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Identifying Ergonomic Risk Factors in Bank

Safiye Ozvurmaz *, School of Nursing, Department Public Health, Adnan Menderes University, Turkey.
Aliye Mandiracioglu, Faculty of Medicine, Department of Public Health, Ege University, Turkey.

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Abstract

Working without changing posture for a long period, repetitive body motions and non-ergonomic work conditions can lead various health problems in bank employees. In this study, the objective is to investigate the ergonomic risk factors of bank employees who work with computers. The study involves 221 bank employees who work with computers. Data were collected using self-assessment surveys which were completed between July-September 2013. The survey includes socio-demographic and work related questions. Ergonomic risk points were assessed using a 6-level Likert scale which inquires constant standing, constant sitting and repetitive motions. Higher ergonomic risk scores indicate poor/inconvenient working conditions. Ergonomic risk point was calculated between 4 as minimum and 24 as maximum. Statistical analysis was performed by chi-square test, student t-test and logistic regression analysis. Demographics of the participants are as follows: 46.6% aged between 30-39 years, 56.1% male, %91.1 university-graduate, 65.6% married, 48.8% have kids. 19.9% of participants do sports, 83.7% right-handed, 6.8% has attended training about ergonomics, 8.1% constantly stand, 40.3% constantly sit, 33.9% do repetitive motions and 5.4% movements which are drastic for the body. 51.1% of the participants described their office chairs to have a medium comfort level and 4.5% reported their office table to have a very good comfort level. Mean ergonomic risk level point is calculated as 13.8±2.8, weekly total computer use time was calculated as 44.6±10.4 and mean comfort perception point for work environment is calculated as 18.9±4.3. It is determined that ergonomic risk factors are common in bank employees working with computers.

Keywords: Ergonomics, risk factor, bank employee, computer Workstation

* ADDRESS FOR CORRESPONDENCE: **Safiye Ozvurmaz,** School of Nursing, Department Public Health, Adnan Menderes University, Turkey. *E-mail address*: sozvurmaz@hotmail.com

1. Introduction

Conditions in the workplace, use of equipment and its general condition are aspects of "ergonomic design" [1]. The principles of ergonomic design may be applied to tools and equipment used, working areas and all parts of working life. Workplace design has a great effect on health [2]. It has been reported that the working environment has a significant effect on the development of work-related health problems [3]. Workers in the banking sector often experience health problems due to the fact that they are exposed to long periods of sedentary work, poor posture and repetitive computer activities [4, 6]. Office workers, and particularly bank workers who use computers, spend almost their entire working hours at the computer, without changing position [7]. Poorly designed computer equipment in the workplace leads to bad postures [8]. Bad postures are the result of incorrect work habits and poorly designed furniture and equipment.

The regulations regarding health and safety precautions for those working with display screen equipment published in the Official Gazette of the Republic of Turkey, Issue 28620, 16.04.2013, state that employers must give those working with display screen equipment training before they start work, and when there are important changes in their working conditions, and that a workplace risk assessment must be made. In studies on those working with computers in different sectors, it has been determined that ergonomics training and ergonomic reorganizations are effective in reducing the frequency and cost of health problems and increasing job satisfaction, productivity and quality of life [9, 10].

Working without changing posture for a long period, repetitive body motions and non-ergonomic work conditions can lead various health problems in bank employees. These health related issues cause financial, time and labour force losses. Arranging work stations ergonomically and training staff about ergonomics decrease the risk factors. In this study, the objective is to investigate the ergonomic risk factors of bank employees who work with computers.

2. Methods

This was a cross-sectional study. Data was collected between July and September 2013 in the city centre. The study population consisted of bank employees working with computers in the city centre. Contact was made with 30 out of a total of 33 banks in the city centre. Employees who worked with computers for at least 10 hours a week and were not pregnant were included in the study.

