

## **Determinants of Job Satisfaction on Firefighters after 2017 Pohang Earthquake**

Seong Yun Park<sup>1</sup>, Jung Hoon Kim<sup>2</sup>

<sup>1</sup>(Department of Disaster Safety Engineering, Hanyang University, Seoul, Republic of Korea)

<sup>2</sup>(Department of Civil Engineering, Hanyang University, Seoul, Republic of Korea)

\*corresponding author: Jung Hoon Kim

---

**Abstract:** In order to understand the determinants of job satisfaction of firefighters in Pohang, Korea, this study considered prior studies, designed a research model, and demonstrated the hypothesis. The results of the study are summarized as follows. First, most of the firefighters put into 2017 Pohang earthquake have a working experience less than 10 years, the ages were in their 30s and 40s. Moreover, the subjects' education levels were higher than higher education. Second, what influenced job satisfaction was in order of compensation, conflict within an organization and workload. The results showed that high level of stress and exposure from the post-traumatic stress disorder were the influential factors of compensation. Conflicts within organization has been caused by differences in thought and behavior among the members, limited resources and polices. It is observable that following the law or the procedures even in an emergency, in addition to provide protection and prevention services affected workload. Third, job characteristics did not have significant impact on job satisfaction. Difficulties from emergency dispatch, irregular life pattern and etc. affected more negatively than having self-esteem from being a firefighter.

---

Date of Submission: 18-06-2020

Date of Acceptance: 04-07-2020

---

### **I. INTRODUCTION**

The earthquake had considerable impact on Pohang citizens and nearby area which had been occurred at 14:20 pm on 15th November 2017 in the 8 kilo meters of Northern area in North region of Pohang City, South Korea. The government identified and recovered the disaster damage by operating the countermeasures headquarter in central, provincial, and regional areas. In particular, in order to extinguishing a fire and executing rescue and first aid, it had placed and deployed a fire manpower to reduce damage and to carried out rehabilitation. Since then, the fire officers have experienced post-traumatic stress disorder and various symptoms in the dispatch process whenever earthquake and/or aftershock occurred, and it has had a considerable impact on their job performance. Fire manpower are saddled with their post-traumatic stress disorders and irregular sleeping pattern and always exposed to job-related stress as a professional profession dispatched to disaster and accident sites. Since fire officers have experienced greater stress than in similar officers of profession such as police officers or maritime police officers, they are suffering more post-traumatic stress disorders. This is the situation that these environmental condition declines job satisfaction of fire officers. Meanwhile, job satisfaction is as emotion whether individual of organization affirms or denies one's duties which is variable dependent on their characteristics of tasks, inclination and working environment. This can be applied into fire officers and there are previous researches regarding job satisfaction of paramedic officers or other fire officers. However, there is a lack of research regarding investigation of fire officers in Pohang region and further study is required to identify factors affecting job satisfaction. Therefore, this study aims to identify the factors determining job satisfaction of fire officers in Pohang and to provide further implication.

### **II. PREVIOUS STUDIES AND HYPOTHESIS**

#### **Job characteristics and Job satisfaction**

Job characteristics refer the characteristics presented in work improving performance outcomes by providing satisfaction and motivation to organizational member. The task performed by organizational members provide motivation and satisfaction to individuals, resulting in outcomes of performance and tasks immersion and this shall lead to devote to work and redesign tasks. Organizational member has different attitude towards the tasks or business depending on their job characteristics, which affects their motivation for their task performance.

Job characteristics are comprised of skill variety, task identity, task significance, autonomy and task feedback (Hackman and Oldham, 1976). Lee (2011) analyzed the effect of job characteristics by organizational

level on job satisfaction in police activities which utilized tasks variety, task significance, task completion and autonomy as factors of tasks. The outcomes of analysis show that factors of tasks affected job satisfaction and caused internal motivation. Lim (2014) proved that challenging tasks mostly impact on job satisfaction by setting up challenging tasks as job characteristics, other variable as task management method of superior and relationship with colleagues respectively, in order to identify the factors determining job satisfaction of police officers.

