Assessing Emotional Exhaustion of Police Officers in Taiwan by Multivariate Analysis of Variance

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Abstract – **This study uses multivariate analysis of variance to analyze the emotional exhaustion of police officers in Taiwan based on the Chinese version of the safety attitudes questionnaire. Position and the interaction of years of service and position are the two demographic variables that have significant influences on burnout. Sergeants tend to have higher emotional exhaustion than middle-ranking police officers statistically from four out of nine questions. In addition, the interaction of year of service and position has significant impacts on two out of nine questions. In summary, sergeants with 20 to less than 30 years have higher emotional exhaustion. Middle-ranking police officers with less than 1 year should be taken great care as well due to their high emotional exhaustion though their sample of size is small.**

Keywords – **Burnout, Emotional exhaustion, Police officer, Multivariate analysis of variance.**

1. Introduction

Burnout is defined as losing enthusiasm for work, treating people as if they were objects, and having sense that the work is no longer meaningful[1]. The characteristics of burnout include emotional exhaustion, depersonalization, and low personal accomplishment [1]. Shanafelt et al. [2] pointed out

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that physician's degree of burnout, which might result from overwork, stress, and fatigue, is related to medical errors. Cimiotti et al. [3] also summarized that burnout is linked to job dissatisfaction. An increase in a nurse's workload might result in poor patient healthcare quality. Seok et al. [4] stated that being a police officer is one of the most stressful occupations because of the nature of police duties and special environmental factors associated with the career.

Peñalba et al. [5] reported that sickness absence rates among police officers are higher, and the major medical retirements are due to psychological or mental health disorder. In addition, police officers experience high level of emotional exhaustion and depersonalization in burnout. Stepka and Basinska [6] summarized that the level of chronic fatigue for police officers is high. Moreover, Stuart [7] pointed out that police is at greater risk of posttraumatic stress reactions and job burnout, which might result in higher risk of psychosocial problems and suicide. In order to prevent suicide, one of the strategies is to reduce job burnout.

Job stress impacts police officers' job satisfaction and their performance of the personnel [8]. Job stress also influences negatively physical, mental, behavioral, and emotional health [4]. Thus, it is critically important to assess police officers' perceived stress levels. Maslach burnout inventory-human services survey (MBI-HSS) with three dimensions along with 22 questions is the mainstream measure to evaluate burnout [9]. For instance, Lee et al. [10] used a Chinese version of MBI-HSS to assess burnout for nurses in Taiwan. Loera et al. [9] also used MBI-HSS to assess burnout for Italian nurses. Because nurses and police officers belong to high burnout jobs, MBI-HSS would be a suitable scale to assess the burnout for police officers.

Different police officers' demographic information might have different perceptions in burnout. For instance, Alexopoulos et al. [11] stated that male and higher ranked police officers reported lower

satisfaction with their jobs. Female officers have higher levels of somatization and depression and work family conflicts statistically [5]. Maran et al. [12] also found that police officers with different genders, sectors, and roles emerged to have different perceptions. Moreover, female officers in all operational service roles are more vulnerable to both organizational and operational stressors than male officers, whereas male officers are more vulnerable to organizational stressors in the interior department. Therefore, it is of interest to observe how police officers with different demographic information are perceived in burnout.

2. Literature review

Maslach burnout inventory-human services survey was designed to measure the burnout syndrome [13]. MBI-HSS is a reliable and valid instrument that contains three distinct subscales of burnout, including emotional exhaustion with nine questions, personal accomplishment with eight questions, and depersonalization with five questions [3]. Cimiotti et al. [3] stated that the emotional exhaustion, the subscale of the MBI-HSS, is the key component to measure the burnout syndrome. In the newest Chinese version of the safety attitudes questionnaire (SAQ), emotional exhaustion is also included to assess the staff's perceptions in burnout [14]. Because both nurses and police officers are classified into high burnout jobs, the emotional exhaustion of MBI-HSS with nine questions is a suitable scale to assess the burnout for police officers. The detailed information about the emotional exhaustion based on the Chinese version of SAQ is provided in Table 1.

Table 1.Nine items in emotional exhaustion of MBI-HSS

Dimension	Question
Emotional Exhaustion	1. I feel like I'm at the end of my rope.
	2. I feel burned out from my work.
	3. I feel frustrated by my job.
	4. I feel I'm working too hard on my job.
	5. I feel emotionally drained from my work.
	6. I feel used up at the end of the workday.
	7. I feel fatigued when I get up in the morning and have to face another day on the job.
	8. Working with people all day is really a strain for me.
	9. Working with people directly puts too much stress on me.

