



## Comparison of job stress, stressful life events, and coping styles between shift and non-shift Personnel

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### Abstract

The aim of this study was to compare job stress, stressful life events, and coping styles among shift and non-shift Personnel. The study was a comparative study in which the study sample included Personnel of an industrial factory in Isfahan. Ninety people were selected with a simple random sampling method. Then, the job stress questionnaire with physical environment, role conflict and role ambiguity dimensions the social readjustment rating scale, and the coping style scale with efficient and inefficient coping style dimensions were filled out by the Personnel. The data were analyzed by SPSS-15.5. The results showed that there were significant differences between shift and non-shift Personnel in terms of job stress and its dimensions, stressful life events, and efficient and inefficient coping styles, such that the shift Personnel, compared to the non-shift Personnel, scored higher in terms of job stress and its dimensions, stressful life events, and coping styles, pointing to the importance of the relationship between shift-working and stress level.

**Keywords:** Stress, Coping Skills, Shift work

### Introduction

Despite scientific and industrial achievements, and our dominance on many natural events, the world is receding from a peaceful life. Today, along with technological progress and the establishment of large complex organizations, the working time of production and service units has changed, rendering shift work as an essential issue. Shift work has become essential in production units, due to their nature and ensuing economic benefits, and in service units, due to countless social needs, the continuous production process and around-the-clock service providing [1]. Although shift work is inevitable and essential in today's world, it interrupts the circadian rhythm, which causes

different physiological and psychological consequences [2]. Sleep, psychosomatic, mood, anxiety disorders [3-7], impaired social and family relationships [8], human errors and serious injury [9], absenteeism, decreased job satisfaction [10] and job burnout [6] are just a few problems of shift working, but a consequence of shift work that exerts too much human and material damages and expenses on the individual and organization is stress [6,11]. According to Yamauchi, Iwamoto, and Harada [12], and also Yamauchi [13] Park, Ha, Yi, and Kim [14] shift work abnormal increases the level of norepinephrine, which is a transmitter, a sign of stress, and a factor that increases the

risk of cardiovascular diseases.

Shift work stress can appear through creating stressful life events or job stress. Stressful life events include generating social stress [15] such as large changes in social activities, family gatherings, food habits, etc. [16]. These stressful events cause job burnout, increased injuries, accidents, and violence in the workplace [17], which intensify psychological diseases and disorders [18]. Job stress is an important consequence of shift work [11]. This kind of stress, which has befallen human societies in the past decades, is known as the disease of the 20th century and a widespread problem [19]. Job stress can be the result of different factors such as physical environment, role conflict, and role ambiguity; for instance, the physical features of the workplace such as noise, heat, humidity, and light can play an important role in causing stress [20]. Role ambiguity refers to a situation in which information related to job procedures is not adequate, or is partially unclear and ambiguous, for Personnel, which can cause psychological pressure. Furthermore, role ambiguity is caused when Personnel are expected to do things that are not related to them, or are inconsistent with their personal values, resulting in psychological stress [21]. Job stress like other stressful life events has harmful effects on the physical and psychological health of individuals and their job performance [22-25], among which are psychosomatic complaints [11], anxiety, depression [26], increased alcohol and tobacco use [17]. However, each individual uses a particular coping style or strategy to deal with different kinds of stress. Coping styles are defined as a set of cognitive and behavioral responses, which aim to control internal and external stress [27-28] and minimize the pressures of stressful situations [29]. These coping styles can improve psychological health [30]. Various research practices have referred to three fundamental kinds of coping styles, that is, problem-focused coping style, avoidance-focused coping style, and emotion-focused coping style; problem-focused coping style is characterized by direct performance for reducing pressures or increased skill management skills; avoidance-focused coping style is based on avoiding

stressful sources, and emotion-focused coping style is the reduction of psychological distress by regulating stressful emotions [31].

