



## The impact of ergonomic conditions on factory workers' self-esteem in Turkey

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### Abstract

**Background:** Working time accounts for a great deal of an individual worker's life. This study aims to examine the impact of ergonomic conditions on the self-esteem of workers in Gaziantep, Turkey.

**Materials and Methods:** This descriptive study was conducted recruiting 755 workers from two factories and verbal informed consent was obtained from the workers. Data were obtained from groups using a self-report form (63 items) and the Rosenberg Self-Esteem Scale (10 items).

**Results:** of 755 workers, 38.3% were aged 26–30 yrs, and 97.2% were male. In addition, 75.4% of the workers reported that they did not have an ergonomic working environment, and 87.4% of low self-esteem workers did not adopt correct posture when working ( $p < 0.05$ ).

**Conclusions:** Most of the workers did not adopt correct posture when working and did not enjoy an ergonomic working environment. Based on the results, creating such an environment would benefit the workers.

**Keywords:** Ergonomics, Workplace, Environment and Public Health, Occupational Health.

### Introduction

The working environment of employees is an important part of their lives. Aside from periods spent conducting active works and activities carried out during these periods, the working environment has a decisive effect on employees' quality and standard of life [1]. Furthermore, working time takes a great deal of a worker's life. Motivation can increase employee productivity and improve the quality of their working lives, so proper ergonomics is an aspect that can be provided by managers [2]. Ergonomic conditions are effective in employee happiness and satisfaction in the working life [3]. Many factors affect ergonomic conditions and personal satisfaction with the working experience [1, 4]. Professional self-

esteem, being apparent from the personal perception of individuals regarding their chosen profession and its valuation by them, affects and is affected by ergonomic conditions, job satisfaction, and the living standard of those individuals. To meet employees' expectations of their working environment, providing occupational health and safety is essential [5, 6]. If the working environment is suitable and ergonomically optimized, the motivation, work efficiency, and self-esteem of employees will increase [7]. In this case, individuals' feeling of worth and belief that they can handle life challenges will increase.

Work environments should be designed so as to ensure full occupational safety [8]. Individuals embed their job status in their professional plans,

which prompts them to perform their role in line with their self-concept. People choose professions commensurate with their own needs and expectations. Choosing the right profession is crucial as it influences private life as well as working life. In the present study, factors affecting professional self-esteem and the way they are affected by ergonomic working conditions have been investigated. Suitable ergonomic requirements and self-respect enable employees to work more effectively.

## Materials and Methods

This descriptive study investigated the impact of ergonomic conditions on workers' self-esteem in Gaziantep, a large city in southeastern Turkey. The study population was selected from the employees of factories X (n = 680) and Y (n = 795). The final population included 755 employees, comprised of 734 males and 21 females, who were present at the time of distributing the questionnaire, in part developed by the researcher and in part based on the Rosenberg Self-Esteem Scale [9]. The mentioned scale features 63 items in 12 categories. The self-esteem category, consisted of 10 items, was used in this study. The Statistical Package for Social Sciences (SPSS) version 22.0 was used for statistical analyses. For the evaluation of the normality of data distribution,

the Kolmogorov–Smirnov test was used, and the data showed normal distribution. In addition, data analysis was conducted using the Pearson's correlation test. Values were considered statistically significant for  $p < .05$ .

The study was approved by the institutional ethics committee of the researcher's university (approval ID no. 10.03.2014/94) as well as the industrial site of Gaziantep for factories X and Y. In addition, verbal informed consent was obtained from the workers who participated in the present study.

## Results

From among the workers who completed the instrument, 734 individuals (97.2%) were men and 21 individuals (2.8%) were women. Amongst them, 38.3% aged 26–30, 34.1% aged 31–35, 22.0% aged 25 or younger, 3.0% aged 36–40, and 2.6% aged 41 or older. In the sample, 82.8% were married, and 75.2% had high school diplomas.

