International Journal of Advanced Nursing Education and Research
Vol.3, No.2 (2018), pp.1-10
http://dx.doi.org/10.21742/ijaner.2018.3.2.01

Does She Advance Her Development in The Face of Cancer? A Structural Equation Model of Post-traumatic Growth after Diagnosed with Cancer

Sook Lee[1], Yeon Jung Kim[2] and Yun Jung Choi[3]

[1]Department of Nursing, Dankook University, Korea
[2]Department of Nursing, Nazarene University, Korea
[3]Red Cross College of Nursing, Chung-Ang University, Korea
[2]yjkim00@kornu.ac.kr

Abstract

The purpose of this study is to perform the structural equation modeling of the relationship among personality, depression, social support, subjective severity, deliberate rumination, intrusive rumination, and post-traumatic growth of patients with breast cancer. Two hundred-one women recruited from inpatient or outpatient female cancer clinics in Korea participated in this study. Personality, social support, and deliberate rumination had significant positive direct effects on post-traumatic growth. Social support, subjective severity, and intrusive rumination had a substantial indirect impact on post-traumatic growth via deliberate rumination. Depression had a significant positive and direct effect on intrusive rumination. The findings of this study suggest a more comprehensive model of development would help understand the various factors that play a role in cancer survivors' perception of psychological growth.

Keywords: *Post-traumatic, Growth, Depression, Personality, Social, Support*

1. Introduction

Patients who get a diagnosis of a cancer disease suffer from a variety of problems during their disease process. They undergo a combination of invasive treatments and side effects, strained interpersonal relationships, as well as emotional issues such as depression, anxiety, and fear of recurrence [1]. However, some patients report positive changes, including improved sense of personal strength, satisfaction of relationships with others, and realized goals and meanings of their lives in novel perspectives [2][3][4][5][6].

Tedeschi and Calhoun identified this phenomenon as "post-traumatic growth" [7]. Post-traumatic Growth (PTG) refers to positive changes in people that go beyond an ability to resist and not be damaged by highly stressful circumstances. In research, there is an increasing awareness that a cancer experience is not only viewed as unfavorable but also has a sort of psychological sequel, which is beneficial for patients with cancer [8]. For this reason, the identification of factors that are associated with PTG after being diagnosed with cancer is essential.

Article history:
Received (January 13, 2018), Review Result (February 12, 2018), Accepted (March 20, 2018)

A variety of correlates of PTG have been identified, including personality traits [9], depression [10][11], social support [12][13][14], intrusive rumination [15], deliberate rumination [3][14][15], stressfulness of cancer [16][17][18] and self-esteem and cancer-coping [19]. These factors are comprehensively interrelated with each other concerning the adjustment to life with cancer. Determining causal relationships among factors regarding PTG of patients with cancer is beneficial.

The purpose of this study was to perform the Structural Equation Modeling (SEM) of relationship: personality, depression, social support, subjective severity, deliberate rumination, and intrusive rumination to PTG in female patients with cancer. A more extensive understanding of such people's perspectives will be expected.

2. Method

2.1. Theoretical framework

The Model of Post-traumatic Growth [20] provided the theoretical basis of this study. This model describes that PTG is most likely a result of an attempt at psychological adaptation for survival, and it can coexist with the residual distress of the trauma, which is considered an ongoing process to adjust oneself from the negative state of emotion. PTG originates from a person's character before the traumatic events; optimism, extraversion, and openness to experience may be related to post-traumatic growth. These characteristics are thought to play a vital role in the positive adaptation of patients with cancer from threatening problems [20].

Pérez et al. [21] reported that patients who concentrated on the negative aspect of their illness spent more time on intrusive rumination, which may lead to higher levels of depressive symptoms. Some researchers have examined the relationship between depression and PTG and reported that depression was associated with lower levels of PTG in cancer survivors [10][11].

In particular, Tedeschi and Calhoun [20] have emphasized the critical role of support among factors related to PTG. Since social supports from diverse systems provide a new perspective on trauma, it could help reform the meaning of the trauma and promote one's growth. Another noteworthy aspect of social support is to minimize negative rumination, which automatically rises along with the emotional distress in the process of PTG.

