

Original Article

Risk factors for fatigue and stress among Korean police officers

JONG-MIN SEOK^{1, 2)}, JAE-HWAN CHO³⁾, WOO-JIN JEON¹⁾, JAE-OUK AHN⁴⁾*

¹⁾ Department of Radiology, National Police Hospital, Republic of Korea

²⁾ Department of Medical Science, Soonchunhyang University, Republic of Korea

³⁾ Department of International Radiological Science, Hallym University of Graduate Studies, Republic of Korea

⁴⁾ Department of Medical IT Engineering, Soonchunhyang University: Asan, Chungnam 336-745, Republic of Korea

Abstract. [Purpose] This study investigated factors that affect the health of police officers by analyzing job stress, psychosocial stress, and fatigue faced by police officers in order to provide basic data for the efficient management of police officers and future comparative research. [Subjects and Methods] Police officers admitted to the National Police Hospital from March to May 2013 were surveyed to investigate their degree of stress. The questionnaire consisted of 4 areas related to patient characteristics: general and demographic characteristics factors, job stress, psychosocial stress, and fatigue. [Results] The analysis of the relationships among job stress, psychosocial health, and fatigue showed the 0%, 44.7%, and 82% of those with healthy, potential, and high risks of stress had high job stress, respectively. Meanwhile, 40.8% and 77.9% of subjects with normal and high risks of fatigue had high job stress. [Conclusion] The studies can be used as basic and comparative data for the prevention and early control of job-related diseases for police officers.

Key word: Fatigue

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INTRODUCTION

Modern society is characterized by a complex and rapidly changing social structure with advances in technology. As police officers are in charge of citizens' safety and are at the frontline of a rapidly changing and complex world, understanding and managing factors threatening the physical and mental health of police officers is important in order for them to be able to fulfill their duties. In particular, chronic job stress and fatigue can threaten physical and mental health¹⁻⁵⁾, and these have been studied in people of various occupations in Korea and abroad⁶⁻⁸⁾.

Police officers are assigned positions on the basis of service sectors and specialty codes, but the majority perform shift work. Such a work pattern perturbs biological rhythms such as sleep, rest, and eating cycles, necessitating adaptations, which greatly burden health⁹⁾. Crimes, a focus of police officers, are becoming more violent and sophisticated; importantly, they increase the difficulty and volume of work. In addition, exposure to danger, the rigid paramilitary hierarchical structure of police organizations, lack of communication, and promotion congestion can all potentially act

as stress-triggering factors for police officers¹⁰⁾. Because of the nature of police duties and special environmental factors associated with this career, being a police officer is considered one of the most stressful occupations¹¹⁾. Although many studies on police officers, including studies about their stress⁸⁻¹³⁾ and service characteristics^{14, 15)}, are underway in Korea, they are limited to certain areas and are therefore not comprehensive studies of job stress, psychosocial health, and fatigue related to the job characteristics of police officers. Thus, this study investigated the factors that affect the health of police officers by studying job stress, psychosocial stress, and fatigue in order to provide basic data for the efficient management of police officers and future comparative research.

SUBJECTS AND METHODS

This study involved a survey targeting police officers admitted to the National Police Hospital from March to May 2013 to investigate their degree of stress. The questionnaire was sent to 400 randomly selected patients, and the data of 353 police officers were analyzed after excluding 47 police officers who did not correctly fill out or respond to the questionnaire. This self-administered questionnaire survey was conducted after patients were given a detailed explanation of the purpose of the survey and the response method. The questionnaire consisted of 4 areas: general and demographic characteristics, job stress, psychosocial stress, and fatigue. SPSS version 18.0 (SPSS, USA) was used to analyze the data as follows. First, technical statistical analysis was per-

*Corresponding author. Jae-Ouk Ahn (E-mail: jahn1365@gmail.com)

formed for the general subject characteristics. Second, the frequency and percentage were obtained from the frequency analysis. Third, Pearson's χ^2 test was performed to analyze the relationships among general characteristics, job stress, psychosocial stress, and fatigue. Finally, multiple logistic regression analysis was used to determine risk factors for high fatigue by calculating odds ratios and 95% confidence intervals.

