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The Effects of Social Support and Self-esteem on the Relationship between Anxiety/Depression and Posttraumatic Growth among Korean Firefighters

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Abstract

This study was designed for the purpose of investigating if anxiety and depression could affect posttraumatic growth as much as posttraumatic stress among firefighters in Korea. We consider social support as an external resource and self-esteem as an internal resource, and examine their roles in the mechanism between anxiety/depression and posttraumatic growth. As a result of descriptive statistical analysis, correlation analysis, linear regression analysis and hierarchical regression analysis, we found that (1) social support and self-esteem increased posttraumatic growth directly or indirectly via anxiety reduction, (2) social support decreased depression significantly while self-esteem did not influence on depression, and (3) depression had no relationship with posttraumatic growth. These results suggest that both extra and intrapersonal resources should be used to enhance firefighters' posttraumatic adjustment and growth only through anxiety reduction.

Key words: anxiety, depression, posttraumatic growth, social support, self-esteem, firefighters

Ⅰ. Introduction

On the job duty, firefighters face with unfortunate, horrendous scenes and injuries very often. Even though there are somewhat predictable situations, most are unexpected and give shocks that overwhelm their capacity to accept and cope. As the result of these traumas, firefighters suffer pains like depression and anxiety(APA, 2013) and end their lives in a high rate (Henderson, *et. al.,* 2016). It is an issue that should be dealt. Our society should consider measures which are for firefighters' psychological health and, moreover, mental growth by overcoming these distress.

Firefighters, high-risk workers who have much job-related stress, show high prevalence rates for various mental illnesses like post-traumatic stress disorder, depression and anxiety disorder (Heinrichs,

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et. al., 2005; Kim, *et. al.,* 2013). Also, recently reported National Emergency Management Agency's papers (Oh, 2005; Kim, *et. al.,* 2013) indicate that there is a trend of increasing firefighters who committed suicides every year and that the number of suicides is similar to that of firefighters who dies on duty from 2008 to 2012, and the former is more than the latter between 2009 and 2011. For more recent finding (Henderson, *et. al.,* 2016), rates of firefighter suicide death are higher than the general population's. A large study for 1027 current and retired firefighters in the U.S. showed high rates of SI (46.8%), plans (19.2%), and attempts (15.5%)(Stanley, *et. al.,* 2015; Boffa, *et. al.,* 2017). As such, firefighters are in a high stressed situation and have serious distress. Notwithstanding these trends, the studies for firefighters in a difficulty haven't been conducted sufficiently. For one evidence, although the workforce members in the U.S. was estimated at 1.1 million as of 2014(Haynes & stein, 2016), there are significantly less research for post-traumatic stress disorder among firefighters than for military or law enforcement officers (Boffa, *et. al.,* 2017). It is necessary to help firefighters overcome trauma to grow psychologically providing preventive education and coping training program for trauma. We want to study the potentials of intra- and external resources for dealing with the difficulties from the stress related to duty. Thus, we tried to investigate intrapersonal resources as well as extra-personal ones for trauma-related stress to be linked with post-traumatic growth and then to help more firefighters get over stress using their resources. Besides, we examine the role of anxiety and depression as main emotions in psychological adjustment.

II. Theoretical Background

The events that give psychologically strong impacts such as accidents, injury, crime, war damages, sexual assault and disaster are called trauma. People who experienced these traumas show severe fear, helplessness, panic, and if their symptoms got more serious, they are diagnosed with post-traumatic stress disorder(PTSD) according to DSM-5 criterions including trauma-related intrusion, trauma-related stimulus avoidance, a negative change of cognition and feeling, and a marked increase in arousal and reactivity. Although the frequency of trauma and degree of shock impacts on a possibility of negative outcomes like PTSD, it has been proved that pre-traumatic factors (e.g. other traumatic experiences, personality trait) and posttraumatic factors (e.g. support system, additional life stress) are important causes of the outbreak (Chae, 2004). However, trauma does not always bring about tragedies such as PTSD and maladjustment. Through external and internal efforts to overcome traumatic event, it can be possible to live more maturely and well than pre-traumatic life. In the case that people must experience repeated and numerous traumas for work like firefighters, it is essential to cope with trauma-related stress and to grow through psychologically positive change that called posttraumatic growth.

Posttraumatic growth(PTG) is gaining a psychological change such as increasing appreciation of life, newly setting priorities, awareness of own increased power, finding new possibilities, increased intimacy in a close relationship, positive spirit change through efforts to overcome trauma(Zoellner, *et. al.,* 2006). PTG

moderates the negative relations between post-traumatic stress and quality of life(Morrill, *et. al.*, 2008). Also, according to the stress buffering effect of PTG (Cohen & Wills, 1985; Pakenham, 2005; Park, *et. al.*, 2010; Silva, *et. al.*, 2012; Li, *et. al.*, 2015), PTG buffers the negative effects of stress interacting with other variables. Thus, promoting PTG is an important matter to people who experienced traumatic events.

