—Post-traumatic growth (PTG) was assessed using a 21-item scale to measure positive outcomes that result from traumatic experiences ³⁹. This scale includes 5 subscales: relating to others, new possibilities, personal growth, spiritual change, and appreciation for life. Participants were asked to indicate the degree to which the change in the item was true in their life as a result of their breast cancer on a 6-point Likert scale ranging from 0 (I did not experience this change) to 5 (I experienced this change to a very great degree). The Chinese version of the scale has been found reliable and valid among Chinese breast cancer survivors ⁷. A higher mean score indicated more PTG. The scale was deemed reliable, $\alpha = .93$ in this sample.

Data Analysis

A series of analyses of variance (ANOVA) was conducted to compare sample characteristics and baseline positive affect and PTG among the three cohorts. Two sets of repeated measures ANOVAs were used to test the hypothesis that the program was associated with improvements in positive affect and PTG. These methods were used to examine the differences in mean scores before and after the intervention as well as to test if there were any significant differences across the three pilot cohorts or a possible interaction effect. All analyses were performed using SPSS (Version 20). As this was a pilot intervention with a relatively small sample size, we used the effect sizes associated with the intervention to evaluate the impact of the JLA. Previous research suggests that significance values are less meaningful for studies with small sample sizes ⁴⁰. Effect sizes were estimated with Cohen's

d to describe the amount of variance in the psychological health outcomes accounted for by the intervention. The reference values for small, medium and large effect sizes were 0.2, 0.5, 0.8, respectively ⁴¹.

Results

Data from 39 Chinese-speaking breast cancer survivors who were enrolled across three cohorts of the Joy Luck Academy (JLA) program were analyzed. The first cohort (JLA 1) had 9 participants, the second cohort (JLA 2) had 12 participants, and the third cohort (JLA 3) had 18 participants. Participants' ages ranged from 40 to 64 years old ($SD = 9.75$). Table 1 details the sample characteristics.

Possible group differences in the 3 cohorts of the JLA at baseline were tested prior to main analysis of the changes in outcomes. The 3 different cohorts did not significantly differ in age and cancer stage, $F(2, 36) = .03, p = .97$ and $F(2, 36) = .83, p = .74$, respectively. At baseline, they did not significantly differ on overall PTG, $F(2, 36) = .44, p = .67$, and positive affect, $F(2, 34) = .62, p = .54$. Table 2 details the means and standard deviations at baseline and follow-up for the health outcomes of each group.

For the main analysis, changes in psychological health outcomes were tested using a repeated measures (baseline and follow-up) ANOVA (see Table 2). Overall, a medium effect size for improvement in positive affect was found, $d = .77$. It indicated that the JLA participants reported a significant increase in positive affect after the intervention. The overall PTG and ($d = .51$) and the Relating to Others subscale ($d = .55$) reported improvements in medium effect sizes after the JLA. One subscale of PTG, Appreciation for Life, demonstrated a large effect size ($d = .94$), indicating that the participants had a greater appreciation for life following the intervention. The remaining two subscales of PTG (New possibilities and Personal growth) showed small effect sizes ($d = .29$).

Discussion

The present article investigated the benefits associated with a psychosocial intervention, the JLA, for Chinese American breast cancer survivors. Studies found that Chinese American breast cancer survivors have difficulties understanding their treatment and prognosis ⁸, and the shame and stigma associated with cancer in their culture leads to less social support received ^{2,23}. Consequently, the informational and psychosocial needs of Chinese breast cancer survivors are not addressed. The JLA was developed with educational and peer-mentor components to provide informational and social support with the goal of improving psychological health. This intervention was also tailored to be culturally sensitive to Chinese breast cancer survivors and community-based with the partnership of HCA to encourage feasibility, suitability, and effectiveness.