RESULTS

Compared to the median reference values of occupational stress for males on the Korean occupational stress scale (KOSS), in the job stress category, stress by task demand had relatively high scores, factors of instability and reward deficiency had low scores, and others had similar scores. Regarding the subcategories of job stress for police officers, task demand was the factor with the highest stress, followed by task autonomy and organizational system (Table 1). The overall mean \pm SD score of psychosocial stress (PWI-SF) was 21.34 ± 6.61 ; that of fatigue (MSF) was 80.98 ± 17.65 , with scores ≤ 92 and >92 (i.e., the 75th percentile) considered normal and high fatigue, respectively. The distributions of job stress, psychosocial stress, and fatigue were as follows. Job stress was mostly similar between the low- and high-stress groups. In the low- and high-stress groups, 62.3% and 37.7% reported job autonomy stress, respectively; meanwhile, 62.9% and 37.1% job instability stress, respectively. Psychosocial health in the healthy, potential stress, and high-stress groups was 4.0%, 77.9%, and 18.1%, respectively. Meanwhile, fatigue in the normal and high-stress groups was 75.6% and 24.4%, respectively (Table 2). Analysis of the relationship between personal characteristics and job stress showed that age, marital status, and education level were not significantly associated with job stress ($p > 0.05$). However, marital status tended to be associated with job stress ($p < 0.1$). Analysis of service characteristics and job stress showed that 29.6%, 32.4%, 55.5%, 52.4% of those with a service length ≤ 10 , 11–20, 21–30, and ≥ 31 years had high job stress, respectively ($\chi^2 = 11.142$). Regarding service type, 45.4% and 56.1% of those in ordinary service jobs and shift work had high job stress, respectively ($\chi^2 = 3.947$, $p < 0.05$). There was no association between job stress and rank, post, the number of service years at a specific division, or service area ($p > 0.05$). However, job stress tended to be associated with rank and post ($p < 0.1$). Analysis of the relationship between job stress, and life and chronic disease characteristics showed that 68.6% and 43.8% of non-exercisers had high job stress, respectively ($\chi^2 = 15.983$, $p < 0.05$); meanwhile, there was no association between job stress and smoking, drinking, driving, chronic diseases, or injuries ($p > 0.05$, Table 3). Analysis of the relationship between psychosocial stress and personal characteristics showed that age, marital status, and education level were not associated with psychosocial stress ($p > 0.05$). Analysis of the relationship between psychosocial stress and service characteristics showed that the number of service years, rank, post, the number of service years at a specific division, service type, and service area were not associated with psychosocial stress ($p > 0.05$). However, rank tended to be associated with psychosocial stress ($p < 0.1$).

Table 1. Levels of job stress between the KOSS in Korean men and police officers

Variables	KOSS		Police officers	
	Median	Mean \pm SD	Median	Rank
Total	50.8	47.9 \pm 9.2	47.9	
Physical environment	44.5	47.3 \pm 19.6	44.4	5
Job demand	50.1	52.9 \pm 15.1	54.2	1
Insufficient job control	53.4	54.3 \pm 13.1	53.3	2
Interpersonal conflict	33.4	40.2 \pm 13.9	33.3	8
Job insecurity	50.1	43.7 \pm 12.1	44.4	5
Organization system	52.4	51.7 \pm 15.1	52.4	3
Lack of reward	66.7	48.4 \pm 14.7	50.0	4
Occupational climate	41.7	45.1 \pm 15.9	41.6	7

KOSS: Korean occupational stress scale

Table 2. Frequencies of occupational stress, psychosocial distress, and fatigue (N = 353)

