

## ERGONOMICAL ANALYSIS OF WORK ENVIRONMENTS OF CUSTOMER REPRESENTATIVES WORKING IN CALL CENTERS

\* Elif ÇELENK KAYA

\*\* Mehmet Merve ÖZAYDIN

\*\*\* Necla İrem ÖLMEZOĞLU

### ABSTRACT

“İşbilimi” meaning of ergonomics-related studies are gaining more importance with each passing day. However, the call center industry in the world, in Turkey, 11.5 million more than 30,000 people running. With each passing day, this number is increased even further if you think about the employees ' ergonomic design of the business environment is very important in terms of business efficiency. We're in the same position for a long time employees, the work carried out by the appropriate table, Chair, or in the case of strongly support equipment, back pain, neck or shoulder injury, such as pain in the legs or feet, muscle and skeletal system diseases, circulatory system disorders can also be confronted with serious health problems, In addition, ambient lighting, noise, and some physical risk factors such as thermal comfort of employees on productivity is extremely important. In this context, the aim of this study was to study the suitability of the conditions of ergonomic aspects in mind when in a call center is intended to investigate the problems of employees ' ergonomic. In the study, call center employees made the implementation of the survey results in the SPSS package program by using statistical analysis methods with interpreted and evaluated.

Key word: 1. ergonomics, 2. call center, 3. Work Environment

---

\* Doç.Dr., Gümüşhane Üniversitesi, Sağlık Yüksekokulu, İş Sağlığı ve Güvenliği Bölümü, elifcelenk1629@hotmail.com

\*\* Doç.Dr., Gazi Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Çalışma Ekonomisi ve Endüstri İlişkileri Bölümü, ozaydin@gazi.edu.tr

\*\*\* Arş.Gör, Gümüşhane Üniversitesi, Sağlık Yüksekokulu, İş Sağlığı ve Güvenliği Bölümü, neclairer@hotmail.com

## ÇAĞRI MERKEZİNDE ÇALIŞAN MÜŞTERİ TEMSİLCİLERİNİN ÇALIŞMA ORTAMLARININ ERGONOMİK ANALİZİ

### ÖZ

İşbilimi anlamına gelen ergonomi ile ilgili çalışmalar her geçen gün daha da önem kazanmaktadır. Bununla birlikte çağrı merkezi sektöründe, dünyada 11,5 milyon, Türkiye’de ise 30 binden fazla insan çalışmaktadır. Her geçen gün bu sayının daha da arttığı düşünülecek olursa, çalışanların iş ortamlarının ergonomik dizaynı iş verimliliği açısından oldukça önemlidir. Çalışanlar uzun süre aynı pozisyonda kaldıklarında, yaptıkları işe uygun masa, sandalye veya destek ekipmanları kullanmamaları durumunda, sırt ağrısı, boyun ya da omuz incinmesi, ayak ya da bacaklarda ağrı gibi kas ve iskelet sistemi hastalıkları, dolaşım sistemi bozuklukları gibi ciddi sağlık problemleriyle karşı karşıya kalabilirler. Bunun yanı sıra ortamdaki aydınlatma, gürültü, termal konfor gibi bazı fiziksel risk etmenleri de çalışanların verimliliği üzerinde son derece önemlidir. Bu bağlamda, bu çalışmada çalışma koşullarının ergonomik açıdan uygunluğu düşünülerek bir çağrı merkezinde çalışanların ergonomik problemlerinin araştırılması amaçlanmıştır. Çalışmada, çağrı merkezi çalışanlarına anket uygulanması yapılmış sonuçlar SPSS paket programı kullanılarak istatistiksel analiz yöntemleriyle değerlendirilip yorumlanmıştır.

Anahtar sözcükler: 1.Ergonomi, 2.Çağrı merkezi, 3.Çalışma Ortamları

## **INTRODUCTION**

Call centers that are developing in accordance with rapid technological improvement and with changing customer satisfaction, became an irreplaceable factor for the companies in today's competition environment. In a period that contains a rapidly increasing competition, easy accessible customers and hard-maintained faithfulness, the biggest difference that companies may create against selective demands of customers is to listen their complaints and to offer the best solutions. At this point, call centers, which act as a bridge between the customer and the company, have an important role as they're easily accessible for the customers, as they contribute to company development by ensuring transmission and evaluation customer demands and requests, and as they enhance the relationship between the company and the customer.

