



An Ergonomic Analysis of Physical Environmental Conditions in Offices (Usak University Academic Staff Example)

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ABSTRACT

Ergonomics is called the scientific study of the relationship between person and his work environment. With the advancing technology and rapidly increasing possibilities, today many businesses are managed from venues and offices. The items (especially furniture) used in spaces and offices are extremely important in terms of increasing the productivity of the employees. With this study, it was tried to investigate whether the ergonomic adequacy of the physical environment conditions in the offices differ significantly according to the demographic characteristics of the academic staff working at Usak University. The research population consists of academic staff working at Usak University. In the spring semester of 2017-2018, totally 720 academic staff work at the university. Within the scope of the study, it was aimed to reach all academic staff, but 300 academic staff were sent a survey. While preparing the questionnaire form to be used in the study, previously prepared studies on the subject were used. Surveys were received from 182 academic staff within the scope of the study. The return rate of the surveys is 61%. The questionnaire forms obtained were then evaluated statistically with the help of SPSS package program. It was determined that 42,3% of the participants were between the ages of 25-34. 57,1% of the participants are men. 78% of the academic staff stated that they found the proximity of the office they work with to the job related tools (photocopy, printer, etc.) are sufficient. 73,6% of the participants think that the office furniture is suitable for their body sizes and 72,5% of the participants think that the other offices that they work at are close enough.

Keywords: Office ergonomics, Usak University, analysis, physical environmental conditions, academic staff,

1. INTRODUCTION

Offices are the room or larger places where people work together or individually. The concept of office in which many meanings reside is the architecture, a design and sociological phenomenon (Çimen, 2008). In offices where activities are carried out within the scope of service areas of various institutions or organizations, the layout of physical environments is very important because of the effect it has on the health, psychology and work efficiency of the employee. Offices are necessary to be designed with ergonomic elements in a way that makes users comfortable. It should not be forgotten that the most important factor in the relationship of the human-machine-environment triad with each other is human (Yararel, 2019).

Ergonomic factors affecting working conditions affect the comfort, satisfaction and performance behavior of employees. When studies on this subject were examined, Doğan (2017) reported that the adjustment to be made under physical environmental conditions increased the performance levels of employees. Tutar and Altınöz, (2003) in their works, revealed the relationship between the work efficiency of employees in both psychological and physical aspects of the appropriate colors used in the offices. According to Frieling, the right color selection in offices; it makes the eyes comfortable and helps to relieve stress (Çete, 2004). Sağocak (2005) stated the findings reached in his research as follows: workplace color is an environmental factor that affects employee status, satisfaction, motivation and performance. It is seen that warm colors focus people on the outside, increasing their awareness of the environment, while cold colors turn them inward, enabling them to focus on visual and mental work. Çınar, (2008) in his study, explained the necessity of designing the office so that solar energy is most utilized in natural lighting. Sunviva (2015) stated that working in areas where natural light is used appropriately keeps the



individual away from psychological problems, making the work more enjoyable. Many studies have stated that white lighting is the most suitable lighting for offices (İncir, 2008; Topaloğlu and Koç, 2010). In his study, Apaydın (2012) reported that the design of lighting in offices depends on the establishment of the necessary conditions, the provision of good eyesight conditions in terms of user requirements and the preservation of the features of the space.

Noise is one of the important factors that causes loss of concentration in the working environment, which reduces work productivity and distorts morale. As noise increases, attention gathering becomes more difficult, the human nervous system deteriorates, as a result of this, productivity decreases in jobs that require skill and mental works (Şaşmaz et al., 2004). Noise is defined as unwanted, unpleasant and uncomfortable sounds in an environment (Yüksel, 2005). While a human ear hears sounds between 0 and 130 dB, a normal conversation is around 60 dB. Sounds between 0-60 dB are difficult to hear. Effects of sound control and noise on employees mood and performance in open offices (Jensen et al., 2005; Kaarlela-Tuomaala et al., 2009). Noise level should not exceed the noise of the fund and should be determined for the preferred location the noise of the fund should not change over time (Tunç Kurt, 2016). It is stated that being in environments where the noise level is high causes loss in work efficiency due to disrupting the nervous system of human beings (Altınöz and Göral, 2009). It can be regarded as an indicator of the relationship between the sound and noise level in the offices and the work performance in the office environment (Çeven and Özer, 2013). Koçer et al., (2016), in their study it was found that the abundance of public circulation in municipal buildings causes disturbing levels of noise in office environments.

Tengilimoğlu and Tutar (2003), furniture, which is an interior reinforcement element, meets physiological, cultural and aesthetic needs. Today, when office furniture is mentioned, tables, chairs, cabinets, caissons and coffee tables are the most commonly used. Furniture should be considered to be more robust and suitable for work than showing off. Choosing the appropriate colors for the furniture to be used in the interior makes that space stronger in terms of usage. Furniture, accessories and color integrity are important in decoration. The lack of one of these factors affects the quality of other factors. Yetiz (2009) stated that although the cost of ergonomic furniture seems to be high, this cost can be ignored due to the efficiency it will achieve at work. Çayır et al., (2013), evaluated the desks used by academic staff in their offices from anthropometric point of view, found that rectangular tables were not useful and 67% of users preferred L-type tables. In the research of Telli and Senol (2013); it is suggested that the seating height, 40,4 cm, seating depth, 47,8 cm, seating width, 36,7 cm, armrest height, 24,7 cm for the office chair. Some of the most important results of the research are height, 68,4 cm, length, 121,5 cm, width, 61,4 cm, foot gap height, 58,4 cm, foot gap width, 58,4 cm, foot gap depth, 58,4 cm for the office work desk.