There is a positive correlation between PTG and social support from meaningful interpersonal relationships [12][13]. Patients with breast cancer who have intense intimacy with their spouses show high levels of PTG [19][22]. Coward and Kahn [23] reported women with breast cancer had a motivation from their children to put efforts into overcoming their illnesses. There is an assumption the personality of female patients may change to a more active one, and they try to develop a more positive perspective on various life-related problems, including the battle against cancer. Female cancer patients show a certain degree of reduction in negative sentiments like loneliness while the increase in interpersonal relationships [23][24][25].

Data from recent studies provide some support for the hypothesized relationships between cognitive process and PTG [26]. Morris and Shakespeare-Finch [14] indicate that deliberate rumination was associated with greater PTG in cancer survivors. Deliberate rumination decreases depression or anxiety in patients with cancer. This is an intentional thought process that active engagement makes sense and solves problems. Otherwise, intrusive rumination is linked to increased negative psychological consequences [17][20]. As the traumatic

experience is prolonged, deliberate rumination has a positive effect on PTG. However, intrusive rumination in the early stage of traumatic incidents also helps increase PTG [16].

In the initial stage of trauma, people experience negative emotions driven by intrusive rumination. But they don't stay on this status. Instead, They would consistently contemplate how to understand and overcome the state induced by the trauma [20]. This deliberate rumination is the process for patients with cancer to persistently figure out and chew over to fight against the disease and its potential impacts, which eventually draws positive meanings out of the illness itinerary [3][14].

Perception of cancer as a traumatic stressor may be more critical in predicting PTG than objective conditions such as stages of cancer or side effects from treatments [18]. Some researchers reported that the subjective severity of illness was strongly associated with PTG [17][18]. They suggest the essential role of subjective appraisal in adjustment to cancer. The perception of the severity of traumatic events triggers the necessity for an active coping mechanism, which plays a role as a precursor to increasing deliberate rumination.

In Summary, the present study focused on the relative contributions of personality, rumination (deliberate and intrusive), depression, social support, and subjective severity to PTG by SEM.

2.2. Sample

Two hundred-one women participated in this study. The average age of participants was 51.9 (SD=9.63) years. The majority of participants were married (n=87.1%). Only 3.5% had received an elementary school education, and 43.3% had a university. Sites of cancer were breast (n=123, 61.2%) or ovary and uterine (n=78, 48.8%). The majority of study participants were diagnosed with stage I (n=66, 32.9%) or stage II (n=67, 33.3%), and the mean time of illness with cancer was 2.11 years (SD=0.55).

2.3. Data collection

The data were collected from November 2012 to April 2013. Participants were recruited from inpatient or outpatient female cancer clinics in Korea. The inclusion criteria were (a) diagnosis of cancer (in ovary, uterine, or breast), (b) ages between 18 and 64 years. Before the data collection, ethical approvals were obtained from the institutional review board of Ewha Womans University in Seoul, Korea. All participants were given a sufficient explanation of the study objectives and processes. Their rights as participants were acknowledged. Only those who voluntarily signed the informed consent were permitted to enter the study.

2.4. Study tool

2.4.1. Post-traumatic growth

It was initially developed by Tedeschi and Calhoun [7] and translated and revised into Korean by Song et al. [27]. It is a self-reporting scale consisting of 16 items with 6-point Likert criteria. Each item was measured on a rating scale of 0 to 5, representing 'did not experience this change as a result of my crisis to 'experience to a very great degree,' respectively. Total scores range from 0 to 80, with higher scores meaning higher levels of post-traumatic growth. The Korean PTGI contains four domains subscale: changed perception of self, relating to others, new possibilities, and spiritual change. Cronbach's alpha was .95 in this study.

2.4.2. Deliberate and intrusive rumination:

It was assessed by the Event-Related Rumination Inventory (ERRI). The ERRI was developed by Cann et al. [28] and was translated into Korean by Yoo [29]. The items included positive or negative repetitive thinking about a highly stressful event. It is a self-reporting scale comprising 20 items with 4-point Likert criteria. Total scores range from 4 to 80, with higher scores meaning higher levels of rumination. ERRI contains two domains subscale: deliberate rumination and intrusive rumination. The Cronbach's alpha was .94 for intrusive rumination and .88 for intrusive rumination [28]. In this study, Cronbach's alpha levels were .93 and .92.