First known call center is the one that was established by Ford Company in 1960s in order to make their customers to notify faulty products. Ford and A&T Company have formed hotlines beginning with 800. The company has rendered toll-free services and proved the necessity to other companies, and then other companies accepted the concept of customer services by toll-free consumer hotlines. In the course of time, call centers became a sector.

Matters such as the design of working place, necessary physical arrangements according to ergonomic conditions of this call center sector that is increasing in importance day after day, became evenly significant. In this

study, a detailed analysis has been conducted for understanding the thoughts of customer representatives working at these call centers in regard to their work environment and conditions. On the other hand, in addition to literature survey, this study has been applied to 290 customer representatives in a call center. As a result of the study; advices on the measures necessary to be taken are given considering the matters which the call center employees see as deficiency and feel uncomfortable with.

## **I. DEFINITION OF ERGONOMICS**

Ergonomics addresses the research and development studies in numerous areas in the industrial world, with a human factor engineering approach as a specific-targeted “combined scientific field”. Scientists who offered the term “ERGONOMICS” which we can express as “human engineering”, desired to ensure the lifelong productivity of human existence and to protect the productive existence of self-improving and strong human by scientific laws. Like the balance and laws of nature, human existence has its own ability, capacity and work power aspects (Erkan, 1996:19). Main purpose of field of occupation of ergonomics is productivity of human factor and its integration in the system, and humanization of working life.

As a result; ergonomics is a multidiscipline research and development area that tries out to set forth the basic law on system productivity and human-machine-environment harmony against organic and psychosocial stress that

may arise from all factors in work environment considering anatomical features, anthropometric characteristics and physiological capacity and tolerance of human (Erkan, 2003:22).

## **II. IMPORTANCE AND PURPOSE OF ERGONOMICS**

Ergonomic approaches in companies that carry out activities in private sector differ greatly. Ergonomic designs which should be placed among the priorities of companies, are sometimes deemed as a luxury preference. However, these preferences which are deemed luxury, affect both productivity of employees and profit maximization of the companies. Employees interact with work environment. Rapid development of the industry brought up the issue of protecting the employees against occupational accidents and diseases, and introduced the concept of ergonomics. When it is considered that working people spend most part of their days in their workplaces, the necessity and importance to eliminate various factors that affect employees' health adversely becomes explicit (Demirdiler and Üçdoğruk, 1995:605). This precision raised the importance of ergonomics and entailed ergonomic design of workplaces.

Purpose of ergonomics is to increase productivity of human in working with machines and tools by determining the machines and environmental conditions proper to natural features of human and by taking necessary measures (Yavuzcan, Acar and Çolak, 1987:57).

### **III. CALL CENTER SECTOR**

#### **A. Information on the Sector (Call Center)**

Call center is, in the simplest definition, a communication unit which answers the calls from their customers, suppliers, vendors of companies and other third parties, starts transactions arising from the calls when necessary, transfers the calls to relevant departments and makes external calls according to the job requirements.

Call center service that was put into practice towards the end of 1960s in the USA in order to pay attention to demands and requests, has been positioned as the optimum environment for determining customer requirements, ensuring their satisfaction and gaining their faithfulness through communications established by means of communication sources with customers expanded by developing technology, telecommunication infrastructure, internet access, mobile communication usage within the process. With the communication channels arising out of developing technology, call centers have been named with different titles such as “customer interaction center, customer contact center, customer support center, customer communication center, customer services center, support line, technical support center, information desk, help desk” according to the qualification of the rendered service and to the channel range. Call centers transformed to “Customer Contact Centers” that manage the communication in all channels by the introduction of channels such as fax, mail, e-mail, and chat over internet beside the calls from telephone in time.

As of 2010, 130.000 call centers, 8,8 million call desks and 11,5 million call center employees render service in call center sector which creates a sector of approximately 340-billion USD in the world (ÇSGB İş Teftiş Kurulu Raporu, 2013.17).