Ergonomics, which means ensuring harmony in human, machine and working environment and bringing the working conditions to the most appropriate level possible, will also provide the improvement of employee performance with the psychological contribution that this harmony will bring (Kahraman, 2013). It is the furniture inside that complements the interior. Choosing suitable furniture makes that space stronger in terms of color, texture integrity and usage (Kalaycıoğlu and Aras, 2015). Morkoç and Okçu (2017), in their study investigated whether the workplaces belonging to the administrative and academic staff of Canakkale Eighteen March University were ergonomic. According to the results of the study, it was determined that furniture of the office and the space could not be ergonomic. As a result of the "evaluation of academic offices on productivity" study conducted by Kurtoğlu and Kistır (2018), it is stated that the degree of satisfaction varies depending on the title in the academic environment, uniform offices do not meet the demands and needs of different users and affect their performance at work.

The aim of this study is to examine the physical environmental conditions of Usak University academic staff in their workplaces in terms of their demographic characteristics.



Within the framework of this basic purpose, the problem of the research is as follows. 'What are the ergonomic effects of the working places and physical environmental conditions of the academic staff of the university?

The sub-problems of the research are as follows;

1. Do the work spaces and physical environmental conditions of the academic staff of the university differ ergonomically to the gender of the participants?
2. Do the study spaces and physical environmental conditions of the academic staff of the university differ ergonomically to the age groups of the participants?
3. Do the study spaces and physical environmental conditions of the academic staff of the university differ ergonomically to the title status of the participants?
4. Do the working spaces and physical environmental conditions of the academic staff of the university differ ergonomically in terms of the year of the participants working in the institution?

2. METHOD

Survey technique was used as a data collection tool in the research. The universe of the research was formed by the academic staff of Usak University (UU). The sample consists of randomly selected participants from the academic staff working at the central campus. While the survey questions were created, previous studies (Armağan, 2003, Güney, 2005, Kırac, 2005 and Tiftik, 2016) were utilized. The data collection tool consists of three parts. In the first part of the survey; general questions about users (gender, age, educational status, duration of service), in the second part; 5-likert type evaluation scale in relation to the physical conditions of the office environment where the participants work.

In the spring semester of the 2017-2018 academic year, the aim was to reach all the academic staff at the central campus and the survey was delivered to all academic staff in May 2018 with the support of the students of Usak University Banaz Vocational School Interior Design program for the implementation of the surveys.

Before the implementation of the surveys, participants were given general information about the purpose, scope and method of the study. There was a return from 182 academic staff after the survey application.

The confidence level and sample size according to acceptable error were calculated for the researches.

Calculating the number of samples

$$n = \frac{N.t^2.p.q}{(N-1).d^2+t^2.p.q} \quad 1$$

N = Number of people in the target audience (universe) = 726

p = Probability of the event being studied = 50%

q = Probability of the event under investigation in the target group (1-p) = 50%

t = Value at a certain level of significance (95% confidence level) according to table t (1,96)

d = Accepted sampling error (10%)

$$n = \frac{726.1,96^2 .0,5.0,5}{(726-1).0,1^2+1,96^2.0,5.0,5}$$

n=85

Accordingly, sample size n=85 was calculated at 95.0% confidence level over 0,05 acceptable error. Since the sample count was at least 85, 182 people were sufficient for the sample. The reliability analysis of the questionnaire used in the study yielded a Cronbach Alpha value of 0.730. Official permission was requested from Usak University Rectorate for the survey application, 09/03/2018-E.Permission No. 9420 has been obtained.

Data Analysis



The analysis of survey data was made of using the SPSS 25 SPSS (Statistical Packages for the Social Sciences) package program. The demographic characteristics of the participants, such as their gender, educational status, service period, and age were analyzed using frequency analysis. Survey data for ergonomics of physical environment conditions were graded with 5 likert scale, one way anova test was applied by removing the frequency tables. The comparison of p value below 0,05 was considered statistically significant in the statistical analyses in the study.

3. RESULTS

The findings of the research have been treated as demographics of employees, ergonomics of working spaces and physical environmental conditions. The gender, age, educational level and service period of the personnel included in the study are given in Table 1.

Table 1. Number and percentage distribution of demographic variables

| Demographic Variables | | Frequency (f) | Rate (%) |
|---------------------------------|---------------------|--------------------------|---------------------|
| Gender | Male | 114 | 62,6 |
| | Female | 68 | 37,4 |
| Age | 25-34 | 77 | 42,3 |
| | 35-44 | 46 | 25,3 |
| | 45-54 | 36 | 19,8 |
| | 55 and above | 23 | 12,6 |
| | Research Assistant | 64 | 35,2 |
| Educational Status | Lecturer | 32 | 17,6 |
| | Dr.Lecturer | 10 | 5,5 |
| | Dr.Faculty Member | 53 | 29,1 |
| | Associate Professor | 15 | 8,2 |
| | Professor | 8 | 4,4 |
| Working Time In The Institution | Less than 12 months | 15 | 8,2 |
| | 1-5 Year | 73 | 40,1 |
| | 6-10 Year | 62 | 34,1 |
| | 11-15 Year | 22 | 12,1 |
| | 16-Year Above | 10 | 5,5 |

When the information in Table 1 is analyzed, it is seen that 62,6% of the academic staff participating in the study were male and 37,4% were female. It was determined that 42,3% of lecturers were between the ages of 25-34, 25,3% between the ages of 35-44, 19,8% were 45-44 years old, and 12,6% were 55 years old and over this age. 35,2% of the lecturers participating in the research are research assistants, 29,1% of them are doctor lecturers, 17,6% are lecturers, 8,2% are associate professors, 5,5% are lecturers 4,4 of them were found to be professors. When the term of the academic staff is investigated, 40,1% of the instructors whose opinions are taken within the scope of the research are between 1-5 years, 34,1% of them are between 6-10 years, 12,1% of them are between 11-15 years. It was determined that 8,2% was less than 1 year and 5,5% was 16 years or more.

