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# Evaluation and comparison of job stress among security workers with fixed and shift work schedules in Municipality of Tehran

## **Abstract**

Municipality of Tehran with huge number of employees and with the aim to reduce stress and promote the work efficiency, seriously wants to achieve suitable and utilizable studies. Osipow's job stress test is one of the best tools to reach this aim. Data population includes securities building of municipality of Tehran (88 persons from region 18 and 72 persons from region 20), who were randomly chosen to be participated in the current survey. For this purpose three types of working hours schedule such as full time shift ( 24 hrs work, 24 hrs rest ), day-shift and night-shift workers, were selected. Data were analyzed by SPSS software and processed by a professional test, MANOVA. Difference of scores in workload role and insufficiency role in subjects with considering of age groups in confidence 95% was valuable ( $p < 0.05$ ). Differences of scores in job stress and subscales of insufficiency role, ambiguity role with considering of work shifts in confidence 95% were statistically significant ( $p < 0.05$ ). At the end, differences of scores in subscales of role rang and responsibility with considering of job regions in confidence 95% were statistically significant ( $p < 0.05$ ). This survey determined that stress decreased with increasing the age. Also work shift had important role in the amount of stress. Therefore, the lowest level of stress was among night-shift workers and the highest stress level was among day-shift workers and 24-24 group was between them. Of course region of workers was related with job stress.

## **Keywords**

workers, security, among, stress, job, comparison, tehran, evaluation, municipality, schedules, work, shift, fixed

## **Disciplines**

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## CASE STUDY

# Evaluation and comparison of job stress among security workers with fixed and shift work schedules in Municipality of Tehran

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**ABSTRACT:** Considering the importance of the rest and absence of tension in work environment (especially in shift working schedule) and consequently promotion of work efficiency, finding ways with the best choices to reduce job stress, seems necessary. Municipality of Tehran with huge number of employees and with the aim to reduce stress and promote the work efficiency, seriously wants to achieve suitable and utilizable studies. Osipow's job stress test is one of the best tools to reach this aim. Data population includes securities building of municipality of Tehran (88 persons from region 18 and 72 persons from region 20), who were randomly chosen to be participated in the current survey. For this purpose three types of working hours schedule such as full time shift ( 24 hrs work, 24 hrs rest ), day-shift and night-shift workers, were selected. Data were analyzed by SPSS software and processed by a professional test, MANOVA. Difference of scores in workload role and insufficiency role in subjects with considering of age groups in confidence 95% was valuable ( $p < 0.05$ ). Differences of scores in job stress and subscales of insufficiency role, ambiguity role with considering of work shifts in confidence 95% were statistically significant ( $p < 0.05$ ). At the end, differences of scores in subscales of role rang and responsibility with considering of job regions in confidence 95% were statistically significant ( $p < 0.05$ ). This survey determined that stress decreased with increasing the age. Also work shift had important role in the amount of stress. Therefore, the lowest level of stress was among night-shift workers and the highest stress level was among day-shift workers and 24-24 group was between them. Of course region of workers was related with job stress.

**KEYWORDS:** *Osipow's questionnaire, Municipality, Stress, Securities, Tehran, Work shift*

## INTRODUCTION

Scientific developments and amazing inventions aiming to achieve more prosperity, sometimes result in consequences which make the challenge for coordinating human and his physiological nature and machine life. Stress or anxiety is one of the factors slowing down and even inhibiting the enhancement of working efficiency. Job stress is one of the most popular medical and managerial subjects by which high levels of employment and job satisfaction can be achieved

with the identification of factors causing stress and the ways to remove them that both employer and the employee take advantage of its benefits are important (Alvani, 2006). According to several studies, increased numbers of hospital admissions are significantly related to exposure to job stress (Korman, 1977). Job stress is one of the most common causes of cardiopulmonary diseases, hypertension, types of gastrointestinal diseases, such as gastric ulcers, duodenal ulcers, colitis, irritable bowel syndrome and musculoskeletal diseases (Baker and Karasek, 2000). Job stress is the strongest

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cause leading to psychological damage and depression which imposes high costs to the national economy, for example, costs imposed on America's industry due to absence of employees from work, insurance payments and medical costs totaled \$ 200 billion per year and in the UK up to 10% of GDP (kawakami and Haratani, 1999). According to Sauter and his colleagues, job stress is the main leading factor of anxiety and depression among workers and the most cause of drug abuse, the use of medicine, tobacco and high tendency to alcohol abuse (Sauter et al., 1999).