### **B. Regional Distribution of Call Center Sector in the World**

Call center sector is evaluated in 4 regions namely Europe, Middle East and Africa Region abbreviated as EMEA, North America Region, Latin America Region and Asia-Pacific Region in the world. Europe, Middle East and Africa Region (EMEA) of which our country is a part, owns %29,7 of the call center sector and this region has not reached its sectorial saturation level. England owns %23 and Germany owns %13 of the shares in the region.

When we look worldwide, North America Region owns %42 of the shares in the sector in call desk distribution and keeps the leading position. In 2012, call desk number in North America constituted %19,7 of Asia-Pacific Region World call center sector. It's expected that growth of world call center sector in general will be %3,2, and regional growth will be %5,1 by years. Countries having the biggest shares of the region are: India %30, China %23, Japan %21 and Australia-New Zealand %10. Latin America Region constitutes %8,6 of the world call center sector, and its annual growth rate is above the world average like EMEA and Asia-Pacific Regions.

Countries with the biggest share in the region are: Brazil %56 and Mexico %24 (ÇSGB İş Teftiş Kurulu Raporu, 2013.17).

### C. Volume and Employment Generation of Call Center Sector in Turkey

Call center sector in Turkey which has a history of about 8-10 years, draws attention with its rapid development as a result of technological advancement in recent years. In 2000, sectorial growth has been %4 in reference to the previous year. In Call Centers Association reports, it has been determined that this growth was actualized mainly in outsourcer service provider companies, that number of call centers is approximately 1000, however about 300 workplaces have a seat capacity of 5 and above when considered in respect of call center desk number. Number of the employees that work / will work in the sector is given in the following figure graphically by years.



**Figure 1:** Number of Employees that Work / Will Work in Call Center Sector by Years



As it's understood from the graphic, number of the employees in the sector was 40.000 in 2010 and it has reached to 58.500 in 2012. Current number of employees in the sector is expected to reach 85.000 in 2015 with the current growth rate. Therefore, amount of increase in the number of employees in the sector is above %100 within 5 years. Factors for this rapid growth in the sector are; development in finance, in telecommunication sectors and in technology, professionalization trend in public services and pioneering role of labor intensive sectors in struggle with unemployment in recent years, and regional promotion applied by government for improvement in regions with low development level (ÇSGB İş Teftiş Kurulu Raporu, 2013.17).

#### **IV. RESEARCH SUBJECT**

Research subject is; studying and evaluating the work environment of customer representatives in a call center rendering service in private sector in Gümüşhane province in terms of ergonomics.

##### **A. IMPORTANCE OF RESEARCH**

Data obtained in consequence of this research, was evaluated and interpreted via SPSS program and shared with senior managers in order to make up the shortages and to increase productivity, and advices were given in regard of necessary changes to be made.

##### **B. RESEARCH MODEL**

Questionnaire model shall be approached in the research. Frame

survey of ergonomics and productivity is conducted below:

General information on customer representatives: Gender, Age, Educational Background, Term of Employment.

Ergonomics: Discomforts in workplaces, working conditions, improvement of layout.

### **C. POPULATION AND SAMPLE**

Population of this research comprises of 80 administrative, technical and auxiliary personnel and 300 customer representatives working in a call center rendering service in private sector in Gümüşhane province in 2015. Sample of the population of 380 persons comprises of 300 customer representatives who carry on the same business with same working conditions. Questionnaire is conducted to 300 customer representatives with required qualifications, and 290 personnel returned the questionnaire.

### **D. DATA COLLECTION TECHNIQUE**

Perceptions of customer representatives in regard to arrangements in their work environment are used as data in this research. These perceptions are expressed numerically and are variable-type data. Questionnaire technique is used in the collection of data in regard to determination of ergonomic arrangements. Demographic information is used for data collection. Questionnaire is prepared as single form and includes 35 questions. Questionnaire comprises of 5 sub-factors. These are 1. demographic information, 2. evaluations on lighting in offices, 3. evaluations

on air conditioning, 4. evaluations on noise, 5. evaluations on furniture and working area. Data obtained from the research is evaluated by using SPSS (Statistical Page Program for Social Science) program.