The frequency, percentage, means and standard deviations of the degree of participation in the statements regarding the ergonomic adequacy of the physical environmental conditions of the office where the participants work are given in Table 2.



Table 2. Participants' views on the physical environmental conditions of the office where they work

| Physical Environmental Conditions of the Office | Very Inadequate | | Inadequate | | Undecided | | Enough | | Very Enough | | x̄ | SS |
|---|-----------------|-----|------------|------|-----------|------|--------|------|-------------|------|------|------|
| | f | % | f | % | f | % | f | % | f | % | | |
| The level of silence of the working places | 5 | 2,9 | 19 | 10,4 | 51 | 28,0 | 96 | 52,7 | 11 | 6,0 | 2,48 | 0,88 |
| The decoration compatibility of the office | 11 | 6,0 | 25 | 13,7 | 40 | 22,0 | 95 | 52,3 | 11 | 6,0 | 2,49 | 0,81 |
| The compatibility of furniture colors in the office | 9 | 4,9 | 26 | 14,3 | 27 | 14,8 | 108 | 59,3 | 12 | 6,6 | 2,48 | 0,80 |
| The usefulness of the furniture in the Office | 2 | 1,1 | 40 | 22,0 | 42 | 23,1 | 82 | 45,1 | 16 | 8,8 | 2,62 | 0,96 |
| Proximity to work-related tools (photocopy, printer, etc.) | 8 | 4,5 | 11 | 6,0 | 21 | 11,5 | 115 | 63,2 | 27 | 14,8 | 2,18 | 0,81 |
| Proximity to other offices you work with | 9 | 4,9 | 19 | 10,4 | 22 | 12,1 | 113 | 62,1 | 19 | 10,4 | 2,37 | 0,98 |
| The space required for your computer, telephone or other equipment in your office | 12 | 6,6 | 15 | 8,2 | 19 | 10,4 | 81 | 44,5 | 12 | 6,6 | 2,84 | 1,11 |
| The planning for the telephone, computer and hardware cables at the desk | 7 | 3,8 | 39 | 21,4 | 27 | 14,8 | 87 | 47,8 | 22 | 12,1 | 2,57 | 1,07 |
| The necessary space to put personal items in the study room | 3 | 1,6 | 27 | 14,8 | 52 | 28,6 | 83 | 45,6 | 17 | 9,3 | 2,54 | 0,91 |
| The suitability of the office furniture for body measurements | 3 | 1,6 | 22 | 12,1 | 23 | 12,6 | 119 | 65,4 | 15 | 8,2 | 2,34 | 0,86 |

According to table 2, it was determined that 58,7% of the participant academic staff found the silence level of the offices sufficient, 58,3% considered decoration compatibility



sufficient, while 20,7% found it insufficient. 65,9% of the participants find that the furniture colors are compatible and 53,9% find the furniture they use in their work areas are useful. 78% of the academic staff stated that they found the proximity of the office they work with to the job related tools (photocopy, printer, etc.) sufficient. 72,5% of the participants find that the proximity of other offices they work with is sufficient. 51,1% of the participants think that there is the necessary space for computers, telephones or other equipment in the study room. While 59,9% of the participants were thinking it is adequate for using telephones, computers, etc. at the desk, 25,2% considered it insufficient. 55,2% of the participants stated that there is not enough space to put personal items in the offices, as well as the opinion that there is enough space to put personal items in the offices (16,4%). 73,6 of the participants stated that office furniture is suitable for their body sizes.

Comparison of the ergonomic competence of the places where the participants work and the physical environmental conditions according to their gender is shown in Table 3.

Table 3. Comparison of the working environment and physical environmental conditions according to the gender of the participants in terms of ergonomics (n = 182)