Schor reported that increased working hours and increased job stress are the consequences of modern urbanization (Schor, 2008). Stress directly contributes to four out of every 10 cases of death due to heart diseases, strokes, accidents and suicides in America and other developed countries (Murphy et al., 1995). According to the World Health Organization (WHO), health is defined as 'a state of complete physical, social and mental well-being and not merely the absence of disease of infirmity and emphasizes that none of these aspects have priority over the other (Manifest of WHO, 1985). Mental health is a positive feeling about oneself, the world around, the place of living and people around, regarding the responsibilities towards others (Veisi, 1999).

Freud defines mental health as the balance between ego and superior ego and also conscious and unconscious levels and states that a person is healthy and has successfully completed the development stage and has not been fixed at any stage (McWilliams, 2011). Stura believes that stress is a result of any physical, psychological or social act which Seyle calls them stressors (Nehra et al., 2012). Seyle says "stress is life and life is stress". However, depending on the type of stress, pressure and its physical effect in the form of acute or chronic diseases or given durability and duration of stress which can last from hours to months or years (Chrousos et al., 1995).

Stress is a pressure on the object that will create tension and deformation. Under this definition, any external factor or stimulus is discussed, such as physical factors (noise, heat, coldness, light, etc.) or psychological causes (bereavement, divorce, job loss, etc.), (Ross and Altmair, 2006). Job stress is a stress that a specific person undergoes for a specific job. Ross and Altmair provided a more comprehensive definition of job stress emphasizing all personal and environmental aspects and the interaction between

them. According to this definition, job stress is the interaction between working conditions and characteristics of the person employed so that the demands of the workplace as a result of relevant pressures are more than that one can manage them (Ross and Altmair, 2006). Beehr and Newman (1978) divided the symptoms of job stress into three categories: psychological symptoms, somatic symptoms and behavioral symptoms including two sub categories, symptoms which directly are related to the person or are due to organizational stress or administrative organization. Job stressors including person-dependent factors are discussed as personality characteristics or generally individual's behaviors at the workplace which is the response to job demands and the interaction with colleagues.

Workplace-dependent stressors are divided into role characteristics, job characteristics, interpersonal relationships, atmosphere and organizational structure, organizational management methods, technology and personal characteristics (Ivancevich et al., 1990). Shift work is one of the features of role characteristics including jobs which require work outside of normal daily working hours: 9 am to 5 pm (Ross and Altmair, 2006) and 7 am to 6 pm (Choobineh et al., 2007). Examples of these types of jobs are related to firefighters, police, hospital services activities and guards. Several studies show that shift work affects directly or indirectly mental efficacy, health and job motivation (Dumont and International Labour Office, 1985).

Human body has a physiological clock or body clock whose task is to set regular sleep, work and appropriate behavior at that time (Guyton and Hall, 2006). According to the International Labour Organization (ILO), about 25% of the workforce in developed countries and the same rate in developing countries perform shift work (Dumont and International Labour Office, 1985).

The work of the security guards in Tehran municipality is divided into three working shifts including fixed morning shift, fixed night shift and 24-hour shift. Due to the large number of buildings and shortage of manpower, the civil administration has decided to use the best practice for arranging guards to reduce stress among the guards. Several studies conducted in developed countries show that long working hours and shift work are involved in the creation of job stress (Barnett et al., 1991; North western National Life Insurance Company, 1991; Houston and Allt, 1997; Rojas and Kleiner, 2000; Leviet et al., 1999;

Princeton survey Research Association, 1997; Barlow, 2001; Baker and Karasek, 2000). Different groups have also studied this issue in Iran (Danaei, 2003; Ghasemkhani and Ziaeeyon, 2005; Molaie *et al.*, 2011; Najafi *et al.*, 2010; Gholamnezhad and Nickpeima, 2009; Choobineh *et al.*, 2007).