Then, we examined which resources could help them to get the growth directly or indirectly. From the perspective of terror management theory (Greenberg, *et. al.*, 1986; Solomon, *et. al.*, 1991; Greenberg, *et. al.*, 1992), self-esteem is the feeling that one is an object of primary value in a meaningful universe and people need self-esteem because it is the central psychological mechanism for protecting individuals from the anxiety that awareness of their vulnerability and mortality would otherwise create. According to the anxiety-buffer hypothesis, self-esteem threats cause anxiety (e.g., Bennett & Holmes, 1975), and these defensive responses to self-esteem threats are mediated by anxiety (e.g., Gollwitzer, *et. al.*, 1982). Also, the use of self-esteem defenses reduces anxiety (e.g., Mehlman & Snyder, 1985). Moreover, Self-esteem has a tendency opposing to depression. Self-esteem is a feeling of cherishing self, whereas low in self-esteem (state of considering oneself humble) can be mentioned as a feeling of inferiority. When thinking oneself as lowly and worthless, the individual is likely to be depressive and negative to daily life and future (Lee, *et. al.*, 2005; Lee, *et. al.*, 2007). Although there are still debates on a direction of the relation between depression and self-esteem like vulnerability mode supposing low self-esteem is a causal risk

factor for depression and scar model insisting low self-esteem is a consequence of depression, numerous studies proved a negative correlation between self-esteem and depression. Expletively, Orth & Robins' review (2013) show vulnerability model has been more supported than scar model. On the other hands, high in self-esteem predicts high in PTG(Lee & Kim, 2012) and actively having positive awareness about self can help PTG(Kim, *et. al.*, 2008). Then, we expected self-esteem increases PTG directly or indirectly through decreased anxiety and reduces depression to prevent subsequent negative outcomes like PTSD.

Social support means affective, instrumental, informational help from others(House & Kahn, 1985). Affective support consists of understanding, expressing affection, caring, compassion, concern, Instrumental support is specific behaviors like lending money, holding heavy things, Informational support reflects advice, recommendation(Helgeson & Lopez, 2010). Many studies proved social support facilitates adjustment to trauma and ailments (Revenson, 2003; Uchino, 2004; Helgeson & Lopez, 2010). Also according to Buffering Model, social support protects individuals from potential pathological impacts of stress events (Cohen & Wills, 1985) such as depression. Other research found that social support reduces depression (Frison & Eggermont, 2015) and anxiety (Han, *et. al.*, 2014) and moderates the stress effects on depression (Wang, *et. al.*, 2014). Based on these results, we expected that social support increases PTG directly or indirectly by reducing anxiety and decreases depression. And this expectation for the effects of social support and self-esteem could be supported with the prior study that showed

firefighters who reported low-perceived social support and high self-blame demonstrated the highest levels of clinically significant symptoms (Meyer, *et. al.,* 2012). Moreover, we aimed to explore whether both resources would moderate the relation between emotion and posttraumatic growth.

In the process of posttraumatic growth, there is a point to think about the role of each emotion. Being a contrary concept of PTSD which was in a subcategory of anxiety disorder, this PTG was expected to be facilitated by reducing anxiety. Although many studies for posttraumatic change explained anxiety and depression in a single mechanism calling them "psychological distress," they are separate emotions despite their high comorbidity. Moreover, anxiety and depression might take on a different aspect each other in the aftermath of traumatic stress, and the result could support the expectation that depression occurred independently from PTSD and was predicted by a different elements of anxiety and depression (O' Donnell, *et. al.,* 2004). Therefore, we expected that anxiety and depression would have its own way in stress and trauma. As shown in ⟨Figure 1⟩, event shock would elicit anxiety and depression and resources (self-esteem and social support) reduce

both. However, only anxiety, not depression, will be negatively linked to the posttraumatic growth which would be helped by two possible resources.

Ⅲ. Research Hypothesis

Based on these backgrounds, we hypothesized that 1) event shock increases anxiety, which decreases post-traumatic growth. 2) social support and self-esteem increase post-traumatic growth respectively 3) both social support and self-esteem decrease anxiety and 4) social support and self-esteem moderate negative effect of anxiety on post-traumatic growth. Then, the hypotheses about depression are that 1) event shock increases depression 2) but, depression has no significant relation with post-traumatic growth and 3) social support and self-esteem decrease depression.

Ⅳ. Methods

1. Participants

The data were collected using questionnaires for participants who have worked at more than 20 fire stations and professional firefighting-related institutions in Seoul, South Korea. They belonged to the rescue party, preventive center, administrative
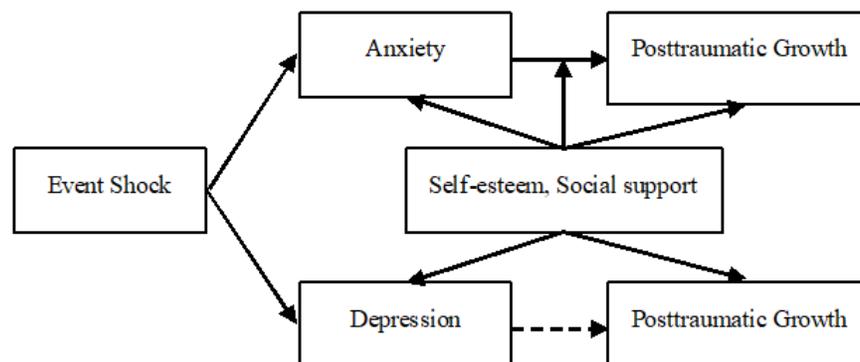

Figure 1. Relations of posttraumatic growth and anxiety or depression

department or Fire house. All agreed with the survey and it took about 1 hours. Total number of respondents is 610(men 513, women 40, not marked 57), the age ranges from 28 to 62 (M = 45.37, SD = 7.65) and the career ranges from 1 to 408 (M = 151.97, SD = 93.91) months.

