

ORIGINAL ARTICLE

Investigating the Relationship between Anxiety and Depression with Fatigue and Job Involvement among Employees in a Copper Smelter

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Received December 22, 2019; Revised January 28, 2020; Accepted June 08, 2020

This paper is available on-line at <http://ijoh.tums.ac.ir>

ABSTRACT

The purpose of this study was to investigate character variations and its relationship with occupational fatigue and involvement (labor participation) among employees in a melting unit at Sarcheshmeh Copper Complex. This cross-sectional research was carried out on 145 employees of melting unit at Sarcheshmeh Copper Complex. A simple random sampling was used to collect data based on the three standard Hospital Anxiety and Depression Scale (HADS), Swedish Occupational Fatigue Inventory (SOFI), and Labor Participation (Job Involvement). One-way ANOVA, Pearson correlation coefficient and Spearman's correlation coefficient were used to analyze the data. The average age of the respondents was 38 ± 6.94 years and their average working experience was 10.46 ± 6.73 years. Among the personnel, (76%, n=111) had acute anxiety and (64%, n=93) had mild depression. The mean and standard deviation of job involvement for these subjects was 52.41 ± 7.12 (Desirable situation). There was a significant relationship among all aspects of fatigue including lack of energy, physical effort, lack of motivation, drowsiness ($P < 0.05$) whereas the physical discomfort with job involvement did not show a positive relationship. The results indicated that there was acute anxiety, mild depression and high job involvement among the employees of melting unit.

KEYWORDS: Depression, Anxiety, Job Fatigue, Job Involvement, Copper Smelter

INTRODUCTION

The variations in character (depression and anxiety) are one of the most common psychological disorders. The psychological issues assessment and evaluating in the form of mood swings is one of the most common mental disorders that are related to the occupational status of individuals in the workplace.

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Due to the increasing prevalence of such disorders and its high morbidity, many efforts have been made to attain its causes. In second decade of twentieth century, physicians, psychologists, and psychoanalysts have studied effects of stressful factors, living conditions, professional, and occupational status on the development of these diseases [1]. Among the physical and mental illnesses,



depression and anxiety are among the most important ones.

Anxiety and depression are the most common mental disorders and are becoming one of the leading public health problems worldwide. These disorders are present globally; their prevalence among the general population is estimated to be 20% in the USA and from 10 to 20% in European countries [2]. Depression is defined by the World Health Organization as one of the most important character disorders that are associated with reduced levels of character, loss of interest, feeling guilty and worthlessness, sleep and appetite disturbances, loss of energy and concentration weakness. Approximately 15% of the total population experiences a period of major depression during their lives [3].

Anxiety is one of the major problems in human life and its complications are completely tangible in individual and social life [4]. A person who is exposed to constant anxiety loses self-esteem and, while feeling humiliation, suffers from depression, which in turn will affect the defected cycle of occupational tension and efficiency. The continuation of this cycle can lead to erosion of mental and physical abilities in individuals and, after a while, leads to unstable mental disorders [5].

Fatigue is known as a risk factor affecting a decrease in the health status of the workforce. The fatigue risks may decrease work motivation, performance, quality of work, many errors in work, work productivity, and increase work stress [6]. Job fatigue is a condition that develops in a career, and therefore, the person does not have the power and desire for mental and physical activity, feels heavy, unwilling to do his/her tasks immediately, and finally reduces his/her efficiency [7]. Job fatigue in most of the literature was defined as employees' comments on fatigue during job performance and classified according to these statements [8]. Job fatigue had been concerned due to negative attitudes to safety, productivity, physical, and mental health of employees [9-10], and also is one of the reasons for the occurrence of complications and illnesses, and the occurrence of work-related accidents [11], leading to a feeling of stress or anxiety and reduced physical capacity [12] and work efficiency [11].

Job involvement refers to a state of psychological identification with work (or) the degree

to which a job is central to a person's identity. From an organizational perspective, it has been regarded as the key to unlocking employee motivation and increasing productivity. From an individual perspective, job involvement constitutes the key to motivation and increasing productivity [13].

Many developments have emerged in recent years in terms of expanding management systems, reducing organizational layers, employee participation in the decision-making process, and making employees more effective in the workplace [14]. By creating a collaborative environment, changes are achievable and collaborative interventions simultaneously enable them to deal with physical and organizational stressors [15]. Therefore, industries are seeking to achieve these goals and try to design systems and strategies to raise labor participation [14].

Regarding the importance of the abovementioned issues, the purpose of this study was to investigate character variations and their relationship with job fatigue and labor participation among employees in a copper smelter.

MATERIALS AND METHODS

This cross-sectional descriptive study was carried out on 145 employees in a copper smelter. A simple random sampling method was used to collect related data using four questionnaires including a demographic questionnaire, hospital anxiety and depression scale (HADS), Swedish occupational fatigue inventory (SOFI), and labor participation (Job Involvement).

Demographic information:

Includes age, gender, work experience, income status, marital status, number of children, education, average daily working hours, and exercise status.