| Physical Environmental Conditions of the Office | Gender | n | \bar{x} | SS | t | p | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------|----------|-----------------------------|-----------|----------|---------------|---|------|-----|------|------|--------|---------------|--------|----|------|------|---|------|-----|------|------|--------|---------------|--------|----|------|------|---|------|-----|------|------|--------|---------------|--------|----|------|------|---|------|-----|------|------|--------|---------------|--------|----|------|------|---|------|-----|------|------|--------|---------------|--------|----|------|------|---|------|-----|------|------|-------|---------------|--------|----|------|------|--|------|-----|------|------|-------|---------------|--------|----|------|------|---|------|-----|------|------|-------|---------------|--------|----|------|------|---|------|-----|------|------|-------|-------|--------|
| The level of silence of the working places | Male | 104 | 2,46 | 0,88 | -0,290 | 0,772 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Female | 78 | 2,50 | 0,89 | | | The decoration compatibility of the office | Male | 104 | 2,62 | 0,84 | 2,413 | 0,017* | Female | 78 | 2,33 | 0,73 | The compatibility of furniture colors in the office | Male | 104 | 2,69 | 0,75 | 4,261 | 0,000* | Female | 78 | 2,21 | 0,78 | The usefulness of the furniture in the Office | Male | 104 | 2,85 | 0,88 | 3,885 | 0,000* | Female | 78 | 2,31 | 0,98 | Proximity to work-related tools (photocopy, printer, etc.) | Male | 104 | 2,29 | 0,90 | 2,296 | 0,023* | Female | 78 | 2,03 | 0,64 | Proximity to other offices you work with | Male | 104 | 2,33 | 0,89 | -0,744 | 0,458 | Female | 78 | 2,44 | 1,09 | The space required for your computer, telephone or other equipment in your office | Male | 104 | 2,85 | 1,09 | 0,077 | 0,939 | Female | 78 | 2,83 | 1,16 | The planning for the telephone, computer and hardware cables at the desk | Male | 104 | 2,67 | 1,07 | 1,480 | 0,141 | Female | 78 | 2,44 | 1,08 | The necessary space to put personal items in the study room | Male | 104 | 2,93 | 0,87 | 8,020 | 0,000* | Female | 78 | 2,01 | 0,67 | The suitability of the office furniture for body measurements | Male | 104 | 2,38 | 0,73 | 0,900 | 0,369 | Female |
| The decoration compatibility of the office | Male | 104 | 2,62 | 0,84 | 2,413 | 0,017* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Female | 78 | 2,33 | 0,73 | | | The compatibility of furniture colors in the office | Male | 104 | 2,69 | 0,75 | 4,261 | 0,000* | Female | 78 | 2,21 | 0,78 | The usefulness of the furniture in the Office | Male | 104 | 2,85 | 0,88 | 3,885 | 0,000* | Female | 78 | 2,31 | 0,98 | Proximity to work-related tools (photocopy, printer, etc.) | Male | 104 | 2,29 | 0,90 | 2,296 | 0,023* | Female | 78 | 2,03 | 0,64 | Proximity to other offices you work with | Male | 104 | 2,33 | 0,89 | -0,744 | 0,458 | Female | 78 | 2,44 | 1,09 | The space required for your computer, telephone or other equipment in your office | Male | 104 | 2,85 | 1,09 | 0,077 | 0,939 | Female | 78 | 2,83 | 1,16 | The planning for the telephone, computer and hardware cables at the desk | Male | 104 | 2,67 | 1,07 | 1,480 | 0,141 | Female | 78 | 2,44 | 1,08 | The necessary space to put personal items in the study room | Male | 104 | 2,93 | 0,87 | 8,020 | 0,000* | Female | 78 | 2,01 | 0,67 | The suitability of the office furniture for body measurements | Male | 104 | 2,38 | 0,73 | 0,900 | 0,369 | Female | 78 | 2,27 | 1,00 | | | | | | | | |
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| | Female | 78 | 2,44 | 1,08 | | | The necessary space to put personal items in the study room | Male | 104 | 2,93 | 0,87 | 8,020 | 0,000* | Female | 78 | 2,01 | 0,67 | The suitability of the office furniture for body measurements | Male | 104 | 2,38 | 0,73 | 0,900 | 0,369 | Female | 78 | 2,27 | 1,00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The necessary space to put personal items in the study room | Male | 104 | 2,93 | 0,87 | 8,020 | 0,000* | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Female | 78 | 2,01 | 0,67 | | | The suitability of the office furniture for body measurements | Male | 104 | 2,38 | 0,73 | 0,900 | 0,369 | Female | 78 | 2,27 | 1,00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The suitability of the office furniture for body measurements | Male | 104 | 2,38 | 0,73 | 0,900 | 0,369 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Female | 78 | 2,27 | 1,00 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

When the study areas of the participants according to their gender groups and the conditions of finding the physical environment ergonomically adequate are examined. It is seen that men find the required area more than women the decoration compatibility of the office, the compatibility of the furniture colors in the office, the usefulness of the furniture in the office, the proximity to work-related tools (photocopy, printers, etc.) and the necessary space to put personal items in the study room.

It has been determined that there is no significant difference according to the gender of the opinions about the silence level of the work places, the proximity of other offices we work with, the space required for your computer, telephone or other equipment in your office, the planning for the telephone, computer and hardware cables at the desk and the suitability of



the office furniture for body measurements ($p > 0,05$).

Comparison of the ergonomic competence of the places where the participants work and the physical environmental conditions according to their age is shown in Table 4.

Table 4. Comparison of the working environment and physical environmental conditions according to the age of the participants in terms of ergonomics (n = 182)