2. Measure

We progressed the survey study using 6 questionnaires. Three of them are for measuring the degree of the event shock, depression and anxiety: Impact of Event Scale-Revised (IES-R), Center for Epidemiologic Studies Depression Scale (CES-D), Beck Anxiety Inventory (BAI). Impact of event scale(IES) was developed by Horowitz, *et. al.* (1979) and was revised by Weiss & Marmar(1997) to study posttraumatic shock and adjustment. IES-R consists of 3 subscales, invasion, avoidance, and hyperarousal, containing 22 items. Items are rated on a 4-point Likert scale, ranging from 0(I hardly feel like it) to 4(I always feel like it). The higher score means stronger impact of event and stronger event shock they experienced. CES-D was designed by Radloff(1977) to measure the level of depression. Cho, *et. al.* (1993) developed the integrative version of 3 adapted CES-Ds in Korea. In this study, this Korean version of CES-D was used. It contains 20 items for the frequency of symptoms experienced for the last one week. The symptoms belong to some domains (such as valuelessness, hopelessness, loss of appetite and sleep disorder). These are rated on a 4-point Likert scale, ranging from 0(under one day) to 3(5~7days). The more depressive the person is, the higher the score is. BAI was designed by Beck, *et. al.* (1985) to discriminate the severity of anxiety. It consists

of 21 items, which is rated on a 4-point Likert scale ranging 0(hardly) to 3(exceedingly). The score under 9, between 10 and 15, between 16 and 20 and 21 or more indicates separately normal, mild anxiety, moderate anxiety, and severe anxiety. We used BAI adapted by Kwon (1992) and a linguist of Australia.

Moreover, we used Post-Traumatic Growth Inventory (PTGI) to measure posttraumatic growth. PTGI was devised by Tedeschi & Calhoun(1996) to assess the degree of positive changes the individual experienced after a traumatic event. We used the Korean version of PTGI revised by Seung, *et. al.* (2009). It is made of 5 subscales, new possibilities, relating to others, personal strength, appreciation of life, spiritual change, and 21 items. They are rated on a 6-point Likert scale, ranging 0(I never experienced a positive change) to 5(I experienced a lot of positive changes). The high score means the individual experienced many positive changes.

Finally, we used Self-Esteem Scale (SES) and Multidimensional Scale of Perceived Social Support (MSPSS) to measure the self-esteem and social support which is the intra and extra resources the firefighters have. Self-Esteem Scale (SES) was developed by Rosenberg(1965) to assess self-esteem level. The scale comprised of 10 items. Items are rated on a 4-point Likert scale, ranging from 1(I slightly feel like it) to 4(I always feel like it). A high score means they have a high level of self-esteem. For measurement of a perceived social support, we used an adaptation of Multidimensional Scale of Perceived Social Support (MSPSS). MSPSS was devised by Zimet, *et. al.*(1988) and translated by Park, *et. al.*(2001). It contains three subscales, social supports from

family, friend, and significant others, consisting of 12 items. Each item is rated on a 5-point Likert scale ranging from 0(hardly) to 4(always). A high score means that he/she perceives much social support. In the ⟨Table 1⟩, there are the number of item, item examples and Cronbach' α of each scale.

3. Data Analysis

The Statistical Package for the Social Sciences (SPSS version 22.0) was used for the analysis. The descriptive statistic analysis was used to describe the demographic characteristic of participants and score distribution of scales. The hypotheses of this study were verified using a correlation analysis, linear regression analysis, hierarchical regressions. The relationship between career/stress-related factors and posttraumatic stress, posttraumatic stress and anxiety/depression, anxiety/depression, and posttraumatic growth was investigated. In hierarchical regressions, four pairs of variables (2 independent variables (anxiety, depression) by two moderating variables (social support, self-esteem)) were regressed onto the PTG effect.

V. Results

1. Demographic Factors Influencing on Traumatic Shock

The distribution of respondents' demographic characteristics is shown in the ⟨Table 1⟩. Most (84%) of them are men and their age and career are varied from 25~60years and 3~30years respectively. Also, most (76.5%) are married.

To explore demographic factors influencing the degree of event shock, we used one-way ANOVA and linear regression analysis. As a result of one-way ANOVA, there is no significant difference of event shock between sex (p = .283). Through correlation and linear regression analysis, it is showed that age (p = .001), career (p = .004) and the number of event-related stress factor (p = .000) associate event shock significantly. That is, the older they are, the longer career they have, or the more number of event-related stress factor they report, the high event shock they experience.

