

AN INVESTIGATION OF WORKING CONDITIONS, OCCUPATIONAL DISEASES AND ERGONOMICS IN JET (OLTU) STONE DRESSING IN ERZURUM**Dr. Dilşad GÜZEL****Assist. Professor, Department of Business Administration****Faculty of Economics and Administrative Sciences****Ataturk University, 25240/ Erzurum, TURKEY****ABSTRACT**

The Jet stone, a semi-precious stone mined in Oltu district of Erzurum is used for making jewelry. It is of great importance in terms of maintaining the tradition of Turkish jewelry art, economic development of the region and providing employment opportunities. In this study, working conditions and exposure to occupational accidents are examined and occupational diseases caused by negative circumstances of this profession are investigated. After this investigation, it is aimed to determine the measures currently taken to prevent these diseases. As a result of investigation, more than the half of the employees suffers from low back, back, hand, neck, arm-wrist and respiratory tract diseases. The employees use glasses, mask, glove, tap, cotton ball etc. in order to prevent these diseases, and they should pay attention to the hygiene, air conditioning and lightening in their workplace. There has not been seen a significant difference between the seniority year and occupational diseases, and this situation shows that the employees take precautions for the occupational diseases. Ergonomic occupational conditions and the precautions taken by them are related and it is seen a strong relationship between the precautions and the occupational diseases

Keywords: Jet(Oltu)Stone, Ergonomics, Occupational Diseases, Turkey, SMEs.

1. Introduction

Preventing workers from occupational diseases, creating a healthy and reliable work environment are one of the most important issues in these days. If the working conditions are accustomed properly for the physical and mental working of someone, physical working is going to support the health and raise the performance. Otherwise, occupational diseases will appear and the performance of the employee is going to decrease.

Heavy loadings, workplace conditions such as inclement weather, extreme heat/ cold, chemical smell, noise, poor lighting, vibration, and dust have direct or indirect effects on employees' job performance. These conditions decrease employees' concentration towards tasks which lead to lowering employees' performance such as low productivity, poor quality, physical and emotional stress, which cause high cost. Effective applications of ergonomics in working conditions enhance employees' job performance; provide safety to the workers, physical well-being, and job satisfaction. Many studies in ergonomic area have focused on the positive effects on quality, productivity, hazards, occupational health, and their cost of effectiveness of ergonomic improvements (Kahya, 2007: 516). The various factors affecting human performance and productivity can be studied and their effects can be reduced considerably with the help of ergonomics (Naravane, 2009: 2). Ergonomic deficiencies are the rooting causes of workplace health hazards, low level of safety and reduced worker productivity and quality (Shikdar, Sawaqed, 2003: 564)

Investigation of the occupational diseases and the causative factors are quite important for the occupational groups. When the causative factors of those diseases and the solution methods, which are to be applied, are figured out, both the employees regain their health and their productiveness will be increased.

With the help of this study, the occupational diseases, the precautions they take and ergonomic occupational conditions of the workers who work in jet dressing business are analyzed and their current conditions are determined.

2. Literary Review**2.1. Jet(Oltu) Stone**

Studying the jewelry and ornamentation culture of the Anatolia which has a deep-rooted history and culture, one can see that high quality ornamentations which show regional characteristics were designed during the historical developmental process (Alparslan: 2009: 2).

Among the regions, where stone dressing, jewelry and the art of ornamentation are carried out all of which show regional characteristics in Turkey, are Erzurum and its district Oltu. Erzurum, whose history dates back to 4000 B.C. and which hosted many civilizations throughout history, is quite rich in terms of traditional handicrafts and Jet Stone is one of the most important craftworks of the region (Anonymous,2004:100).

Jet Stone, which is mined only in Erzurum, Oltu and takes its name (Oltu Stone) from this district, has been ornamented for almost 230 years in Erzurum and Oltu and it is used in ornamentations, domestic accessories and particularly in rosary. In addition to the usage only of Jet stone for the production of the materials, this art of handicraft is carried out with the ornamentation of various metals like gold and silver with jewelry techniques and their usage with Jet stone(Alparslan:2009;2).

