

# Occupational Risk Factors among Primary Health Care Workers in Mersin, Turkey

## Mersin’de Birinci Basamak Sağlık Hizmeti Çalışanları Arasındaki Mesleki Risk Faktörleri

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**ABSTRACT Objective:** The current study aims to identify the occupational health risks faced by primary health care workers in Mersin city center. **Material and Methods:** Data were collected between June-July 2009. The target population of this cross-sectional study was 807 health workers serving in the primary health care centers in Mersin city center and related villages. No sampling was carried out; this study aimed to reach all of the health care centers and health care workers in the city center and surroundings. The consent of the ethics committee and the consent of the participants were obtained after informing them about the study. Six hundred sixty six (82.5%) of the workers were reached and agreed to participate in this survey. The workers filled out the forms by themselves. The health risks faced by the health workers within the past year were accepted as the dependent variables. It was compared with independent variables such as the workplace risks, location of the workplace in the urban or suburban regions, occupation group, and sex. Descriptive statistics were used to summarize the data while Chi-square test was employed to compare categorical variables. **Results:** 40.7% of the health care workers were working as midwives and 73.0% were females; 87.2% of them had experienced at least one health risk within the past year. The most frequent health risks faced by the health workers were physical-ergonomic (78.8%), biological (56.8%), psychological (54.4%) and chemical (18.0%) risks. Ninety one percent of them believed that their life was not in safe in the workplace. The rate of physical-ergonomic risks were higher in doctors, in midwives, and in non-married participants, the biological risks were higher in female health care workers, doctors, in non-married workers; the psychological risks were in non-married participants while the chemical risks were higher for those working in suburban areas. All of the risks were at a higher level among those participants who thought that their workplace was not safe. It was also understood that experiencing psychological risks decreased despite the increase in work period. **Conclusion:** Primary health care workers face many health risks in the workplace.

**Key Words:** Health personnel; primary health care; occupational exposure; risk factors

**ÖZET Amaç:** Mevcut çalışma Mersin şehir merkezindeki birinci basamak sağlık hizmeti çalışanlarının işyerinde karşılaştıkları sağlık risklerini tanımlamayı amaçlamıştır. **Gereç ve Yöntemler:** Veriler Haziran-Temmuz 2009 arası toplandı. Bu kesitsel çalışmanın amacı Mersin şehir merkezi ve ilişkili köylerdeki birinci basamak sağlık merkezlerinde hizmet gören 807 sağlık çalışanına ulaşmaktır. Çalışmamızda bir örnekleme yapılmadı. Kent merkezi ve çevresinde bulunan bütün sağlık ocakları ve tüm sağlık çalışanlarına ulaşmak hedeflendi. Etik kurul onayı alındı ve çalışmaya katılanlara çalışma hakkında bilgi verilerek, katılım onayları alındı. Ulaşılan 666 (%82.5) sağlık çalışanı araştırmaya katılmayı kabul etti. Çalışanlar kendi başlarına formları doldurdular. Geçmiş yıl içerisinde sağlık çalışanlarının yüzleştiği sağlık riskleri bağımlı değişken olarak kabul edildi ve işyeri riskleri, işyeri yerleşiminin şehirde veya banliyöde olması, mesleki grup ve cinsiyet gibi bağımsız değişkenler ile kıyaslandı. Verileri özetlemek için tanımlayıcı istatistikler kullanılırken, kategorik değişkenleri kıyaslamak için ki-kare testine başvuruldu. **Bulgular:** Sağlık hizmeti çalışanlarının %40.3’ü ebe olarak çalışıyordu ve %73.0’i kadındı; %87.2’si geçmiş yıl içerisinde en az bir sağlık riski ile karşılaşmıştı. Sağlık çalışanları tarafından yüzleşilen en sık sağlık riskleri fiziksel-ergonomik (%78.8), biyolojik (%56.8), psikolojik (%54.4) ve kimyasal (%18.0) risklerdi. Çalışanların %91’i işyerindeki kendisinin güvende olmadığını düşünmekteydi. Fiziksel-ergonomik riskler doktor, ebe ve evli olmayan çalışanlarında, biyolojik riskler doktor, evli olmayan ve kadın çalışanlarda, psikolojik riskler evli olmayan ve kimyasal riskler banliyölerde çalışanlarda daha yüksek orandaydı. İşyerinde kendini güvende hissetmeyenlerde bütün riskler daha yüksek orandaydı. Ayrıca görev süresinin artmasına karşın psikolojik riskle karşılaşmanın azaldığı saptandı. **Sonuç:** Birinci basamak sağlık hizmeti çalışanları işyerinde birçok sağlık riskleri ile yüz yüzedir.