2. Relationship between Event Shock and Anxiety/Depression

The relationship between event shock and

Table 1. Description of the scale

Scale	Number of item	Item examples	Cronbach' α
Impact of Event Scale-Revised	22	Sometimes, the feeling about the accident is brought back by something. The accident comes to mind unintentionally.	.970
Center for Epidemiologic Studies Depression Scale	20	I thought my life a failure. I felt people hated me.	.910
Beck Anxiety Inventory	21	I feel the fear of happening the very bad thing. I often get scared and feel fear.	.910
Post-Traumatic Growth Inventory	21	I realized my life is precious. I found the new way where my life is ought to proceed.	.920
Self-Esteem Scale	10	I think I am valuable like others I have a positive attitude to myself.	.744
Multidimensional Scale of Perceived Social Support	12	When I need a help, somebody is near me. I can discuss my problem with my family.	.910

Table 2. Description of the samples

		Number of respondents (NR)	Percentage of NR to number of TR*	Number of Missing Value
Sex	Male	513	84.10%	57
	female	40	6.56%	
Age	25 ≦age<30	3	0.49%	86
	30 ≦age<35	43	7.05%	
	35 ≦age<40	88	14.43%	
	40 ≦age<45	84	13.77%	
	45 ≦age<50	157	25.74%	
	50 ≦age<55	81	13.28%	
	55 ≦age< 60	47	7.70%	
	60 ≦age	21	3.44%	
Career (year)	0 ≦career< 5	128	20.98%	43
	5 ≦career< 10	89	14.59%	
	10 ≦career< 15	122	20.00%	
	15 ≦career< 20	129	21.15%	
	20 ≦career< 25	65	10.66%	
	25 ≦career< 30	22	3.61%	
	30 ≦career	12	1.97%	
Marital Status	single	137	22.46%	2
	married	467	76.56%	
	divorced	2	0.33%	
	separated	1	0.16%	
	Bereaved	1	0.16%	

anxiety/depression was examined by a correlation analysis and regression analysis. In a correlation analysis, event shock has significantly positive relation with anxiety(r = .675, p = .000) and depression (r = .560, p = .000) respectively, and then, it was proved that event shock influences anxiety (p = .000) and depression (p = .000) significantly through regression analysis (〈Table 3〉).

3. Relationship between Anxiety/Depression and Posttraumatic Growth

Whether anxiety and depression associate PTG was examined through a correlation and linear regression analyses. While anxiety has a negative relation with PTG(r = −.087, p = .032), depression has no relation with PTG. Thus as a result of regression analysis of anxiety, anxiety decreases PTG significantly (p=.032).

4. Social Support/Self−Esteem and PTG

Social support and PTG are in a positive relation(r = .393, p = .000), and social support increases PTG significantly (p = .000). Likewise,

Table 3. Results of Regression Analysis for event shock, anxiety and depression

IV	DV	Nonstandard coefficient		Standard coefficient	t	p
		B	SE	β		
event shock	anxiety	.473	.021	.675	22.538	.000
	depression	.271	.016	.560	16.605	.000

self-esteem and PTG are in a positive relation ($r = .329$, $p = .000$), the influence of self-esteem on PTG was proved ($p = .000$) in 〈Table 4〉 and 〈Table 5〉.

5. Social Support/self-Esteem and Anxiety/Depression

Social support has negative relationships with anxiety($r = .320$, $p = .000$) and depression($r = -.169$, $p = .000$). And, self-esteem is in a negative relation with anxiety and no relation with depression. In regression analysis, social support decreases anxiety ($p = .000$) and depression ($p = .000$), and self-esteem decreases anxiety significantly ($p = .025$).

6. Moderating Effects of Social Support and Self-Esteem

In hierarchical regression analysis, the moderating effects of social support and self-esteem on anxiety's negative relation with PTG. As a result, both social support and self-esteem increase the explanation power of anxiety for PTG, then, they have moderating effects (〈Table 6〉 and 〈Table 7〉).

7. The Posttraumatic Growth

As the result of these analyses, anxiety was related to posttraumatic growth, but depression wasn't. Therefore, the posttraumatic growth process model of only anxiety was presented below.

This model shows how the firefighters' traumatic experiences affect their anxiety and posttraumatic growth. The degree of event shock from traumatic events is associated with anxiety positively, which decreases the level of posttraumatic growth. Social support and self-esteem can lower anxiety and help posttraumatic growth directly. Besides, they can increase posttraumatic growth indirectly by decreasing anxiety. On the other hand, depression doesn't have association with posttraumatic growth as we hypothesized. Firefighters can reduce depression through social support, but it does not be linked to growth.