As a result of rapid technological changes today and gradually increasing human needs, although most of our handicrafts have started to lose importance, Jet Stone dressing, which preserves its traditional maintenance, plays an important role in terms of the development of Erzurum and Oltu, the utilization of the region's resources and providing job opportunities for large masses (Alpaslan,2010:180).

2.2. Ergonomics

Ergonomics can be defined simply as the study of work. More specifically, ergonomics is the science of designing the job to fit the worker, rather than physically forcing the worker's body to fit the job(OSHA,2000:1)

According to the official definition by the International Association of Ergonomics, ergonomics is "the scientific discipline to optimize the interaction between humans and other elements of the system and using the theory, knowledge, principles, data and methods to optimize human well-being and performance of the system(Sekulova,simon:2010:462)

An objective of the ergonomics approach is to obtain an effective match between the user and the work system and one in which there is optimization of: working efficiency, health and safety, comfort and ease of use(Stubbs,2000:278).

If any organization wants to increase the working condition of employee, organization could provide satisfactory working atmosphere for the workers (Sohail,Delin;2013:127)

2.3. Ergonomics and Occupational Diseases

Health of workers is influenced by work and external influences and personal dispositions (Sekulova,Simon:2010:462). Improving worker's productivity, and occupational health and safety are major problems. Some of the common problems are improper workplace design, ill-structured jobs, mismatch between worker abilities, adverse environment, poor human-machine system design and inappropriate management programs. This leads to occupational accidents, making workers' health poorer, mechanical equipment injuries, disabilities, and in turn reduces worker productivity and product/work quality, and increases cost. Ergonomics or human factors application have been found to improve worker productivity, occupational health, safety and satisfaction. This has both direct and indirect effects on overall performance. It would, therefore, be extremely difficult to attain a company' objectives without giving proper consideration to ergonomics (Shikdar,Sawaqed 2004:224).

An ergonomically deficient workplace can cause physical and emotional stress, low productivity and poor quality of work (Ayoub, 1990).

The best prevention against musculoskeletal disorders is to implement ergonomic principles which, according to studies, may reduce disease by 30-40%.

Occupational diseases are divided into six groups

- Occupational diseases caused by chemical substances
- Occupational diseases caused by physical factors
- Occupational diseases of the lung, pleura and peritoneum
- Skin diseases
- Infectious and parasitic occupational diseases
- Occupational diseases caused by other factors(Sekulova,Simon:2010:436).

3. Method

This study, aimed to investigate the physical occupational conditions, occupational diseases and ergonomic occupational conditions of the people who are preoccupied with Jet Stone dressing and active in Erzurum, is

intended to make research about what kind of occupational diseases the employees have and what kind of precautions they take, and to what extent they do have the ergonomic occupational conditions. For this reason, questionnaires are formed regarding to the studies carried out and the literature and this questionnaire was applied to the people who are preoccupied with Jet Stone dressing. In order to obtain the goal of the study and reach reliable data, every employee is interviewed and asked to fill in the questionnaire. The aim of the study is to determine the occupational diseases that the employees are exposed to, take precautions, and guide them by expressing that the occupational diseases could be reduced through ergonomic factors.

3.1. The Main Mass of People

The people who are preoccupied with Jet Stone dressing in Erzurum constitute the main mass of the study. The number of these people is taken from the union of chamber of merchants and craftsmen and within this context it has been determined that there are 104 active business in Erzurum. However, some of the employees in those businesses did not accept to fill in the questionnaire and as a result of this situation the questionnaire has been applied to 83 people.

3.2. The Collection of the Data

In this study, the occupational diseases, physical and ergonomic occupation conditions of the employees who work for the Jet Stone dressing have been determined. For this reason, a questionnaire has been prepared as from December 2012 and the questionnaire has been applied one-to-one to 83 business employees who are members of union of chamber of merchants and craftsmen. The collected data have been analyzed with SPSS 17.0 packaged software and these results have been read.