Problem-focused styles are considered as effective styles, and avoidance-focused and emotion-focused styles are regarded as ineffective ones [29]. A review of literature on coping styles shows that the kind of coping style used by the individual affects his or her physical and psychological health [32]. Behavioral and emotional problems, violent behaviors, physical disorders, eating disorders [33] are among the consequences of using unsuitable or inefficient styles; by comparison, using efficient styles reduces negative emotions [34].

Technological advances and the establishment of large and complex organizations in Iran has made shift work an inevitable, and sometimes, necessary issue. This is while this phenomenon has numerous physical, psychological and social consequences, which are very important to know in order to reduce its damages. One of these consequences is stress (including the job stress and life stress), and subsequently, using coping styles. Few studies have been conducted on stress in Iran; whereas, no study has been performed on coping styles not only in Iran but also worldwide; therefore, the objective of this study is to compare job stress, stressful life events and coping styles among shift and non-shift Personnel; accordingly, the hypotheses of the present research are as follows. 1- Shift and non-shift Personnel differ in terms of job stress. 2- Shift and non-shift Personnel differ in terms of stressful life events. 3- Shift and non-shift Personnel differ in terms of the kind of coping styles.

### **Method**

This study comparative study was conducted on all male shift and non-shift Personnel of an industrial factory in Isfahan. One-hundred and thirty Personnel were selected by simple random sampling after providing the list of the Personnel. It has been suggested to select, at least, 15 subjects for the sample volume of a comparative study [35]. Furthermore, the number of cases should be more than the

number of dependent variables in a MANOVA analysis [36].

In total, there were 14 cells in this study (two levels of independent variables: shift and non-shift work, and seven dependent variables for each of them); therefore, the minimum required samples for each box in this case was 7; accordingly, the sample size was adequate and, indeed, more than the recommended volume. After collecting the questionnaires, some of them were omitted due to the inadequacy of the responses and not receiving some of the questionnaires; as a result, the sample volume reduced to 90; thus, the study sample consisted of 90 Personnel, 45 shift and 45 non-shift Personnel, with the age range of 20-50 and a high school diploma qualification. In this way, the groups were matched for sex (male) and education (high school diploma). In line with the study objectives, the following scales were used after selecting the sample.

1) Stress Assessment Questionnaire: This questionnaire includes 10 items on a five-point Likert scale (always= 10, never= 0), assessing the three factors of physical environment (3 items), role conflict (4 items), and role ambiguity (3 items) [43]. This questionnaire, which was designed on the basis of the views of the two famous management scholars, Hellriegel and Slocum, has a high level of face validity and reliability [44]. To check the reliability of the questionnaire in this study, Cronbach's alpha for 90 persons was measured at 0.79.

2) Social Readjustment Rating Scale (SRRS): This scale was designed by Holmes and Rahe in 1967 to assess the extent of stressful life events of individuals. The scale consists of 43 life events, each exerting different levels of psychological pressures and distress on the life of ordinary people. A numerical value has been assigned to each of these events, ranging from 11 for trivial events to 100 for the death of spouse. The reliability of this instrument for the Iranian sample was reported at 0.70 with the re-test method; its validity was reported at 0.74 using the concurrent validity method with the stress index [39].

3) COPE inventory: This inventory, designed by Carver, Scheier & Weintraub (1989), is a 60-

item questionnaire, which assesses 15 factors with three subscales of problem-focused, positive emotion-focused, and negative emotion-focused coping styles on a four-point Likert scale (0-3). Studies by Carver, Scheier & Weintraub in 1989 reported the re-test reliability coefficient of the different scales at  $r=0.42-0.67$ . The convergent and discriminant validity of this scale was also confirmed, in view of the correlation between the subscales of this test and scales such as optimism, self-esteem, hard-working, type A personality and anxiety [29]. In Iran, the translated questionnaire was presented to four psychologists, confirming its content validity, and the total reliability coefficient of the questionnaire was measured at 0.93 [40]. The maximum and minimum reliability coefficients were reported through re-test at 0.95 and 0.63, respectively [29]. It is noteworthy that the dual division of efficient coping style (problem-focused and positive emotion-focused) versus inefficient coping style (negative emotion-focused) was used in this research for the statistical analysis of the findings. After collecting the data, in addition to descriptive statistical methods such as the mean and standard deviation, the multivariate analysis of variance test (MANOVA) was performed with the SPSS-11.5 to compare job stress, stressful life events and coping styles in the shift and non-shift Personnel.