Kim (2015) investigated the relationship between job-related stress and job satisfaction of fire officers by consisting of job -related stress as remuneration, promotion, work hours, autonomy and organizational operation. The results identifying factors affecting job satisfaction have shown negative relationship between job-related stress and job satisfaction. Choi et al. (2015) also identified the effects on job satisfaction and found that job characteristics affecting job satisfaction were injury of colleague, evident collect of deceased patients, break time and program for stress arbitration. As a result, it is considered that job characteristics shall be impacted by job satisfaction and therefore, this study established the following hypothesis.

*Hypothesis 1. Job characteristics shall have a positive effect on job satisfaction.*

### **Burden of task and job satisfaction**

The burden of task refers to requirement of performing excessive or detrimental tasks (Gupta and Beehr, 1979) or refers to the adverse perception or emotion felt by individual due to conditions or events that a particular individual is aware of in the work environment (Parker and Decotiis, 1983). The factors of task burden can be classified into factors of physical environment, organization, task, individual and non-organization.

Cha et al. (2018) identified the relationship between job -related stress, job satisfaction, and satisfaction with life of police officers. The job stress was measured by task requirement, task autonomy, relationship conflicts, task instability, system of organization, inadequate compensation, and culture at work. Further, the job satisfaction was measured by intention of career change, task itself, level of remuneration, self-defense, and interpersonal relation. The results of study show that job stress has effect on the intention of career change, including relationship conflicts and insecure task. Also, this presents that impact of job stress on the job itself was impacted on in terms of task requirement and task autonomy. The impact of task related stress on the level of remuneration was positive in job autonomy. The positive relations were shown in the impact on self-defense or self-regulation on task requirement and task autonomy. Also, the impact on interpersonal relations showed positive in the task autonomy.

Lim and Kong (2019) demonstrated the relationship between job-related stress and job satisfaction of Fire Facility Management officers by measuring job-related stress as following factors: physical environment, task requirement, task autonomy, relationship conflict, job insecurity, organization system, expected compensation, culture of work place. Also, the job satisfaction was measured by task, salary, promotion, and organization system. The study has shown that the physical environment, task requirement, organizational structure, inadequate compensation and workplace culture affected negatively job satisfaction as job-related stress increased. It is possible to consider that burden of tasks could affect job satisfaction, and therefore this study establishes the following hypothesis.

*Hypothesis 2. Burden of task shall affect job satisfaction as negative.*

### **Organizational conflicts and job satisfaction**

Organizational conflicts happen from inconsistencies in goals, ambiguity of roles or responsibilities, competition due to lack of resources, interdependency, communication distortion, task compensation, perception differences and difference in personalities of team members (Lee, 2011). The impact of conflicts on the organization can be classified into positive function and negative function. The positive function includes establishment of self-identification, self-awareness of malfunction, establishment of norms and rules, promoting competition to find good opinions, and promoting tension for human and society (Lee, 2011). On the other hand, negative function is including inhibition of organizational effectiveness, losses of cooperative and teamwork atmosphere, provoking hostility and antagonism, formation of dictatorial leadership, increase inflexible bias, reduction of communication and application of narrow standards (Shin, 2015).

Cheong (2013) studied the effect of organizational conflicts on job satisfaction and the results suggest different outcomes from prior research by analysing organizational conflicts using relationship conflict and task conflict. In other words, previous study stated that the relationship conflict had a negative impact and the task conflict had a positive impact. However, this study found that both conflict impact negatively. Hwang (2015) demonstrated the effect of job related stress on job satisfaction of police officers. As a result of analyzing job related stress divided by role conflict, role ambiguity, and excessive role, role conflict and role ambiguity had a negative effect on job satisfaction, but excessive role had no effect. Son et al. (2010) identified a significant correlation between relationship conflict and the level of burn-out symptom by police officers. As a result, it is

considered that organizational conflict impact on job satisfaction and therefore, this study established the following hypothesis.