3.3. Findings

The questionnaire includes two sections. In the first section, there are demographic questions about the employees of this occupation, and in the second section there are questions about occupational diseases, the precautions taken for those diseases and the ergonomic design of the workplace. The data collected after the application of the questionnaire are tabulated and the tables have been read. In the table 3.1, demographic characteristics of the employees of Jet Stone dressing have been shown.

Insert Table3.1.here ,

38.6% of the employees is over 39 years old, 21.7% of them are between 25 and 31, 19.2% of them are between 18 and 24. These results show that the people who are preoccupied with this job belong to the middle-aged population and the youth are not quite interested in the job, thus, it can be said that this occupational group loses its charm gradually. When we look at the marital status of the employees, it is seen that 74.7% of them are married and 25.3% of them are single. It is also seen here that as a result of the employees' high average of age the percentage of the married employees is higher. When we look at the educational background of the employees, 43.4% of them graduated from high schools and their equivalents, 27.7% of them are primary school graduates, 16.9% of them are university graduates and 12% of them are vocational high school graduates. This situation shows that the great majority of the employees head towards this occupation after primary or high school and also the vocational high school and university graduates show that there are people who prefer this occupation although they take different levels of education and do different jobs. When we look the working periods in the sector, 28.4% of the employees have worked more than 21 years, 8.4% of them are interested in this job for less than 5 years. As it is mentioned above, these results show that the young population does not head towards this occupation too much; rather the middle-aged group carries on a business in the sector.

Insert Table3.2.here

Table 3.2. Shows the reasons why the employees of Jet Stone Dressing chose this occupation. In this sector, the employees' reasons of choosing this occupation are; 51.2% of them say because it is a patrilineal handicraft, 18.3% of them say because there is not a different job to do, 17.1% of them say because they are interested in the job, 7.3% of them say because the job is peculiar to their hometowns, 2.4% of them say because the job brings in good money and 3.7% of them say because of other reasons. This situation shows that the job does not bring in good money so the great majority of the employees chose this occupation because they would like to maintain the family business.

Insert Table3.3.here

Table 3.3 shows from whom the employees learnt the occupation or what their sources are. According to this situation, 54.2% of the employees learnt this job from their families, 39.8% of them from their artisans, 2.4% of them from their friends, 2.4% of them from technical courses and 1.2% of them learnt with other

techniques. It is again seen when the results are compared with the reasons why the employees chose this job that this job in general is an art passing from family to family.

Insert Table3.4.here

Table 3.4 shows the working hours of the employees of Jet Stone Dressing. 56.6% of the employees work 8 to 12 hours, 27.7% of them work 13 to 17 hours, 8.4% work less than 8 hours, 7.2% of them work more than 18 hours.

Insert Table3.5.here

Table 3.5 shows the occupational accident status of the employees of Jet Stone Dressing. 88.3% of the employees have not had an accident before, 11.7% of them have had an occupational accident before.

Insert Table3.6.here

Table 3.6.shows the occupational diseases of the employees of Jet Stone dressing.56% of the employees suffer from low backache, 54.2% of them suffer from back and hand pain, deformity of the fingers and eye disease, 55.4% of them suffer from arm-wrist and finger pains, 51.8% of them suffer from pain in the neck, allergy and cuts, 53% of them suffer from rheumatism, knee pain, burns and respiratory tract diseases, 56.6% of them suffer from tissue loss in the fingers and 50.6% of them suffer from hearing loss.

Insert Table3.7.here

Table 3.7.shows the precautions for the occupational diseases that the employees of the jet stone dressing take. 97.6% of the employees use glove and glass for protecting themselves from the occupational diseases and they also pay attention to the hygiene conditions of the place they work in, 96.4% of them pay attention to the air conditioning and lightening in the place they work, 95.2% of them use masks, 94% of them take precautions by using taps, cotton balls, earflaps etc.

