

## Occupational Stress and Risk Factors in Veterinary Surgeons <sup>[1]</sup>

Sibel CEVİZCİ <sup>1,3</sup> Ülken Tunga BABAOĞLU <sup>2</sup> Adnan SERPEN <sup>3</sup>  
Osman YILMAZ <sup>3,4</sup> Hakan BOYAR <sup>3</sup> Suat ÇELİKEL <sup>3</sup>

<sup>[1]</sup> This study was presented as poster at the XV. National Public Health Congress on 2-6 October, Bursa, Türkiye, 2012

<sup>1</sup> Canakkale Onsekiz Mart University, School of Medicine, Department of Public Health, TR-17100 Canakkale - TURKEY

<sup>2</sup> Ahi-Evran University, Colleges of Health, TR-40100 Kirsehir - TURKEY

<sup>3</sup> Izmir Chamber of Veterinary Medicine, Veterinary Public Health Study Group, TR-35220 Izmir - TURKEY

<sup>4</sup> Dokuz Eylul University, Institute of Health Sciences, Department of Laboratory Animals, TR-35210 Izmir - TURKEY

Makale Kodu (Article Code): KVFD-2013-9426

### Summary

The aim of this study was to investigate occupational stress and risk factors among veterinary surgeons. The present cross-sectional study was performed in 2012 via a web-based survey. Data of 223 individuals who responded to the survey are presented. In order to evaluate the occupational stress Turkish Version of "Swedish Demand-Control-Support Questionnaire" was used. Mean age of participants was 37.45±9.11 and 28.3% of subjects were female. Work load, work control, skill, decision latitude, and social support mean points with standard deviations were found to be 9.42±1.86, 10.27±2.72, 7.06±1.78, 3.21±1.64 and 11.26±3.94, respectively. It was reported that 92 subjects were working for public institutions and 131 were working for private sector. Decision latitude and social support levels in surgeons working for public institutions were statistically significantly lower than their counterparts in the private sector. There was no statistically significant difference in work load, work control and skill use between two groups. Of participants 54.3% reported that they had car accidents, 19.3% reported that they had the accident in the last one year, and 9.9% reported that they had the accident during a patient visit. Majority of Turkish veterinary surgeons in our study group reported that they experienced occupational stress. Occupational stress and related factors in work environment can influence work health negatively by causing physical, mental and social problems.

**Keywords:** Veterinary surgeon, Occupational stress, Work load, Work control, Social support

## Veteriner Hekimlerde İş Stresi ve Risk Faktörleri

### Özet

Bu çalışmada, veteriner hekimler arasında iş stresinin ve risk faktörlerinin incelenmesi amaçlandı. Kesitsel tipteki bu çalışma, 2012 yılında web-tabanlı anket aracılığı ile yapıldı. Ankete yanıt veren 223 bireyin verileri sunuldu. İş stresini değerlendirmek için "İsveç İş Yükü-Kontrol-Destek Anketi"nin Türkçe Sürümü kullanıldı. Katılımcıların yaş ortalaması 37.45±9.11'di ve %28.3'ü kadındı. Katılımcıların iş yükü, iş kontrolü, beceri, karar serbestliği ve sosyal destek ortalama puanları ile standart sapmaları sırasıyla 9.42±1.86, 10.27±2.72, 7.06±1.78, 3.21±1.64 ve 11.26±3.94 olarak belirlendi. Kamuda çalışan hekimler arasında karar serbestliği ve sosyal destek düzeyleri özel sektörde çalışanlara göre istatistiksel olarak anlamlı düzeyde daha düşüktü. İş yükü, iş kontrolü ve beceri kullanımı yönünden iki grup arasında istatistiksel olarak anlamlı bir fark saptanmadı. Katılımcıların %54.3'ü araba kazası yaşadıklarını, %19.3'ü son bir yıl içinde kaza yaptıklarını ve %9.9'u kazaların hasta ziyareti sırasında olduğunu bildirdi. Çalışma grubumuzda yer alan veteriner hekimlerin çoğu iş stresi yaşadıklarını bildirdi. İş stresi ve işyeri ortam faktörleri, fiziksel, ruhsal ve sosyal sağlık sorunlarına yol açarak çalışanların iş sağlığını olumsuz yönde etkileyebilir. İş sağlığı ve güvenliği uygulamalarının henüz her meslek grubuna yansımadığı Türkiye gibi ülkelerde veteriner hekimler arasında iş stresi gibi mesleki risklere karşı koruyucu, hizmet içi eğitimlerin yapılması yararlı olacaktır.