*Hypothesis 3. Organizational conflict shall have a negative impact on job satisfaction.*

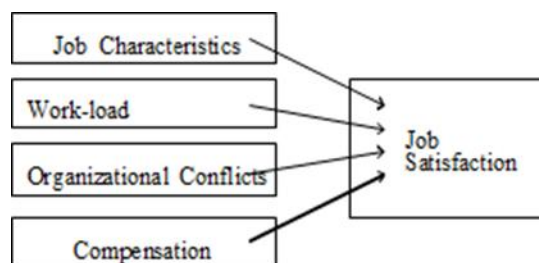
### **Compensation and job satisfaction**

Compensation refers to basic wage received by organizational members and also involving salary, welfare, non-economic extra task, work environment, paid holidays, paid leave, fringe benefit including promotion, medical support, pension assistance and other extra pay (Reynolds et al., 1978). Compensation has function of economic, investment, employee satisfaction and performance (Min, 2010). Jang (2019) studied the effect of compensation system on the job satisfaction of care workers and found that the compensation system had a negative effect. The results indicated that the better compensation system, the lower the job satisfaction, and emphasized that the further in-depth research would be needed.

Yu (2011) analyzed the effect of compensation factors on job satisfaction of maritime police officers. According to the analysis of the compensation factors, compensation factors are divided as external, transactional, and social. The results have shown that external compensation significantly influenced job satisfaction that include welfare, promotion, guarantee of identification and work environment. Among the task compensation factors, the following factors were influenced: task significance, task interest, opportunity of growth and task relevance, and among the social compensation factors, membership recognition, social recognition and support from colleagues had significant effects. As a result, compensation could be considered to affect job satisfaction and therefore, this study established the following hypothesis.

*Hypothesis 4. Compensation shall have a positive effect on job satisfaction.*

To verify suggested hypothesis, Figure no 1. has presented a regression model with job characteristics, burden of task, organizational conflict, and compensation as independent variables and job satisfaction as subordinate variables.



**Fig no 1.** Suggested regression model

### **III. METHODS**

This study investigated five officials deployed to the Pohang earthquake in 2017 to verify the hypothesis set in this study. The questionnaire was measured on a five-point Likert Scale with a total of 25 questions, including five job characteristics, five burden of tasks, five organizational conflicts, five compensation questions, and five job satisfaction questions, using the preceding study. The collected data were analyzed by technical statistics and regression analysis using SPSS for Windows (Ver 26.0) programme.

A survey was conducted from 2nd January 2020 to 17th January 2020 of 270 respondent by contacting fire officials working in currently as of December, 2019. The questionnaire distributed to 270 subjects, 211 copies were used for analysis, excluding those that were not collected and those that were not sincerely responded. Table 1 is a characteristics of specimen and the working period of fire-fighting tasks are as following: 37.0 percent (%) in 6 to 10 years, 31.3% in 1 to 5 years and 27.0% in 11 to 15 years, 68.3% in less than 10 years. The age group presented as follows: 47.4% accounted for 30s, 31.3% accounted for 40s, 17.1% accounted for 20s that shows major age group of fire officers are between 30s to 40s. The tasks classified into main response task with 32.2%, extinguish fire with 23.7%, first-aid activities with 18.5% and rescue activities 18.0%. In gender index shows male officer accounted for 76.3% which occupied majority and female officer accounted for 23.7%. The type of work were 31.3% on-site and 68.7% on-site. The level of education was 39.8% of university graduates, 37.4% of college graduates and 15.2% of college dropout. This shows that 92.4% accounted for who received higher education. The index of marriage, 50.7% of married and 41.2% of single and 8.1% of et cetera.