## Results

The descriptive findings for all research variables, i.e. job stress, stressful life events and coping styles are presented in table 1. Based on this table, the mean of overall job stress, physical environment, role conflict, role ambiguity, stressful life events, and efficient/inefficient coping style for the shift Personnel were 74.35, 23.37, 24.26, 23.15, 55.07, 26, and 25.71, respectively; and for the non-shift Personnel, they were 54.08, 19.46, 16.48, 17.91, 28.16, 21.91, and 12.38, respectively. Besides, the mean of all scores shows that all study variables are higher among the shift Personnel, compared to the non-shift Personnel

To determine the significant difference between

**Table 1** Descriptive data for shift and non-shift workers in the job stress, stressful life events and coping styles

Variables	Group	Mean	Std. Deviation
Job stress	Shift workers	74.35	10.63
	Non-shift workers	54.08	12.97
	Shift workers	23.37	3.80
	Non-shift workers	19.46	5.43
Life stress	Shift workers	24.26	6.11
	Non-shift workers	16.48	7.21
	Shift workers	23.15	4.18
	Non-shift workers	17.91	5.47
Coping style	Shift workers	55.07	56.26
	Non-shift workers	28.16	37.49
	Shift workers	26	5.97
	Non-shift workers	21.91	7.54
Efficient	Shift workers	25.71	29.88
	Non-shift workers	12.38	11.22

the two shift and non-shift worker groups, a multi-variable analysis (MANOVA) was performed for each of the study variables. In this research, dependent variables included job stress, stressful life events, and coping styles, and the independent variable was shift working. Initially, preliminary presuppositions such as normality, linearity, outliers, matrix-covariance similarity, multicollinearity were examined to ensure no serious violations. The Wilks' Lambda test was used to check the effect of the group variable on the study variables, which showed the value of Wilks' Lambda at 0.473 at significance value of 0.001. Therefore, there is a statistically significant

difference between the shift and non-shift Personnel regarding the combined dependent variables ( $P < 0.01$ ,  $F = 13.05$ ).

As table 2 shows, when the dependent variables are considered separately, the results indicate that there is a statistically significant difference between the shift and non-shift Personnel regarding job stress ( $P < 0.01$ ,  $F = 56.66$ ), physical environment ( $P < 0.01$ ,  $F = 15.63$ ), role conflict ( $P < 0.01$ ,  $F = 30.45$ ), role ambiguity ( $P < 0.01$ ,  $F = 26.04$ ), stressful life events ( $P < 0.01$ ,  $F = 7.13$ ), efficient coping style ( $P < 0.01$ ,  $F = 8.13$ ), and inefficient coping style ( $P < 0.01$ ,  $F = 7.85$ ).

**Table 2** Results of MANOVA for shift and non-shift workers in the job stress, stressful life events, and coping styles

Variable	Sum of Squares	df	Mean Square	F	Sig.
Overall job stress	9241.60	1	9241.60	56.66	0.001*
Physical environment	344.18	1	344.18	15.63	0.001*
Role conflict	1361.11	1	1361.11	30.45	0.001*
Role ambiguity	618.84	1	618.84	26.04	0.001*
Stressful life events	16294.68	1	16294.68	7.13	0.009*
Efficient coping style	376.18	1	376.18	8.13	0.005*
Inefficient coping style	4000	1	4000	7.85	0.006*

$P \leq 0.01$

**Discussion**

The present study was conducted to compare job stress, stressful life events, and coping styles among shift and non-shift Personnel. The analysis of the findings is important in two respects. The

first is the extent of job stress and stressful life events, regarding which the results showed that the mean of job stress and its dimensions, that is, physical environment, role conflict and role ambiguity, was higher among the shift