According to 62.3% of the workers, no measures had been adopted against occupational accidents in the working environment; in addition, no warning signs were erected for occupational accidents in the working environment, as reported by 45.7% of the workers. Furthermore, 26.6% of the workers had been exposed to occupational accidents, and 49.8% of them had experienced falls from height.

**Table 1.** Distribution of health features among workers

Items	Number	%
Experienced health problems in the workplace	Yes	423
	No	332
Being provided with health education at work	Yes	151
	No	604
Regular health inspections at work	Yes	476
	No	279
Receiving medical reports on work-related illnesses in the last year	Yes	111
	No	644
Having a health problem	Yes	226
	No	529
Workplace-related health problems (n = 226)	Yes	173
	No	53
The presence of an existing chronic disease	Yes	167
	No	588
The chronic disease title (n = 167)	Diabetes	42
	Hypertension	74
	Heart diseases	25
	Asthma	20
	Rheumatism	6
The presence of a musculoskeletal system disease	Yes	233
	No	522
The name of the musculoskeletal disease (n = 233)	Hernia of the loins	133
	Back pain	67
	Joint-connective tissue diseases	23
	Rheumatism	10
Total	755	100.0

According to interviews, 56% of the workers had experienced health problems in the workplace, 80% had not received regular health educations, 29.9% had health problems unrelated to work, 76.6% had work-related health problems, 22.1% had chronic health problems, and 30.9% had experienced problems in the musculoskeletal system (Table 1). Poor lighting was reported by 43% of the workers, and 78.5% of them had problems with the hot working environment. In addition, 87.4% of the workers had noise

problems, 76.6% accessed no daylight, 60.1% had no sufficient ventilation, 55.0% were exposed to radiation, 75.4% did not enjoy an ergonomic working environment, 42.9% said that their working environment was not unsuitable for performance, 51.4% reported that work-related tools and equipment were not suitable, 81.2% stated that they did not adopt correct posture at work, and 85.7% said that they always worked in a standing position (Table 2).

**Table 2:** Ergonomic distribution of workers' working environment

Items		Number	%
Problems with lighting	Yes	325	43.0
	No	430	57.0
Receiving daylight	Yes	177	23.4
	No	578	76.6
Problems with high temperatures	Yes	593	78.5
	No	162	21.5
Problems with noise	Yes	660	87.4
	No	95	12.6
Ventilation provided in the working environment	Yes	301	39.9
	No	454	60.1
Exposure to radiation	Yes	415	55.0
	No	149	19.7
	I do not know	191	25.3
Taking occupational safety measures	Yes	591	78.3
	No	164	21.7
Ergonomic working environment convenience	Yes	186	24.6
	No	569	75.4
Suitability of the working environment	Yes	431	57.1
	No	324	42.9
Suitability of the work-related tools and equipment	Yes	367	48.6
	No	388	51.4
Working in the appropriate position	Yes	142	18.8
	No	613	81.2
Working posture	Continuously standing	647	85.7
	Continuously seated	19	2.5
	Continuously on the move	89	11.8
Total		755	100.0

The self-esteem level was found out to be moderate in 52.5% and low in 25.2%.

A statistically significant correlation was found between self-esteem values and the workers' marital status ( $p < 0.05$ ), where married workers were less visionary than unmarried ones. In

addition, a statistically significant correlation was found between self-esteem values and working in an ergonomic position ( $p < 0.05$ ), where 87.4% of the workers of low self-esteem did not work in an appropriate position (Table 3, 4).