2.4.3. Personality

It was assessed by the Myers-Briggs Type Indicator (MBTI). The MBTI was developed by Myers and Briggs [30] and was translated and revised into Korean by the Korea MBTI Institute. We used the Korean version of MBTI form G and extracted part of Extraversion - Introversion. This study used the continuous scoring method described in the MBTI manual [31], suggesting continuous scores in correlational research such as the Extraversion-Introversion index. The individual gathers energy from the outer world (Extraversion ''E'') or the inner world (Introversion ''I''). This index is scored such that increasingly lower scores indicate increasing Extraversion preference, whereas higher scores indicate increasing Introversion preference. Cronbach's alpha was .73 in this study.

2.4.4. Depression

It was assessed using Zung's Depression Inventory (ZDI). The ZDI was developed by Zung [32], and Lee translated it into Korean [33]. The scale consists of 20 items with 4-point Likert criteria—twenty items assessing three sources of pervasive, physiological, and psychological depression. Total scores range from 4 to 80, with higher scores meaning higher levels of depressive mood. Cronbach's alpha for this instrument had been reported to be .84 in a previous study [33] and .75 in this study.

2.4.5. Social support

It was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS). The MSPSS was developed by Zimet et al. [34] and translated into Korean by Shin and Lee [35]. Twelve items assess three sources of support: family, friends, and significant others. Items are rated on a 5-point Likert scale ranging from 1 (very strongly disagree) to 5 (very strongly agree). Total scores range from 5 to 60, with higher scores indicating more significant support. Cronbach's alpha for this instrument had been reported to be .89 from a previous study [35]. Cronbach's alpha was .86 in this study.

2.4.6. Participant's perception of cancer diagnosis severity

It was assessed via an eleven-point Likert scale ranging from 0 (not at all traumatic) to 10(severely traumatic).

2.5. Data analysis

Pearson correlation coefficients were calculated using the SPSS 19.0 program (IBM). The SEM was conducted using the AMOS 19.0 program to test the proposed model of personality, deliberate rumination, intrusive rumination, social support, depression, and subjective severity on PTG. Only indicators which were significantly related to PTG were selected for inclusion in the model. We selected variables whose fit indices were high and whose coefficient P-values could be interpreted as significant. Statistical significance was set at $P < 0.05$.

3. Results

3.1. Measurement model

Factor analysis and reliability of measurement tools for the variables. For personality and subjective severity, a single indicator was used, which, due to assigning a fixed value, specified the variance of single indicators. The data were demonstrated through a Kaiser-Meyer-Olkin measure. All indicators were more significant than 0.70 (appropriate), suggesting that intrusive rumination, deliberate rumination, depression, and social support were helpful indicators of PTG. The components accounted for 57.1-78.7% of the variance in the data, with a strong loading. These results for the measures with sound psychometric properties above 0.50. Such factor loadings indicated all factors used in this study were supported by proper validity [36].

Table 1. Goodness of fit measures: criteria and acceptable fit interpretation

Goodness of Fit Measures	Results	Criterion level	Interpretation
÷2/df	1.37	1-3	The results meet all the criteria of good model fit.
GFI	0.95	≥0.90	
AGFI	0.91	≥0.90	
SRMR	0.04	≤0.08	
NFI	0.95	≥0.90	
CFI	0.98	≥0.90	
RMSEA	0.04	≤0.05	

GFI: goodness of fit index, AGFI: adjusted goodness of fit index, SRMR: standardized root means square residual, NFI: normal fit index, CFI: comparative fit index, RMSEA: root mean square residual error of approximation.

3.2. Model testing

The initial hypothesized model needed to fit the empirical data better. So we modified it using the Modification Indices (MI), and psychological depression has been deleted in this process. Those indicated a good model fit for the entire criterion [Table 1] [37].

Personality (â=.144, p<.05), social support (â=.335, p<.05), and deliberate rumination (â=.408, p<.01) had significant positive direct effect on PTG. And social support (â=.114, p<.05), subjective severity (â=.093, p<.05) and intrusive rumination (â=.177, p<.01) had significant positive indirect effect on PTG. These predictors explained 38.5% of the variance in PTG of female patients with cancer. The findings indicated social support (â=.278, p<.01), subjective severity (â=.210, p<.01), and intrusive rumination (â=.435, p<.01) had a significant

direct effect on deliberate rumination and depression(â=.365, p<.01)had a significant indirect effect on deliberate rumination via intrusive rumination.

These predictors explained 34.1% of the variance in deliberate rumination of female patients with cancer. Depression (â=.839, p<.01) had a significant direct effect on intrusive rumination and explained 72.5% of the variance in intrusive rumination of female patients with cancer [Table 2], [Figure 1].