**Anahtar Kelimeler:** Sağlık personeli; temel sağlık hizmeti; mesleki maruziyet; risk faktörleri

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World Health Organization reports that there are 59.2 million health workers in the world.<sup>1</sup> In Turkey, there are a total of 328 915 healthcare workers, 103 177 of whom are doctors, 92 509 of whom are nurses, 46 172 of whom are midwives and 87 057 are other workers.<sup>2</sup> 60 143 (18.3%) of this staff work in 6 377 different primary healthcare centers.<sup>3</sup> Those who work in healthcare services are faced with various occupational risks like repeated trauma, toxins, heat, noise, dusts, stress and a broad range of infectious agents.<sup>4,5</sup> The potential risks affecting workers' health are grouped as physical, ergonomic, biological, psychosocial, and chemical risk factors and organizational problems.<sup>6,7</sup>

In the healthcare sector, musculoskeletal disorders due to ergonomic inconveniences and physical risks and other occupational injuries take place especially in hospitals.<sup>8</sup> According to some studies, 33-86% of the nurses experience backache due to the work they carry out in the workplace.<sup>9-12</sup> Healthcare workers are under the risk of many infections that may be disseminated by the patients in the daily workplace. Among these infections, tissue injuries and blood born infections have a special place due to their frequency and negative effects.<sup>4,13</sup> The risk of exposure to violence is 16 times more than other occupation groups in healthcare workers.<sup>14</sup> It is reported that violence towards healthcare workers is a common problem in many countries and is continuously increasing.<sup>1,15,16</sup> The rate of violence towards healthcare workers ranges between 37% and 76%.<sup>16</sup>

The chemicals may have systemic effects as well as accident risks and toxic effects. They not only affect healthcare workers but also their children, who develop consequences like that of their parents'.<sup>4</sup> Although healthcare workers are under high risk in terms of chemical dangers, their protection level is relatively lower in comparison with the other risks.<sup>17</sup>

The issue of healthcare workers' health is examined at the level of hospitals among primary healthcare institutions. There are few studies assessing the primary healthcare workers' workplace health risks. For this reason, in this

study it was aimed to assess the occupational health risks faced by healthcare workers serving primary healthcare institutions in the Mersin city center.

## MATERIAL AND METHODS

### ETHICS APPROVAL

The research protocol was approved by the Ethics Commission of the Medical Faculty in Mersin University, and permission to conduct the study was obtained from local health authorities. Participation was voluntary and informed consent was obtained.

### PRIMARY HEALTHCARE SYSTEM AND HEALTH CENTRES IN TURKEY

Primary healthcare services are delivered by "healthcare centers" in Turkey. A team of doctors, nurses, midwives, health officials, environmental health technician, laboratorians, and medical secretary serve in healthcare centres. Nearly 25-30 workers in the urban regions work in each healthcare center depending on the population of the related region while this number is 5-10 for those located in the suburban regions.<sup>18</sup>

### THE RESEARCH TYPE AND UNIVERSE

The data of this cross-sectional study were collected between June and July 2009. According to Mersin Health Directorate's records, 807 healthcare workers work in 53 healthcare centers in the Mersin city center. Twenty nine urban and 24 suburban healthcare centers were identified as the work regions. No sampling was carried out in the study. It was aimed to incorporate all of the healthcare centers in the city center and surroundings and to reach all of the healthcare workers serving in the area. If the healthcare workers could not be reached in the first visit, a second visit was carried out in order to talk to those healthcare workers. One hundred thirty eight people could not be reached since they were on leave or were assigned temporary duties elsewhere. Three of the doctors refused to participate in the study. Six hundred sixty six of the healthcare workers (82.5%) were reached and included in the study.

## DATA COLLECTION METHOD

A self-administered questionnaire included two sections; in the first section the demographic information of the healthcare workers were included while in the second section, the type and number of health risks encountered within the past year and the related measures were included. Healthcare centers were visited in order to collect data. The healthcare workers were informed about the study and they provided us with consent form during the data collection process.

## VARIABLES

Location of the healthcare centres in the urban/suburban area, the sex of the healthcare workers, educational level, marital status, occupation, work period, whether they had occupational risk training and the safety perception of the workplace were identified as the independent variables. The occupations of the healthcare workers were divided into four groups: doctor, midwife, nurse and other workers. The continuous variables of age and working period were evaluated by dividing the time periods into decades.

The physical and ergonomic risks were placed in the same group in this study. The healthcare workers' workplace risks were assessed in four groups by means of 18 questions in total (physical+ergonomic factors= nine questions, biological factors= three questions, psychological factors= four questions, and chemical factors= two questions). "Workplace health risks" were considered as the dependent variable. The data collection form contained questions on how many times the workers experienced a workplace health risk within the past year. The replies "one and more" was regarded as "yes" while the "zero" responses were regarded as "no".