Table 4. Results of Correlation analysis for anxiety, depression, social support, self-esteem and posttraumatic growth(PTG)

	Anxiety	Depression	Social support	Self-esteem	PTG
Anxiety	1				
Depression	.709**	1			
Social support	-.320**	-.169**	1		
Self-esteem	-.091*	.032	.461**	1	
PTG	-.087*	-.024	.393**	.329**	1

Table 5. Results of Regression Analysis for anxiety, depression, social support, self-esteem and posttraumatic growth(PTG)

IV	DV	Nonstandard coefficient		Standard coefficient	t	p
		B	SE	β		
Anxiety	PTG	-.138	.064	-.087	-2.145	.032
Social support	PTG	.699	.066	.393	10.542	.000
	Anxiety	-.358	.042	-.320	-8.342	.000
	Depression	-.130	.031	-.169	-4.223	.000
Self-esteem	PTG	1.606	.187	.329	8.603	.000
	Anxiety	-.278	.124	-.091	-2.248	.025
	Depression	.067	.086	.032	.781	.435

Table 6. Moderating effect of Social support on the relation of anxiety and posttraumatic growth

	Predictor	R	R-Sq.	R-Sq. (adj.)	MS	F	A
1	anxiety	.087	.008	.006	2021.396	4.600	.032
2	anxiety,　social support	.395	.156	.153	21033.258	56.207	.000
3	anxiety, social support, anxiety*social support	.401	.161	.157	14432.308	38.714	.000

Table 7. Moderating effect of Self-esteem on the relation of anxiety and posttraumatic growth

	Predictor	R	R-Sq.	R-Sq. (adj.)	MS	F	A
1	anxiety	.087	.008	.006	2021.396	4.600	.032
2	anxiety, self-esteem	.334	.112	.109	15045.783	38.193	.000
3	anxiety, self-esteem, anxiety*self-esteem	.334	.112	.107	10036.612	25.438	.000
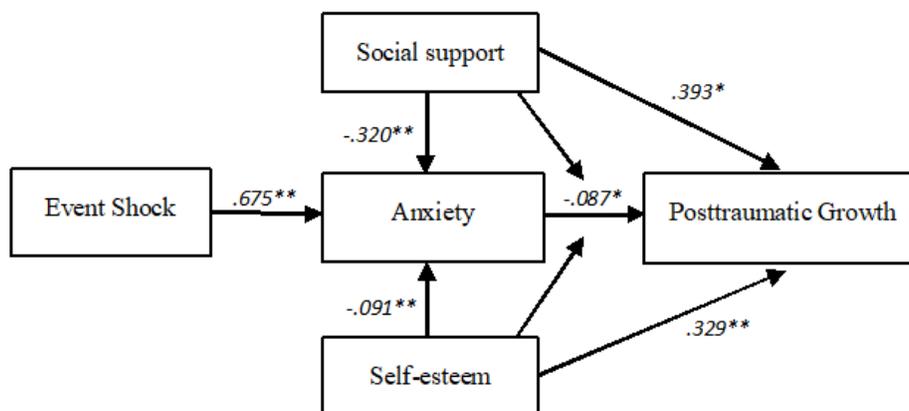
Figure 2. The posttraumatic growth process model of anxiety

Ⅵ. Discussion

We tried to explore variables influencing psychological distress of firefighters and examine how to get post-traumatic growth through these factors. 610 firefighters were surveyed for questionnaires including Self-esteem Scale, Multidimensional Scale of Perceived Social Support, Impact of Event Scale-Revised, Center for Epidemiologic Studies Depression Scale, Stress-Related Factor Scale, Beck Anxiety Inventory, Posttraumatic Growth Inventory and the collected data were analyzed.

As a result of demographic analysis, men's event shock was not different from women's, but age, career and the number of stress-related factors increased shock level. It is because age is commonly proportionate to career and the longer career is, the higher the possibility that the individual would experience unexpected events becomes. Secondly, the degree of event shock affects their anxiety and depression positively. It corresponds with the cited results (Christian, *et. al.,* 2004) that predictability is a key feature of several anxiety disorders, including posttraumatic stress disorder(Foa, *et. al.,* 1992), and that unpredictable danger is more debilitating than predictable danger (Mineka, *et.*

al., 1984).

Also, although event shocks that firefighters experienced for the fire-service increased both anxiety and depression, only the level of anxiety was negatively correlated with the posttraumatic growth. With these findings, we suggest that anxiety and depression have different roles in the development of posttraumatic growth. Traumas mainly induce anxiety and depression as responses and they are comorbid symptoms of many mental disorders like posttraumatic stress disorder. Therefore, many researchers studied them in a single construct with regard to traumatic stress. However, these emotions should be dealt with different ways. Whereas traumatic stress is especially caused by immoderate anxiety and the positive changes are occurred by overcoming it, depression is just a comorbid symptom. That is, the effect of depression on posttraumatic growth could not be same with that of anxiety. So, we would have to regard anxiety as essential emotion and depression as incidental emotion to the aftereffect of trauma. With this perspective, we would like to discuss results about the effects of anxiety and depression separately.