There are various models for studying job stress, such as response-based model, stimulus-based model, interactive model, information processing model and model for systematic review of stress (Beehr and Newman, 1978; Ivancevich *et al.*, 1990; Ross and Altmaier, 2006; Chrousos *et al.*, 1995; Veisi, 1999; Noorbala *et al.*, 2001).

The present study is based on the interactive model, as stimulus and response can be assessed by this model at the same time. Although, this study did not cover all demographic aspects of stress, it has tried to provide a good solution for this group with the focus on guards' working shifts. Therefore, this study aimed to determine the effect of shift and fixed work on creating job stress in male guards of Districts 18 and 20 of Tehran Municipality, Iran.

## MATERIALS AND METHODS

This cross-sectional (descriptive-analytical) study was conducted from May 2012 to September 2012 on security guards working in Districts 18 and 20 of Tehran Municipality (Fig.1); the study group included 160 security guards consisting of 2 groups, 88 in District

18 and 72 in District 20 who were employed under a contracting company, (Districts 18 and 20 were chosen based on the willingness of their responsible managers).

### Subjects and sample size

In this study random convenience sampling was used. First, two Districts 18 and 20 were selected out of 22 Districts of Tehran Municipality and then day shift guards (12 hours), night shift guards (12 hours) and shift work (24-hour shift) were randomly selected. The female guards were excluded. The security guards who were participated in the present study had more than one year of experience and were fully trained in six months in-service training course according to the regulations in Tehran Municipality. Since population variance was not available, theoretical variance was estimated by assuming scale scores normal distribution in population and using theoretical range of scores. Scoring was based on five-point Likert scale and there were 60 propositions, therefore, the minimum, maximum, and mean scores were 60, 300, and 150, respectively.

### Data collection tools

The Osipow job stress containing 60 items was used to collect data. Occupational Role Questionnaire (Osipow, 1987) consisting of three parts, were used to assess individual's stress in terms of six dimensions: workload of the role, role insufficiency, role duality, role boundary, responsibility and physical environment. Each of these six dimensions is evaluated

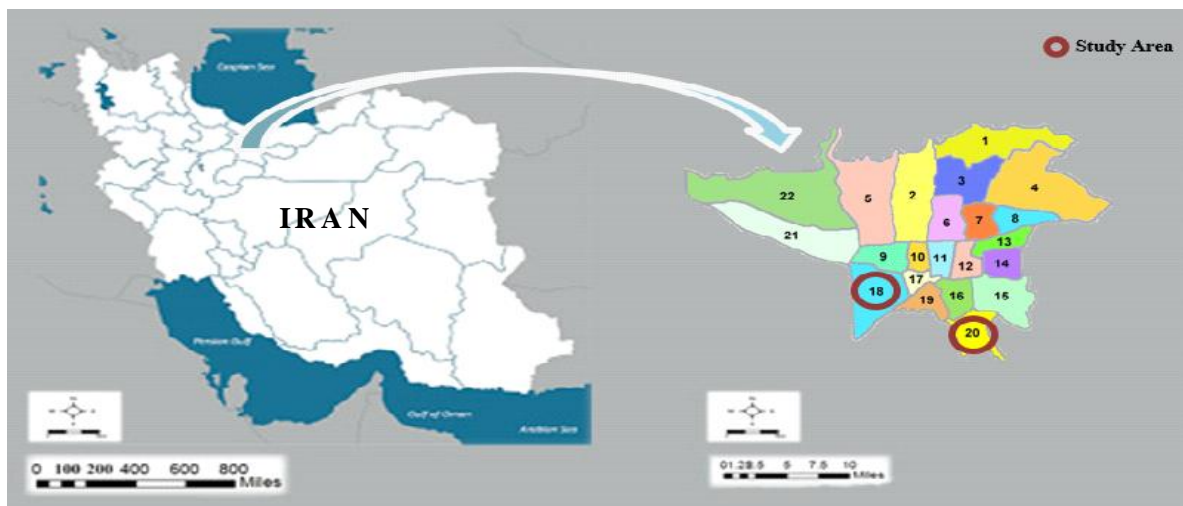


Fig. 1: Districts 18 and 20 of Municipality of Tehran as the study area

by 10 items. In addition, demographic information including age, marital status, education, work experience, etc. were obtained by another questionnaire. The individuals were put into one of the five categories according to their scores: 1: Stress-free, 2: Natural, 3: Low stress 4: Average stress and 5: Severe stress. The reliability of the test was calculated by test-retest in a satisfactory level (Cronbach's alpha was 0.89). To determine the technical validity of the questionnaire, first, the questionnaire was translated from the original language into Persian, and then an independent translator translated it again into the original language (English). This was to ensure that the concept was fully transferred to Persian.