## DATA ANALYSIS

Descriptive statistics were used in summarizing the data (percentages, median, and range). The Chi-square test was used to compare the categorical variables. A p value less than or equal to 0.05 was considered statistically significant.

The state of experiencing workplace healthcare risk was evaluated by means of univariate analy-

ses with independent variables. In order to identify the factors influencing the risk, Binary Logistic Regression (BLR) was performed. "Enter" model was used in the BLR analysis. According to univariate analysis results, the relationship between sex, occupation and thinking that his/her health was safe in the workplace was found to be significant; thus these variables were included in the model. Location of the workplace, marital status, working period and risk training experience were also incorporated in the model due to their clinical significance. Since there could be a relationship between working period and age, occupation and educational level; age and educational level were not included in the model. Working period was included in the analysis as a continuous variable.

In order to identify factors influencing workplace health risks evaluated in four separate groups, a separate BLR analysis was carried out. "Forward LR" model was used in the BLR analysis. The variables which were found to be significant according to univariate analyses and having clinical significance (location of the workplace, sex, marital status, occupation, working period, risk training experience, and thinking that his/her health is safe in the workplace) were included in the model. The results of the four analyses are demonstrated in a table.

## RESULTS

### DEMOGRAPHIC INFORMATION

Six hundred sixty six people working in the primary healthcare institutions in Mersin city center were included in the study; 528 (79.3%) subjects were from the urban area while 138 (20.7%) were from the suburbs. Two hundred seventy-one (40.7%) of the participants were midwives; 486 (73.0%) were females; 323 (48.5%) were within the 30-39 age range; 301 (45.2%) were college graduates; 588 (88.3%) were married and 329 (49.4%) had a working period of 18.0 (2-36) years (Table 1). The median age of the workers' was 39.0 (21-61) years and the median working period was 18.0 (2-36) years.

**TABLE 1:** Occupational health risk status of the healthcare workers in terms of demographic and occupational features (Mersin, Turkey 2009)

Variables (n)	Those who have not encountered any risk		Those who have encountered at least one risk		X <sup>2</sup> (p)
	n	%	n	%	
<b>Location of the workplace</b>					
Urban (528)	64	12.1	464	87.9	0.942
Suburban (138)	21	15.2	117	84.8	(0.332)
<b>Sex</b>					
Men (180)	32	17.8	148	82.2	5.572
Women (486)	53	10.9	433	89.1	(0.018)
<b>Age (yr)</b>					
20-29 (43)	7	16.3	36	83.7	
30-39 (323)	40	12.4	283	87.6	
40-49 (269)	31	11.5	238	88.5	3.574
50 and above (31)	7	22.6	24	77.4	(0.311)
<b>Educational level</b>					
High school-below (174)	24	13.8	150	86.2	
College (301)	40	13.3	261	86.7	0.777
University (191)	21	11.0	170	89.0	(0.678)
<b>Marital status</b>					
Married (588)	80	13.6	508	86.4	3.202
Non-married (78)	5	6.4	73	93.6	(0.074)
<b>Occupation</b>					
Doctor (142)	16	11.3	126	88.7	
Midwife (271)	25	9.2	246	90.8	
Nurse (137)	17	12.4	120	87.6	14.862
Other (116)	27	23.3	89	76.7	(0.002)
<b>Working period</b>					
0-9 years (80)	10	12.5	70	87.5	
10-19 years (329)	37	11.2	292	88.8	1.629
20 and above (257)	38	14.8	219	85.2	(0.443)
<b>Risk training experience</b>					
Yes (101)	13	12.9	88	87.1	0.001
No (565)	72	12.7	493	87.3	(0.972)
<b>Thinking that his/her health is safe in the workplace</b>					
Yes (59)	21	35.6	38	64.4	30.305
No (607)	64	10.5	543	89.5	(0.001)
<b>Total</b>	<b>85</b>	<b>12.8</b>	<b>581</b>	<b>87.2</b>	

### THE RISKS ENCOUNTERED BY THE HEALTHCARE WORKERS WITHIN THE PAST YEAR

It was found that 581 (87.2%) of the workers encountered at least one of the risk factors within the past year. According to univariate analysis results, it was also observed that female healthcare workers ( $p=0.018$ ) and those who thought that their workplace was not safe ( $p=0.001$ ) encountered more oc-

cupational health risks than the other groups. The doctors, midwives, and nurses encountered more workplace health risk than other occupational groups ( $p=0.002$ ); 101 (15.2%) of them had received a training on occupational risks; 607 (91.1%) and thought that they were not safe in their workplace during work (Table 1). As a result of the BLR analyses performed in order to assess the factors influ-

encing state of experiencing occupational risks in the workplace, it was found out that doctors (OR= 2.08,  $p=0.041$ , 95% CI= 1.030-4.213) and midwives (OR=2.81,  $p= 0.013$ , 95% CI= 1.249-6.334) are exposed to more occupational risks when compared to other workers; similarly, those who did not think his/her health was not safe at work (OR= 4.16,  $p= 0.001$ , 95% CI= 2.216-2.364) were exposed to more occupational risks than those who thought they were safe.