First, social support and self-esteem lowered anxiety, which influenced posttraumatic stress disorder negatively. It means that social support and self-esteem help to reduce anxiety and then, to facilitate posttraumatic stress disorder undermining the negative effect of anxiety on it. Also, social support and self-esteem can increase posttraumatic growth directly. If the trauma experienced firefighters used these resources properly, they would get positive psychological changes like posttraumatic growth. On the other hand, depression did not affect to posttraumatic growth. This result poses the possibility that depression does not play a major role but only is a comorbid emotion, and it supports the interpretation that depression is a separate construct in the acute, not chronic, aftermath of trauma (O'Donnell, *et. al.,* 2004). Posttraumatic growth is a result of the struggle with trauma, not a by-product occurring naturally. Positive reappraisal or the individual's ability to reappraise the traumatic event in a positive way in the fight has been theorized as essential for posttraumatic growth and successful adaptation to traumatic events and also, the cognitive process of rumination and meaning-making have been linked to greater posttraumatic growth (Slyke, 2014). Even though both anxiety and depression are characterized by rumination, they have distinct destinations. Whereas anxiety could be linked to posttraumatic growth by individual's endeavors or others' help (like social support), depression could lastly "not be depressive" by themselves or others' support. Finally, whereas social support could decrease both anxiety and depression, self-esteem could lower only anxiety. It might pose a possibility that social support of external resources can help the individual having psychological difficulties more effectively than self-esteem of internal resources. Sufficient studies about it need to be conducted to compare the effectiveness of resources.

Although this study was for the issue "how could we help firefighters get positive psychological changes?", we should consider the chance that could threaten the existence of this study. Is surely the posttraumatic growth useful to everyone? Many researchers have examined posttraumatic growth by the premise that growth and stress are in a positive

linear relation. However, recently raised the new likelihood that they are actually in a curvilinear relation and overgrowth could rather make more psychological difficulties (Kleim & Ehlers, 2009) has to be considered. Other limitation is related to study design. For the future study, the found relations should be examined by longitudinal study for more understanding of causal directions among variables.

This study has clinically valuable implications despite the limitation. To date, researches have showed significant findings about the relation of posttraumatic growth and related factors. However, the comprehensive understanding is need for practical use like treatment, intervention, or politic preparation. In this respect, our study has a implication because we tried to understand posttraumatic growth in a process linking them rather than examining the relation of trauma, negative emotion, posttraumatic growth and influencing factors fragmentarily. The other is that more firefighters can be helped because we examined the potentials for external- and intrapersonal factors as resources to overcome negative feelings and get a better life. Then it could be of help for prevention and therapeutic intervention programs for them. They might consist of improving self- esteem and educating firefighters' families about their possible distress and method for giving proper social support to them.

References

American Psychiatric Association. 2013. *Diagnostic and Statistical Manual of Mental Disorders (5thed)*. Arlington, VA: American Psychiatric Publishing.

Bennett, D. H. and D. S. Holmes. 1975. Influence of Denial (Situational Redefinition) and Projection on Anxiety Associated with Threat to Selfesteem. *Journal of Personality and Social Psychology*. 32: 915-921.

Boffa, J. W., I. H. Stanley, M. A. Hom, A. M. Norr, T. E. Joiner, and N. B. Schmidt. 2017. PTSD Symptoms and Suicidal Thoughts and Behaviors among Firefighters. *Journal of Psychiatric Research*. 84: 277-283.

Chae, Jeong Ho. 2004. Diagnosis and Pathophysiology of Posttraumatic Stress Disorder(PTSD). *Korean J. Psychopharmacol.* 15(1): 14-21.

Cho, Maeng Je and Kye Hee Kim. 1993. In the Preliminary Evaluation Study of Major Depressive Patients: The Center for Epidemiologic Studies - Depression Scale (CES-D). *Korean Journal of Psychiatric*. 32(3): 381-399.

Cohen, S. and T. A. Wills. 1985. Stress, Social Support, and the Buffering Hypothesis. *Psychological Bulletin*. 98: 310–357.

Foa, E. B., R. Zinbarg, and B. O. Rothbaum. 1992. Uncontrollability and Unpredictability in Post-traumatic Stress Disorder: An Animal Model. *Psychological Bulletin*. 112: 218–238.

Frison, E. and S. Eggermont. 2015. The Impact of Daily Stress on Adolescents' Depressed Mood: The Role of Social Support Seeking through Facebook. *Computers in Human Behavior*. 44: 315-325.

Gollwitzer, P. M., W. B. Earle, and W. G. Stephan. 1982. Affect as a Determinant of Egotism: Residual Excitation and Performance Attributions. *Journal of Personality and Social Psychology*. 43: 702-709.

Greenberg, J., S. Solomon, T. Pyszczynski, A. Rosenblatt, J. Burling, D. Lyon, and E. Pinel. 1992. Why Do People Need Self-esteem? Converging Evidence that Self-esteem Serves an Anxiety-buffering Function. *Journal of Personality and Social Psychology*. 63(6): 913.

Greenberg, J., T. Pyszczynski, and S. Solomon. 1986. The Causes and Consequences of a Need for Self-esteem: A Terror Management Theory. In R. F. Baumeister(ed.). *Public Self and Private Self.* New York: Springer-Verlag.

Grillon, C, J. P. Baas, S. Lissek, K. Smith, and J. Milstein. 2004. Anxious Responses to Predictable and Unpredictable Aversive Events. *Behavioral Neuroscience*. 118(5): 916.