### E. RELIABILITY ANALYSIS

Reliability defines the level of being independent from any fault. Reliability of a scale is determined by its production of consistent, balanced and recurring results. In this research, Cronbach  $\alpha$  value is used in determination of scale reliability (Ceylan, Çöl, Gül, 2005:45). Cronbach  $\alpha$  values of the scale used in this study are implemented through SPSS statistic program. Cronbach  $\alpha$  value shows weighted standard variation average found by proportioning total error variations to general variation in a scale (Özdamar, 1999:513).

Cronbach  $\alpha$  value of the study is:

Cronbach's Alpha	N of Items
,744	35

### F. FINDINGS RECEIVED FROM THE RESEARCH

In a research conducted in a call center in Gümüşhane, competency and incompetency of the work environment in terms of ergonomics are studied and interpreted according to the findings received from the research.

**Table 1: General Information on Call Center Customer Representatives**

Gender Information of Customer Representatives
--

VALUE	NUMBER	PROPORTION
Female	202	69,7
Male	88	30,3
Total	290	100,0
<b>Age Information of Customer Representatives</b>		
VALUE	NUMBER	PROPORTION
24 and under	176	60,7
Between 25-30	100	34,5
Between 31-36	12	4,1
Between 37-42	2	,7
Total	290	100,0
<b>Educational Information of Customer Representatives</b>		
VALUE	NUMBER	PROPORTION
Primary school	5	1,7
High school	61	21,0
Üni.(still continuing)	144	49,7
University	80	27,6
Total	290	100,0
<b>Term of Employment of Customer Representatives</b>		
VALUE	NUMBER	PROPORTION
0-5 years	257	88,6
6-10 years	25	8,6
11-15 years	7	2,4
21 years and above	1	,3
Total	290	100,0
<b>Which of the health problems below resulting from your job did you encounter?</b>		
DEĞER	SAYI	ORAN
Worn out vocal cords	58	20,0
Vascular disorders (cystitis, high cholesterol, etc.)	7	2,4
Musculoskeletal disorders (lumbar, back, neck pain, etc.)	106	36,6
Worn out throat	45	15,5
Psychological disorders	29	10,0
Blank	45	15,5
Total	290	100,0

According to a study conducted by Call Center Employees Association (July 2013), approximately 30.000 employees work in call



1- Do you feel comfortable with the lighting in your working area?	101	34,8	189	65,2	0	0	290	100,0
2- Do you have a personal light in addition to the general lighting in your work environment?	20	6,9	269	92,8	1	,3	290	100,0
3- Are the windows behind or near the working area?	237	81,7	51	17,6	2	,7	290	100,0
4- Do the windows have adjustable shades?	257	88,6	33	11,4	0	0	290	100,0
5- Is the defective lighting equipment fixed immediately?	176	60,7	100	34,5	14	4,8	290	100,0

**Table 3: Evaluations of Call Center Customer Representatives in regard to Air Conditioning**

Questions about Air Conditioning	YES		NO		NO IDE		TOTAL	
	NUMBER	PROPORTION	NUMBER	PROPORTION	Number	PROPORTION	NUMBER	PROPORTION
1- Is the interior air clean and healthy?	141	48,6	147	50,7	2	,7	290	100,0
2- Is there any air conditioning system in the work environment?	180	62,1	97	33,4	13	4,5	290	100,0
3- Does the air conditioning system work in good order?	119	41,0	107	36,9	64 (blank)	22,1	290	100,0
4- Is there cigarette smoke or carbon dioxide resulting from human breathing in your office?	77	26,6	207	70,3	9	3,1	290	100,0
5- Are the temperature and humidity values in the work environment monitored periodically?	111	38,3	170	58,6	9	3,1	290	100,0

**Table 4: Evaluation of Noise Status in Call Centers**

Questions about Evaluation of Noise	YES		NO		NO IDEA		TOTAL	
	NUMBER	PROPORTION	NUMBER	PROPORTION	Number	PROPORTION	NUMBER	PROPORTION
1- Are the ceilings and walls covered with noise reducing equipment?	142	49,0	126	43,4	22	7,6	290	100,0
2- Is noise level measured and recorded in your workplace?	58	20,0	220	75,9	12	4,1	290	100,0
3- Is the noise level non-disturbing?	137	47,2	143	49,3	10	3,4	290	100,0
4- Is the inter-personal oral communication performed easily in the work environment?	226	77,9	56	19,3	8	2,8	290	100,0
5- Are telephone and bell equipment replaced with other non-disturbing voiced or luminous signs?	113	39,0	152	52,4	25	8,6	290	100,0