*Statistical methods*

MANOVA test was used to determine job stress of three working groups and the interaction of other variables and subscales of Osipow questionnaire. Using SPSS-17, alpha values less than 0.05 were considered significant at confidence interval of 95%.

**RESULTS AND DISCUSSION**

In this study, 160 security guards participated with the highest frequency in the age group 41-50 years (40%). In terms of the work experience, 146 guards (91%) had a work experience of less than 20 years, in terms of marital status, 132 guards (83%) were married and in terms of education, 84 guards (53%) had middle school degree; 35% were day shift guards, 24% were night shift guards and 41% worked at 24-hour shift; in terms of the place of work, 88 guards (55%) were selected from District 18 and 72 guards (45%) from district 20 (Fig. 2).

Demographic characteristics showed that job stress significantly related to workload of the role and role insufficiency regarding the variable of age at confidence interval of 95% ( $P < 0.05$ ), i.e. the least amount of stress was observed in the age group of 51-60 years (Figs. 3 and 4).

In addition, the relationship between job stress was not significant in any of the subscales considering the

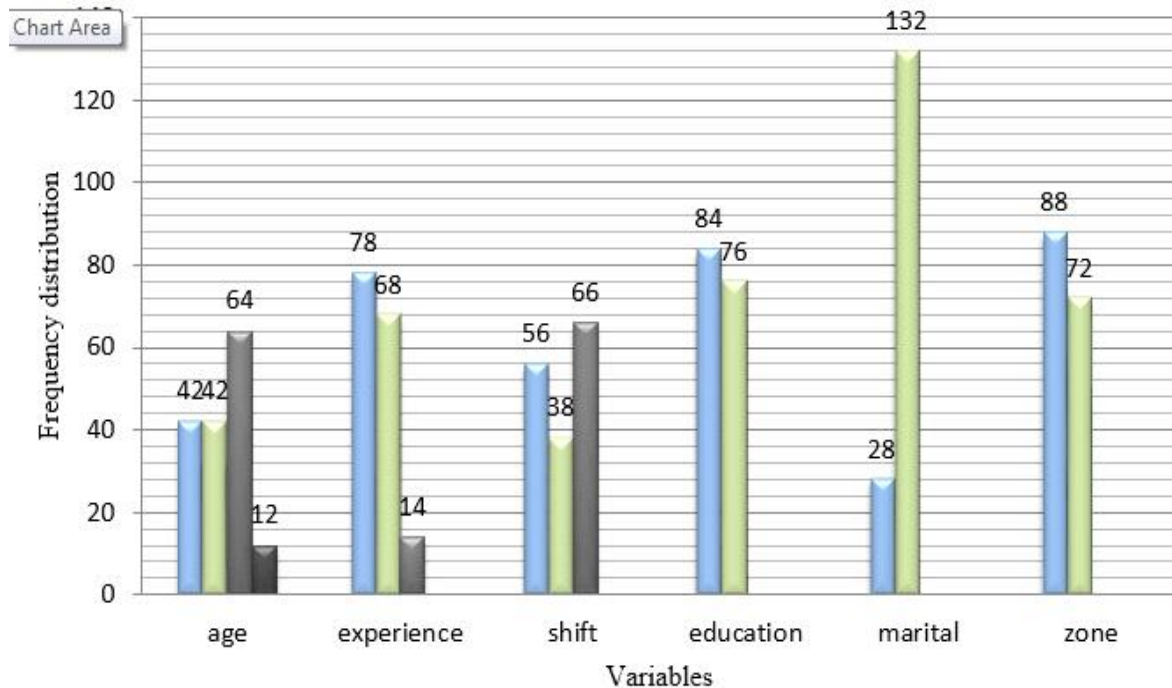


Fig. 2: Frequency Distribution by Age, Work Experience, Shift work, Education, and Marital Status of Guards Working in Districts 18 and 20