Employees filled in a self-report questionnaire. Items on the questionnaire included socio-demographic information (age, sex, level of education, marital status, number of children) and factors relating to working life (status, total length of employment, time spent per week using a computer both at work and outside work). Following data collection, bank employees were given "ergonomics training". In the present study, ergonomic risk scores were calculated with reference to constantly standing, constantly sitting, repetitive movements and other awkward movements such as pushing and pulling, lifting heavy weights, twisting, bending and reaching. These were evaluated on a 6-point Likert scale with the following options: never, about 1-2 hours (very little), at least 2 hours (about a quarter of working hours), at least 4 hours (about half of working hours), at least 6 hours (about three-quarters of working hours) and always (almost all working hours). This scale scored from 1 to 6, shows ergonomic risk scores. Increasing ergonomic risk scores indicate that working conditions are negative/bad for employees. The lowest possible score on the scale is 4 and the highest is 24. The perceived comfort of work environment features (the comfort of use of the chair, table, monitor, keyboard and mouse) and environmental characteristics (lighting, heating and ventilation) were also measured. There was one question for each heading. Responses were evaluated using a 4-point Likert scale of "bad, fair, good or very good"; the lowest possible score was 8 and the highest possible score was 32. Higher scores indicated higher perceptions of comfort.

Data were analyzed using SPSS 15.0. Numbers and percentage distributions of participants according to socio-demographic variables were calculated. Analyses were conducted using the Student t-test and ANOVA; means and standard deviations have been given. $p<0.05$ was accepted as statistically significant.

Approval of the ethics committee and written consent of the participants were obtained.

3. Results

Of participants, 56.1% were male; mean age was 33.99±7.10 (23-56). 91.9% were university graduates, 65.6% were married and 50.2% had no children. The features of the participants are shown in Table 1.

Mean length of employment was 7.76±6.31 years (1-28), mean daily working hours were 8.92±1.88 hours (1-13), and weekly working hours were 44.69±10.41 hours (1-84). 93.2% of participants had not had any training regarding their health risks.

It was found that 8.1% of participants were continuously standing during their working hours, 40.3% were continuously sitting, 33.9% made repetitive movements, and 5.4% made movements which strained their bodies. Mean ergonomic risk score was found to be 13.89±2.80 (4-24). The mean working environment risk score of participants was 27.0±4.1; the median was 28. The means and standard deviations of scores relating to features of the chair, table/desk, monitor, keyboard, mouse, lighting-heating-ventilation and presence and use of other office equipment are shown in Table 2.

Bank employees who participated in the study were asked their opinions of the chair, table, monitor, keyboard and mouse they used at work, and of the lighting, ventilation and heating/cooling of their workplace. 51.1% reported that their chair was fairly comfortable to use and 4.5% reported that their tables was very comfortable to use. The percentages of those describing the comfort of use of their monitor, keyboard and mouse as very good were 5.9%, 4.5% and 5.9% respectively. The average perceived workplace comfort score was 18.92±4.30 (8-32).

According to the results of the univariate analyses, ergonomic risk scores of women were significantly higher than those of men (t: 4.128, p: 0.001); perceived workplace comfort scores were also significantly higher for women than men (t: 3. 202, p:0.02). There were no significant differences according to level of education, marital status, age or length of time in the profession. Those who spent their entire working day using a computer had significantly higher ergonomic risk scores (F: 7.92, p: 0.001). Those who had to work very quickly (F: 3. 56, p:0.01) and very intensively (F: 2.85, p.0.02) had significantly higher perceived workplace comfort scores.

4. Discussion

Ergonomic risk factors for bank workers using computers were identified. In the present study, the ergonomic risk scores and perceived workplace comfort scores of women were higher than those of men. There may be many reasons for sex differences. These sex differences may be explained by women being exposed to physical and psychosocial risk factors more frequently (differences in workload), women having a smaller build than men, differences in biological and anthropometric measurements and women having weaker muscles than men [11,12].