Table no 1: Shows general characteristics of the participants.

*Determinants of Job Satisfaction on Firefighters after 2017 Pohang Earthquake*

Characteristics	Categories	n (%)
Career in present work unit (yr)	1~5	66 (31.3)
	6~10	78 (37.0)
	11~15	57 (27.0)
	16~20	6 (2.8)
	20 <	4 (1.9)
Age (yr)	20~29	36 (17.1)
	30~39	100 (47.4)
	40~49	66 (31.3)
	50~59	9 (4.2)
Work unit	administration	68 (32.2)
	fire suppression	50 (23.7)
	emergency rescue	39 (18.5)
	rescue	38 (18.0)
	driving	14 (6.6)
	the others	2 (0.9)
Gender	female	161 (76.3)
	male	50 (23.7)
Types of work	desk job	66 (31.3)
	outside duty	145 (68.7)
Educational level	high school	15 (7.1)
	college	79 (37.4)
	dropping out of the university	32 (15.2)
	university	84 (39.8)
	graduate school	1 (0.5)
	Marital status	unmarried
	married	107 (50.7)
	the others	17 (8.1)
		211 (100.0)

Table no 2:Shows factor analysis

Factor	Item	factor loading	Eigen value	Cron. $\alpha$
Job Characteristics	Fear of life threats or injuries when working in the field.	.726	3.063	.841
	The site was dangerous and had been passive.	.818		

	In order to get to the scene quickly, broken the traffic laws	.815		
	Frequent dispatch and training are not good for health.	.707		
	Field work is either an area of interest or an area of interest.	.839		
Workload	There are many other tasks besides the ones I have been in charge of.	.769	3.198	.861
	There are times when I have to work in a different direction than I judged.	.883		
	Sometimes we ignore rules or policies in order to perform a task.	.797		
	Work intensity should be maintained for a long time.	.684		
	The scope for performing tasks and taking responsibility is not clear.	.783		
Organizational Conflicts	Conflict with bosses forcing improper instructions	.724	2.383	.741
	Conflict with the boss who unfairly evaluated personnel evaluation.	.686		
	My coworker does not encourage or respect me.	.629		
	I think my colleague criticizes me unfairly.	.642		
	I don't think the standards or rules for doing business are clear.	.787		
Compensations	Considering the nature of work, salary and income are appropriate.	.622	3.013	.833
	Work harder because treatment is getting better.	.804		
	There are many opportunities to develop skills.	.811		
	I work hard because I think my situation will be better.	.754		
	There is plenty of opportunity to demonstrate your ability.	.868		
Job Satisfaction	Sometimes I want to quit a fire job.	.710	3.244	.783
	I am proud of my job.	.850		
	I think the job helps me develop myself.	.850		
	I really like my job as a firefighter.	.757		
	When you think about firefighting, I may not want to go to work.	.824		

**Table no. 3:**Shows regression results for the hypothesis

Depen. Variable	Indepen. Variable	beta	t	<sup>2</sup> Adj. R	F
Job Satisfaction	Job Characteristics	-	-	.490	51.371* **
		.03	.042		
	Workload	.2	4.1		

		68	02 ** *		
	Organizational Conflicts	.2 57	4.2 31 ** *		
	Compensations	.5 44	9.6 25 ** *		

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

#### IV. RESULT

Analysis of factor and reliability were performed to verify the validity and reliability of the survey tools used in this table (See Table 2). The reliability was selected with an alpha coefficient of 0.6 or higher which are highly reliable, with job characteristics of 0.841, task burden of 0.861, organizational conflict of 0.741, compensation of 0.833 and job satisfaction of 0.783, respectively. The validity of the survey tool was verified by Factor analysis, orthogonal rotation of Varimax was selected with a higher than 1.0 of eigenvalue and factor loading was selected 0.4 or higher. As a result, five factors were extracted, with 3.063 of eigenvalue and 0.707 to 0.839 of factor loading in the task characteristics. The eigenvalue and factor loading value were presented the following components, respectively, 3.198 and 0.684 to 0.883 of task burden, 2.383 and 0.629 to 0.787 of organizational conflicts, 3.013 and 0.622 to 0.868 of compensation and job satisfaction presented 3.244 and 0.710 to 0.850 for each eigenvalue and factor loading.

