

ORIGINAL ARTICLE

Correlation Analysis Between Workers' Characteristics With Stress Levels on Firefighters in Surabaya

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ABSTRACT

Introduction: Mental wellbeing is one of aspects in Occupational Health and Safety scope which is often ignored and potentially turns into an obstacle relevant to daily activities related or not related to one's occupation. Worker who is undergoing stress is vulnerable to health issues and potentially causes their work efficiency to be lowering which lead to less productivity. The purpose of this study was to analyze whether there was a relationship between the characteristics of firefighters (age, years of service, education and marital status) with the level of stress experienced by firefighters. **Methods:** This study is using qualitative method with analytic approach. Samples of this study are 17 firefighters in Fire Department City of. Data are collected using DASS21 questionnaire and interview. **Results:** The results showed that most of the respondents sustain normal level of stress (82,3%) within 21-25 age range, whose years of service within 1-5 years, and who are married. **Conclusion:** Result of statistic test indicates there is correlation between years of service to workers' stress. ($p=0,006$), and there is no correlation between marriage status ($p=0,228$) and age ($p=0,062$) with workers' stress.

Keywords: Firefighters, Age, Years of service, Marriage status, Stress

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INTRODUCTION

On 2006 The World Health Organization (WHO) defined 'health' as State of complete physical, mental, and social well being, and not merely the absence of disease or infirmity. Every workplace has potential danger which may disrupt workers' health, even put workers safety on risk. Such potentials may cause ailments on workers condition be it physically, mentally, or socially. The National Institute of Occupational Safety and Health (NIOSH) in the United States noted that since the 90s of all labor compensation health costs, 80% was spent on work-related diseases (Work Related Diseases) namely "Stress Related Disorder" (ICD -9-309) while in the United Kingdom (UK) there were 71% of managers who experienced physical and mental health problems due to work stress and were also found in Australia (1).

Mental ailments such as stress are often unnoticed until workers sustain its worst aftermaths and disrupt their daily activities. If not managed promptly, excessive stress may result in physical and mental disease even disturbance in social life. Signs of stress one may feel include change in temperament such as a cheerful person turns gloomy,

change in appetite, and increasing irritability.

Due to society's low awareness on mental wellbeing, mental strain is often ignored. Possible stressors of occupational stress are workers' external and internal. On moderate amount, stress will act as motivator for workers doing their job well. However, on excessive amount stress will harm workers physically and mentally. Excessive stress level on workers may result in lower work efficiency and productivity. Stress is directly linked to seven out of ten deadly disease, with cardiovascular as the main cause of death on male and female (2). While unmanaged stress may cause harm on workers, on larger scale it may negatively affect a company. Short term effects of stress including lower motivation to work, difficulty in concentrating, and lower productivity. Long term effects including various diseases including rising blood pressure, and if workers cannot manage their stress well they may resign from their job.

According to Huizink firefighters are often exposed to various health hazards during their rescue missions (3). Firefighters are prone to hearing disturbance due to noises on the rescue mission site (4). Exposure to victim's blood has firefighters on risk contracting hepatitis B and A. Air pollutions cause firefighters at risk on contracting respiratory disease, especially on fire fighting duty.

In addition to physical risk, excessive work demands

and responsibility on victim's life also have impact on firefighters' psychological state. According to research by Hutami et.al. (5), a workplace with extreme noise level and heat, potential contacts with sharp materials and chemicals are main contributors of stress of workers in Unit Fire and Rescue PT. YTL Jawa Timur Generator Unit 5 & 6 PLTU Paiton Probolinggo, East Java. Another factor causing work stress on firefighters based on the results of research by Kim, Y.K et al. (6) is the occurrence of work-related injuries and the frequency of injury. The incident of injury while on duty can have an impact on the mental health of a firefighter. Firefighting offers the potential for a range of experiences that are in complete contrast to the normality of everyday life. As an occupation it is associated with emergent danger, uncertainty and unpredictability. Research conducted P.H Barnes (7) shows the results of the integration between work of firefighters with clinical data on post-traumatic stress disorder. It argues that certain operational factors and the emotional and psychosomatic effects of emergency response work may predispose firefighters to stress reactions by increasing their vulnerability to emergency trauma.