The primary aim was to evaluate the possible psychological health benefits of the JLA. Participants reported improvements in psychological health, as demonstrated by significant increases in positive affect and appreciation for life (one of the dimensions of post-traumatic growth measure). Our findings are also in line with previous studies indicating that psychological benefits (e.g., greater positive affect, fewer depressive symptoms) could be

increased through interventions providing the education component¹⁰ and peer social support¹¹. The findings provide support that this type of intervention is a promising approach to promote positive affect and PTG among this population.

We found moderate effect sizes in the improvement of overall PTG and the Relating to Others subscale. However, they were not statistically significant improvements after the JLA. The findings seem to be consistent with another qualitative study that Chinese American breast cancer survivors were more likely to report more appreciation for life and positive changes in interpersonal relationships, as compared to other aspects⁴². For breast cancer survivors, some PTG factors may not be relevant; for example, new possibilities (such as ‘I developed new interests’) may not be something that cancer survivors’ experience following treatment. Alternatively, having thought that a cancer diagnosis meant death, then surviving it would elicit more appreciation for one’s own life. The significant changes in specific aspects of PTG may also attribute to the content of the intervention. The JLA focused on providing education sessions on how to adapt to life with cancer and peer mentoring for providing social support (in terms of advice and emotional support), which may be more likely to elicit changes in participants’ interpersonal relationships and awareness of good things happening in their life (appreciation for life). On the other hand, skills training and discussion on spiritual matters were covered less in the JLA, making participants less likely to experience changes in personal strength, new possibilities, and spirituality after the intervention. Researchers may need to pay attention to the specificity between the program content and it’s target health outcomes to change. Such findings may imply that the facilitation of PTG may be sensitive to changes in the program content, interaction dynamics among the peers and the mentors, plus individual characteristics of the participants. JLA may benefit from incorporating change techniques to promote changes in personal strength, new possibilities, and spirituality. More research is warranted to test these techniques and the associated changes.

Implications for Cancer Survivors

These findings have important implications for cancer survivors. This investigation adds to the much-needed research on the use of psychosocial interventions for Chinese breast cancer survivors and suggests that they can and should be used. The combination of education and peer mentoring was well-accepted by the participants, confirming the feasibility and applicability of this type of intervention in this population. With this group being particularly understudied and underserved, further research and the trialing of interventions is critically needed. Additionally, the JLA was iteratively tailored for this group’s specific psychological needs based on feedback from community partners and participants. Changes to the content and length of the program did not greatly influence the overall benefits. This intervention thus can be adapted or tailored in order to make it easily deliverable without major losses in psychological health benefits. It could possibly be integrated into other ethnic or cultural communities with similar findings. Future research would be needed to test the modifications for other communities and vulnerable groups.

Limitations

This study is subject to several limitations. To begin with, this study was a small pilot program without a controlled comparison. Therefore, a large controlled randomized trial is needed to confirm the effectiveness of the intervention. In addition, the evaluations were only conducted pre- and immediately post-intervention. We cannot conclude any long-term or lasting effects. Future research should measure participants' health at multiple time points after the completion of the intervention; previous evidence suggests possible long-term effects¹². Additionally, we were not able to include potential confounding variables in the analysis as it was not feasible with exploratory nature of the pilot study. Future research will need to consider and control for potential confounding variables (e.g., participation in other support groups and acculturation, time since treatment).

After completion of the JLA program, acceptability was assessed, and the JLA was well-accepted by participants³⁴. There was also a high participant retention rate (i.e., 83%), comparable to other psychosocial and education interventions trials with breast cancer survivors^{5,43,44}. Primary reasons for not attending sessions and dropout were ill-health and time commitment. These reasons were commonly reported in other breast cancer survivor intervention studies^{5,43}. They were understandable as many of the participants had low socioeconomic status and demanding jobs, which was disclosed in their conversations with HCA and the research team.