Almost all participants had received no previous training about office ergonomics. No statistically significant relationship was found between ergonomic risk scores and having received office ergonomics training. However, studies on those working with computers in different sectors have determined that ergonomics training and ergonomic reorganizations are effective in increasing productivity, job satisfaction and quality of life [10, 12, 13].

Table 1. Demographic and working life features of participants

Sex	Male	124	56.1
	Female	97	43.9
Age groups			
	20-29	64	29.0
	30-39	103	46.6
	40-49	44	19.9
	50-59	10	4.5
Educational level			
	High school	18	8.1
	University	203	91.9
Marital status			
	Single	76	34.4
	Married	145	65.6
Number of children			
	None	111	50.2
	1	64	29.0
	2	42	19.0
	3	4	1.8
Position			
	Manager	30	13.6
	Worker	191	86.4
Years worked in current job			
	1-10 years	162	73.3
	11-20 years	48	21.7
	21+ years	11	5.0
Length of total working life			
	1-10 years	131	59.3
	11-20 years	70	31.7
	21+ years	20	9.0
Training on health risks			
	Yes	15	6.8
	No	206	93.2
Daily working computer			
	None	5	2.3
	Approx. 1-2 hours	9	4.1
	At least 2 hours	17	7.7
	At least 4 hours	16	7.2
	At least 6 hours	49	22.2
Working very quickly			
	Never	3	1.4
	Rarely	25	11.3
	Sometimes	56	25.3
	Often	137	62.0
Working very intensively			
	Never	1	0.5
	Rarely	25	11.3
	Sometimes	48	21.7
	Often	147	66.5

Table 2. Distribution of risk assessment scores of participants

Risks related to working environment and conditions			
Working environment score	27.0±4.1	28	16.0-39.0
Features of the chair	7.0±1.8	7.0	1-12
Features of the table/desk	1.9±0.9	2.0	0-4
Features of the monitor	3.3±1.1	3.0	0-5
Features of the keyboard	5.0±1.4	5.0	1-9
Features of the mouse	4.8±1.3	5.0	0-8
Features of the lighting, heating and ventilation	3.6±1.0	4.0	1-5
Presence and use of other office equipment	1.87±1.0	2.0	0-3

* mean ± standard deviation

Basic features of the working environment, chair, table/desk, monitor, keyboard, mouse, lighting-heating-ventilation and presence and use of other office equipment were evaluated. A statistically significant relationship was found between features of the working environment and ergonomic risk scores. In a study by Nakazawa, it was reported that as time spent using a computer increased, physical, psychological and sleep-related symptom scores also increased [14]. Ariens et al determined that spending more than 95% of working time sitting was a risk factor for individuals [15]. Previous epidemiological studies and a cross-sectional study conducted in China have found that taking breaks during working time has a positive effect and that sufficient rest is important [16,17]. In a study by McLean et al, it was reported that short 20 minute breaks were effective for comfort [18]. An unsuitable area under the table and insufficient level of comfort in the working environment lead to many health problems [19]. Amick et al reported that with ergonomics training, ergonomic risk factors decreased [20]. In a study by Robertson et al, it was reported that compared to the control group, those in the intervention group had a higher level of knowledge about office ergonomics and higher perceived workplace comfort scores [21].

In the 21st century, computers have begun to be used widely both at home and in the workplace. Therefore, the drawbacks of using a computer more than is necessary should not be ignored. It should not be forgotten that if suitable equipment and ergonomic conditions are not provided to computer users, there may be negative effects on their physiology and psychology, which may result in permanent disabilities.

There is no perfect posture for bank workers; in addition, this posture cannot be maintained all day. Therefore, they may need to change posture frequently during the day and taking short breaks may be appropriate [8].

5. Conclusion

The data obtained in this study may be used as a reference for further research and include comparable results which may be used in work health and safety campaigns related to the ergonomic features of computer use. Raising awareness of ergonomics among bank workers and conducting participatory ergonomic intervention programs may be beneficial.

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