Insert Table3.8.here

In order to determine the relationship among ergonomic occupational conditions, occupational diseases and the precautions taken, correlation analyses have been carried out and the results are shown in the table 3.8.

There is a reasonable relationship between answerers' ergonomic working conditions and the precautions they take. Again there is a strong relationship between the precautions they take and the occupational diseases. According to this situation, precautions taken carry out the formation of the ergonomic atmosphere. In addition, as the occupational diseases increase the precautions that are taken increase as well.

Insert Table3.9.here

In order to test if there is any difference between various seniority groups in terms of occupational diseases, ANOVA analysis has been done and the results are shown in Table 3.9.as a result of the analysis there has not been seen any differences between the seniority groups. And this situation shows that as time goes on, the employees take more precautions in order to get rid of the negativities caused by this occupation, and they are barely affected by these negativities.

4. Results and Suggestions

In this study carried out in Erzurum, when the demographic characteristics of the individuals, who are preoccupied with Jet Stone dressing, are analyzed, it is seen that the great majority of the employees are over 39 years old, married, they are graduated from high school and its equivalents and they have been doing this job for more than 21 years. The great majority of the employees choose this job because it comes from a family business and they learn about the job in their families. Still, the great majority work from 8 to 12 hours per a day and they have not had any occupational accidents before.

More than the half of the employees suffers from low back, back, hand, neck, arm-wrist, knee pain, deformation in the fingers and loss of tissue, eye diseases, allergies, cuts, rheumatism, burns, hearing losses and respiratory tract diseases.

The employees use glasses, mask, glove, tap, cotton ball etc. in order to prevent these diseases, and they should pay attention to the hygiene, air conditioning and lightening in their workplace.

There has not been seen a significant difference between the seniority year and occupational diseases, and this situation shows that the employees take precautions for the occupational diseases. Ergonomic occupational conditions and the precautions taken by them are related and it is seen a strong relationship between the precautions and the occupational diseases.

Those traditional handicrafts have started to lose its importance as a result of the rapid technological developments and this threatens Jet Stone dressing which is an important factor in terms of the development of the region and providing employment.In order to express the resistance of the job against the

technological developments, increasing its attraction, handing down the job to the next generations, the young employee candidates and the employees of this job should be encouraged. Ergonomic occupational conditions and precautions taken will enable the employees to get efficiency from this job and it will also increase the demand to the job.

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Appendix

Table 3.1 Demographic Characteristics of the Employees of Jet Stone Dressing

| | | N | % |
|--------------------------------|---------------------------------------|----|------|
| Age | 18-24 | 16 | 19.2 |
| | 25-31 | 18 | 21.7 |
| | 32-38 | 17 | 20.5 |
| | 39-45 | 16 | 19.3 |
| | 46 and more | 16 | 19.3 |
| | TOTAL | 83 | 100 |
| Marital Status | Married | 62 | 74.7 |
| | Single | 21 | 25.3 |
| | TOTAL | 83 | 100 |
| State of Education | Primary School | 23 | 27.7 |
| | High School and its Equivalent | 36 | 43.4 |
| | Vocational High School | 10 | 12 |
| | University | 14 | 16.9 |
| | TOTAL | 83 | 100 |
| Working Duration in the Sector | Less than 5 years | | |
| | 6-10 | 21 | 25.9 |
| | 11-15 | 14 | 17.3 |
| | 16-20 | 16 | 19.8 |
| | 21 and more | 25 | 28.4 |
| | TOTAL | 83 | 100 |

Table 3.2. The Reasons Why the Employees Choose this Job

| | | N | % |
|---------------------------------|-------------------------------------|----|------|
| The reason for choosing the job | Family Business | 42 | 51.2 |
| | Unemployment | 15 | 18.3 |
| | It brings in good money | 2 | 2.4 |
| | The interest in the job | 14 | 17.1 |
| | It is peculiar to the region | 6 | 7.3 |
| | Other | 3 | 3.7 |
| | TOTAL | 82 | 100 |