| Physical Environmental Conditions of the Office | Age | n | \bar{x} | SS | F | p |
|---|--------------|----------|-----------------------------|-----------|----------|---------------|
| The level of silence of the working places | 25-34 | 77 | 2,44 | 0,87 | 0,829 | 0,479 |
| | 35-44 | 46 | 2,59 | 0,91 | | |
| | 45-54 | 36 | 2,56 | 0,97 | | |
| | 54 ve üzeri | 23 | 2,26 | 0,75 | | |
| The decoration compatibility of the office | 25-34 | 77 | 2,49 | 0,82 | 2,725 | 0,046* |
| | 35-44 | 46 | 2,74 | 0,77 | | |
| | 45-54 | 36 | 2,36 | 0,76 | | |
| | 54 ve üzeri | 23 | 2,22 | 0,80 | | |
| The compatibility of furniture colors in the office | 25-34 | 77 | 2,73 | 0,77 | 5,925 | 0,001* |
| | 35-44 | 46 | 2,26 | 0,74 | | |
| | 45-54 | 36 | 2,50 | 0,88 | | |
| | 54 ve üzeri | 23 | 2,09 | 0,60 | | |
| The usefulness of the furniture in the office | 25-34 | 77 | 3,03 | 0,79 | 9,726 | 0,000* |
| | 35-44 | 46 | 2,35 | 0,99 | | |
| | 45-54 | 36 | 2,39 | 0,93 | | |
| | 54 and above | 23 | 2,13 | 0,97 | | |
| Proximity to work-related tools (photocopy, printer, etc.) | 25-34 | 77 | 2,45 | 0,94 | 6,889 | 0,000* |
| | 35-44 | 46 | 1,98 | 0,61 | | |
| | 45-54 | 36 | 2,11 | 0,67 | | |
| | 54 and above | 23 | 1,74 | 0,54 | | |
| Proximity to other offices you work with | 25-34 | 77 | 2,34 | 0,84 | 1,176 | 0,320 |
| | 35-44 | 46 | 2,43 | 1,05 | | |
| | 45-54 | 36 | 2,56 | 1,23 | | |
| | 54 and above | 23 | 2,09 | 0,79 | | |
| The space required for your computer, telephone or other equipment in your office | 25-34 | 77 | 2,94 | 1,10 | 2,261 | 0,083 |
| | 35-44 | 46 | 2,52 | 0,96 | | |
| | 45-54 | 36 | 3,11 | 1,21 | | |
| | 54 and above | 23 | 2,74 | 1,18 | | |
| The planning for the telephone, computer and hardware cables at the desk | 25-34 | 77 | 2,65 | 1,04 | 0,517 | 0,671 |
| | 35-44 | 46 | 2,48 | 1,09 | | |
| | 45-54 | 36 | 2,44 | 1,16 | | |
| | 54 and above | 23 | 2,70 | 1,06 | | |
| The necessary space to put personal items in the study room | 25-34 | 77 | 3,17 | 0,80 | 32,617 | 0,000* |
| | 35-44 | 46 | 2,15 | 0,70 | | |
| | 45-54 | 36 | 2,06 | 0,71 | | |
| | 54 and above | 23 | 1,96 | 0,64 | | |
| The suitability of the office furniture for body measurements | 25-34 | 77 | 2,27 | 0,64 | 0,362 | 0,781 |
| | 35-44 | 46 | 2,43 | 0,91 | | |
| | 45-54 | 36 | 2,36 | 1,10 | | |
| | 54 and | 23 | 2,30 | 0,97 | | |

above

When the study areas of the participants according to their age groups and the conditions of finding the physical environment ergonomically adequate are examined, it is seen that the group that finds the decoration compatibility of the office they work with is very sufficient is the age group of 35-44 and the group that finds it very inadequate is 54 and above. ($P < 0,05$). According to the Tukey test result, the difference was found to be between the ages of 35-44 and 54 and over. The group, who thought the compatibility of furniture colors in the office very sufficient was 25-34 years old, and the group that thought it was very inadequate was 54 and over; according to the Tukey test result, the difference was found to be between the ages 25-34, 45-54, 54 and over 54. The group, who thought the usefulness of the furniture in the office very sufficient was 25-34 years old, and the group that found it very inadequate was 54 and over; according to the Tukey test result, the difference was found to be between the ages of 25-34 and 54 and over. It is seen that the group, which finds its proximity to work-related tools (photocopy, printer, etc.) very sufficient is 25-34 years old and the very inadequate group is 54 years old and over. ($p < 0,05$). According to the Tukey test result, the difference was found to be between the ages of 25-34 and 45-54 and 54 and over. It is seen that the group, who found the necessary space to put personal items in the study room very sufficient is 25-34 years old and the very inadequate group is 54 and over. ($p < 0,05$).

The level of silence of the working places, the proximity of other offices we work with, the space required for your computer, telephone or other equipment in your office, the planning for the telephone, computer and hardware cables at the desk and the suitability of the office furniture for body measurements are not significant ($p > 0,05$).

The comparison of the places where the participants work and the physical environmental conditions in terms of ergonomic competence according to their staff is shown in Table 5.

Table 5. Comparison of the working places and the physical environmental conditions according to the staff of the participants in terms of ergonomics (n=182)

| Physical Environmental Conditions of the Office | Academic Staff | n | \bar{x} | SS | F | p |
|---|---------------------|----|-----------|------|-------|---------------|
| The level of silence of the working places | Research Assistant | 64 | 2,53 | 0,85 | 0,511 | 0,768 |
| | Lecturer | 32 | 2,38 | 0,94 | | |
| | Dr.Lecturer | 10 | 2,50 | 0,97 | | |
| | Dr.Faculty Member | 53 | 2,57 | 0,93 | | |
| | Associate Professor | 15 | 2,27 | 0,88 | | |
| | Professor | 8 | 2,25 | 0,46 | | |
| The decoration compatibility of the office | Research Assistant | 64 | 2,44 | 0,81 | 2,925 | 0,015* |
| | Lecturer | 32 | 2,84 | 0,77 | | |
| | Dr.Lecturer | 10 | 2,90 | 0,99 | | |
| | Dr.Faculty Member | 53 | 2,40 | 0,72 | | |
| | Associate Professor | 15 | 2,07 | 0,70 | | |
| | Professor | 8 | 2,50 | 0,93 | | |
| The compatibility of furniture colors in the office | Research Assistant | 64 | 2,80 | 0,80 | 5,268 | 0,000* |
| | Lecturer | 32 | 2,59 | 0,67 | | |
| | Dr.Lecturer | 10 | 2,30 | 0,48 | | |
| | Dr.Faculty | 53 | 2,25 | 0,85 | | |