Hospital Anxiety and Depression Scale (HADS):

This questionnaire was designed by Zigmond and Sanayt (1983) including 14 questions in order to measure character variations, especially anxiety, and depression. Base on this scale, there are seven

questions regarding symptoms of anxiety (Questions 1, 4, 5, 8, 9, 12, and 13), and seven questions about symptoms of depression (Questions 2, 3, 6, 7, 10, 11 and 14). Each question was rated on a four-point scale, with the highest score equals to 21 for depression and anxiety. Authors recommend 11 as a cutoff point in which higher points have clinical importance [16-17].

Swedish Occupational Fatigue Inventory (SOFI):

It is a validated and multidimensional tool for assessing occupational fatigue, developed by Esberg et al. The physical and mental dimensions of occupational fatigue by measuring self-report intensity and status of occupational fatigue can be assessed using this questionnaire and has a good reliability and validity in many occupations [18]. The 20 item version of this questionnaire consists of five sections: lack of energy, physical effort, physical effort, lack of motivation and sleepiness, each section being evaluated with four questions. Each item is rated as zero (not at all) to ten (extremely agreed) scores [12].

Labor Participation Questionnaire (Job Involvement):

This 20 questions questionnaire introduced by Ladahl and kejnar, aiming to measure how much a person is being trained by his occupation and examining job involvement. The questionnaire is

based on four-dimensional spectrum (fully agreed, agreed, disagreed, and fully disagreed), and its scores are 1 (I fully agreed) to 4 (fully disagree). The lowest and highest scores in this questionnaire are 20 and 80 respectively. If the score is higher than 40, the person's job involvement is high and otherwise the person does not have a particular job involvement [19- 20].

The Cronbach's alpha coefficients obtained are as follow: Hospital anxiety and depression scale equals 0.86 and 0.78, respectively [16], Swedish occupational fatigue equals 0.92 [12] and labor participation equals 0.81[19]. For data analysis, one-way ANOVA, Pearson correlation and Spearman coefficients were used with SPSS software version 24.

RESULTS

The present study was conducted on 145 employees at the Sarcheshmeh copper complex. The respondents' age was between 26 to 57 years old with an average age of 38 ± 6.94 years, with a minimum working experience of 1 year and a maximum of 30 years, and their average working experience was 10.46 ± 6.73 years. Other demographic information has been shown in Table 1. The statistical results of the Hospital Anxiety and Depression Scale (HADS) showed that among the participants, 7 (5%) have normal score, 27 (19%) have mild and 111 (76%) had acute anxiety. Depression scores were also found in 22 (15%) subjects as normal, 93 (64%) were mild and 30 (21%) were acute.

Table 1. Demographic information (n=145)

Variable	Variable classification	N (%)
Gender	Male	126(87%)
	Female	19(13%)
Marital status	Married	125(86.2%)
	Single	18(12.4%)
Number of children(in married subjects)	None	35(24%)
	1-2	82(56.6%)
	3 or more	28(19.4%)
Education	Diploma	47(32.4%)
	Undergraduate	18(12.4%)
	graduated	58(40%)
	Master's degree	22(15.2%)
Average daily working hours	8 hours	90(62%)
	More than 8 hours	55(38%)
Smoking	Smokers	30(20.7%)
	Non smokers	115(80%)
Exercise	Yes	87(60%)
	No	58(40%)

The mean and standard deviation of job involvement score for the participants in this study was 52.41 ± 7.12 . Also, the mean and standard deviation of various dimensions of occupational fatigue, including

lack of energy, physical effort, physical discomfort, lack of motivation, and drowsiness have been presented in Figure 1.

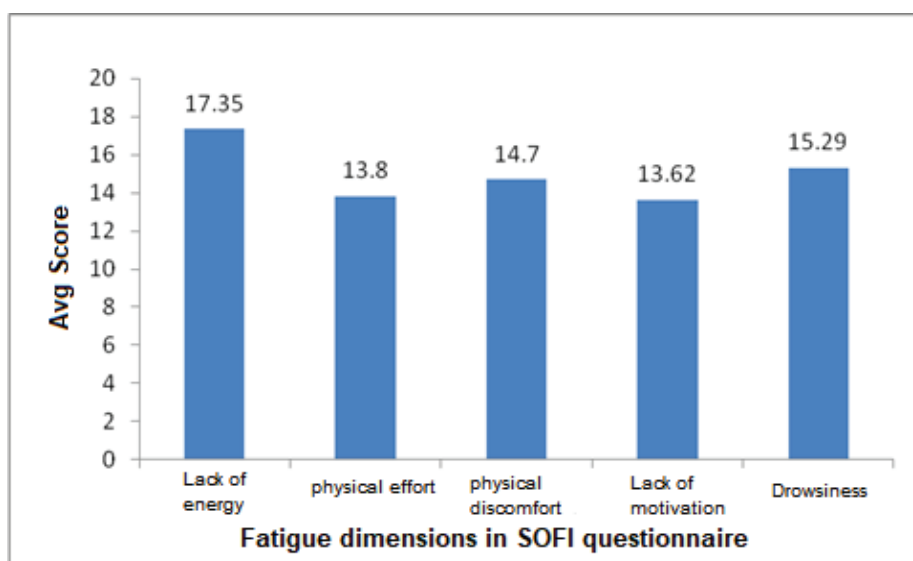


Fig 1. Fatigue dimensions in the SOFI questionnaire

There was a significant relationship between all aspects of fatigue except for physical discomfort with job involvement. There was also a correlation between age and some of the fatigue dimensions. Lack of motivation was the only one the fatigue dimensions