Variables	Classification	Frequency (%)
Physical environment	Low	192 (54.4)
	High	161 (45.6)
Job demand	Low	208 (58.9)
	High	145 (41.1)
Insufficient job control	Low	220 (62.3)
	High	133 (37.7)
Interpersonal conflict	Low	184 (52.1)
	High	169 (47.9)
Occupational stress	Low	222 (62.9)
	High	131 (37.1)
Job insecurity	Low	204 (57.8)
	High	149 (42.2)
Organization system	Low	213 (60.3)
	High	140 (39.7)
Lack of reward	Low	190 (53.8)
	High	163 (46.2)
Occupational climate	Low	177 (50.1)
	High	176 (49.9)
Psychosocial distress	Healthy	14 (4.0)
	Potential risk	275 (77.9)
	High risk	64 (18.1)
Fatigue	Normal risk	267 (75.6)
	High risk	86 (24.4)

Analysis of the relationship between psychosocial health and life and chronic disease characteristics showed that 13.4 and 37.7% of non-smokers had a high risk of psychosocial stress, respectively ($p < 0.05$); meanwhile, 30.2% and 14.2% of non-exercisers had a high risk of psychosocial stress, respectively ($p < 0.05$). Furthermore, 13.3% of 20.6% of those without and with chronic diseases or injury had a high risk of psychosocial stress, respectively ($p < 0.05$). Drinking and driving were not associated with psychosocial stress ($p > 0.05$, Table 4). Analysis of the relationship between personal characteristics and fatigue showed no associa-

Table 3. Associations between general characteristics and job stress (N= 353)

Variables	Classification	Frequency (%)	
		Low	High
Age (years)	≤ 40	14 (45.2)	17 (54.8)
	41–50	33 (46.5)	38 (53.5)
	≥ 51	130 (51.8)	121 (48.2)
Marital status	Single	16 (69.6)	7 (30.4)
	Married	161 (48.8)	169 (51.2)
Education level	High school	51 (48.6)	54 (51.4)
	College	62 (51.7)	58 (48.3)
	≥ University	64 (50.0)	64 (50.0)
Years of service	≤ 10	19 (70.4)	8 (29.6)
	11–20	25 (67.6)	12 (32.4)
	21–30	65 (44.5)	81 (55.5)
	≥ 31yr	68 (47.6)	75 (52.4)
Class	≤ Senior Policeman	17 (73.9)	6 (26.1)
	Assistant Inspector	27 (54.0)	23 (46.0)
	Inspector	95 (46.6)	109 (53.4)
	Senior Inspector	31 (55.4)	25 (44.6)
	≥ Superintendent	7 (35.0)	13 (65.0)
	Police affairs	56 (50.5)	55 (49.5)
Job types	Life security	65 (45.1)	79 (54.9)
	Traffic police	8 (61.5)	5 (38.5)
	Guard police	25 (69.4)	11 (30.6)
	Investigate – Detective	16 (51.6)	15 (48.4)
	Intelligence – Peace preservation police	7 (50.0)	7 (50.0)
	Maritime Police etc.	0	4 (100)
Years of service at department	≤ 10	80 (50.6)	79 (49.4)
	11–20	19 (50.0)	19 (50.0)
	21–30	43 (49.4)	44 (50.6)
	≥ 31yr	35 (50.0)	35 (50.0)
Work type	Fix	112 (54.6)	93 (45.4)
	Shift	65 (43.9)	83 (56.1)
	Seoul & Gyeonggi-do	66 (52.0)	61 (48.0)
Work area	Gangwon-do	15 (53.6)	13 (46.4)
	Chungcheong-do	33 (49.3)	34 (50.7)
	Gyeongsang-do	35 (44.3)	44 (55.7)
Smoking status	Jeolla-do & Jeju-do	28 (53.8)	24 (46.2)
	Non-smoker	103 (50.5)	101 (49.5)
	Smoker	30 (43.5)	39 (56.5)
Smoking	Ex-smoker	44 (55.0)	36 (45.0)
	No	147 (51.8)	137 (48.2)
Alcohol consumption	Yes	30 (43.5)	39 (56.5)
	No	29 (52.7)	26 (47.3)
Driving	Yes	148 (49.7)	150 (50.3)
	No	10 (41.7)	14 (58.3)
Exercise	Yes	167 (50.8)	162 (49.2)
	No	27 (31.4)	59 (68.6)
Chronic disease & damage	Yes	150 (56.2)	117 (43.8)
	No	64 (53.3)	56 (46.7)
	Yes	113 (48.5)	120 (51.5)