**Table 5: Evaluations of Employees in regard to Office Equipment and Working Area**

Questions about Furniture and Working Area	YES		NO		NO IDE		TOTAL	
	NUMBER	PROPORTION	NUMBER	PROPORTION	Number	PROPORTION	NUMBER	PROPORTION
1- Is the chair / sitting material designed in a manner that its feet are flat on the floor and hips and knees can be bent at proper angle?	104	35,9	177	61,0	9	3,1	290	100,0
2-Does the seat place recline?	126	43,4	152	52,4	12	4,1	290	100,0
3-Is the seat height adjustable?	216	74,5	65	22,4	9	3,1	290	100,0

4- Is the seat place surface covered with a fabric allowing comfortable longtime working?	122	42,1	159	54,8	9	3,1	290	100,0
5- Is front edge of the seat material rounded in order to not cut into the backs of knees or block blood stream?	129	44,5	154	53,1	7	2,4	290	100,0
6- Is the backrest height adjustable?	117	40,3	164	56,6	9	3,1	290	100,0
7- Is there a screen saver on the screen of your work computer?	55	19,0	227	78,3	8	2,8	290	100,0
8- Do you feel uncomfortable in your ears with continuous usage of headsets?	189	65,2	93	32,1	8	2,8	290	100,0
9- Is there sufficient area to separate different tasks / documents in your working area?	176	60,7	94	32,4	20	6,9	290	100,0
10- Do you feel uncomfortable with being continuously within the sight of other persons?	131	39,0	152	52,4	25	8,6	290	100,0
11- Do you have a chance to decorate and make changes in your working place?	157	54,1	125	43,1	8	2,8	290	100,0
12- Are open wires and disordered electric equipment in the working area arranged in a manner that they do not bother the employees?	150	51,7	132	45,5	8	2,8	290	100,0
13- Are edges of your work table flat and rounded?	230	79,3	53	18,3	7	2,4	290	100,0
14- Are the file cabinets arranged as not requiring slanting and reaching?	176	60,7	100	34,5	14	4,8	290	100,0
15- Is your work affected adversely due to the misplacement of table, chair and cabinets in your workplace?	106	36,6	177	61,0	7	2,4	290	100,0



## **CONCLUSION AND EVALUATION**

In this study, factors that affect the work environment such as lighting, air conditioning, noise, office furniture, etc. are examined, and conveniences to be brought by ergonomics to working conditions, and necessity to provide optimum conditions in order to make the employees comfortable in work environment, to make them feel that they live while working is underlined. Based on the fact that ensuring proper conditions affects the productivity of employees positively, actions to be done and measures to be taken are emphasized in order to keep the environmental factors at a level bringing minimum damage to the employees. This can be achieved by simple arrangements that do not require high cost.

In our study, ergonomic conditions in the call center where we performed application is examined and it's been considered that necessary efforts are made in general in order to create an ergonomic office design. However, determined deficiencies and arrangements to be done in order to increase productivity are given below.

In order to make the employees focus on their tasks in an office environment, employees should work in an environment properly illuminated. Table 2 shows the evaluations of customer representatives in a call center in regard to lighting. %34,8 of the employees within the scope of research feel comfortable with the lighting in workplace, and %65,2 do not feel comfortable. A significant part of the employees feel uncomfortable with the lighting. In such a case, employees tend to make mistakes. Insufficient

personal lighting (%92,8) causes unease to employees in terms of noticing details and focusing attention. Conducting sensitive studies shall make contribution to increase the productivity. In the call center where a questionnaire survey was conducted, %81,7 of the participants stated that windows are behind or near the working area. This causes the employees feel uncomfortable due to the incidence direction of the light. As a result of evaluation and survey, it's been observed that window shadows necessary to prevent reflection from windows are usually available (%88,6). However, evaluation results show that window shadows are not sufficiently functional. %60,7 gave positive opinion to immediately fixing defective lighting. This is also a positive development for uninterrupted work. As there is 3 shifts in the call center where the questionnaire was conducted, solving the lighting problem immediately especially for employees on night shifts is essential for productivity.