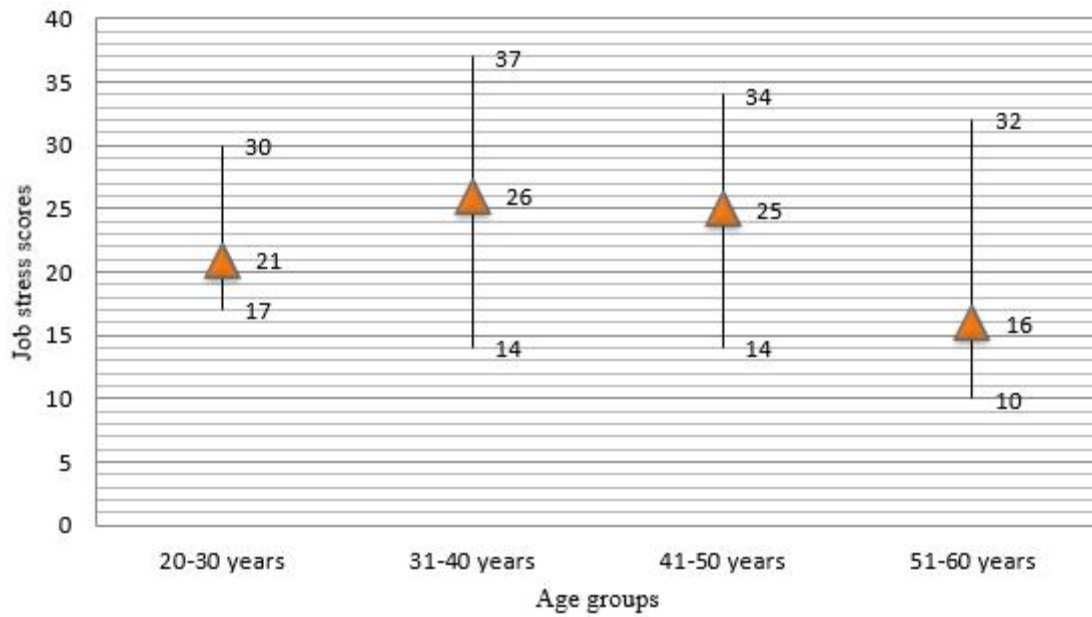


Fig. 3: Comparison of the mean, minimum, and maximum role workload scores of the experimental groups (the guards working in Districts 18 and 20) according to the separate age group of the subjects

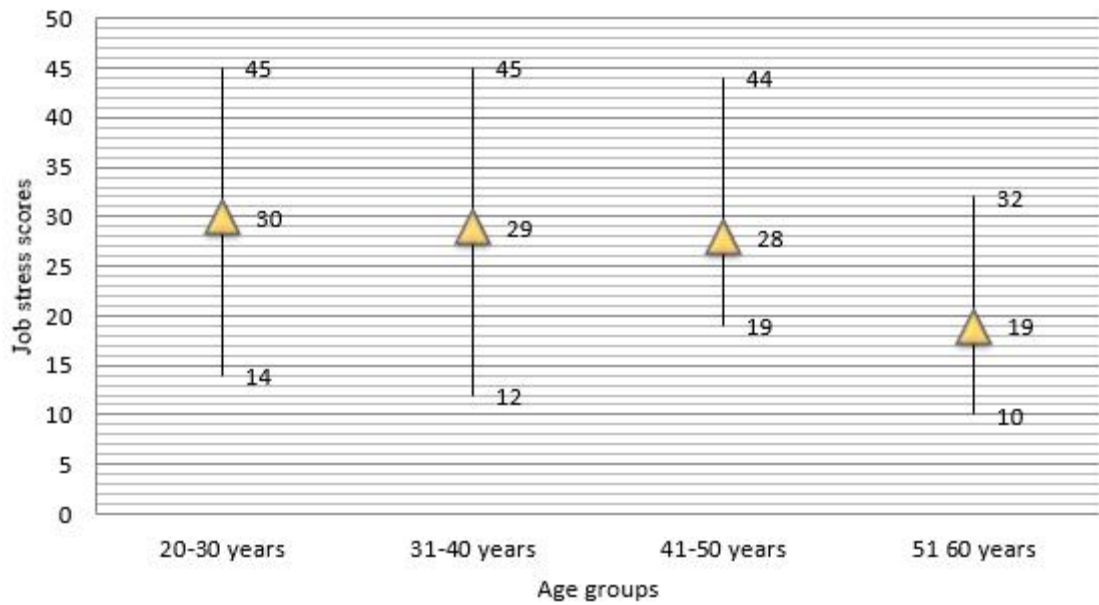


Fig. 4: Comparison of the mean, maximum, and minimum role insufficiency scores of the experimental groups (the guards working in Districts 18 and 20) according to the separate age group of the subjects