Table 3.3. The person or the source from whom/which the Jet Stone dressing is learnt

| | | N | % |
|-----------------------|------------------------|----|------|
| How the job is learnt | In the family | 45 | 54.2 |
| | In the course | 2 | 2.4 |
| | From an artisan | 33 | 39.8 |
| | From a friend | 2 | 2.4 |
| | Other | 1 | 1.2 |

Table 3.4. The Working Hours of the Employees of Jet Stone Dressing

| | | N | % |
|---------------------|---------------------------|----|------|
| Daily Working Hours | Less than 8 hours | 7 | 8.4 |
| | 8-12 | 47 | 56.6 |
| | 13-17 | 23 | 27.7 |
| | More than 18 hours | 6 | 7.2 |
| | TOTAL | 83 | 100 |

Table 3.5. Occupational Accident Status of the Employees of Jet Stone Dressing

| Occupational Accident Status | Yes | 9 | 11.7 |
|------------------------------|--------------|----|------|
| | No | 68 | 88.3 |
| | Total | 77 | 100 |

Table 3.6. Occupational Diseases of the Employees of Jet Stone Dressing

| | N | % |
|----------------------------------|----|------|
| Low Backache | 47 | 56.6 |
| Backache | 45 | 54.2 |
| Hand pain | 45 | 54.2 |
| Arm-wrist pain | 46 | 55.4 |
| Neck pain | 43 | 51.8 |
| Rheumatism Diseases | 44 | 53. |
| Knee pain | 44 | 53 |
| Respiratory tract diseases | 44 | 53 |
| Pain and numbness in the fingers | 46 | 55.4 |
| Deformity of the fingers | 45 | 54.2 |
| Loss of tissue in the fingers | 47 | 56.6 |
| Eye diseases | 45 | 54.2 |
| Allergy | 43 | 51.8 |
| Burn | 44 | 53 |
| Cut | 43 | 51.8 |
| Hearing Loss | 42 | 50.6 |

Table 3.7 the Precautions Which the Employees of Jet Stone Dressing Take

| | N | % |
|--|----|------|
| Use of Glasses | 81 | 97.6 |
| Use of Gloves | 81 | 97.6 |
| Use of Mask | 79 | 95.2 |
| Paying attention to the hygiene in the workplace | 81 | 97.6 |
| Air Conditioning | 80 | 96.4 |
| Lightening | 80 | 96.4 |
| Use of taps, cotton balls, earflaps | 78 | 94 |

Table 3.8. Ergonomic Occupational Conditions, the Relationship between Occupational Diseases and Precautions Taken

| | | Ergonomic Occupational Conditions | Occupational Diseases | Precautions Taken | Having Occupational Diseases |
|-----------------------------------|---------------------|-----------------------------------|-----------------------|-------------------|------------------------------|
| Ergonomic Occupational Conditions | Pearson Correlation | 1 | -,037 | ,240* | -,078 |
| | Significance(p) | | ,808 | ,032 | ,508 |
| | N | 81 | 46 | 80 | 75 |
| Occupational Diseases | Pearson Correlation | -,037 | 1 | ,379** | -,241 |
| | Significance(p) | ,808 | | ,009 | ,129 |
| | N | 46 | 47 | 46 | 41 |
| Precautions Taken | Pearson Correlation | ,240* | ,379** | 1 | ,015 |
| | Significance(p) | ,032 | ,009 | | ,896 |
| | N | 80 | 46 | 82 | 76 |

*p<0.05, ** p<0.05

Table 3.9. ANOVA Analysis carried out between Occupational Diseases and Working Years

| | Sum of Squares | df | Mean square | F | Significant |
|----------------|----------------|----|-------------|-------|-------------|
| Between Groups | ,927 | 4 | ,232 | 1,020 | ,408 |
| Within Groups | 9,314 | 41 | ,227 | | |
| | 10,241 | 45 | | | |