Table 2. Standardized direct, indirect, and total effects for the model

SMC=Squared multiple correlations (R2)

Variables		Direct effect (p)	Indirect effect (p)	Total effect (p)	SMC
Post-traumatic growth		-	-	-	-
•	Personality	.144*(.022)	-	.144*(.022)	-
•	Depression	-.295(.227)	.131(.368)	-.163(.137)	-
•	Social support	.335*(.038)	.114*(.017)	.449*(.011)	-
•	Subjective severity	.069(.471)	.093*(.026)	.161(.131)	.385
•	Deliberate rumination	.408**(.003)		.408**(.003)	-
•	Intrusive rumination	-.021(.930)	.177**(.001)	.157(.368)	-
Deliberate rumination		-	-	-	-
•	Social support	.278**(.006)	.002(.956)	.280**(.005)	.341
•	Subjective severity	.210**(.007)	.020(.571)	.230**(.004)	
•	Intrusive rumination	.435**(.003)		.435**(.003)	
•	Depression	-	.365**(.004)	.365**(.004)	
Intrusive rumination		-	-	-	-
•	Depression	.839*(.009)	-	.839*(.009)	.725
•	Social support	.004(.964)	-	.004(.964)	
•	Subjective severity	.045(.592)	-	.045(.592)	

**p< .05, **p< .01*

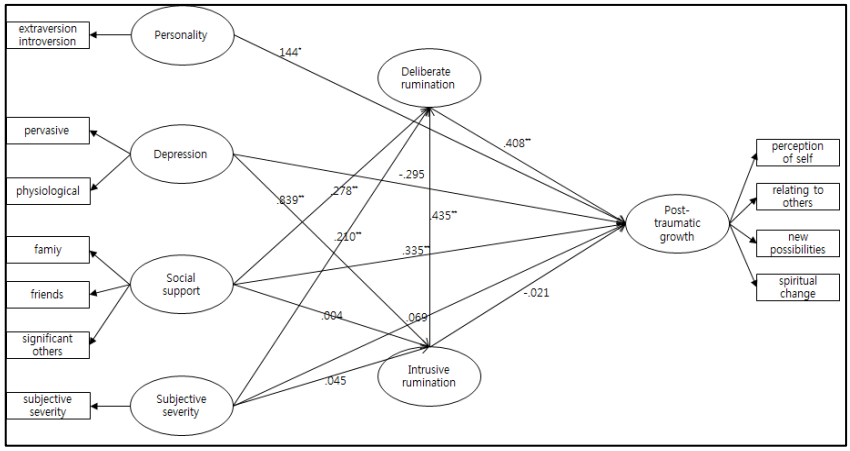

Figure 1. The model of post-traumatic growth

4. Discussion

According to this study, personality, social support, and deliberate rumination significantly positively affect PTG. An extroverted person is sociable [31]. So, this person would like to meet people with whom to talk. Otherwise, introverted people are bashful, so they would like to be sunk in meditation alone and prefer to be absorbed in their internal world. Reflecting these personality characteristics, nursing interventions should be applied for two main goals: extroverted cancer patients should be encouraged to share their stories in self-help groups and find a common grounding in group activities. For introverted patients, they should be assured to express their emotions and thoughts on cancer experiences while doing activities such as meditation and writing. Personality is not about "good" and "bad"; each personality has its characteristics. Therefore, based on the research outcomes, it is necessary to provide nursing interventions customized for each characteristic to promote PTG through self-exposure.

In this study, social support was directly related to PTG of female patients with cancer. This result is consistent with the direct effects of social support in a previous study [9][14]. According to Tedeschi and Calhoun [7][20], humans who have gone through traumatic events accept that they need help from others, try to find supporting resources around them, and want to express their emotions about the trauma. Nurses should include family-oriented supporting systems in their nursing plans and help activate self-help groups to share health-related information and disease experiences. In addition, nurses themselves should play the role of a meaningful support system in providing emotional support to cancer patients through therapeutic communication, helping them endure the adverse effects of treatment, and being confident in the disease fight.