Han, B., B. Yan, J. Zhang, N. Zhao, J. Sun, C. Li, X. Lei, H. Liu, and J. Chen. 2014. The Influence of the Social Support

on Symptoms of Anxiety and Depression among Patients with Silicosis. *The Scientific World Journal.* doi: 10.1155/2014/724804.

Haynes, H. J. G. and G. P. Stein. 2016. *U.S. Fire Department Profile.* The National Fire Protection Association. Retrieved from https://www.nfpa.org/-/media/Files/News-a nd-Research/ Fire-statistics/Fire-service/osfdprofile.pdf

Heinrichs, M., D. Wagner, W. Schoch, L. M. Soravia, D. H. Hellhammer, and U. Ehlert. 2005. Predicting Posttraumatic Stress Symptoms from Pretraumatic Risk Factors: A 2-year Prospective Follow-up Study in Firefighters. *American Journal of Psychiatry.* 162(12): 2276-2286.

Helgeson, V. S., and L. Lopez. 2010. Social Support and Growth Following Adversity. *Handbook of Adult Resilience.* 309-330.

Henderson, S. N., V. B. Van Hasselt, T. J. LeDuc, and J. Couwels. 2016. Firefighter Suicide: Understanding Cultural Challenges for Mental Health Professionals. *Professional Psychol: Research and Practice.* 47(3): 224-230.

Horowitz, M., N. Wilner, and W. Alvarez. 1979. Impact of Event Scale: A Measure of Subjective Stress. *Psychosomatic Medicine.* 41(3): 209-218.

House, J. S., R. L. Kahn, J. D. McLeod, and D. Williams. 1985. Measures and Concepts of Social Support. *Social Support and Health..* 83-108. Orlando: Academic Press.

Jenna, Van Slyke. 2014. *Post-traumatic Growth.* Naval Center for Combat & Operational Stress Control.

Kim, Hee Sook, Gyeong Ran Park, and Ho Jin Lee. 2013. Influencing Factors on Impact of Event in Firefighters. *Korean Review of Crisis and Emergency Management.* 9(5): 1-16.

Kleim, B. and A. Ehlers. 2009. Evidence for a Curvilinear Relationship between Posttraumatic Growth and Posttrauma Depression and PTSD in Assault Survivors. *Journal of Traumatic Stress.* 22(1): 45-52.

Lee, Chang Ho, Woon Chung Nam, and Seong Ho Jo. 2005. *Fundamentals of Counseling Psychology.* Seoul: Hakjisa.

Lee, Sook and Yeon Jung Kim. 2012. Posttraumatic Growth of Patients with Breast Cancer. *Korean Society of Nursing Science.* 42(6): 907-915.

Li, W. J., M. Miao, Y. Q. Gan, Z. J. Zhang, and G. Cheng. 2015. The Relationship between Meaning Discrepancy and Emotional Distress among Patients with Cancer: The Role of Posttraumatic Growth in a Collectivistic Culture. *European Journal of Cancer Care.* 25(3): 491-501.

Mehlman, R. C. and C. R. Snyder. 1985. Excuse Theory: A Test of the Self-protective Role of Attributions. *Journal of Personality and Social Psychology.* 49: 994-1001.

Meyer, E. C., R. Zimering, E. Daly, J. Knight, B. W. Kamholz, and S. B. Gulliver. 2012. Predictors of Posttraumatic Stress Disorder and Other Psychological Symptoms in Trauma-exposed Firefighters. *Psychological Services.* 9(1): 1.

Mineka, S., M. Cook, and S. Miller. 1984. Fear Conditioned with Escapable and Inescapable Shock: Effects of a Feedback Stimulus. *Journal of Experimental Psychology: Animal Behavior Processes.* 10: 307-323.

Morrill, E. F., N. T. Brewer, S. C. O'Neill, S. E. Lillie, E. C. Dees, L. A. Carey, and B. K. Rimer. 2008. The Interaction of Post-traumatic Growth and Post-traumatic Stress Symptoms in Predicting Depressive Symptoms and Quality of Life. *Psycho-Oncology.* 17(9): 948-953.

O' Donnell, M. L., M. Creamer, and P. Pattison. 2004. Posttraumatic Stress Disorder and Depression Following Trauma: Understanding Comorbidity. *American Journal of Psychiatry.* 161(8): 1390-1396.

Oh, Jin Hwan and Nan Yeong Im. 2006. Analysis on Influence Factors of Secondary Traumatic Stress, Burnout, and Physical Symptoms for Firefighters. *J. Korean Acad. Funda. Nurs.* 13(1): 96-106.

Orth, U. and R. W. Robins. 2013. Understanding the Link between Low Self-esteem and Depression. *Current Directions in Psychological Science.* 22(6): 455-460.

Pakenham, K. I. 2005. Benefit Finding in Multiple Sclerosis and Associations with Positive and Negative Outcomes. *Health Psychology.* 24: 123-132.

Park, C. L., J. Chmielewski, and T. O. Blank. 2010. Post-traumatic Growth: Finding Positive Meaning in Cancer Survivorship Moderates the Impact of Intrusive Thoughts on Adjustment in Younger Adults. *Psycho-Oncology.* 19: 1139−1147.