variables of work experience, marital status and education ( $P>0.05$ ). But the difference was significant at confidence interval of 95% between overall scores of job stress and the two subscales of role insufficiency

and role duality regarding the variable of working shift ( $P<0.05$ ) (Figs. 5, 6 and 7). The least stress level was related to the night shift, 24-hour shift and day shift, respectively.

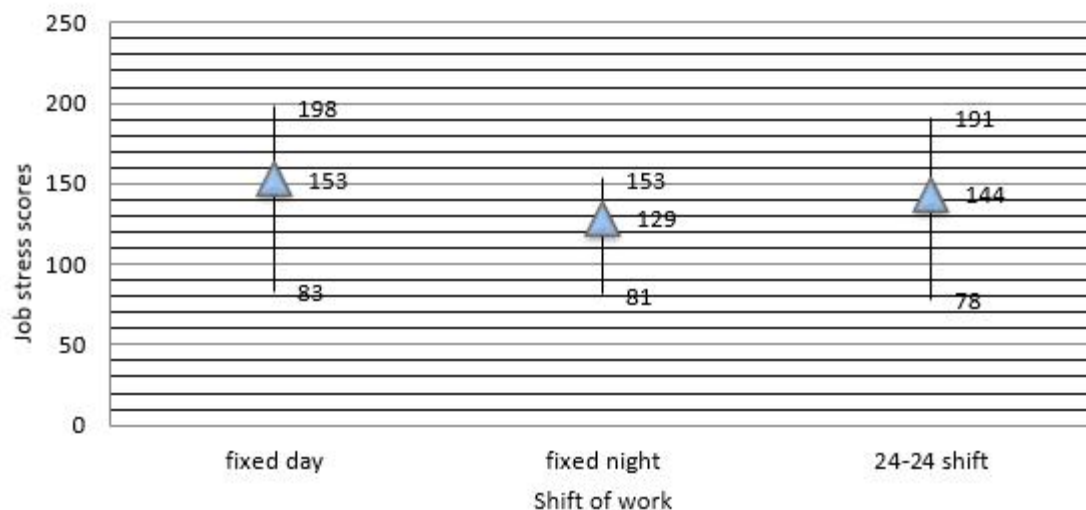


Fig. 5: Comparison of the mean, minimum, and maximum job stress scores of the experimental groups (the guards working in Districts 18 and 20) according to the separate shift work of the subjects