that had a meaningful relationship with work experience. The results have been shown in Table 2. There was no significant difference between marital status and gender with fatigue dimensions ($P > 0.05$).

Table 2. Pearson correlation between fatigue dimensions with age, work experience, and job involvement

Fatigue dimensions	Mean(SD)	P-value age	P-value work experience	P-value job involvement
Lack of energy	17.5±9.8			0.013
Physical effort	13.8±8.8	0.03		0.018
Physical discomfort	14.7±9.44	0.022		0.068
Lack of motivation	13.62±8.05	0.025	0.048	0.028
Drowsiness	15.29±10.6			0.016

DISCUSSION

The purpose of this study was to investigate character variations and their relationship with occupational fatigue and labor participation among employees of the melting unit at the Sarcheshmeh copper complex. According to the employees' response to the anxiety and depression scale (HADS), the anxiety score was 76%, the depression score was 64%, and the other scores were at other levels. These results indicated acute anxiety and mild depression among the employees of melting unit; the reason for these results can be due to difficulty of the work caused by nature of the work in the melting and casting industries, as well as working environment conditions, employees' mental incompatibility, job dissatisfaction, Overtime and shift working and stress: so that in Nouroozi kushali et al. described anxiety and depression as stress-related outcomes in the work environment [18].

The average score of job involvement for subjects of this study was 41.52, which indicates a favorable situation. If the score is more than 40, job involvement is high and the closer the score to 80, the more likely a person's job involvement. The high job involvement reflects the experience of meaningfulness, desire, pride, drowning in work and a pleasant feeling of the work. In this situation, a person becomes interested in his or her job over time [22]. If the level of job involvement is predicted through different variables, we can take effective steps in selecting individuals as well as increasing satisfaction in personnel and of organization, because job involvement leads to more efficiency [23-24]. Therefore, by reducing anxiety, depression, and occupational fatigue, it is possible that the attachment and interest of employees to the job increase and their job involvement increase. Similarly, managers should increase the commitment of employees by creating a healthy, intimate, trustworthy, innovative, competitive and dynamic environment, and facilitate the achievement of organizational goals.

In the current study, there was a significant relationship between all aspects of fatigue except physical discomfort with job involvement, which shows that the lower the personnel energy, the less interest in job involvement (labor participation) and

physical discomfort of personnel do not affect their job engagement.

There was a significant relationship between age and some dimensions of fatigue (physical activity, physical discomfort and lack of motivation). These results also indicated that as the age increases, fatigue increases due to the employees' physical discomfort. The outcomes of Tabatabai et al. study was in line with the results of the present study. In this study, there was a significant relationship between age and fatigue in personnel ($P = 0.05$), with fatigue increasing as age increases [19]. However, in the study of Karimi et al. there was no positive relationship between the dimensions of fatigue and age [8].

Also, one aspect of fatigue (lack of motivation) had a significant relationship with work experience. This means that as the personnel's work experience increases, their fatigue will increase due to lack of motivation, which can be due to uniformity in workplace, doing repetitive works, gaining much experience, and so on. In the study of Zakeri et al. there is no meaningful relationship between motivation and work experience [20].

In this study, there was no significant relationship between marital status and gender of the personnel with fatigue dimensions, while it would be expected to see more fatigue in the married subjects, or because men were less tired due to their morale and physical condition than women in their hard working conditions. In this study, marital status and gender had no effect on employees' fatigue. Also, in a study by Karimi et al. [8], Azad et al. [4], there was no significant relationship between dimensions of fatigue and marital status. According to the results of Spearman's correlation coefficient between age, depression and job involvement, there was a significant relationship between the two groups. In confirmation of the results, the results from Marshall et al. showed that there is a significant relationship between age and job involvement [21]. On the contrary, the results of Ziaee's study [22] showed no significant relationship between age and job involvement.

According to the one-way ANOVA, there was a significant relationship between the dimensions of fatigue and the only dimension of drowsiness with

anxiety and depression ($P = 0.04$). Also, in the study of Sahebi et al. mental health dimensions including physical health, social function, anxiety and depression were positively correlated with drowsiness in personnel [24]. They can significantly reduce their exposure to occupational environments and increase job involvement by managing and controlling stress through identifying resources and controlling them.

ACKNOWLEDGMENT

The authors appreciate all those who helped us in completing this study.

Conflict of interest

The authors of this paper declare no conflict of interest.

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