Table 3 shows the answers to the questions regarding examination of the work environment in terms of air conditioning, cleaning and health. As can be seen in the table, %50,7 of the employees stated that the air is not clean and healthy. Only %41 of the employees who stated that there is an air conditioning system in their work environment with a proportion of %62,1, expressed that the air conditioning system operates in good order, and %36,9 of them expressed that the air conditioning system does not operate in good order. It's been determined by the obtained data that cigarette smoke and carbon dioxide contamination arising from cigarette smoke do not exist

extremely (%70,3) within the call center. This proves that they act responsible on legal regulations on this matter. %58,6 of the participants gave negative answer to the question “Are the temperature and humidity values in the work environment monitored periodically?”. To work at proper temperature and humidity values in environments where a great number of employees work such as call centers is vital both for workers’ health and for work productivity. In order to fill the deficiency on this matter, electronic temperature and humidity meters may be placed in work environment.

Table 4 shows evaluations related to noise in the call center. Buildings should be covered with noise reducing equipment in order to avoid external noise. %49 of the participants stated that ceilings and walls are not covered with noise reducing equipment, %43,4 stated that they are covered and %7,6 of them stated that they have no idea. Considering the opinions of %49 of the participants who stated that ceilings and walls are not covered with noise reducing equipment, making improvement shall affect the productivity positively. As long as the noise level is not measured and monitored, we cannot know whether it’s at a harmful level or not. By our questionnaire, it appeared that noise has never been measured (%75,9). However, although the noise level has never been measured, %47,2 of the employees stated that noise level of the call center discomforts them. Noisy environments prevent healthy communication. In order to ensure a proper communication between the employees and other people and also between employees and other employees, noise should be reduced. In the office where

the research has been conducted %77,9 of the oral communication can be performed easily and %19,3 of it cannot be performed conveniently. One of the devices that cause noise in the office is the telephone and bell equipment. In the call center where we performed application, %52,4 of the noise is caused by the telephone sound. In order to prevent such noises, it'll be helpful to use luminous systems.

Table 5 shows the data related to the evaluations of the employees in regard to the office furniture and their environment. %35,9 of the customer representatives who work in the call center stated that the chairs / seat materials are designed in a manner that they're flat on the floor and hips and knees can be bent at proper angle. A major part of %61 stated the opposite. By these proportions, we understand that some of the chairs / seat materials were not designed in a manner to comfort the worker. More ergonomic work environment may be ensured when these broken or uncomfortable chairs are designated and replaced by the management. Employees spend most of their time at sitting position. They will not feel much tired as long as they feel comfortable. %52,4 of the employees said no to the question "Does the seat place recline?". This recline prevents the employee to slip forward. In order to create a more comfortable seating position, this condition should be provided to all employees. Very tall or very short employees can get a comfortable seating position only by adjustable seats. Otherwise, the employee will be in difficulty and will feel uncomfortable with his/her body. This is contrary to principles of ergonomics. Not all employees in this office

feel uncomfortable in general with sitting raised or lowered (%74,5). Among the employees who spend their 6-7 hours sitting, %42,1 stated that the fabric covered on the seat does not bother them. %54,8 of them stated that they're uncomfortable with the fabric. Covering this kind of seats with proper fabric will be an appropriate adjustment in terms of ergonomics. Inappropriate fabric may cut the back of the knees and block the blood stream, thus may cause physical unbalance. Employees feel uncomfortable especially due to foot swelling and numbing. And this blocks productivity.

%40,3 of the employees stated that they can adjust backrest of their chairs, and %56,6 of them stated that they cannot. Seats to be used in offices should be designed accordingly and should have a structure comforting the employees. In addition to this, seats should be wheeled in order to provide movement to frontward, backward, left and right, and ideal number of the wheels is 5. People may feel psychologically uncomfortable and under pressure when they stand still and do not move. Adjustments on this matter will ensure more free work environments for people and work productivity will increase.

Employees who spend most of their time sitting in front of the computer should have screen savers in order to protect their eyes from fatigue and harmful beams. %78,3 of the employees stated that they do not have a screen saver on their computers. Considering this proportion, it's understood that no measures are taken against protecting the employees from computers. It's an important lack not having screen savers for employees who have to

work in front of computers continually. Therefore, employees stated that they suffer from eye disorders. By filling the deficiency, employees will become comfortable visually and will be protected against the harmful beams from the screens.