As a result of the Multiple regression analysis, all but hypothesis 1 were adopted (see Table 3). In Regression model, it was significant when Adj.R2 is 0.490 and F value is 51. 371 (p=0.000). Each component was influenced as follows; burden of tasks (t=4.102, p=0.000), organizational conflicts (t=4.231, p=0.000) and compensation (t=9.625, p=0.000).

The results of analysis show that the impact on job satisfaction is in order of compensation, organizational conflicts and burden of task indicating that it is important to restore the mind and physical recovery over a long-term period.

#### V. CONCLUSION

Due to the fact that the Pohang earthquake occurred in a shallow area, and the aftershocks continued to occur, the fire officials who were deployed at the time were exposed considerable amount of stress. Although, there are several previous researches investigate on job satisfaction of other fire-fighter officers such as emergency ambulance workers, there are lack of study regarding fire-officers in Pohang region. Therefore, this study focused on fire-officers in Pohang and identify the factors affecting job satisfaction. The results of the study are summarized as follows: First, most of the fire officials who were deployed to the Pohang earthquake had a working period less than 10 years, were in their 30s to 40s and have higher education levels. Second, the ones that affects job satisfaction were shown in order of compensation, organizational conflict, and burden of task. Lastly, job characteristics did not significantly affect job satisfaction. The implications of the study are as follows: First, the reason behind the compensation greatly effect on job satisfaction, reflecting the following conditions: the work environment is inappropriate, the work-related stress is high and work environment is highly likely to be exposed to post-traumatic stress disorder. It also reflects that the circumstance that officers cannot receive appropriate compensate for being deployed to various fire extinguish or disaster site. Secondly, the organizational conflict affects job satisfaction due to the fact that the organization member has different opinion or pose different thoughts and actions because of the limited resources, inappropriate polices. This can cause job-related stress or turnover due to that team member cannot be harmonized or build the bond. Therefore, it is necessary to establish policies, resources, and procedures to prevent and resolve organizational conflicts. Third, the reasons behind burden of job have affected job satisfaction are reflected the following reality. Unlike other professions and duties, fire-fighting tasks with strong work intensity, fire-officers must comply with laws and rules in emergency situations and carry out protection or prevention in addition to fire-fighting duties. This indicates the need for work guidelines, responsibilities and recommendations that reflects the characteristics of firefighting. Fourth, the task characteristics effect on job satisfaction due to that it is reflected the reality of emergency dispatch, irregular daily routine, difficulties during shift work and unsatisfied treatment by fire-fighters rather than their self-esteem from rescue and transmit urgent patient or resident. Therefore, it is necessary to seek the measure to improve fire administration, work environment and their welfare. To conclude,

the limitations of this study are as follows: First, there are further additional research required to design research model including working hours, ages, main duties, gender, form of tasks, level of educations and marriage. Second, job satisfaction was not considered, even though it was affected by factors of off-work life. Third, it failed to present a suggestion that reflected the factors which affected job satisfaction. The future studies would be able to suggest new results and implication reflecting within limitations of current study.