The original Maslach burnout inventory uses the frequencies to ask the respondents to choose from such as a few times a year, monthly, a few times a month, every week, a few times a week, and every day [13]. In the Chinese version of SAQ, a five-point Likert scale was used ranging from strongly disagree to strongly agree [14]. However, in order to assess the degree of burnout, the frequency is better to reflect the respondents' scenarios. In our study, four types of frequencies, including less than one day, 1-2 days, 3-4 days, or 5-7 days per week, are applied for respondents to choose from. That is, a four-point Likert scale was used to assess the degree of burnout for police officers for each question in the emotional exhaustion. Moreover, a higher value indicates higher burnout from the respondent. In addition to burnout, five demographic variables were chosen, including gender, age, marital status, years of service, and position.

3. Research method

Different police officers with different demographic information might perceive burnout differently. The purpose of this study is to observe if police officers with different demographic information perceive differently in emotional exhaustion based on the Chinese version of the safety attitudes questionnaire.

Multivariate analysis of variance (MANOVA) with $\alpha = 0.05$ is applied rather than analysis of variance (ANOVA) in this study. ANOVA is to analyze uni-response problems and assumes that dependent variables are not correlated. In contrast, MANOVA uses the variance-covariance between variables to test the statistical significance of the mean differences when there are several correlated dependent variables and to further observe how independent variables influence dependent variables [15].When a p-value is less than $\alpha= 0.05$, McHugh [16] recommended that Bonferroni method is a preferred method for post hoc analysis that reduces the probability of a Type I error except for gender, marital status, and position with only two levels.

The survey was conducted in November 2015 by convenience sampling in Taiwan. A total of 213 questionnaires were issued, but only 169 questionnaires were valid, representing a 79.3% effective response rate. The demographic information, such as gender, age, marital status, year of service, and position, is provided in Table 2. The reliability of the questionnaire which was measured by Cronbach's α is 0.869, indicating that the internal consistency reliability is good [17]. With the Kaiser-Meyer-Olkin measure for sampling adequacy of 0.856 and significant Bartlett's test of sphericity (p-value = 0.000), factor analysis can be performed. By applying SPSS 18.0 software, the parameters were as follows. Principal component analysis with correlation matrix was chosen. The option of

eigenvalues over one was selected. The rotation method was varimax. In our analysis, there was only one eigenvalue greater than one, and, more importantly, each factor loading was greater than 0.5, showing that the construct validity was supported by factor loading.

Table 2. Demographic information of this study

Demographic Variable		Frequency	Percentage
Gender	1. Male	109	64.5
	2. Female	60	35.5
Age	1. 20-29 years old	65	38.5
	2. 30-39 years old	74	43.8
	3. 40-49 years old	28	16.5
	4. 50-59 years old	2	1.2
	5. 60 years old and above	0	0
Marital Status	1. Single	81	47.9
	2. Married	88	52.1
	3. Other	0	0
Year of Service	1. Less than 1 year	13	7.7
	2. 1 to less than 10 years	87	51.5
	3. 10 to less than 20 years	51	30.2
	4. 20 to less than 30 years	18	10.6
	5. 30 years and more	0	0
Position	1. Sergeant	147	87.0
	2. Middle-Rank Police Officer	22	13.0
	3. High-Rank Police Officer	0	0

4. Research results

The frequency distribution, namely less than one day a week, 1-2 days a week, 3-4 days a week, and 5-7 days a week, for each question based on 169 respondents are depicted in Table 3. The average value for each question is to compute the average frequency. In this study, the frequencies of less than 1 day, 1-2 days, 3-4 days, and 5-7 days per week are assigned as the values of 1, 2, 3, and 4, respectively. The higher average value for each question indicates the higher burnout perceived by the respondents. From the descriptive statistics, Item 6 (I feel used up at the end of the workday.) has the highest average value followed by Item 7 (I feel fatigued when I get up in the morning and have to face another day on the job.) and Item 2 (I feel burned out from my work.). In contrast, Item 3 (I feel frustrated by my job.) has the lowest average value followed by Item 1 (I feel like I'm at the end of my rope.) and Item 9 (Working with people directly puts too much stress on me.).