**Anahtar sözcükler:** Veteriner hekim, İş stresi, Risk faktörleri, İş yükü, İş kontrolü, Sosyal destek anketi

### INTRODUCTION

According to World Health Organization (WHO), occupational stress is a response, which appears when

levels of knowledge, skill, and coping with of subjects in order to work and solve problems under high workload



**İletişim (Correspondence)**



+90 386 2114829



ulkentunga@yahoo.com

and occupational stress [1]. Occupational stress is tolerable only if it is stimulating, motivating, and encouraging for learning innovations. However, this delicate balance may be affected favourably or unfavourably by work-related (duration of work, workload, duration of pauses, social support etc.) and individualized (socio-economical state, family-surrounding relationships, personality etc.) factors. When the change starts to develop in an unfavourable direction (high workload, weak social support, low work control etc.), work stress continuously strengthens. When this high work stress reaches a level which cannot be managed by the worker and becomes chronic, it causes decreased work efficiency by causing physical, mental, and social health problems [1-4]. Work load-work control and support model is one of the best methods, which indicate these components acting in development of work stress [2-4].

Occupational stress and mood disorders like depression and anxiety are also observed widely among veterinary surgeons, which affect health unfavourably [5,6]. Recent studies have especially indicated that occupational stress, anxiety and depression related to various physical and mental reasons caused increased suicidal risk [7-11]. It has been defined that suicide related mortality rate was 3-4 folds increased among veterinary surgeons than the population as well as 2 folds higher than other healthcare personnel [8,11]. Workload-work control and support model are generally employed in studies, which investigate occupational stress among veterinary surgeons [12]. According to studies performed on veterinary surgeons, main risk factors triggering occupational stress are extended working hours, inefficient time for family and for resting and having no enough break, financial problems, difficulty in following up new developments and innovations, requirement of limitless working period, high expectations of clients/animal owners, intense physical workload, low rating of veterinary occupation by population, and disrespectful behaviour among veterinary surgeons [12-17]. In addition, several factors like private life conditions of staff, absence of occupational controls, inability to contribute in decision making steps, low social support at working environments, unclear and incomprehensible job descriptions can also trigger occupational stress [15,18].

In the present study, it was aimed to investigate occupational stress and risk factors among veterinary surgeons in Turkey.

## MATERIAL and METHODS

This present cross-sectional study was performed between January and June in 2012. Study data were collected via a web survey prepared by investigators. The web-based survey was transferred to chambers of veterinary surgeons and veterinary surgeons via internet. Data from 223 responders were presented. The Swedish

Demand-Control-Support Questionnaire [19-21], which was tested for validation and reliability in Turkish by Demiral et al. [22] was used to measure occupational stress of veterinary surgeons. High scores from the scale indicated high occupational stress, high work control and high social support. Occupational stress was evaluated as ratio of workload to work control. Socio-demographic data, risk factors related to occupation, and some health behaviour were also investigated in this present web-based study.

Statistical analyses were performed by using SPSS 15.0 package program. Mean, standard deviation, median, and ratio values were used for descriptive analysis of data. T test and One Way Variation analysis were used for comparisons of means in normally distributed data analysis, whereas non-parametric statistical tests (Mann-Whitney U and Kruskal-Wallis) were used in analysis of abnormally distributed data. Mann Whitney U test was used in comparison of occupational stress levels of subjects working for the public and private sector. The level of significance was accepted at  $P < 0.05$ .