Probably the biggest problem in the call centers is various disorders that may occur in ears due to the usage of headsets by customer representatives. %65,2 of the employees gave an affirmative answer to the question “Do you feel uncomfortable in your ears with continuous usage of headsets?”. %32,1 of them gave a negative answer to this question. Especially in using headsets, headsets should be customized. Allergic reactions may occur when a headset is used by more than one person. Selection of headset is also extremely important. It would be proper to have ergonomic headsets and to determine the type of the headsets considering its intended use and place of use.

%54,1 of the employees gave an affirmative answer, %43,1 of them a negative answer, and %2,8 stated that they have no idea to the question “Do you have a chance to decorate and make changes in your working place?”. Employees may be given the chance to decorate their work environment at a certain extent. By this way, they will not feel themselves like strangers and will not feel uncomfortable. They will feel like home when they come to the office, thus productivity rate will increase.

Considering the data obtained, it's understood that open wires and disordered electric equipment in the work environment do not bother %51,7

of the employees, and do bother %45,5 of the employees. As accidents may occur as a result of stumbling on open wires, these problems should be eliminated in order to ensure a comfortable work environment.

Sharp and angled tables are very wrong designs in terms of ergonomics that give harm to people due to crashes. According to the answers given to question 15 of Table 5, %79,3 stated that table corners are flat and rounded, %18,3 of them stated that table corners are not flat and rounded. %79,3 shows the sensibility to this matter.

Tables and cabinets are used very often by the personnel in the office. Therefore, both of their dimensions and heights should be in proper sizes. Obtaining affirmative answer from %60,7 of the employees for the question related to this subject in our questionnaire, proves that file cabinets are arranged in a manner that does not require slanting and reaching.

Basic requirement to ensure a comfortable work environment in an office is order. Our movement area will be comfortable when we place the tables, chairs and cabinets according to the layout principles. Disorder causes confusion and time loss. %36,6 of the participants stated that they face disorder, and %61 stated that they do not.

In conclusion, data obtained from the study are evaluated and interpreted above and advices are given in regard of the arrangements necessary to be done. Execution of these arrangements will provide physically and psychologically healthier and more ergonomic work environment for employees in the office, and this will increase productivity.

Therefore, it's suggested that this call center will achieve a higher service success.

## **BIBLIOGRAPHY**

CEYLAN,Adnan, Çöl Güner, Gül Hasan (2005), “*İşin Anlamlılığını Belirleyen Sosyo-Yapısal Özelliklerin Güçlendirmeye Olan Etkileri ve Sonuçları Üzerine Bir Araştırma*”, Doğu Üniversitesi Dergisi, 6 (1), ss.35-51

DEMİRDİLER, Sevda ve Ş. ÜÇDOĞRUK. (1995). *İş Kazaları Ve Ergonomi*.İstanbul:Milli produktivite Yayınları.

ERKAN, Necmettin. (1996). *İşçi Sağlığı ve İş Güvenliği Sorunlarına Ergonomik Yaklaşım, 3. Ergonomi Kongresi*, Ankara:Milli Produktivite Merkezi Yayınları.

ERKAN, Necmettin. (2003). *Ergonomi*, Ankara: Milli Produktivite Merkezi Yayınları.

ÖZDAMAR, Kazım (1999), *Paket Programlar İle İstatistiksel Veri Analizi*, 2.Bs., Kaan Kitabevi Eskişehir

T.C. ÇALIŞMA VE SOSYAL GÜVENLİK BAKANLIĞI İş Teftiş Kurulu Başkanlığı.*Çağrı Merkezlerinde Çalışma Koşullarının İyileştirilmesine ve Sosyal Tarafların Bilinçlendirilmesine Yönelik Programlı Teftiş Sonuç Raporu*.(2013).Temmuz.Ankara.



YAVUZCAN, GÜNGÖR, A. İ. ACAR ve A. ÇOLAK. (1987). *İnsanın İş Yapabilme Yeteneğinin Bisiklet Ergonomisi Yöntemiyle Belirlenmesi*, Milli Prodüktivite Merkezi Verimlilik Dergisi. 1(4),57.