Table 3. The frequency distribution and average values of nine questions

Question	Frequency (in days)				Average
	1 <	1-2	3-4	5-7	
1. I feel like I'm at the end of my rope.	20	70	58	21	2.47
2. I feel burned out from my work.	19	60	62	28	2.59
3. I feel frustrated by my job.	25	78	47	19	2.36
4. I feel I'm working too hard on my job.	19	64	67	19	2.51
5. I feel emotionally drained from my work.	35	43	54	37	2.55
6. I feel used up at the end of the workday.	26	50	54	39	2.63
7. I feel fatigued when I get up in the morning and have to face another day on the job.	23	54	58	34	2.61
8. Working with people all day is really a strain for me.	20	64	58	27	2.54
9. Working with people directly puts too much stress on me.	26	59	60	24	2.49

To test if H_0: $\mu_1 = \mu_2 = \ldots = \mu_k$ is to be rejected in multivariate analysis of variance, Wilk's likelihood ration test, Pillai test, Lawley-Hotelling test, and Roy's largest root are the four commonly used approaches in practice. If the mean vectors of dependent variables are collinear, Roy's largest root is more powerful than the other three approaches. In contrast, if the mean vectors are more diffuse, the other three approaches outperform Roy's largest root [18]. Belsley et al. [19] stated that conditional index (CI) can be an index to estimate if the mean vectors of dependent variables are collinear. Larger CI values indicate a more serious effect of collinearity. Specifically, if CI value is between 15 and 30, collinearity exists. If CI value is between 30 and 100, a moderate to high effect of collinearity exists. If CI value is greater than 100, the collinearity is serious. In this study, the CI values ranging from 7.962 to 19.436 shows the collinearity exists. Thus, Roy's largest root is more powerful to detect if H_0 is to be rejected. Table 4. summarized the MANOVA test statistics based on Roy's largest root with $\alpha = 0.05$, where p values of position and the interaction of year of service and position are less than 0.05.

Table 4.MANOVA test statistics by Roy's largest root

Effect	Value	Sig.
Gender	0.076	.385
Age	0.086	.277
Marital Status	0.067	.487
Year of Service	0.099	.189
Position	0.193	.006*
Gender * Age	0.077	.373
Gender * Marital Status	0.061	.561
Gender * Year of Service	0.119	.093
Gender * Position	0.064	.530
Age * Marital Status	0.030	.923
Age * Year of Service	0.105	.155
Age * Position	0.069	.469
Marital Status * Year of Service	0.120	.095
Marital Status * Position	0.025	.955
Year of Service * Position	0.146	.035*

Table 5. summarizes that positions have influences on Items 1, 3, 5, and 9 statistically. Specifically, sergeants have higher values on these four items, indicating sergeants have higher burnout than middle-rank police officers.

Table 5.Test between-subjects effects in position

Dependent Variable	F	Sig.	Post Hoc Analysis
1. I feel like I'm at the end of my rope.	8.583	.004*	1 > 2
2. I feel burned out from my work.	1.675	.198	
3. I feel frustrated by my job.	4.369	.038*	1 > 2
4. I feel I'm working too hard on my job.	.033	.855	
5. I feel emotionally drained from my work.	10.748	.001*	1 > 2
6. I feel used up at the end of the workday.	2.950	.088	
7. I feel fatigued when I get up in the morning and have to face another day on the job.	1.042	.309	
8. Working with people all day is really a strain for me.	0.526	.469	
9. Working with people directly puts too much stress on me.	5.794	.017*	1 > 2

To further analyze the interaction of year of service and position on burnout, there are eight combinations of the interactions as shown in Table 6. Table 7. depicts the interaction of year of service and position along with post hoc analyses. The interaction has impacts on Items 5 and 6 statistically. Tables 8. and 9. summarize the average values and their sample of sizes for the respective Items 5 and 6. On Item 5, Table 8. shows that middle-rank police officers with less than 1 year in service have the highest value followed by sergeants with 20 to less than 30 years in service from the descriptive statistics. A higher value indicates higher burnout. That is, middle-rank police officers with less than 1 year have the highest emotional exhaustion. In contrast, middle-rank police officers with 10 to less than 20 years in service have the lowest value followed by middle-rank police officers with 20 to less than 30 years in service. In addition, the post hoc analysis shows that sergeants with 1 to less than 10 years, 10 to less than 20 years, and 20 to less than 30 years in service have significantly higher values than middle-rank police officers with 10 to less than 20 years. Besides, sergeants with 20 to less than 30 years have a higher value statistically than middle-rank police officers with 20 to less than 30 years. Generally, sergeants feel emotionally drained from their work significantly.