Another critical finding is the deliberate rumination of female patients with cancer, which is the major contributing factor. These findings are congruent with previous studies [3][14][16]. Antoni et al. [38] applied the cognitive-behavioral intervention program to female patients with breast cancer in the early stage once a week for ten weeks and found stress, depression, and intrusive rumination decreased. In the meantime, optimism and emotional expression increased to support the struggle against cancer. Based on those findings, nurses should help patients with cancer to reflect on them and express their emotions to find positive meanings in the disease process. Also, cognitive intervention should be given to support cognitive restructuring.

This study shows social support, subjective severity, and intrusive rumination have indirect effects on PTG through deliberate rumination. These findings were supported by a study by Tedeschi and Calhoun [20]. They found the indirect impact of social support through deliberate rumination contributes to the PTG by restructuring the meaning of the trauma since social support from diverse systems provides a new perspective on the traumatic event. Therefore, as mentioned above, the nursing plan should include an assessment of the supporting systems of cancer patients.

Subjective severity has indirect effects on PTG via deliberate rumination. This result supports previous research; Lee et al. reported female patients with newly diagnosed cancer feel shocked and feared, but their need and affection for life lead them to cope with the cancer actively [25]; Tedeschi and Calhoun [7][20], Cann, et al. [28] found, as more threat perception on trauma they have, as more cancer patients challenge themselves to deal with the existing diagram. In contrast, Morris and Shakespeare-Finch [14] pointed out a higher subjective severity accelerates intrusive rumination but turns out only to aggravate distress and has no correlation with deliberate rumination. Choi [39] argued that excessively higher threat perception interferes with the intellectual process for growth and causes psychological

confusion. Like these reports, not all preceding investigations show the same research outcomes. Thus, additional research is necessary before making conclusions based on this finding.

Results of this study show that intrusive rumination has no direct effects on post-traumatic growth but an indirect impact via deliberate rumination. Cann et al. [28] suggest that the two types of rumination coexist throughout the disease process: intrusive rumination takes up more proportion in the initial stage. However, its portion decreases over time during the cognitive process. The deliberate rumination gradually increases to cope constructively with human conscious effort. Previous researchers reported intrusive rumination as a significant predictive factor, a prerequisite for actively understanding stressful experiences [16][28]. Chan et al. [3] also reported that female patients with cancer experience deliberate rumination and intrusive rumination in coexistence throughout the whole disease process. Likewise, this result also agreed with that obtained in Chan's study. This study found that the two types of rumination have a positive relationship with one another, and intrusive rumination accounted for a substantial proportion of deliberate rumination. In this research result, it appeared that depression doesn't influence post-traumatic growth. This result is against the research outcome of Ho, Chan, and Ho [11]. They found that a lower level of depression is closely connected with post-traumatic growth. However, it cannot be clearly said that there is no relation between depression and PTG since deliberate rumination, a key contributing factor to post-traumatic growth, is primarily affected by intrusive rumination, and 73% of intrusive rumination is explained by depression. Moreover, Zung's scale [32], adopted for measuring depression in this study, includes diverse physical responses originating from depression. Since inpatients who are hospitalized for surgery, chemotherapy, and radiation therapy are included in this study, it is thought it is unclear whether the physical response is due to treatment adverse effects or due to depression.

Based on this research outcome, more reflection on the disease can benefit PTG, so nurses should understand the rumination characteristics of women with cancer. So, they are able to plan a cognitive nursing intervention to promote PTG by replacing intrusive rumination, which automatically happens in the early stage of diagnosis with deliberate rumination. Furthermore, nursing researchers are expected to figure out the diverse factors affecting the pathway of intrusive and intentional rumination and conduct further studies on analyzing the factors. Moreover, nursing intervention should be provided for various preceding factors to have a positive influence on PTG through deliberate rumination.

The findings of this study suggest a more comprehensive model of growth would help understand the various factors that play a role in cancer survivors' perception of psychological development. Nurses and health providers need to assist patients with cancer to comprehend their experience regarding cancer in new perspectives to facilitate the PTG, which requires considering patients' personality, cognitive, emotional, and social factors.

5. Limitations of the study

This study was conducted using convenience sampling, which needs to be considered regarding the generalization of results, as patients with cancer have a variety of factors that are not entirely defined yet.

Acknowledgments

Sigma Theta Tau International Honor Society of Nursing Lambda Alpha Chapter-at-Large partially supported this work.