As for the risks encountered within the past year, it was determined that 78.8% encountered physical-ergonomic, 56.8% biological, 54.4% psychological and 18.0% chemical risks. According to the BLR analysis, the rate of physical-ergonomic risks were higher in doctors, in midwives, and in non-married participants, the biological risks were higher in female healthcare workers, doctors, in non-married workers; the psychological risks were higher in non-married participants and the chemical risks were higher in those working in suburban areas. All of the risks were at a higher level among those participants who thought that their workplace was not safe. Furthermore, it was observed that experiencing psychological risks decreased although the work period increased (Table 2).

It was determined that 362 (54.4%) of the health workers encountered acute musculoskeletal pain due to work conditions, 314 (47.1%) were exposed to verbal insults by the patient or the patient's relatives, 289 (43.3%) encountered sharp object injuries, 229 (34.4%) encountered chronic musculoskeletal pain due to work conditions and 219 (32.9%) were exposed to patients' body fluids (Table 3).

#### THE RISKS ENCOUNTERED BY THE HEALTHCARE WORKERS IN TERMS OF OCCUPATIONS

The healthcare workers' occupations and the risks they encountered were also assessed. It was determined that doctors encountered more loud voice and noise, contact with body fluids (vomit, stool, urine, saliva, etc.), and verbal insult or threat by the patient or the patient's relatives, midwives encountered more heat stroke during field work, and

animal (dog, etc.) attack resulting or not resulting in injury, nurses had sharp object injuries, and physical or verbal violence by their colleagues and/or managers (Table 3).

In this research, it was found that 87.2% of the primary healthcare workers experienced some kind of occupational risk within the past year. The rate of experiencing a workplace health risk was higher among doctors and nurses when compared to the other workers. The workers mostly experienced physical-ergonomic risks. The rate of experiencing physical-ergonomic risks was higher among doctors and nurses when compared to other workers.

## DISCUSSION

This study is one of the few epidemiological studies evaluating primary healthcare workers' occupational health risks. Therefore, the findings of this study were not only compared to studies performed in the primary level but also to the studies performed in hospitals.

#### THE RISKS ENCOUNTERED BY THE HEALTH WORKERS WITHIN THE PAST YEAR

In this study, it was determined that nearly nine tenth of the healthcare workers experienced an occupational risk within the past year. Ergör et al.<sup>19</sup> reported a similar high risk (84.6%) in emphasized the severity of the risk. Those working in risky environments have a higher risk of encountering occupational risks in terms of work conditions and therefore have a lower level of work productivity.<sup>20</sup> The health workers' experience of any occupational risk factor spoils health workers' health while negatively influencing the delivery of the health services in terms of quality and quantity. In addition, the fact that doctors and midwives experience health risks more frequently may be related to the fact that they have a higher number of occupational groups and different areas.

#### PHYSICAL AND ERGONOMIC RISKS

Chambers et al.<sup>21</sup> reported that 18% of the primary healthcare institutions faced physical health problems. In the present study, it was found out that nearly four fifths of the healthcare workers experienced

**TABLE 2:** Binary logistic regression analysis of the factors influencing experience of risk of the healthcare workers' according to workplace risk groups (Mersin, Turkey 2009).