| | Member | | | | | | |
|---|---------------------|---------------------|------|------|-------|---------------|---------------|
| | Associate Professor | 15 | 2,27 | 0,59 | | | |
| | Professor | 8 | 1,75 | 0,46 | | | |
| The usefulness of the furniture in the Office | Research Assistant | 64 | 3,05 | 0,81 | | | |
| | Lecturer | 32 | 2,75 | 0,80 | | | |
| | Dr.Lecturer | 10 | 1,70 | 0,67 | | | |
| | Dr.Faculty Member | 53 | 2,40 | 1,01 | 7,405 | 0,000* | |
| | Associate Professor | 15 | 2,20 | 1,08 | | | |
| | Professor | 8 | 2,00 | 0,76 | | | |
| | | Research Assistant | 64 | 2,52 | 0,93 | | |
| Proximity to work-related tools (photocopy, printer, etc.) | Lecturer | 32 | 2,06 | 0,72 | | | |
| | Dr.Lecturer | 10 | 1,60 | 0,70 | | | |
| | Dr.Faculty Member | 53 | 2,13 | 0,65 | 5,408 | 0,000* | |
| | Associate Professor | 15 | 1,80 | 0,56 | | | |
| | Professor | 8 | 1,63 | 0,52 | | | |
| | | Research Assistant | 64 | 2,38 | 0,83 | | |
| | | Lecturer | 32 | 2,38 | 1,04 | | |
| Proximity to other offices you work with | Dr.Lecturer | 10 | 1,80 | 0,42 | | | |
| | Dr.Faculty Member | 53 | 2,60 | 1,18 | 1,712 | 0,134 | |
| | Associate Professor | 15 | 2,07 | 0,96 | | | |
| | Professor | 8 | 2,13 | 0,35 | | | |
| | | Research Assistant | 64 | 2,95 | 1,08 | | |
| | | Lecturer | 32 | 2,78 | 1,07 | | |
| | | Dr.Lecturer | 10 | 2,20 | 1,03 | | |
| The space required for your computer, telephone or other equipment in your office | Dr.Faculty Member | 53 | 2,91 | 1,16 | 0,883 | 0,494 | |
| | Associate Professor | 15 | 2,73 | 1,28 | | | |
| | Professor | 8 | 2,75 | 1,04 | | | |
| | | Research Assistant | 64 | 2,75 | 1,02 | | |
| | | Lecturer | 32 | 2,56 | 1,11 | | |
| | | Dr.Lecturer | 10 | 2,80 | 1,32 | | |
| | | Dr.Faculty Member | 53 | 2,26 | 1,04 | 1,397 | 0,228 |
| The planning for the telephone, computer and hardware cables at the desk | Associate Professor | 15 | 2,67 | 1,05 | | | |
| | Professor | 8 | 2,75 | 1,16 | | | |
| | | Research Assistant | 64 | 3,20 | 0,82 | | |
| | | Lecturer | 32 | 2,69 | 0,69 | | |
| | | Dr.Lecturer | 10 | 1,80 | 0,63 | 20,430 | 0,000* |
| | | Dr.Faculty Member | 53 | 2,04 | 0,71 | | |
| | | Associate Professor | 15 | 1,93 | 0,59 | | |



| | | | | | | |
|---|---------------------|----|------|------|-------|---------------|
| The suitability of the office furniture for body measurements | Professor | 8 | 2,00 | 0,76 | 2,600 | 0,027* |
| | Research Assistant | 64 | 2,31 | 0,61 | | |
| | Lecturer | 32 | 2,38 | 0,87 | | |
| | Dr.Lecturer | 10 | 3,20 | 0,79 | | |
| | Dr.Faculty Member | 53 | 2,19 | 0,98 | | |
| | Associate Professor | 15 | 2,40 | 1,06 | | |
| | Professor | 8 | 2,13 | 0,83 | | |

According to the staff of the academic staff participating in the research, it is seen that the academic staff who find the decoration compatibility of their office very satisfactory are lecturer and the academic staff who find it very inadequate are the professors who find the decoration compatibility of their office very adequate. ($p < 0,05$). According to the Tukey test result, the difference was found to be between the associate professor and the lecturers. The academic staff who found the compatibility of the furniture colors in the office very satisfactory was the research assistant and the academic staff who found it very insufficient was the professor; according to the Tukey test result, the difference was found to be between the professor and the research assistant and the teaching staff. The academic staff who think the usefulness of the furniture in the office very sufficient, and the academic staff who think it is very inadequate are the lecturers; according to the tukey test result, it was determined that the difference was among the doctor lecturers, professors, associate professors, and lecturers. It is seen that the academic staff who think the proximity to work-related tools (photocopy, printers, etc.) very sufficient, and the academic staff who find it very insufficient are doctors. ($p < 0,05$). According to the Tukey test result, the difference was found to be between the doctor lecturer and the associate professor and research assistant staff. It is seen that the academic staff who find the necessary space to put personal items in the study room very well is a research assistant and the very inadequate group is a teaching assistant. ($p < 0,05$). According to the results of the Tukey test, it was determined that the group, who thought the necessary area to put personal items very well was among the titles of doctor lecturer, professor, lecturer and research assistant. It is seen that the academic staff who find the suitability factor of the office furniture suitable for their body sizes very well is a doctor lecturer and the very inadequate group is a professor. ($p < 0,05$). According to the results of the Tukey test, it was determined that the group, who think the necessary space to put personal items very well was among the staff of the doctor lecturer, professor and lecturer.