References

[1] I. Okamoto, D. Wright, and C. Foster, "Impact of cancer on everyday life: A systematic appraisal of the research evidence," Health Expectations, vol. 15, no. 1, pp.97-111, **(2012)**

[2] S.Y. Hwang, "An exploratory analysis of the existential experiences of women with cancer," Journal of the Korean Neuropsychiatric Association. vol.45, no.6, pp.554-564, **(2006)**.

[3] M.W. Chan, S.M. Ho, R.G. Tedeschi, and C. Leung, "The valence of attentional bias and cancer-related rumination in post-traumatic stress and post-traumatic growth among women with breast cancer," Psycho-Oncology, vol.20, no.5, pp.544-552, **(2011)**

[4] F. Mols, A.J. Vingerhoets, J.W.W. Coebergh, and L.V. Van de Poll-Franse, "Well-being, post-traumatic growth and benefit finding in long-term breast cancer survivors," Psychology Health, vol.24, no.5, pp.583-595, **(2009)**

[5] S M. Silva, C. Crespo, and M.C. Canavarro, "Pathways for psychological adjustment in breast cancer: A longitudinal study on coping strategies and post-traumatic growth," Psychology Health, vol.27, no.11, pp.1323-1341, **(2012)**

[6] D.M. Posluszny, A. Baum, R.P. Edwards, and M.A. Dew, "Post-traumatic growth in women one year after diagnosis for gynecologic cancer or benign conditions," Psychosocial Oncology, vol.29, no.5, pp.561-572, **(2011)**

[7] R.G. Tedeschi and L.G. Calhoun, "The post-traumatic growth inventory: Measuring the positive legacy of trauma," Journal of Traumatic Stress, vol.9, pp.455-471, **(1996)**

[8] I.J. Lee, "A systematic review of post-traumatic growth in cancer," Social Work Practice & Research, vol.6, pp.81-113, **(2009)**

[9] H.J. Kim, J.H. Kwon, J.N. Kim, R. Lee, and K.S. Lee, "Post-traumatic growth and related factors in breast cancer survivors," The Korean Journal of Health Psychology, vol.13, no.3, pp.781-799, **(2008)**

[10] K. Mystakidou, E. Tsilika, E. Parpa, D. Kyriakopoulos, N. Malamos, and D. Damigos, "Personal growth and psychological distress in advanced breast cancer," Breast, vol.17, no.4, pp.382-386, **(2008)**

[11] SMY Ho, C.L.W. Chan, and RTH Ho, "Post-traumatic growth in Chinese cancer survivors," Psycho-Oncology, vol.13, pp.377-389, **(2004)**

[12] I.Y. Han and I.J. Lee, "Post-traumatic growth in patients with cancer," Korean Journal of Social Welfare Studies, vol.42, no.2, pp.419-441, **(2011)**

[13] O. Bozo, E. Gündogdu, and C. Büyükasik-Colak, "The moderating role of different sources of perceived social support on the dispositional optimism-posttraumatic growth relationship in postoperative breast cancer patients," Journal of Health Psychology, vol.14, no.7, pp.1009-1020, **(2009)**

[14] BA. Morris, and J. Shakespeare-Finch, "Rumination, post-traumatic growth, and distress: Structural equation modeling with cancer survivors," Psycho-Oncology, vol.20, pp.1176-1183, **(2011)**

[15] L.G. Calhoun, A. Cann, R.G. Tedeschi, and J. McMillan, "A correlational test of the relationship between post-traumatic growth, religion, and cognitive procession," Journal of Traumatic Stress, vol.13, no.3, pp.521-257, **(2000)**

[16] K. Taku, A. Cann, R.G. Tedeschi, and L.G. Calhoun, "Intrusive versus deliberate rumination in post-traumatic growth across US and Japanese samples," Anxiety, Stress & Coping, vol.22, no.2, pp.129-136, **(2009)**

[17] K.M. Bellizzi and T.O. Blank, "Predicting post-traumatic growth in breast cancer survivors," Health Psychology, vol.25, no.1, pp.47-56, **(2006)**

[18] M.J. Cordova, J. Giese-Davis, M. Golant, C. Kronenwetter, and V. Chang, "Breast Cancer as trauma: Post-traumatic stress and post-traumatic growth," Journal of Clinical Psychology in Medical Settings. vol.14, no.4, pp.309-319, **(2007)**

[19] S. Lee and Y.J. Kim, "Post-traumatic growth of patients with breast cancer," Journal of Korean Academy of Nursing, vol.42, no.6, pp.907-915, **(2012)**