Independent variables	$\beta$	p	OR	95% CI
<b>Physical-ergonomic</b>				
<b>Marital status</b>				
Married=0	0.990	0.011	2.69	1.25-5.80
Not married=1				
<b>Occupation</b>				
Other=0		0.008		
Doctor=1	0.806	0.010	2.24	1.22-4.12
Midwife=2	0.767	0.004	2.15	1.28-3.61
Nurse=3	0.242	0.404	1.27	0.72-2.25
<b>Thinking that his/her health is safe in the workplace</b>				
Yes=0	0.790	0.008	2.20	1.23-3.96
No=1				
<b>Biological</b>				
<b>Sex</b>				
Male=0	0.582	0.032	1.79	1.05-3.05
Female=1				
<b>Marital status</b>				
Married=0	0.749	0.006	2.12	1.25-3.59
Not married=1				
<b>Occupation</b>				
Other=0		0.024		
Doctor=1	0.800	0.003	2.23	1.32-3.76
Midwife=2	0.214	0.459	1.29	0.70-2.18
Nurse=3	0.337	0.276	1.40	0.76-2.57
<b>Thinking that his/her health is safe in the workplace</b>				
Yes=0				
No=1	1.104	0.001	3.02	1.65-5.51
<b>Psychological</b>				
<b>Marital status</b>				
Married=0				
Non-married=1	0.561	0.033	1.75	1.05-2.93
Working period	-0.027	0.038	0.97	0.95-0.99
<b>Thinking that his/her health is safe in the workplace</b>				
Yes=0				
No=1	1.479	0.001	4.39	2.34-8.22
<b>Chemical</b>				
<b>Location of the workplace</b>				
Urban=0				
Suburban=1	0.766	0.001	2.15	1.38-3.36
<b>Thinking that his/her health is safe in the workplace</b>				
Yes=0				
No=1	1.257	0.018	3.51	1.24-9.96

a physical-ergonomic risk factor at least once in the past year. In comparison with the study by Chambers et al.<sup>21</sup>, it can be seen that in the present study, those working in the primary healthcare institutions experience physical and ergonomic risks more frequently. This may have to do with the physical, ergonomic

deficiencies in the workplace as well as the healthcare workers' lack of knowledge, attitudes and behaviors related to protection from the risks.

In the present study, it was observed that doctors and midwives experienced physical and ergonomic risks more frequently than other healthcare

**TABLE 3:** Distribution of the healthcare workers' risks and health problems in terms of occupation (Mersin, Turkey 2009).

Variables	Doctor %	Midwife %	Nurse %	Other %	Total %	$\chi^2$ (p)	
Physical-ergonomic	Acute musculoskeletal pain due to work conditions	57.0	55.4	56.2	46.6	54.4	3.557 (0.313)
	Chronic musculoskeletal pain due to work conditions	40.8	33.2	36.5	26.7	34.4	6.081 (0.108)
	Exposure to loud voice and noise	43.7	28.0	31.4	21.6	30.9	16.620 (0.001)
	Heat stroke during field work	4.9	41.3	26.3	7.8	24.6	88.394 (0.001)
	Falling/slipping without injury	18.3	17.7	19.7	16.4	18.0	0.501 (0.919)
	Breaking sth-dislocation, injury in any part of the body due to falling-sliding	10.6	14.0	13.9	7.8	12.2	3.696 (0.296)
	Risk of traffic accidents (which does not result in injury)	6.3	6.6	5.1	3.4	5.7	1.736 (0.629)
	Traffic accident (resulting in injury)	3.5	2.6	1.5	0.9	2.3	2.582 (0.461)
	Electric shock / accident	1.4	2.2	4.4	0.9	2.3	4.296 (0.231)
Biological	Sharp object injury (sting, cut, etc)	25.4	48.7	54.7	39.7	43.4	29.779 (0.001)
	Contact with body fluids (vomit, stool, urine, saliva, etc.)	58.5	25.5	29.2	23.3	32.9	54.518 (0.001)
	Animal (eg.dog) attack during field work resulting in injury	1.4	8.5	6.6	1.7	5.4	12.907 (0.005)
Psychological	Verbal insult or threat by the patient or the patient's relative	59.9	43.2	47.4	40.5	47.1	12.977 (0.005)
	Physical attack by the patient or the patient's relatives	18.3	13.7	10.9	15.5	14.4	3.322 (0.345)
	Physical or verbal insult made by the colleagues and/or managers	11.3	10.3	19.0	4.3	11.3	14.006 (0.003)
	Animal (eg. dog) attack during field work which does not result in injury	5.6	18.5	9.5	0.9	10.8	32.506 (0.001)
Chemica	Damage on the gown/apron due to chemical solid or liquid splash without any injury	14.8	16.6	16.1	15.5	15.9	0.247 (0.970)
	Damage on the gown/apron due to chemical solid or liquid splash with injury	6.3	4.4	4.4	3.4	4.7	1.342 (0.719)

workers. The fact that doctors are exposed to loud voice and noise more frequently may stem from the work environment. It is thought that the waiting patients and relatives cause this high level of noise and sound. The fact that midwives go out of the healthcare institution to monitor the pregnant, babies, and children might have exposed them to more sunlight and heatstroke. In the study by Ergör et al.<sup>19</sup>, it was stated that primary healthcare workers

excluding the doctors experienced more heart strokes compared to others.