Other issues to address beside factors stemming from workplace are factors from within the workers itself. These factors including age, years of service, marriage status, and gender. According to Oliveira (8), years of service and age are found to correlate with firefighters stress level in Sro Paulo Brazil. Research by Koortzen (9) on South Africa results showed firefighters who were married and within 26-30 years of age have higher stress level compared to other groups. However, Nikita et.al (10) found nocorrelation between age and years of service to stress level of Manado firefighters.

Understanding factors that correlates to workers' stress is a part of stress management. By doing so, an instance can determine the next countermeasures to manage stress in workplace more efficiently. The aim of this study is to understand the correlation of workers' characteristic (age, years of service, and marriage status) with stress of firefighters in City of Surabaya Fire Department.

MATERIALS AND METHODS

This research uses qualitative methode. Primary source of this research's data are questionnaire results and interview on firefighters in City of Surabaya Fire Department. Questionnaire used in this research is DASS21. There are 17 firefighters participating in this research. The stress level assessment criteria based on the DASS 42 questionnaire are: score 0-23 = mild stress, score 34-52 = moderate stress, score 53-73 = severe stress, score ≥75 = stress is very heavy.

Data obtained are analyzed using software platform SPSS. Statistical method used to analyze the data is chi-square method and research hypothesis is tested using

Pearson and Fisher test.

RESULTS

Level of stress sustained by respondents are divided into five categories: normal, mild, moderate, severe, and extremely severe. Table I shows 14 respondents are within normal stress level, making up 82,3% of the entire sample. 3 respondents or 17,7% of the sample are within mild stress level. The samples were divided into five age groups.

Table I: Workers' Stress Level

Stress Level	Frequency	Percentage (%)
Normal	14	82,3
Mild	3	17,7
Total	17	100

Table II indicates the youngest respondents were within 21-25 years old age group and oldest respondents were within 46-50 years old age group. Most respondents were from youngest age group, 21-25 years old group, with 7 respondents (41,2%). Group with the least number of respondents was 36-40 years old age group with only 1 respondent (5,9%). The average of respondents' age was 30 years old. Education of firefighters 100 percent completes education in high school or vocational high school, so that the relationship is not analyzed with variable stress levels.

Respondents distribution based on their years of service was split into 4 groups (Table II). There were 10 firefighters (58,8%) who have worked for 1-5 years. There was same amount of firefighters who have worked for 6-10 years and 11-15 years, which is 3 firefighters (17,7%). Meanwhile, there was only one worker (5,8%) who have worked the longest which is for 16-20 years. The workers's average years of service is 6,7 years.

Respondents distribution based on their marriage status

Table II: Characteristics of the respondents

	N (%)
Age	
21-25	7 (41.2)
26-31	4 (23.4)
31-35	2 (11.8)
36-40	1 (5.9)
46-50	3 (17.7)
Years of service	
1-5	10 (58.8)
6-10	3 (17.7)
11-15	3 (17.7)
16-20	1 (5.8)
Marital status	
Married	7 (41.2)
Unmarried	10 (58.8)

are shown in Table II. While distribution of respondents' stress level based on their age is shown in Table III. Statistic analysis result showed correlation between workers' age and stress indicated by $p=0,062$. The value is greater than 0,05, which means there's no Correlation between firefighters' age and stress level.

Table III: Workers' stress level grouped based on their age

Age (Years)	Stress Level				Total	
	Normal		Mild		n	%
	n	%	n	%		
21-25	7	41.2	0	0	7	41.2
26-31	4	23.4	0	0	4	23.4
31-35	1	5,9	1	5.9	2	11.8
36-40	0	0	1	5.9	1	5.9
46-50	2	11.8	1	5.9	3	17.7
Total	14	82.3	3	17.7	17	100

Distribution of respondents' stress level based on their years of service is shown by Table IV. According to statistic analysis relationship between years of service and firefighters' stress is showed by $p=0,006$. The result indicated there was significant relationship between years of service and firefighters' stress.

Table IV: Workers' stress level grouped based on their years of service

Years of service (years)	Stress Level				Total	
	Normal		Mild		n	%
	n	%	n	%		
1-5	10	58.8	0	0	10	58.8
6-10	3	17.6	0	0	3	17.6
11-15	1	5.9	1	5.9	2	11.8
16-20	0	0	2	11.8	2	11.8
Total	14	82.3	3	17.7	17	100

Distribution of respondents' stress level based on their marriage status is shown by Table V. Correlation between marriage status and firefighter's stress is shown by $p= 0,228$, which indicated there is no correlation between marriage status and firefighters' stress.