Table 4. Associations between general characteristics and psychosocial stress (N= 353)

Variables	Classification	n (%)	
		Low	High
Age (years)	≤40	14 (45.2)	17 (54.8)
	41–50	33 (46.5)	38 (53.5)
	≥51	130 (51.8)	121(48.2)
Marital status	Single	16 (69.6)	7 (30.4)
	Married	161 (48.8)	169 (51.2)
Education level	High school	51 (48.6)	54 (51.4)
	College	62 (51.7)	58 (48.3)
	≥University	64 (50.0)	64 (50.0)
Years of service	≤10	19 (70.4)	8 (29.6)
	11–20	25 (67.6)	12 (32.4)
	21–30	65 (44.5)	81 (55.5)
	≥31yr	68 (47.6)	75 (52.4)
Class	≤Senior Policeman	17 (73.9)	6 (26.1)
	Assistant Inspector	27 (54.0)	23 (46.0)
	Inspector	95 (46.6)	109 (53.4)
	Senior Inspector	31 (55.4)	25 (44.6)
	≥Superintendent	7 (35.0)	13 (65.0)
	Police affairs	56 (50.5)	55 (49.5)
Job types	Life security	65 (45.1)	79 (54.9)
	Traffic police	8 (61.5)	5 (38.5)
	Guard police	25 (69.4)	11 (30.6)
	Investigate-Detective	16 (51.6)	15 (48.4)
	Intelligence-Peace preservation police	7 (50.0)	7 (50.0)
	Maritime Police etc.	0	4 (100)
Years of service at department	≤10	80 (50.6)	79 (49.4)
	11–20	19 (50.0)	19 (50.0)
	21–30	43 (49.4)	44 (50.6)
	≥31yr	35 (50.0)	35 (50.0)
Work type	Fixed	112 (54.6)	93 (45.4)
	Shift	65 (43.9)	83 (56.1)
	Seoul & Gyeonggi-do	66 (52.0)	61 (48.0)
Work area	Gangwon-do	15 (53.6)	13 (46.4)
	Chungcheong-do	33 (49.3)	34 (50.7)
	Gyeongsang-do	35 (44.3)	44 (55.7)
Smoking status	Jeolla-do & Jeju-do	28 (53.8)	24 (46.2)
	Non-smoker	103 (50.5)	101 (49.5)
	Smoker	30 (43.5)	39 (56.5)
Smoking	Ex-smoker	44 (55.0)	36 (45.0)
	No	147 (51.8)	137 (48.2)
Alcohol drinking	Yes	30 (43.5)	39 (56.5)
	No	29 (52.7)	26 (47.3)
Drive	Yes	148 (49.7)	150 (50.3)
	No	10 (41.7)	14 (58.3)
Exercise	Yes	167 (50.8)	162 (49.2)
	No	27 (31.4)	59 (68.6)
Chronic disease & damage	Yes	150 (56.2)	117 (43.8)
	No	64 (53.3)	56 (46.7)
	Yes	113 (48.5)	120 (51.5)

tions with respect to age group, marital status, or education level ($p > 0.05$). Analysis of the relationship between service characteristics and fatigue showed that 20.5% and 29.7% of ordinary service police officers and shift workers had a high risk of fatigue, respectively ($\chi^2 = 3.984$, $p < 0.05$). However, there were no associations between fatigue and service length, rank, post, or service length at a certain section or service area ($p > 0.05$). Analysis of the relationship between life and chronic disease characteristics and fatigue showed that 20.4% and 40.6% of non-smokers and smokers had a high risk of fatigue, respectively ($p < 0.05$). Meanwhile, 36.0% and 20.6% of non-exercisers and exercisers had a high risk of fatigue, respectively ($p < 0.05$). There were no associations between fatigue and driving, chronic diseases, or injuries ($p > 0.05$, Table 5). Analysis of the relationships among job stress, psychosocial health, and fatigue showed that 0%, 44.7%, and 82.8% of the healthy, potential risk, and high-risk psychosocial stress groups had high job stress, respectively ($\chi^2 = 44.618$, $p < 0.05$). Meanwhile, 40.8% and 77.9% of subjects with normal and high risks of fatigue had high job stress, respectively ($\chi^2 = 35.781$, $p < 0.05$, Table 6).