## REFERENCES

- [1]. Cha, U.S., Yoon, Y.S., and An, D.S. (2018). The effects of job stress on job satisfaction and life satisfaction of police officers participating in leisure activities. *Korean Journal of Leisure, Recreation & Park*, Vol. 42, No. 3, pp. 27-42.
- [2]. Cheong, J.O. (2013). An empirical study on the relationships between organizational conflicts, organizational citizenship behavior, and job satisfaction. *Korean Society and Public Administration*, Vol. 24, No. 2, pp. 461-482.
- [3]. Choi, S.S., Han, M.A., Park, J., Ryu, S.Y., Choi, S.W.,  
[4]. and Kim, H.R. (2015). Impact of job-related characteristics and post-traumatic stress on job satisfaction among 119 rescue crews. *Journal of the Korean Society of Emergency Medicine*, Vol. 26, No. 4, pp. 286-296.
- [5]. Gupta, N., and Beehr, T.A. (1979). Job stress and employee behaviors. *Organizational Behavior and Human Performance*, Vol. 23, No. 3, pp. 373-387.
- [6]. Hackman, J.R., and Oldham, G.R. (1976). Motivation through the design of work: Test of a theory. *Organizational Behavior and Human Performance*, Vol. 16, No. 2, pp. 250-279.
- [7]. Hwang, C.H. (2015). A study on the types of job stress organizational effectiveness: Focused on the moderating effect of job satisfaction. *Korean Association of Public Safety and Criminal Justice Review*, Vol. 24, No. 1, pp. 223-251.
- [8]. Jang, I.J. (2019). The effect of job environment and compensation system on job satisfaction, organizational commitment and turnover intention of caregiver: The mediating effect of empowerment. Ph.D. dissertation, Kyonggi University.
- [9]. Kim, H. (2015). Job stress, coping type, and job satisfaction in firefighters. *Korean Journal of Occupational Health Nursing*, Vol. 24, No. 4, pp. 323-330.
- [10]. Lee, J.H. (2011). The effects of job satisfactions on organizational commitment by the police organization level: Difference analysis between Gyeongbuk Provincial police agency and police station officials. *Journal of Korean Public Police and Security Studies*, Vol. 7, No. 4, pp. 103-126.
- [11]. Lee, Y.B. (2011). A study on the impacts of conflict management strategies to organizational effectiveness. Ph.D. dissertation, Kyungwon University.
- [12]. Lim, C.H. (2014). A study on the determinants of job satisfactions among police officers. *Korean Police Studies Review*, Vol. 13, No. 3, pp. 239-272.
- [13]. Lim, K.Y., and Kong, H.S. (2019). Effects of task stress on the job satisfaction of fire protection management workers. *Fire Science and Engineering*, Vol. 33, No. 5, pp. 130-139.
- [14]. Min, K.H. (2010). Personal management. Seoul: Muyok pub. Parker, D.F., and DeCotiis, T.A. (1983). Organizational determinants of job stress. *Organizational Behavior and Human Performance*, Vol. 32, No. 2, pp. 160-177. Reynolds, L.G., Masters, S.H., and Moser, C.H. (1978). *Labor economics and labor relations* (7th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- [15]. and Human Performance, Vol. 32, No. 2, pp. 160-177. Reynolds, L.G., Masters, S.H., and Moser, C.H. (1978). *Labor economics and labor relations* (7th ed.). Englewood Cliffs, NJ: Prentice-Hall.
- [16]. Englewood Cliffs, NJ: Prentice-Hall.
- [17]. Shin, W.M. (2015). The influence of leader's conflict management style on leader trust, organizational commitment, turnover intention among employees in professional dance company. Ph.D. dissertation, Sungkyunkwan University.
- [18]. Son, Y.J., Choi, E.Y., and Song, Y.A. (2010). The relationship between stress and depression in nursing college students. *Korean Journal of Stress Research*, Vol. 18, No. 4, pp. 345-351.
- [19]. Yu, Y.H. (2011). A study on the determinants of job satisfaction for the maritime police officer. *The Journal of Social Science*, The Research Institute of Social Science, Dongguk University, Vol. 18, No. 3, pp. 181-204.

Jung Hoon Kim, et. al. "Determinants of Job Satisfaction on Firefighters after 2017 Pohang Earthquake." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 25(7), 2020, pp. 15-21.