## RESULTS

In the present study, 245 subjects were enrolled and response of 223 participants, who completed the survey were examined. Mean age of participants was  $37.45 \pm 9.11$  years. Of participants, 71.7% were males. Of participants, 34.1% ( $n=76$ ) reported that they had their own office and average duration in occupation was  $12.9 \pm 9.5$  years. The demographic data of the study group were presented in *Table 1*.

Participants expressed that they worked  $5.9 \pm 0.8$  day in a week on average. Daily working, while standing up, while sitting and duration of computer use were evaluated as work-related factors. Reported work-related factors by veterinary surgeons on *Table 2*. When the correlation between occupational stress level and work-related factors was investigated no statistically significant difference was detected (between subjects working for public and private sector).

Of participants 19.7% ( $n=44$ ) declared that they exercised regularly and 57.8% ( $n=129$ ) reported that their working environments affected them negatively. Of participants, 51.5% ( $n=115$ ) reported that they experienced physical disturbances in the last one month at the work or because of the work (*Table 3*). When physical disturbances with respect to gender were examined, chronic fatigue was the 3rd in order, whereas the 5th in order for males. Physical health problem, which was first in order was lower back and back pain for both females and males. The most commonly reported mental health problem was stress (19.7%), (*Table 3*).

Of participants, 51.1% ( $n=114$ ) reported that they kept

**Table 1. Sociodemographic characteristics of the study participants**  
**Tablo 1. Çalışmaya katılanların sosyodemografik özellikleri**

Factors	Mean±SD	Min-Max.
Age	37.45±9.11	24-66
Average duration in occupation (years)	12.9±9.5	1- 43
Gender	Number (n)	Percentage (%)
Male	160	71.7
Female	63	28.3
Total	223	100.0
<b>Marital status</b>		
Married	163	73.1
Single	60	26.9
Total	223	100.0
<b>Number of children</b>		
1	60	26.9
2	66	29.6
3 and more	12	5.4
Total	138	100.0
<b>Working for</b>		
Veterinary clinic/hospital	83	37.2
Private sector	48	21.5
University	41	18.4
Ministry of Agriculture	39	17.5
Municipality	10	4.5
Turkish Armed Forces	2	0.9
Total	223	100.0
<b>Having own workplace</b>		
Yes	76	34.1
No	147	65.9
Total	223	100.0

animals, and 31.6% of those subjects keeping animals declared that they kept cats (n=62), and 18.4% (n=43) reported that they kept dogs. Of 114 subjects, who responded the survey and kept animals, 79.8% (n=91) reported that keeping animals decreased occupational stress. Veterinary surgeons, who participated in the study, reported stressors related to occupation by veterinary surgeons (Table 4). When investigated with respect to gender, mistreatment/death of animal was at the first line in order (Male = 19.0%, Female = 20.6%). The second most commonly reported stressor among males was animal owner pressure or super pressure (12.7%) whereas it was transmission risk of zoonosis diseases among females (17.5%). Moreover, mistreatment/death of animal stressor was defined to be decreased with the increasing age (Fig. 1).

Of participants, 54.3% (n=121) reported that they had a car accident; 19.3% of them (n=43) had an accident in the last one year, and 10.8% of them had the traffic accident.

**Table 2. Reported work-related factors by veterinary surgeons**  
**Tablo 2. Veteriner hekimlerin bildirdiği iş ile ilişkili faktörler**

Factors	Mean±SD	Min-Max.
Day work (week)	5.9±0.8	4-7
Use cell phone (minutes)	70.41±61.14	10-300
Daily working (h/day)	Number (n)	Percentage (%)
4-5 h	5	22.2
6-7 h	18	8.1
8-9 h	101	45.3
10 h and more	99	44.4
Total	223	100.0
<b>Daily working durations while standing up (h/day)</b>		
0-1 h	15	6.7
2-3 h	33	14.8
3-4 h	35	15.7
4-5 h	39	17.6
5-6 h	36	16.1
6 h and more	65	29.1
Total	223	100.0
<b>Daily working durations while sitting down (h/day)</b>		
0-1 h	26	11.7
2-3 h	34	15.2
3-4 h	26	11.7
4-5 h	50	22.4
5-6 h	39	17.5
6 h and more	48	21.5
Total	223	100.0
<b>Use computer (h/day)</b>		
0-1 h	47	21.1
2-3 h	49	22.0
3-4 h	45	20.2
4-5 h	25	11.2
5-6 h	23	10.3
6 h and more	34	15.2
Total	223	100.0

Moreover, 82.1% of veterinary surgeons (n=183), who completed the survey, responded as "Yes" to the question "Do you believe that you experience occupational stress?". Of participants, 47.5% (n=106) responded as "I am, but it is not enough", and 36.8% (n=82) responded as "No" to the question "Are you able to spare enough time to yourself or to your family?"