[20] R.G. Tedeschi and L.G. Calhoun, "Post-traumatic growth: Conceptual foundation and empirical evidence," Psychological Inquiry, vol.15, no.1, pp.1-18, **(2004)**

[21] J.E. Pérez, A.R. Smith, R.L. Norris, K.M. Canenguez, E.F. Tracey, and S.B. DeCristofaro, "Types of prayer and depressive symptoms among cancer patients: The mediating role of rumination and social support," Journal of Behavioral Medicine, vol.34, no.6, pp.519-530, **(2011)**

[22] T. Weiss, "Correlates of post-traumatic growth in married breast cancer survivors," Journal of Social Clinical Psychology, vol.23, pp.733-746, **(2004)**

[23] D. Coward and D. Kahn D, "Transcending breast cancer: Making meaning from diagnosis and treatment," Journal of Holistic Nursing, vol.23, pp.264-283, **(2005)**

[24] YH Noh, "Breast cancer survivor's conquest experience," Journal of Qualitative Research, vol.4, no.1, pp.7-25, **(2003)**

[25] S.H. Lee, J.E. Kim, H.K. Lee, N.M. Kang, H.W. Kim, E.H. Lee, M.H. Hur, and Y.S. Park, "A grounded theory approach to the process of life adaptation in women with cervical cancer," Journal of Korean Academy of Women's Health Nursing, vol.10, no.1, pp.32-41, **(2004)**

[26] L.G. Calhoun and R.G. Tedeschi, "Post-traumatic growth: Future directions Post-traumatic growth: Positive change in the aftermath of the crisis," NJ: Lawrence Erlbaum Associates, Inc., pp.215-238, **(1998)**

[27] SH Song, H.S. Lee, J.H. Park, and K.H. Kim, "Validity and reliability of the Korean version of the post-traumatic growth inventory," Korean Journal of Health Psychology, vol.14, no.1, pp.193-214, **(2009)**

[28] A. Cann, L.G. Calhoun, R.G. Tedeschi, K.N. Triplett, T. Vishnevsky, and C.M. Lindstrom, "Assessing post-traumatic cognitive processes: The event-related rumination inventory," Anxiety, Stress & Coping, vol.24, no.2, pp.137-156, **(2011)**

[29] H.J. Yoo, "A study of the structural relationship between variables that influence post-traumatic growth," Ph. D. dissertation, Pusan University, Pusan, Korea, **(2012)**

[30] L.B. Myers, "Manual: The Myers-Briggs type indicator," Princeton, NJ: Educational Testing Services

[31] J.T. Kim, H.S. Sim, and SB Je, Theory, psychometrics, application MBTI, (2nd edition), Assesta, Seoul, **(2009)**

[32] W.W.K. Zung, "A self-rating depression scale," Arch General Psychiatry, vol.12, pp.63-70

[33] J.H. Lee, "Development of the Korean form of Zung's self-rating depression scale," The Yeungnam University Medical Journal, vol.12, no.2, pp.292-305, **(1995)**

[34] G.D. Zimet, N.W. Dahlem, S.G. Zimet, and G.K. Farley, "The multidimensional scale of perceived social support," Journal of Personality Assessment, vol.52, pp.30-41, **(1988)**

[35] C.S. Shin and Y.B. Lee, "The effects of social supports on the psychosocial well-being of the unemployed," Korean Journal of Social Welfare, vol.37, pp.241-269, **(1999)**

[36] H.S. Lee and J.H. Lim, Structural equation modeling & AMOS 18.0/19.0, Jyphyunjae, Seoul, **(2011)**

[37] B.R. Bae, "Structural Equation Modeling with Amos 19," Principles and Practice, Chungram, Seoul, **(2011)**

[38] M.H. Antoni, J.M. Lehman, K.M. Kilbourn, A.E. Boyers, J.L. Culver, S.M. Alferi, S.E. Yount, BA. McGregor, P.L. Arena, S.D. Harris, and C.S. Carver, "Cognitive-behavioral stress management intervention decreases the prevalence of depression and enhances benefit finding among women under treatment for early-stage breast cancer," Health Psychology, vol.20, no.1, pp.20-32, **(2001)**

[39] S.M. Choi, "Exploration of post-traumatic growth-related variables," Ph. D. dissertation, Korea University, Seoul, Korea, **(2008)**