Retsas and Pinikahana<sup>10</sup> stated that 75.9% of the nurses in Australia, Dıraçoğlu<sup>22</sup> stated 71.3% of the nurses in Turkey, and Ando et al.<sup>12</sup> stated that 54.7% of the nurses in Japan had backache. According to the results of this study, backache is experienced more frequently by nurses while in the present study, physical pain is experienced in all of the occupational

groups at the same rate. Ergör et al.<sup>19</sup> reported that 51.7% of the healthcare center workers encountered acute physical pain, 39.2% had chronic physical pain within the past year. In the present study, the most frequently encountered problems were physical and ergonomic problems, acute and chronic physical pain similar to Ergör et al.'s<sup>19</sup> findings.

### BIOLOGICAL RISKS

According to previous studies, 47.3-63.0% of the healthcare workers were exposed to percutaneous mucosal injury within the past year<sup>19,23,24</sup> and 54.04% contacted blood and body fluid.<sup>25</sup> Hadadi et al.<sup>26</sup> stated that encountering blood and body fluid was at a higher rate in nurses, and Hosoglu et al.<sup>24</sup> reported that percutaneous mucosal injury was more frequently observed in young people. It is thought that these differences are based on the health system, health staff distribution and work conditions.

In our study, nurses and midwives, especially those working in primary healthcare institutions were under the risk of sharp object injuries, had contact with body fluids and the related contagious disease risks due to their work definitions. Atenstaedt et al.<sup>27</sup> stated that primary healthcare workers were under high risk in terms of needle-stick injuries. In some studies, the incidence of contact with blood and body fluids,<sup>28-30</sup> and the incidence of sharp object injuries<sup>23,28-31</sup> were reported to range between 51.0-79.0% and 24.0-82.0%,<sup>23,28-31</sup> respectively. Similar findings were obtained in the present study. In addition, the fact that especially midwives encounter dog attack resulting in injury during field work was significant on account of suspicious animal contact (rabies) and the consequent necessity for medical intervention such as vaccination and the need for immunoglobulin.

In the present study, female healthcare workers were exposed to sharp object injury more than the others.<sup>19,32</sup> The fact that the majority of the female healthcare workers are midwives and nurses may account for this.

### PSYCHOLOGICAL RISKS

According to previous studies, the healthcare personnel encounter verbal violence at a rate of 30.6-

75.0%, and physical violence at a rate of 1.4-28.0%.<sup>21,33-36</sup> Ergör et al.<sup>19</sup> reported that 58.7% of the workers were exposed to verbal insult or threat by the patient or the patient's relative; 14.0% to physical violence by the patient or the patient's relative and 17.5% to physical or oral insult/threat by the colleague and/or managers. In this study, the rates of verbal or physical violence (verbal 47.1%, physical 14.4%) encountered by the healthcare workers were similar to the previous studies.

Violence in the healthcare sector and workplace differs by countries; however, the common point in these studies is that women are exposed to violence more frequently. It was reported that nurses in Australia, Lebanon, South Africa, Thailand; and doctors in Bulgaria and Portugal were exposed to more violence than the other occupation groups.<sup>16</sup> As for Turkey, it has been stated that nurses are exposed to more violence than the others.<sup>37</sup> In the present study, the fact that nurses are exposed to verbal insult from colleagues and managers can be accounted for by the fact that all of the nurses are women and women experience a higher level of violence.

A significant finding of the study is that healthcare workers experience fewer psychological risks as their work period increases. This may be explained by the fact that workers gain positive skills in years and create solutions realizing the psychologically conflicting situations in advance.

### CHEMICAL RISKS

McDiarmid<sup>17</sup> notes that healthcare workers may experience many risks in various jobs in terms of chemical danger. Ergör et al.<sup>19</sup> reported that primary healthcare workers encounter splash of chemicals or liquids which do not result in injury (33.6%) and splash of chemicals or liquids which result in injury (3.5%). In the present study, these rates were found to be 15.9% and 4.7%, respectively. Ergör et al.<sup>19</sup> reported that doctors faced chemical splash more than the other occupational groups. However in our study, there was not a significant relationship between occupational groups and encountering chemical matters.

## MARITAL STATUS AND RISK

The fact that single healthcare workers experience physical-ergonomic, biological and psychological risks more often could not be accounted for by the previous literature findings. Nevertheless, it could be argued that single healthcare workers may have experienced more risks since they are younger and thus have less experience, as well as having to work in healthcare centers far from the city center and with inadequate tools.

## THINKING THAT HIS/HER HEALTH IS IN SAFETY IN THE WORKPLACE AND RISK

Healthcare workers who do not feel secure in the workplace experience some kind of workplace health risks and all of the risk groups imply that their sense of security is decreased after encountering risks.