It has been determined that the level of silence of the working places, the proximity of other offices we work with, the space required for your computer, telephone or other equipment in your office and the planning for the telephone, computer and hardware cables at the desk do not differ significantly ($p > 0,05$).

The comparison of the places where the participants work and the physical environmental conditions according to the seniority of their ergonomic adequacy is shown in Table 6.

Table 6. Comparison of work places and physical environmental conditions ergonomically according to the seniority of the participants (n=182).

| Physical Environmental Conditions of the Office | Academic Seniority | n | \bar{x} | SS | F | p |
|---|---------------------|----|-----------|------|-------|-------|
| The level of silence of the working places | Less than 12 months | 15 | 2,53 | 0,83 | 1,049 | 0,383 |
| | 1-5 Year | 73 | 2,44 | 0,90 | | |
| | 6-10 Year | 62 | 2,63 | 0,93 | | |
| | 11-15 Year | 22 | 2,23 | 0,87 | | |



| | | | | | | |
|---|---------------------|----|------|------|--------|---------------|
| | 16-Year Above | 10 | 2,30 | 0,48 | | |
| | Less than 12 months | 15 | 2,47 | 0,83 | | |
| The decoration compatibility of the office | 1-5 Year | 73 | 2,55 | 0,82 | 3,290 | 0,012* |
| | 6-10 Year | 62 | 2,65 | 0,77 | | |
| | 11-15 Year | 22 | 1,95 | 0,58 | | |
| | 16-Year Above | 10 | 2,40 | 0,97 | | |
| | Less than 12 months | 15 | 2,47 | 0,64 | | |
| The compatibility of furniture colors in the office | 1-5 Year | 73 | 2,77 | 0,79 | 5,090 | 0,001* |
| | 6-10 Year | 62 | 2,29 | 0,80 | | |
| | 11-15 Year | 22 | 2,36 | 0,73 | | |
| | 16-Year Above | 10 | 1,90 | 0,57 | | |
| | Less than 12 months | 15 | 2,93 | 0,96 | | |
| The usefulness of the furniture in the Office | 1-5 Year | 73 | 3,00 | 0,76 | 7,470 | 0,000* |
| | 6-10 Year | 62 | 2,27 | 0,94 | | |
| | 11-15 Year | 22 | 2,32 | 1,17 | | |
| | 16-Year Above | 10 | 2,10 | 0,74 | | |
| | Less than 12 months | 15 | 2,93 | 0,96 | | |
| Proximity to work-related tools (photocopy, printer, etc.) | 1-5 Year | 73 | 2,27 | 0,87 | 6,401 | 0,000* |
| | 6-10 Year | 62 | 2,06 | 0,67 | | |
| | 11-15 Year | 22 | 1,91 | 0,53 | | |
| | 16-Year Above | 10 | 1,60 | 0,52 | | |
| | Less than 12 months | 15 | 2,73 | 1,03 | | |
| Proximity to other offices you work with | 1-5 Year | 73 | 2,22 | 0,77 | 2,977 | 0,021* |
| | 6-10 Year | 62 | 2,63 | 1,20 | | |
| | 11-15 Year | 22 | 2,09 | 0,81 | | |
| | 16-Year Above | 10 | 2,00 | 0,47 | | |
| | Less than 12 months | 15 | 2,73 | 0,96 | | |
| The space required for your computer, telephone or other equipment in your office | 1-5 Year | 73 | 2,96 | 1,12 | 0,363 | 0,835 |
| | 6-10 Year | 62 | 2,76 | 1,13 | | |
| | 11-15 Year | 22 | 2,82 | 1,26 | | |
| | 16-Year Above | 10 | 2,70 | 0,95 | | |
| | Less than 12 months | 15 | 2,80 | 1,01 | | |
| The planning for the telephone, computer and hardware cables at the desk | 1-5 Year | 73 | 2,62 | 1,04 | 0,815 | 0,517 |
| | 6-10 Year | 62 | 2,40 | 1,15 | | |
| | 11-15 Year | 22 | 2,59 | 1,01 | | |
| | 16-Year Above | 10 | 2,90 | 1,10 | | |
| | Less than 12 months | 15 | 3,73 | 0,96 | | |
| The necessary space to put personal items in the study room | 1-5 Year | 73 | 2,93 | 0,71 | 25,975 | 0,000* |
| | 6-10 Year | 62 | 2,02 | 0,64 | | |
| | 11-15 Year | 22 | 2,09 | 0,87 | | |
| | 16-Year Above | 10 | 2,10 | 0,74 | | |
| | Less than 12 months | 15 | 2,60 | 0,74 | | |
| The suitability of the office furniture for body measurements | 1-5 Year | 73 | 2,25 | 0,66 | 0,788 | 0,534 |
| | 6-10 Year | 62 | 2,39 | 1,03 | | |
| | 11-15 Year | 22 | 2,23 | 0,87 | | |
| | 16-Year Above | 10 | 2,50 | 1,08 | | |
| | Less than 12 months | 15 | 2,60 | 0,74 | | |