DISCUSSION

Stress is associated with almost all human diseases including various physical diseases¹⁵. Job stress negatively affects physical, mental, behavioral, and emotional health and exacerbates diseases and risk factors¹⁶. In addition to the relationship between job stress and disease, police officers' stress continues to be studied. Outside Korea, Arter reports that stress is related to police officers' accidents¹⁷. Meanwhile, in Korea, Kim reports that 59.3% of respondents had the highest stress level, and more than 80% had high stress levels, which correspond to a psychological exhaustion state caused by stress¹⁸. In the present study, the mean stress level of police officers on the KOSS was 47.96 ± 9.2 points. Meanwhile, Kim used a short form of the KOSS and reports the mean job stress of police officers was 60.02 ± 2.49 points¹⁹. Furthermore, Son et al.²⁰ report that stress was 2.42 on a 4-point scale, which is equivalent to 60.5 points if converted to a 100-point scale. The discrepancies in stress level are likely due to the characteristics of the subjects in the present study, who tended to be of advanced age, have experience in police organizations, and have an interest in welfare policy; therefore, they seemed to have benefited. Firefighters, who are similar to police officers in many aspects, are reported to have a mean job stress level of 48.60 ± 9.89 on the KOSS⁶, which is similar to that in police officers in the present study. In the present study, the overall means and standard deviations of psychosocial stress (PWI-SF) fatigue (MSF) were 21.34 ± 6.61 80.98 ± 17.65 , respectively. A study of Korean firefighters similar to the present study in many ways reports a mean PWI-SF of 22.4 ± 7.1 ²¹, while a study of fatigue in domestic workers by Chang et al. reports a mean MSF of 78 ± 19.0 ²². No associations between general personal characteristics and job stress were found in the present study. Studies of job stress in Korean police officers, such as that by Son et al., report significant associations of job stress with age and marital status²⁰. Meanwhile, another study reports job stress among police officers aged 36–40 years is signifi-

Table 5. Associations between general characteristics and fatigue (N= 353)