Table V: Workers' stress level grouped based on their marriage status

Marriage Status	Stress Level				Total	
	Normal		Mild		n	%
	n	%	n	%		
Unmarried	7	41.15	3	17.7	10	58.8
Married	7	41.15	0	0	7	41.15
Total	14	82.3	3	17.7	17	100

DISCUSSION

Statistic analysis result showed correlation between workers' age and stress indicated by $p=0,062$. The value is greater than 0,05, which means there's no correlation between firefighters' age and stress. Similar result is shown by study conducted by Nikita et.al (10) on Manado firefighters. Meta analysis by Rauschenbach et.al (11)

also showed there is no general correlation between age and stress. The absence of a relationship between age and work stress because of the age of the respondents in this study is due to the 41,18 % of respondents included in the age group with ages between 21-25 years and having good interpersonal relationships so as to realize mutual understanding and mutual benefit between individuals. This condition causes most firefighters to be in the normal category of stress levels. Age variables have no relationship with stress levels of firefighters may be due to the age range of respondents who are not too far in each age group, so it does not have a significant relationship with stress levels.

Another theory put forward by Woolston, M.S (12) states that Across generations , Stress in America TM survey shows that our ability to manage stress and achieve healthy lifestyle varies by age. Younger Americans report experiencing the most stressful and the least relief - higher stress report levels than older generations and say they are not managing it well.

The level of education is an important factor in a person. Variations in the level of education in one group of workers can affect the understanding, knowledge and actions of occupational safety and health. In this study there was no variation on the education level variables of firefighters, so the researchers decided not to analyze the relationship between educational variables and stress levels.

According to statistic analysis relationship between years of service and firefighters' stress is showed by $p=0,006$. The result indicated there was significant relationship between years of service and firefighters' stress. The value is less than 0.05, which means hypothesis null is rejected. Similar result is also shown by research by Syabilah (13) on civilian pilot. The results of this study are in line with the research of Santo de Oliveira et.al (14) conducted on military firefighters from the fire rescue corps of the state of Sro Paulo. Longer years of service means the worker has more experience and has adapted well to his workplace, but it also means the worker has been exposed to more unpleasant experiences when doing their job. The latter condition would contribute in higher stress level on workers who have worked for longer time than newer workers. Working period has an important influence in triggering work stress. Workers with a longer working period tend to have a better ability and understanding of their work compared to workers who have a shorter work period. The results of this study indicate that tenure has a significant relationship with work stress, and workers with shorter work periods are more likely to experience work stress. This is because the possibility of new employees still have to learn about work problems in the first years and immediately jump into the job. This can lead to work stress.

To determine correlation between marriage status and

stress, data is tested using chi-square method using Fisher test. The test resulting in $p=0,228$ which indicated there is no correlation between marriage status and firefighters stress. The results of this study are in line with the research of Yanto (15) which shows that there is no significant relationship between marital status and the level of work stress on new nurses in Semarang. Other studies show different results, namely the marital status of nurses influences the high work stress experienced (16). The difference in the results of this study was caused by firefighters in this study as many as 58.8% not married status 17, 7% of them experience mild stress levels. While as many as 41, 15% with married status are in the normal stress category. This condition is influenced by the existence of a good relationship in marriage. The conflict between roles in work and roles in the family influences the emergence of work stress (17). Aging is the problem with almost every family involving strains and stresses in taking care of them (18).

This research is in line with the research of Sulistyawati et al, which shows that the work stress of nurses based on marital status of respondents with unmarried status has a moderate level of work stress which is higher than that of married people. This result is different from several other studies that respondents with higher marital status experienced work stress compared to unmarried respondents. This difference is likely to result from married nurses getting full support in their work as nurses and the ability to adjust to work so that the psychological burden on work and family can be handled properly (19). This research is not in line with research Other studies have shown different results, namely the marital status of nurses affecting the high work stress experienced. In the results of the research Chiang and Chang showed that married workers had a tendency to experience high levels of stress levels. (16). On the afore mentioned research, the respondents are mostly females, who have both responsibility as a housewife and a worker. In this research conducted by author, 15 out of 17 respondents are males.

CONCLUSION

Stress experienced by Firefighters is classified as normal (82.3%) and mild (17.7%) because stress management has been carried out with physical activity and good relationships between workers. Workers characteristic found to correlate with workers stress is years of service. Age and marriage status are not found to correlate with workers' stress level.

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