When the conditions of finding the physical environmental conditions of the working places according to the seniority of the academic staff participating in the research are found to be ergonomically adequate, it is seen that the group that finds the decoration compatibility of the office they work with is sufficient for 6-10 years and the group that finds it very insufficient is 11-15 years ($p < 0,05$). According to the Tukey test result, the difference was found to be between 11-15 years and 6-10 years and 16 years and more. The group that found the compatibility of furniture colors in the office very sufficient is 1-5 years, and the group that finds it very inadequate is 16 years and over 16 years; according to the tukey test result, the difference was found to be between 1-5 years and 6-10 years and seniors with 16 years or more. The group that found the usefulness of the furniture in the office very sufficient was 1-5 years, and the group that found it very inadequate was 16 years and over 16 years; according to the tukey test result, the difference was found to be between 1-5 years and 11-15 years and seniors with 16 years or more. It is seen that the group that finds it proximity to business related tools (photocopy, printer, etc.) very sufficient is less than 12 months and the group that finds it very insufficient is 16 years or more. ($p < 0,05$). According to the Tukey test result, the difference was found to be between the groups with less than 12 months, 11-15 years and 6-10 years and seniority of 16 years or more. It is seen that the group, which finds the proximity of the other offices you work with very well, is less than 12 months and the group that finds it very inadequate has 16 years or more. ($p < 0,05$). According to the Tukey test result, the difference was found to be between the groups with seniority less than 12 months and over 16 years. It is seen that the group, which found the necessary space to put personal items in the study room, less than 12 months, and the group, who found it very inadequate, had 6-10 seniority. ($p < 0,05$). According to the Tukey test result, the difference was found to be between the groups with seniority less than 12 months and over 16 years. It is seen that the group, which found the necessary space to put personal items in the study room, less than 12 months, and the group, who found it very inadequate, had 6-10 seniority. ($p < 0,05$). According to the Tukey test result, the difference was found to be less than 12 months between the groups of 1-5 years and 6-10 years.

Teaching staff; it has been determined that there is no significant difference according to the seniority of the opinions about the silence level of the work places, the space required for your computer, telephone or other equipment in your office and the adaptation of the office furniture to the measurements of the phone, computer and hardware cables at the desk ($p > 0,05$).

4. CONCLUSION

With this study, it was tried to investigate whether the ergonomic adequacy of the physical environment conditions in the offices differ significantly according to the demographic characteristics of the academic staff working at Usak University. In this context, a questionnaire was applied to the academic staff working in the offices, and the results of the survey were evaluated by entering the SPSS program. According to the results of the study, the majority of the participants were male (62,6%), mostly (42,3%) were in the second rank in the 25-34 age group (25,3%), mostly (35,2%). It was observed that they were mostly (29,1%) lecturer, mostly (40,1%) their seniority was between 1-5 years, and mostly (34,1%) were between 6-10 years.

When investigating the ergonomically adequate conditions of the working places and physical environmental conditions according to the gender of the participants, the decoration compatibility of the office they work with, the compatibility of the furniture colors in the office, the usefulness of the furniture in the office, the closeness to the work-related tools (photocopy, printer, etc.) and personal items in the study room it is seen that men find the required area more than women. The level of silence of the working places, the proximity of other offices we work with, the space required for your computer, telephone or other equipment in your office, planning for telephone, computer and hardware cables at the desk and the suitability of office furniture for body measurements are not significant for gender ($p > 0,05$).



When the ergonomic adequacy conditions of the working places and physical environmental conditions according to the age groups of the participants were examined according to the age groups; 25-34 of the group, who found the decoration compatibility of the office very adequate, who found 35-44 years old, the compatibility of the colors of the furniture in the office, the usefulness of the furniture, the closeness to work-related tools (photocopy, printer, etc.) and the space required to put personal items in the study room they seem to be among the age groups.

The level of silence of the working places, the proximity of other offices we work with, the space required for your computer, telephone or other equipment in your office, the planning for the telephone, computer and hardware cables at the desk and the suitability of the office furniture for body measurements are not significant ($p>0,05$).

When the ergonomic adequacy conditions of the physical environment conditions of the working places of the teaching staff participating in the research are examined according to their staff; It is seen that the academic staff who find the decoration compatibility of the office and the suitability of office furniture to body sizes are very proficient. It has been determined that the academic staff who find the compatibility of the furniture colors in the office, the usefulness of the furniture, the proximity to the work-related tools (photocopier, printer, etc.), and the space required to put personal items in the study room are sufficient. The silence level of the working places, the proximity of the other offices we work with, the space required for your computer, telephone or other equipment in your office and the planning for the telephone, computer and hardware cables at the work desk did not differ significantly from their staff ($p>0,05$).

When the ergonomic adequacy conditions of the physical environment conditions of the working places of the participants were examined according to their seniority in the institution, it was determined that the group, who found the decoration compatibility of the office they work very satisfactory, was between the groups with 6-10 years seniority and 1-5 years of the group who found the compatibility of the furniture colors in the office very useful. It is seen that the group with a seniority of less than 12 months has a very sufficient group for the closeness to work related tools (photocopy, printer, etc.), the proximity of other offices you work with, and the space required to put personal items in the study room.

It has been determined that there is no significant difference according to the seniority of the opinions about the silence level of the work places, the space required for your computer, telephone or other equipment in your office and the adaptation of the office furniture to the measurements of the phone, computer and hardware cables at the desk for teaching staffs. ($p>0,05$).

Furniture and equipment used in offices rather than producing standard, it is necessary to rebuild the academic staff according to their wishes and demands.

TEŞEKKÜR

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