## RISK TRAINING EXPERIENCE AND RISK

Although it was expected that those healthcare workers who received information on occupational risks would experience fewer risks, it was observed that those who received education encountered the same amount of risk as others. This leads one to think that the instruction was inadequate or inadequate physical equipment causes increased risk.

## LIMITATIONS

The limitations of the study include the possibility that the answers about risk within the past year questions might have been negatively affected by the memory factor and that the health results emerging as a result of the risks depended on reports rather than records. Additional limitations include inability to reach all of the primary healthcare center workers in the city, lack of knowledge about the department and the job in which the workers experienced health risks and inability to compare research findings with more studies on primary healthcare workplace health risks.

## CONCLUSION

The occupational risks faced by healthcare workers at primary healthcare services differ from those encountered in secondary healthcare institutions in many aspects since the structure of the presented healthcare service, work conditions and the encountered patient profiles are different from each other.

Nine tenths of the primary healthcare workers in Mersin had encountered an occupational risk within the past year. The most frequently encountered risks by healthcare workers were physical risks. More than half also encountered biological and psychological risks. Nine tenths of the workers did not feel safe in the workplace. The outcome of these studies have shown that the healthcare workers occupied in the primary healthcare face so many health risks. It should be emphasized that a qualified healthcare directly depends on the health of the healthcare workers work in these institutions. Therefore, it is essential to take immediate measures in order to eliminate health risks in the primary healthcare.

The number of individual, organizational and legal regulations towards decreasing the present physical-ergonomic, biological, psychological and chemical risks to minimum and protecting the healthcare workers' health should be augmented. Healthcare workers should have continuous training on workplace risks and how to protect themselves against. Detailed risk assessment studies should be conducted in problematic health areas in order to identify the health problems. Monitoring and prevention programs should be developed for all of the health risks in primary health institutions.