Table 6.Combinations of year of service and position

Notation	Combination of Year of Service and Position
1	Less than one year * Sergeant
2	Less than one year * Middle-Rank Police Officer
3	1 to less than 10 years * Sergeant
4	1 to less than 10 years * Middle-Rank Police Officer
5	10 to less than 20 years * Sergeant
6	10 to less than 20 years * Middle-Rank Police Officer
7	20 to less than 30 years * Sergeant
8	20 to less than 30 years *Middle-Rank Police Officer

Table 7.Test between-subjects effects in interaction of year of service and position

Dependent Variable	F	Sig.	Post Hoc Analysis
1. I feel like I'm at the end of my rope.	1.331	.267	
2. I feel burned out from my work.	0.703	.552	
3. I feel frustrated by my job.	0.575	.633	
4. I feel I'm working too hard on my job.	1.238	.298	
5. I feel emotionally drained from my work.	5.017	.002*	3 > 6, 5 > 6, 7 > 6, 7 > 8
6. I feel used up at the end of the workday.	3.606	.015*	2 > 6, 7 > 6
7. I feel fatigued when I get up in the morning and have to face another day on the job.	1.906	.132	
8. Working with people all day is really a strain for me.	1.053	.371	
9. Working with people directly puts too much stress on me.	1.351	.261	

Table 8.Average values, standard deviations, and sample of sizes for the combinations of year of service and position on Item 5

Combination	Average Value	Standard Deviation	Sample of Size
1	2.09	1.136	11
2	3.50	0.707	2
3	2.68	0.925	80
4	1.86	1.069	7
5	2.66	0.987	44
6	1.00	0.000	6
7	3.25	1.055	12
8	1.71	1.254	7
Average	2.55	1.052	

Table 9.Average values, standard deviations, and sample of sizes for the combinations of year of service and position on Item 6

Combination	Average Value	Standard Deviation	Sample of Size
1	2.36	1.286	11
2	4.00	0.000	2
3	2.69	0.922	80
4	2.14	0.900	7
5	2.66	0.914	44
6	1.50	0.548	6
7	3.25	1.055	12
8	2.14	1.345	7
Average	2.63	1.004	

On Item 6, Table 9. shows that middle-rank police officers with less than 1 year have the highest value followed by sergeants with 20 to less than 30 years from the descriptive statistics. These two types of police officers feel used up at the end of the workday more seriously. The scenario on Item 6 is equivalent to that on Item 5. On the contrary, middle-rank police officers with 10 to less than 20 years have the lowest value followed by middle-rank police officers with 1 to less than 10 years and 20 to less than 30 years. From Table 7., the post hoc analysis shows that middle-rank police officers with less than 1 year and sergeants with 20 to less than 30 years have significantly higher values than middle-rank police officers with 10 to less than 20 years.

Based on the above findings, gender, age, marital status, and year of service do not have significant influences on emotional exhaustion. In contrast, different positions have different perceptions on emotional exhaustion. Sergeants have significantly higher burnout values on Items 1, 3, 5, and 9, showing that they are at the end of the rope, frustrated by their jobs, emotionally drained, and having too much stress when working with people directly. For the interactions, only the interaction of years of service and position has statistical impacts on Items 5 and 6. Generally, middle-rank police officers with less than 1 year and sergeants with 20 to less than 30 years perceive higher emotional exhaustion than the others, while middle-rank police officers with 1 to less than 10 years, 10 to less than 20 years, and 20 to less than 30 years have the lower emotional exhaustion than the others. From the managerial viewpoints, police officers who are middle-rank police officers with less than 1 year and sergeants with 20 to less than 30 years should be carefully taken great care because they tend to have higher emotional exhaustion.

5. Conclusions

This study analyzes the emotional exhaustion of police officers in Taiwan based on the burnout dimension of the Chinese version of the safety attitudes questionnaire.The results show that most of the police officers have the frequencies of 1-2 and 3-4 days per week indicating that their emotional exhaustions are relatively high. Specifically, "I feel used up at the end of the workday", "I feel fatigued when I get up in the morning and have to face another day", and "I feel burned out from my work"are the top three notches among nine questions from the descriptive statistics.

Sergeants tend to have higher emotional exhaustion than middle-rank police officers. Specifically, sergeants feel like at the end of their rope, frustrated by their jobs, emotionally drained

from their work, and too much stress to work with people directly significantly. In addition, sergeants with 20 to less than 30 years feel emotionally drained from their work significantly. Moreover, middle-rank police officers with less than 1 year and sergeant with 20 to less than 30 years feel used up at the end of the workday. In order to improve their burnout, sergeant with 20 to less than 30 years should be placed in a higher priority. Though the sample of size for middle-rank police officers with less than 1 year is small, the results indicate that their emotional drain should be carefully monitored.

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