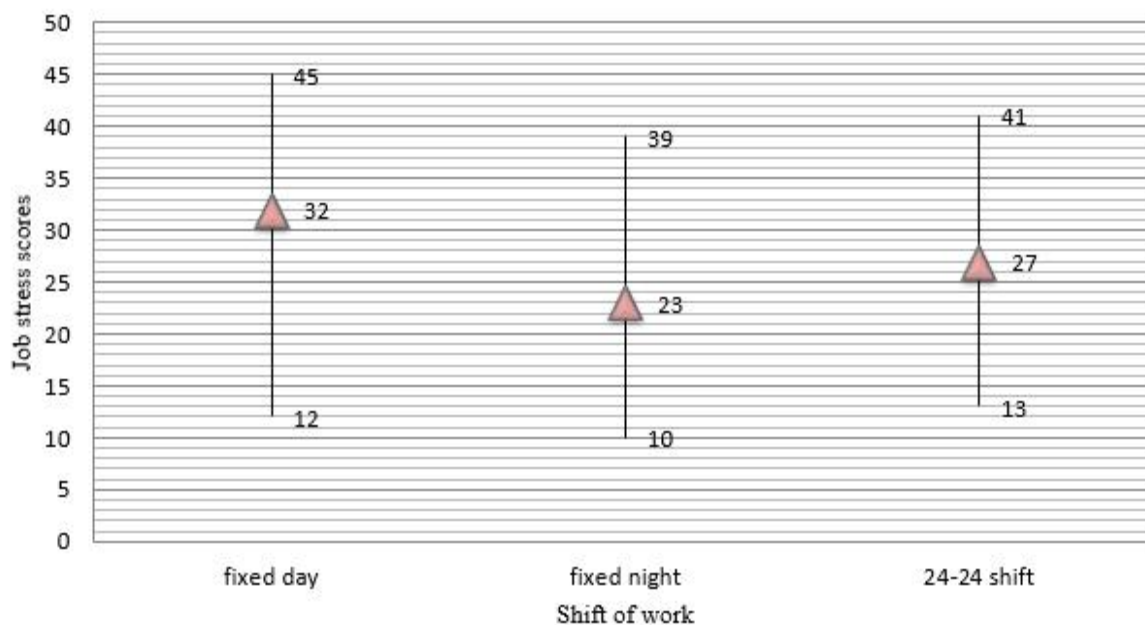


Fig. 6: Comparison of the mean, minimum, and maximum scores of role incompetency of the experimental groups (the guardsworking in Districts 18 and 20) according to the separate shift work of the subjects



Finally, as shown in Table 1, the difference was significant at confidence interval of 95% between the scores of role boundary and responsibility regarding working guards' service area ( $P < 0.05$ ).

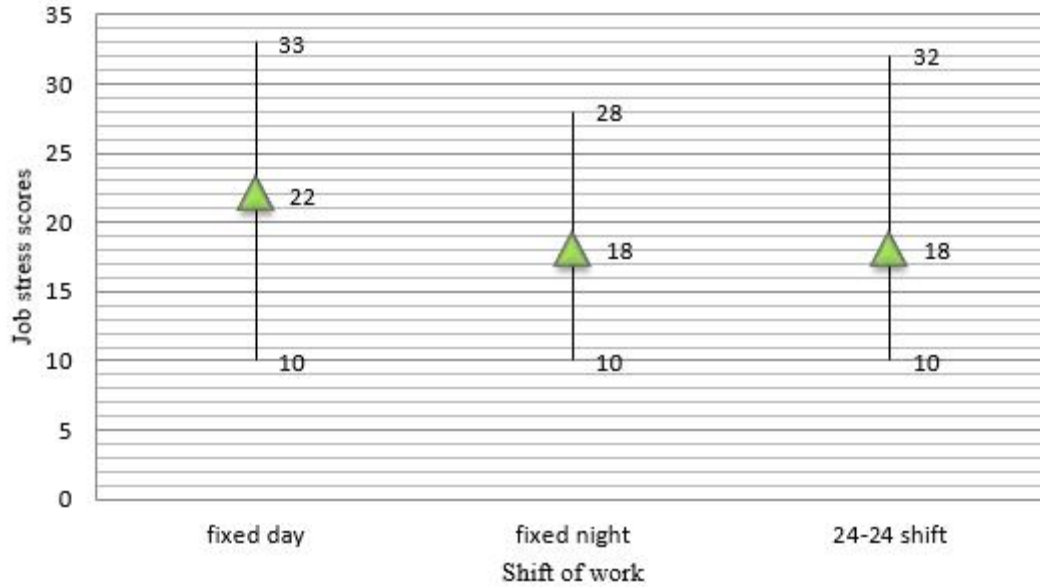


Fig. 7: Comparison of the mean, minimum, and maximum scores of role duplication of the experimental groups (the guards working in Districts 18 and 20) according to the separate shift work of the subjects

Table 1: Significant regression model of the subscales along with the variables of the subjects

Remaining variable in the model	F (fisher)	p-value
AGE:		
Role workload	7.400	$p < 0.01$
Role incompetency	2.740	$p < 0.05$
Shift work:		
Overall job stress	4.544	$p < 0.05$
Role incompetency	4.076	$p < 0.05$
Role ambiguity	3.866	$p < 0.05$
Service place:		
Role range	4.654	$p < 0.05$
Responsibilities	6.796	$p < 0.05$

## CONCLUSION

The mean score of job stress from Osipow questionnaire is less in the age group of 51-60 years in the two mentioned subscales. It seems that with increasing age the knowledge and experience of guards become more about the demands of the workplace and necessary skills required dealing with people around and this ability helps them to have less job stress facing occupational problems. However, other studies showed a negative relationship between job stress and the resulting fatigue and age (Molaie *et al.*, 2011; Halvaniet *al.*, 2007; Choobineh *et al.*, 2010; Abbaszade, 2003).