Personnel, pointing to a significant difference between them and the non-shift Personnel in this respect. This finding is consistent with the study by Jamal [6] and Srivastava [11] regarding the role of stress as an important consequence of shift working. In addition, the mean of stressful life events was higher among the shift Personnel, pointing also to a significant difference between them and the non-shift Personnel on this score. The study result is consistent with that by Grosswald on the effect of shift working on causing social stress [8], and that by Highes regarding the effect of shift working on major changes in social activities, family gatherings and food habits [9].

It is possible to explain this finding based on studies conducted by Yamanchi et al. [12], Yamanchi [13], and Park et al. [14]. They attributed stress caused by shift working to an increase in a transmitter, effective in producing stress, called norepinephrine. In the same way as stress caused by shift working might bring about harmful consequences [11,17,18,26], other consequences of shift working, such as circadian cycle disorder [6], sleep, psychosomatic, mood, anxiety disorders [3-7], impaired social and family relationships [8], human errors and serious injury [9], absenteeism, decreased job satisfaction [10] and job burnout might increase the stress level of shift Personnel.

On the other hand, an increase in job stress and its dimensions is not unexpected among shift Personnel, as the individual in shift jobs should adapt himself biologically, psychologically, and indeed, socially to the new situation, but as this adaptation cannot be easily accomplished in shift jobs and requires a great deal of time, the individual might be affected by role conflict or experience role ambiguity by failing to have a clear understanding of the objectives of his own activities, and his responsibility and roles, which multiplies his stress.

From a second perspective, that is, coping styles, the results showed that the mean usage of efficient and inefficient coping styles was higher among the shift Personnel, pointing to a significant difference between them and the non-shift Personnel regarding this variable.

The results of studies by Srivastava [11] and Gerber et al. [15] suggested shift working is associated with increased stress, which, in turn, can risk physical and psychological health of people [17]. Therefore, any individual in such a condition uses a coping style or strategy to control stress [27,28] and minimizes the pressures of a stressful situation [29]. If stress is higher among shift Personnel, they will, quite reasonably, use coping styles (including the efficient and inefficient kinds) more than do non-shift Personnel. But the important point here is the difference between the shift and non-shift Personnel in using efficient and inefficient coping styles. The comparison of the mean usage of the efficient coping style, unlike the inefficient coping style, did not reveal a significant difference between the two groups. Shift Personnel, perhaps due to their higher levels of stress, might appeal to any means to ease their own stress, using the simpler coping styles, that is, the inefficient ones, as a consequence of their lack of adequate education. Explaining this point, however, requires further research.

### **Conclusion**

The findings of this study showed that shift Personnel, compared to non-shift Personnel, experienced higher levels of job stress and its dimensions, that is, role conflict and ambiguity, stressful life events, and using efficient/inefficient coping styles. Finally, it is important to note that, due to some limitations, it is difficult to make definitive conclusions and generalize the results of this study. One limitation of this study is that it was performed in one industrial factory in Isfahan; therefore, the generalization of the results requires further studies.

Another limitation is that mediating variables, such as age and work experience, were not studied; therefore, other researchers are recommended to examine more fully the relationship between job stress, stressful life events, and coping styles among shift and non-shift Personnel by taking into account mediating variables. According to the results of this study, shift Personnel undergo higher

levels of job stress and stressful events; thus, they should be periodically checked with regard to their stress level, benefiting from solutions such as behavioral, biological, cognitive, and social interventions and education, and even job changes, in proportion with their stress level. Furthermore, as any human being naturally employs coping styles to mitigate stress, human resource specialists in factories and organizations are recommended to enable their Personnel to use efficient coping styles by holding different educational workshops.

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### Contributions

Study design: NF

Data collection, analysis: and manuscript preparation: MSKH

### Conflict of interest

"The authors declare that they have no competing interests."

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