**Table 3:** Distribution of workers in an appropriate position in terms of self-esteem

Self-esteem	Appropriate position				Total		Statistics	
	Yes		No					
	Number	%	Number	%	Number	%	df	P
High	36	21.4	132	78.6	168	100.0	2	.038
Medium	82	20.7	314	79.3	396	100.0		
Low	24	12.6	167	87.4	191	100.0		
Total	142	18.8	613	81.2	755	100.0		

**Table 4:** Distribution of workers in an experiencing high temperature problems in terms of self-esteem

Self-esteem	High temperature problems				Total		Statistics	
	Yes		No					
	Number	%	Number	%	Number	%	df	P
High	122	72.6	46	27.4	168	100.0	2	.037
Medium	311	78.5	85	21.5	396	100.0		
Low	160	83.8	31	16.2	191	100.0		
Total	593	78.5	162	21.5	755	100.0		

A statistically significant correlation was found between self-esteem values and the problem of high temperatures at work ( $p < 0.05$ ), where 83.8% of the individuals of low self-esteem faced this problem (Table 3). A statistically significant correlation was found among the feeling of being threatened, having low self-esteem, and exposure to occupational accidents ( $p < 0.05$ ), with 83.7% of the individuals who did not feel threatened not having been exposed to occupational accidents (Table 5).

A statistically significant correlation was found among social isolation, self-esteem, and the lighting problem ( $p < 0.05$ ), with 47% of the workers with social isolation having experienced lighting problems. In addition, a statistically significant correlation was found among the workers' relationship with their fathers, self-esteem, and having experienced an accident ( $p < 0.05$ ), with 75.4% of those with a good relationship with their fathers having experienced no occupational accidents.

**Table 5:** Distribution of workers exposed to occupational accidents according to the feeling of threat

Feeling of threat	Exposure to occupational accidents				Total		Statistics	
	Yes		No					
	Number	%	Number	%	Number	%	df	P
None	22	16.3	113	83.7	135	100.0	3	.022
Low	75	30.1	174	69.9	249	100.0		
Medium	75	28.8	185	71.2	260	100.0		
High	29	26.1	82	73.9	111	100.0		
Total	201	26.6	554	73.4	755	100.0		

## Discussion

Unfortunately, most measures for providing ergonomic working environments are not operationalized in Turkey, with neither employers nor employees showing adequate motivations for adopting them. This leads to long working hours, the accepting of arbitrary demands made by employers, and worker submission to precarious working conditions [10]. The pressure and stress caused by probable dismissal make employees feel uneasy in the working environment [11] and undermine their self-confidence, attention, and ability to concentrate on their work [12]. Working impetuously, intensely, and carelessly increases the risk of having accidents. In this study, 62.3% of the participants reported a full lack of prevention measures against occupational accidents at work, and 45.7% of them reported the absence of warning signs against occupational accidents. According to a study, 27.5% of the employees surveyed used personal objects for protection purposes, and 26.3% of them had not experienced occupational accidents, with a significant correlation having been found between personal

security and work accidents [13]. Also, occupational safety standards vary by industry and corporation, so these results suggest that all employers do not adopt necessary control measures.

In the present study, 56% of the workers had work-related health problems, and 14.7% of them had received treatments in the previous year for such problems. These health problems could be attributed to incongruity between the job and the worker. Regular control examinations should be conducted to diagnose work-related health and structural (anatomical) problems. About half of the workers surveyed (43%) stated that their working environment did not have sufficient lighting, and 76.6% reported that they did not receive daylight. Poor lighting, the resultant fatigue, and the distraction of attention all increase the risk of occupational accidents. In addition, insufficient lighting affects physical and mental health negatively. Well-lit environments prevent early fatigue, thereby leading to a reduction in occupational accidents.

About 78.5% of the workers experienced the problem of high temperatures at work. In a



previous study, employees reported no monitoring of the levels of temperature or humidity at work [14].

Unpleasant temperatures at work are a physical problem for workers. Working under the conditions of high temperatures and humidity above or below the standard levels without appropriate preparations may lead to occupational accidents and also trigger chronic diseases. In this study, it was found out that 87.4% of the workers experienced noise problems at work. According to a study, 41.4% of the subjects worked in a hazardous noise zone, and 34.1% of them worked in a precautionary zone (65–85 dB), with 24.3% of the subjects having worked in a secure zone (lower than 65 dB). All stations in the hazardous zone were located in the production and sifter halls, containing mills, pull tools, and air compressors among other high-noise machineries [15].