Variables	Classification	n (%)		
		Healthy potentiality		High Risk
Age group	≤40	2 (6.5)	23 (74.2)	6 (19.4)
	41–50	3 (4.2)	56 (78.9)	12 (16.9)
	≥51	9 (3.6)	196 (78.1)	46 (18.3)
Marital status	Single	1 (4.3)	20 (87.0)	2 (8.7)
	Married	13 (3.9)	255 (77.3)	62 (18.8)
Education level	High school	3 (2.9)	82 (78.1)	20 (19.0)
	College	4 (3.3)	99 (82.5)	17 (14.2)
	≥University	7 (5.5)	94 (73.4)	27 (21.1)
Years of service	≤10	1 (3.7)	25 (92.6)	1 (3.7)
	11–20	1 (2.7)	30 (81.1)	6 (16.2)
	21–30	8 (5.5)	114 (78.1)	24 (16.4)
	≥31yr	4 (2.8)	106 (74.1)	33 (23.1)
Class	≤Senior Policeman	1 (4.3)	21 (91.3)	1 (4.3)
	Assistant Inspector	1 (2.0)	44 (88.0)	5 (10.0)
	Inspector	7 (3.4)	153 (75.0)	44 (21.6)
	Senior Inspector	4 (7.1)	45 (80.4)	7 (12.5)
	≥Superintendent	1 (5.0)	12 (60.0)	7 (35.0)
	Police affairs	5 (4.5)	87 (78.4)	19 (17.1)
	Life security	8 (5.6)	103 (71.5)	33 (22.9)
Job types	Traffic police	0	13 (100)	0
	Guard police	1 (2.8)	31 (86.1)	4 (11.1)
	Investigate – Detective	0	26 (83.9)	5 (16.1)
	Intelligence-Peace preservation police	0	13 (92.9)	1 (7.1)
	Maritime Police etc.	0	2 (50.0)	2 (50.0)
	≤10	8 (5.1)	121 (76.6)	29 (18.4)
	11–20	1 (2.6)	30 (78.9)	7 (18.4)
Period of Department worked (yr)	21–30	4 (4.6)	70 (80.5)	13 (14.9)
	≥31yr	1(1.4)	54 (77.1)	15 (21.4)
	Fix	10 (4.9)	160 (78.0)	35 (17.1)
Work type	Shift	4 (2.7)	115 (77.7)	29 (19.6)
	Seoul & Gyeonggi-do	5 (3.9)	97 (76.4)	25 (19.7)
	Gangwon-do	0	25 (89.3)	3 (10.7)
Work area	Chungcheong-do	5 (7.5)	49 (73.1)	13 (19.4)
	Gyeongsang-do	2 (2.5)	63 (79.7)	14 (17.7)
	Jeolla-do & Jeju-do	2 (3.8)	41 (78.8)	9 (17.3)
	Non-smoker	8 (3.9)	175 (85.8)	21 (10.3)
Smoking status	Smoker	3 (4.3)	40 (58.0)	26 (37.7)
	Ex-smoker	3 (3.8)	60 (75.0)	17 (21.3)
	No	11 (3.9)	235 (82.7)	38 (13.4)
Smoking	Yes	3 (4.3)	40 (58.0)	26 (37.7)
	No	4 (7.3)	43 (78.2)	8 (14.5)
Alcohol drinking	Yes	10 (3.4)	232 (77.9)	56 (18.8)
	No	1 (4.2)	18 (75.0)	5 (20.8)
Driving	Yes	13 (4.0)	257 (78.1)	59 (17.9)
	No	1 (1.2)	59 (68.6)	26 (30.2)
Exercise	Yes	13 (4.9)	216 (80.9)	38 (14.2)
	No	10 (8.3)	94 (78.3)	16 (13.3)
Chronic disease & damage	No	10 (8.3)	94 (78.3)	16 (13.3)

Table 6. Associations among job stress, psychosocial stress, and fatigue

Variables	Classification	n (%)	
		Low	High
Psychosocial distress	Healthy	14 (100)	0
	Potential risk	152 (55.3)	123 (44.7)
	High risk	11 (17.2)	53 (82.8)
Fatigue	Normal	158 (59.2)	109 (40.8)

cantly high²²); however, Kim²¹) did not find such an association. A study of social stress in firefighters reports that those under younger than 40 years had higher stress than those older than 40 years²³). The relationship between age and fatigue remains controversial: one study reports no significant association in people 18–50 years old and decreased stress in women younger than 50 years²⁴), whereas another study reports significantly higher fatigue for women, and younger, unmarried, and highly educated people²⁵). The present study found no associations of age with job stress, psychosocial stress, and fatigue. This appears to be due to differences in the population and the classification standard between the present and previous studies. In particular, in this study, subjects in their 50s were predominant. Furthermore, there were limitations in obtaining information, because the subjects were in the hospital. This study has some limitations. First, this study did not compare results between genders because of the absence of female subjects, even though the absence is due to the nature of the law enforcement occupation, which largely consists of male personnel. Another limitation is that subjects in their 50s were predominant; this may be a confounding factor, because the subjects were collected from a hospital, which is unusual in this context. Previous studies frequently report gender-specific associations between stress and fatigue. The KOSS, a Korean job stress measurement tool developed by Chang et al. may have failed to reflect the unique characteristics of police officers. In this regard, modifying the content in order to better reflect the characteristics of police officers should be considered as was done in the study of Moon²⁶). Personality characteristics and family stress should also be considered in future studies as they influence fatigue. Regular studies of stress and fatigue of police officers such as the present one as well as studies aiming to improve factors affecting stress and fatigue will help improve the mental health of individual police officers as well as the safety and personnel management of police organizations. Thus, such studies can be used for basic and comparative data for the prevention and early control of job-related diseases in police officers.

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