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## REFERENCES

- World Health Organization. Overview for health. The World Health Report 2006: Working Together for Health. Geneva: WHO; 2006. p.xv-xxvi.
- Gümrükçüoğlu OF, Tosun N, Yol S, Septioğlu AS, Zırh H, Solak M, ve ark. [Health Manpower Status Report of Turkey]. T.C. Sağlık Bakanlığı, T.C. Yükseköğretim Kurumu. Bakanlık Yayın No: 739. Ankara: Uyum Ajans 2008. p.13-62.
- Buzgan T, Keskinliç B, Baykan H, Bayazıt L, Gümüş A. Temel Sağlık Hizmetleri Genel Müdürlüğü Çalışma Yıllığı, 2006. Yayın no: 721. Ankara: Kuban Matbaacılık 2007. p.29-154.
- Vecchio D, Sasco AJ, Cann CI. Occupational risk in health care and research. *Am J Ind Med* 2003;43(4):369-97.
- CDC and NIOSH. Overview of hospital hazards. Guidelines for Protecting the Safety and Health of Health Care Workers. Washington, DC: US Government Printing Office; 1988. p.11-20.
- Froneberg B. National and international response to occupational hazards in the health-care sector. *Ann N Y Acad Sci* 2006;1076:607-14.
- Tennessee LM, Padilla M. Module three: hazards, their potential effects and their control. Health and Safety of Workers in the Health Sector: A Manual for Managers and Administrators. PAHO and WHO. Washington, DC: Library of PAHO Headquarters – Cataloging at Source; 2006. p.42-102.
- Boyer J, Galizi M, Cifuentes M, d'Errico A, Gore R, Punnett L, et al.; the Promoting Healthy Safe Employment (PHASE) in Healthcare Team. Ergonomic and socioeconomic risk factors for hospital workers' compensation injury claims. *Am J Ind Med* 2009;52(7):551-62.
- Lorusso A, Bruno S, L'Abbate N. A review of low back pain and musculoskeletal disorders among Italian nursing personnel. *Ind Health* 2007;45(5):637-44.
- Retsas A, Pinikahana J. Manual handling activities and injuries among nurses: an Australian hospital study. *J Adv Nurs* 2000;31(4):875-83.
- Yip YB. A study of work stress, patient handling activities and the risk of low back pain among nurses in Hong Kong. *J Adv Nurs* 2001;36(6):794-804.
- Ando S, Ono Y, Shimaoka M, Hiruta S, Hattori Y, Hori F, et al. Associations of self estimated workloads with musculoskeletal symptoms among hospital nurses. *Occup Environ Med* 2000;57(3):211-6.
- Prüss-Ustün A, Rapiti E, Hutin Y. Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers. *Am J Ind Med* 2005;48(6):482-90.
- Kingma M. Workplace violence in the health sector: A problem of epidemic proportion. *Int Nurs Rev* 2001;48(3):129-30.
- Wassell JT. Workplace violence intervention effectiveness: A systematic literature review. *Saf Sci* 2009;47(8):1049-55.
- Martino VD. Workplace violence in the health sector. Country Case Studies: Brazil, Bulgaria, Lebanon, Portugal, South Africa, Thailand and an additional Australian Study, Synthesis Report. ILO/ICN/WHO/PSI Joint Programme on Workplace Violence in the Health Sector. Geneva: ILO/ICN/WHO/PSI; 2002. p.1-40.
- McDiarmid MA. Chemical hazards in health care high hazard, high risk, but low protection. *Ann N Y Acad Sci* 2006;(1076):601-6.
- The General Directorate of Primary Health Care Services, the Ministry of Health of Turkish Republic. [Directive on the implementation of Primary Health Services]. Date: 20.12.2001, Number: 8597. Ankara: 2001.
- Ergör A, Kılıç B, Gürpınar E. Work risks in primary health care centers. Assessment of the situation in Narlıdere training research hospital and primary health care centers of the regional directorate of health. *JOHS* 2003; 16(1):44-51.
- Parlar S. [A problem that is not considering in health workers: Healthy work environment]. *TAF Prev Med Bull* 2008;7(6):547-54.
- Chambers R, Miller D, Tweed P, Campbell I. Exploring the need for an occupational health service for those working in primary care. *Occup Med* 1997;47(8):485-90.
- Dıraçoğlu D. [Musculoskeletal pain among medical staff]. *Türkiye Klinikleri J Med Sci* 2006;26(2):132-9.
- Kermode M, Jolley D, Langkham B, Thomas MS, Crofts N. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural North Indian health care settings. *Am J Infect Control* 2005; 33(1):34-41.
- Hosoglu S, Akalin S, Sunbul M, Oktun M, Ozturk R; Occupational Infections Study Group. Predictive factors for occupational bloodborne exposure in Turkish hospitals. *Am J Infect Control* 2009;37(1):65-9.
- Çelik Y, Akduman D, Kiran S. [Evaluation of healthcare workers and students' knowledge levels about infections transmitted by blood and body fluids, infection control measures, exposure frequencies and serological and hepatitis B vaccinations status]. *Türkiye Klinikleri J Med Sci* 2010;30(4):1246-55.
- Hadadi A, Afhami S, Karbakhsh M, Esmailpour N. Occupational exposure to body fluids among healthcare workers: a report from Iran. *Singapore Med J* 2008;49(6):492-6.
- Atenstaedt RL, Payne S, Roberts RJ, Russell IT, Russell D, Edwards RT. Needle-stick injuries in primary care in Wales. *J Public Health (Oxf)* 2007;29(4):434-40.
- Askarian M, Shaghaghian S, Gillen M, Assadian O. Body fluid exposure in nurses of Fars province, Southern Iran. *Arch Iranian Med* 2008;11(5):515-21.
- Beltrami EM, Williams IT, Shapiro CN, Chamberland ME. Risk and management of bloodborne infections in health care workers. *Clin Microbiol Rev* 2000;13(3):385-407.
- Sencan I, Sahin I, Yildirim M, Yesildal N. Unrecognized abrasions and occupational exposures to blood-borne pathogens among health care workers in Turkey. *Occup Med (Lond)* 2004;54(3):202-6.
- Phipps W, Honghong W, Min Y, Burgess J, Pellico L, Watkins CW, et al. Risk of medical sharps injuries among Chinese nurses. *Am J Infect Control* 2002;30(5):277-82.
- Heide I. Labour standards promoting women workers' rights and gender equality. ABC of Women Workers' Rights and Gender Equality. 2<sup>nd</sup> ed. Geneva: International Labour Office (ILO); 2007. p.1-5.
- Adib SM, Al-Shatti AK, Kamal S, El-Gerges N, Al-Raqem M. Violence against nurses in healthcare facilities in Kuwait. *Int J Nurs Stud* 2002;39(4):469-78.
- Açelik A, Deniz F, Yeşildal N, Mayda AS, Şerifi BA. [Health survey and life habits of nurses who work at the Medical Faculty Hospital at AIBU]. *TAF Prev Med Bull* 2005;4(2):55-66.
- Findorff MJ, McGovern PM, Wall M, Gerberich SG, Alexander B. Risk factors for work related violence in a health care organization. *Inj Prev* 2004;10(5):296-302.
- Kowalenko T, Walters BL, Khare RK, Compton S; Michigan College of Emergency Physicians Workplace Violence Task Force. Workplace violence: a survey of emergency physicians in the state of Michigan. *Ann Emerg Med* 2005;46(2):142-7.
- Ayrancı Ü. Violence toward health care workers in emergency departments in West Turkey. *J Emerg Med* 2005;28(3):361-5.