In this study, the majority of the workers complained about noise. The noise could cause uneasiness, prevent verbal communications, reduce work efficiency, impair thinking, damage hearing, and harm the hearing system, in case of the poor insertion of ear plugs. In addition, 60.1% of the workers were beset by poor ventilation conditions. Air pollution in the workplace could lead to insufficient oxygen intake. This condition would quickly increase fatigue and reduce efficiency. It also irritates the senses and diverts workers' attention from work, with all the aforementioned issues leading to accidents. All these are non-ergonomic factors affecting the workplace and employee health. Although new labor laws are adequate, they are not enforced or observed. In this study, it was found out that 21.7% of the participants did not enjoy work safety, more than 60% of them were not provided with an ergonomic working environment, more than half of the tools and equipment were not suitable, and the majority of the workers adopted standing posture throughout their working shifts. In a study of coal workers, 41.1% of the workers considered measures taken to protect employee health sufficient, 36.2% considered them partially satisfactory, and 22.7% regarded them insufficient [16]. Research shows that workplace safety measures are not at desirable levels [16, 17]. It is employers' responsibility to provide safety materials and ensure their use.

In this study, it was found out that more than half of the participants had moderate self-esteem, over one-fourth of them had low self-esteem, and less than one-fourth of them had high self-esteem. Self-esteem is the result of an individual's opinion and expectation of being accepted or rejected. This

concept indicates whether individuals consider themselves valuable. Individuals with high self-esteem respect and see themselves valuable. In this study, the high incidence of the moderate level of self-esteem shows that the workers do not consider themselves valuable to the society. The correlation between marital status and escapism was found out to be statistically significant ( $p < 0.05$ ), where married participants were less probable to be escapist than unmarried ones. A previous study reported that males participants had higher self-esteem than females [18]. Most workers with low self-esteem believe that they do not adopt appropriate posture in their workplace [19].

The majority of the workers with low self-esteem reported poor temperature conditions at work. A statistically significant correlation was found among the workers' relationship with their fathers, self-esteem, and exposure to occupational accidents ( $p < 0.05$ ), where 31.6% of those with poor paternal relationships were exposed to occupational accidents. It was also determined that the individual's family environment would affect self-esteem [20, 21]. Positive communications with the family were also found out to increase self-esteem. The lack of this factor could cause challenges at work and lead to an increase in occupational accidents.

Thus, employers should adopt necessary measures against occupational accidents so that employees would receive regular trainings, and that ergonomic risk factors would be evaluated. The damage to health and the risks of occupational diseases must be assessed, and affected workers must be treated. In addition, the ergonomic conformity of all tools and equipment used in the working environment should be evaluated. Furthermore, the materials used at work should be ergonomically adapted to human anatomy and physiology. Factors that affect employee self-esteem should be evaluated, with programs to be developed for boosting it by supporting employees psychologically, physiologically, and socially. Employers and employees must determine negative factors, such as ergonomic risks that affect employee self-esteem to adopt necessary measures.

The study participants were limited to the voluntary workers of two factories at an industrial site where small-scale enterprises are located in Gaziantep.

## **Conclusion**

More than half of the workers stated that no measures had been taken against occupational accidents in their working environments, and the

majority of them reported health problems associated with the workplace. The workers did not have proper stations or ergonomic working environments. The majority of the workers stated that the workplace did not meet ergonomic standards, and more than half of them reported that the tools and equipment utilized were not ergonomic. In addition, the vast majority of the participants had not received any health trainings. The results indicate that the workers did not enjoy an ergonomic working environment. The findings of the current study show that providing ergonomic conditions for workers is a global issue. To improve the conditions, workers and employers should be informed of international legislations, and continuous research must be conducted on ergonomic issues as well as the self-esteem of workers to identify ongoing and new problems.

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