Radloff, L. S. 1977. The CES-D Scale a Self-report Depression Scale for Research in the General Population. *Applied*

Psychological Measurement. 1(3): 385-401.

Revenson, T. A. 2003. Scenes from a Marriage: Examining Support, Coping, and Gender within the Context of Chronic Illness. *Social Psychological Foundations of Health and Illness*. 1: 530-559.

Rosenberg, M. 1965. Rosenberg Self-esteem Scale (RSE). Acceptance and Commitment Therapy. *Measures package*. 61: 52.

Silva, S. M., H. C. Moreira, and M. C. Canavarro. 2012. Examining the Links between Perceived Impact of Breast Cancer and Psychosocial Adjustment: The Buffering Role of Posttraumatic Growth. *Psycho- Oncology*. 21: 409−418.

Solomon, S., J. Greenberg, and T. Pyszczynski. 1991. A Terror Management Theory of Social Behavior: The Psychological Functions of Selfesteem and Cultural Worldviews. In M. P. Zanna(ed.). *Advances in Experimental Social Psychology*. 24: 93-159.

Song, Seung Hoon, Hong Seock Lee, Joon Ho Park, and Kyo Heon Kim. 2009. Validity and Reliability of the Korean Version of the Posttraumatic Growth Inventory. *The Korean Journal of Health Psychology*. 14(1): 193-214.

Stanley, I. H., M. A. Hom, C. R. Hagan, and T. E. Joiner. 2015. Career Prevalence and Correlates of Suicidal Thoughts and Behaviors among Firefighters. *J. Affect. Disord.* 187: 163-171.

Tedeschi, R. G. and L. G. Calhoun. 1996. The Posttraumatic Growth Inventory: Measuring the Positive Legacy of Trauma. *Journal of Traumatic Stress*. 9(3): 455-471.

Uchino, B. N. 2004. *Social Support and Physical Health: Understanding the Health Consequences of Relationships*. Yale University Press.

Wang, X., L. Cai, J. Qian, and J. Peng. 2014. Social Support Moderates Stress Effects on Depression. *International Journal of Mental Health Systems*. 8(1): 41.

Zimet, G. D., N. W. Dahlem, S. G. Zimet, and G. K. Farley. 1988. The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*. 52(1): 30-41.

Zoellner, T. and A. Maercker. 2006. Posttraumatic Growth in Clinical Psychology—A Critical Review and Introduction of a Two Component Model. *Clinical Psychology Review*. 26(5): 626-653.

Korean References Translated from the English

김희숙, 박경란, 이호진. 2013. 소방공무원의 사건충격에 미치는 영향요인: 구미시 소방공무원을 대상으로. 한국위기관리논집. 9(5): 1-16.

김희정, 권정혜, 김종남, 이란, 이건숙. 2008. 유방암 생존자의 외상후성장 관련 요인 탐색. 한국심리학회지: 건강. 13(3): 781-799.

오진환, 임난영. 2006. 소방대원의 이차 외상성 스트레스, 소진 및 신체적 증상의 영향요인 분석. 기본간호학회지. 13(1): 96-106.

조맹제, 김계희. 1993. 주요우울증환자 예비평가에서 the center for Epidemiologic Studies-Depression(CES-D)의 진단적 타당성 연구. 한국정신의학. 32(3): 381-399.

채정호. 2004. 외상 후 스트레스 장애의 진단과 병태 생리. 대한정신약물학회지. 15(1): 14-21.

한국 소방관들의 불안, 우울과 외상후성장의 관계에서 사회적 지지와 자존감이 미치는 영향

국문초록   본 연구는 소방대원의 우울과 불안이 외상후스트레스만큼 외상후성장과 관련이 있음을 관찰하기 위하여 실시한 조사연구이다. 이 조사를 위해 소방대원의 심리적 상태인 우울, 불안, 충격사건 경험을 조사하였고, 그들의 내부자원인 자아존중감과 외부자원인 사회적지지를 조사하였으며, 외상후스트레스와 외상후성장을 측정하였다. 소방대원들이 직무 중에 경험한 충격사건과 외상후스트레스로 인한 우울과 불안이 개인 내외부자원을 통해 외상후 성장에 연결될 수 있는지를 살펴보기 위하여 통계프로그램 SPSS 22.0을 통하여 기술통계, 상관분석, 회귀분석을 실시하였다. 그 결과, 1) 사회적 지지와 자존감은 외상후 감소를 직접적으로, 불안감소를 통해 간접적으로 줄였고, 2) 사회적 지지는 우울을 유의하게 감소시켰지만, 자존감은 우울에 영향을 미치지 못했으며, 우울 자체는 외상후성장과 어떤 관계도 가지지 못했다. 본 연구의 결과들은 개인 내외부자원 모두 오직 불안감소를 통해서만 소방대원들의 외상후 적응과 성장 증진에 활용될 수 있음을 시사한다.

주제어 : 불안, 우울, 외상후성장, 사회적지지, 자존감, 소방대원

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