Finally, the underlying mechanisms of the intervention warrant investigation. We did not address the effective elements of the education and peer-mentor components in the JLA. Previous research suggests that knowledge, self-esteem, body image, coping strategies, and illness perceptions may play important roles in mediating the effect of psychosocial interventions for breast cancer survivors¹¹. Future studies should explore the mechanisms that explain the benefits of the intervention in greater depth. Again, it must be acknowledged that this is the first step towards testing the effectiveness of the JLA, and there was no control group so the findings must be interpreted carefully. The conclusions must recognize that having an intervention and its associated social support may be beneficial in itself and a future RCTs is needed to test whether simply having a culturally-tailored intervention with a peer support component may be beneficial for the participants regardless of the quality or quantity of the educational content. Due to the underserved and socially vulnerable^{13,14}, any type of intervention may bring the positive impacts to this group of cancer survivors, and future work could explore the necessary components of the intervention (e.g., social or peer support) for positive effects. Understanding these mechanisms enables researchers and program providers (e.g., community and healthcare organizations) to identify and improve the "active ingredients" of the programs.

Conclusions

Despite the limitations, this pilot study explored the benefits of a psychosocial intervention for Chinese breast cancer survivors. It was encouraging to find that participants reported more positive affect and a greater appreciation for life after participation in the JLA. As an exploratory intervention study, our findings can serve as the first step to improving the lives

of Chinese American breast cancer survivors and supports the development and implementation of psychosocial interventions for this underserved population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Sample Characteristics

Variables	JLA 1 (n=9)	JLA 2 (n=12)	JLA 3 (n=18)	Overall (n=39)
Age (M, SD)	53.67, 6.18	53.00, 6.03	53.61, 6.72	52.74, 9.75
Marital status (n)				
Married	4	6	8	18
Divorced	4	1	3	8
Single	0	5	5	10
Separated	0	0	1	1
Not reported	1	0	0	1
Cancer stage (n)				
0	0	2	0	2
1	2	3	9	14
2	5	3	5	13
3	2	4	4	10
Treatment (n)				
Lumpectomy	1	5	5	11
Chemotherapy	8	7	12	17
Radiation	5	9	6	20
Mastectomy	7	7	12	26
Reconstruction (n)	1	0	3	4

Note. Participant could undergo more than one treatment.

Abbreviations: JLA, Joy Luck Academy; M, mean; SD, standard deviations

ANOVA Examining the Effect of the Joy Luck Academy on Positive Affect and Post Traumatic Growth

Table 2.

	JLA Cohort	Baseline		Follow-up		Time effect		
		Mean (SD)	Mean (SD)	Mean (SD)	F	p	d	
Positive Affect	1	25.10 (6.38)	29.80 (8.50)	4.98	.03	.77		
	2	28.09 (7.16)	30.09 (27.18)					
	3	24.94 (9.70)	27.18 (8.95)					
Post Traumatic Growth	1	3.34 (.99)	3.47 (.90)	2.21	.15	.51		
	2	3.67 (.71)	3.88 (.52)					
	3	2.90 (1.15)	3.04 (1.00)					
Appreciation for Life	1	3.37 (.86)	3.67 (.71)	4.58	.04	.94		
	2	3.56 (1.14)	3.69 (.92)					
	3	2.57 (1.34)	2.81 (1.19)					
Relating to others	1	3.63 (.95)	3.71 (.75)	2.65	.11	.55		
	2	3.87 (.65)	4.16 (.46)					
	3	3.27 (1.18)	3.47 (1.16)					
New Possibilities	1	3.18 (1.11)	3.27 (1.13)	.62	.44	.29		
	2	3.47 (.87)	3.70 (.71)					
	3	2.54 (1.44)	2.60 (1.19)					
Spiritual change	1	2.50 (1.92)	2.89 (1.62)	1.26	.27	.41		
	2	3.79 (.89)	3.88 (1.62)					
	3	3.09 (1.30)	3.26 (1.32)					
Personal strength	1	3.42 (1.17)	3.42 (1.04)	.27	.37	.29		
	2	3.56 (.77)	3.79 (.64)					
	3	2.79 (1.15)	2.93 (1.02)					

Abbreviations: SD, standard deviations; JLA, Joy Luck Academy