According to the results, education, marital status and job experience have no significant correlation to guards' job stress in the two Districts. Studies conducted in Iran have also confirmed the aforementioned results (Choobineh *et al.*, 2010; Abbaszade, 2003), but in terms of job experience, unlike the present study, other studies showed an inversely significant relationship (Danaei, 2003; Molaie *et al.*, 2011; Halvaniet *al.*, 2007; Choobineh *et al.*, 2010; Abbaszade, 2003) which may be due to more experience in dealing with problems or reduced workload due to job promotion related to years of employment.

The results of the present study show a significant relationship between shift work and overall score of job stress in subscales of role insufficiency and role duality. This relationship suggests that highest, lower and lowest mean score of job stress are related to day shift guards, 24-hour shift and night shift guards, respectively.

The studies of Halvani indicate that day shift guards have more stress than night shift guards (Halvani *et al.*, 2007), which is consistent with the results of this study. However, some foreign studies (Baker and Karasek, 2000; Rabinowitz, 2004; Princeton survey research association, 1997; Nourth western national life insurance company, 1991) and national studies (Danaei, 2003; Molaie *et al.*, 2011; Ghasemkhani and Ziaeeeyon, 2005; Gholamnezhad and Nickpeima, 2009; Abbaszade, 2003) show the significance of the relationship as high stress levels in night shift guards and shift work guards.

Despite the logical approval of stress in night shift guards and 24-hour shift guards, it seems that high levels of stress in day shift guards can be due to numerous orders issued, the large number of clients and sometimes the complexities and contradictions in orders issued by their supervisor during the day shift. Therefore, creating motivation and continuous monitoring of guards' job stress and even providing more facilities for them are

necessary and the role of training and periodic use of consulting with psychologists, physicians and specialists should not be forgotten. In addition, in terms of service area and job stress it was found that only role boundary and responsibility have a significant relationship. This relationship suggests that the guards in District 18 have fewer conflicts with what their working conscience determines and what is expected from them. Also, according to the results of these findings, the guards in District 18 feel more responsibility for their work. Municipality in District 18 uses more 24-hour shift for arranging its guards and it was revealed that this group had lower levels of job stress. Descriptive statistics indicate that in District 18 for 24 day shift guards (27%), 64 guards (73%) work in other shifts (20 guards in night shifts and 44 guards in 24-hour shift).

However, in District 20 for 32 day shift guards (45%), 40 guards (55%) work in other shifts (18 night shift guards and 22 guards in 24-hour shift). Therefore, considering the low levels of stress in these groups, it can be expected that the guards in District 18 have lower stress levels. Given the following reasons the use of guards in 24-hour shift is reasonable: (1) More access to workforces in terms of length of working time, (2) More freedom for taking leave of absence, (3) The possibility for reducing workforces and costs (cost effective), (4) Reduced job stress in 104 guards (65%) from a total of guards including night shift and 24-hour shift guards, (5) Creating more economic activity for 24-hour shift group on holidays, (6) The possibility for providing more training courses for target groups, (7) Providing more freedom for guards to choose their shifts voluntarily and consequently increasing their job satisfaction.

It is suggested that a larger sample size be used in future studies, and research be conducted in other Districts and for all the municipality staff offices, more questioners and more specific tests be used after shift work, such as Survey Of Shift workers (SOS) or Occupational Stress Inventory (OSI), and future research should also be designed and implemented in the field of educational or psychological interventions and their effects on reducing stress levels.

## CONFLICT OF INTEREST

The authors declare that there are no conflicts of interests regarding the publication of this manuscript.

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It is our duty to thank the officials, personnel, and assiduous security guards of the municipal zones of 18 and 20 of Tehran Municipality who made their great efforts in conducting this survey. We also appreciate Mrs. Monir Sadeghian who helped us tremendously in the statistical analysis sector.

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