Mean stress scores were higher in subjects working for public sector than for the private sector (42.56 vs. 40.29, respectively). There was a statistically significant difference in decision latitude between subjects working for public and private sector (P<0.05) (Table 5).

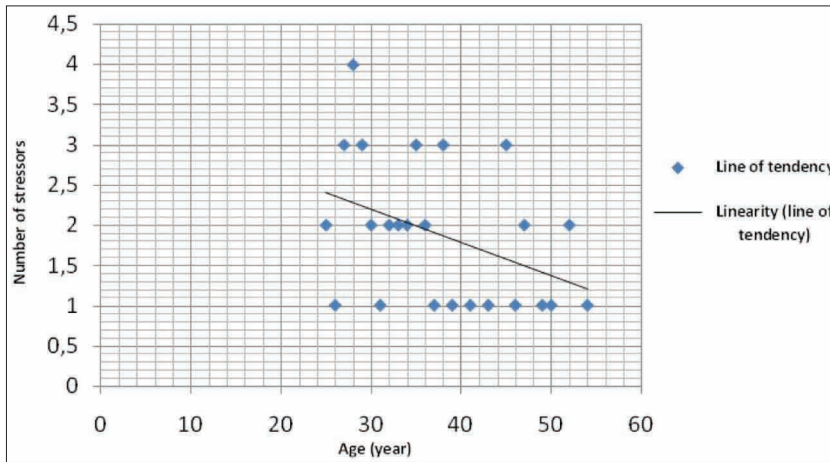
**Table 3.** Reported physical and mental health problems by veterinary surgeons**Tablo 3.** Veteriner hekimlerin bildirdiği fiziksel ve ruhsal sağlık problemleri

Physical	Number (n)	Percentage (%)
Lower back and back pain	58	26.0
Chronic fatigue	10	4.5
Leg, foot pain	10	4.5
Head, neck pain	9	4.0
Skin infections and irritation	8	3.6
Animal attack, being bitten	7	3.1
Other	13	5.9
Total	115	100.0
Mental		
Unresponded	25	21.4
Stress	23	19.7
Short temper	18	15.4
Depression	15	12.8
Burnout	14	12.0
Unhappiness/restlessness	12	10.3
Chronic fatigue/insomnia	9	7.7
Attention deficit	1	.9
Total	117	100.0

**Table 4.** Reported stressors related to occupation by veterinary surgeons**Tablo 4.** Veteriner hekimler tarafından bildirilen iş ile ilgili stresörler

Stressors	Number (n)	Percentage (%)
Unresponded	76	34.1
Mistreatment/animal death	45	20.2
Transmission of zoonosis disease	36	16.1
Animal owner pressure/superior pressure	27	12.1
Animal attack	20	9.0
Future/economic concerns	12	5.4
Other	6	2.7
Traffic accident	1	.4
Total	223	100.0

Moreover, there was a statistically significant difference in stress points between subjects who owned their businesses and who worked for employers ( $t = -3.204$ ;  $P < 0.05$ ). Mean score of subjects working for employers were higher than those who owned their businesses (42.39 vs. 38.97). There were statistically significant differences in work control, skill and decision latitude when stress points were examined in subscales ( $P < 0.05$ ,  $P < 0.05$ ,  $P < 0.05$ ,  $t = -4.406$ ,  $t = -3.089$ ,  $t = -3.867$ ). Means of subjects working for employers were higher in all three score examinations (work control = 9.29-10.78, skill = 6.60-7.29, decision latitude = 2.68-3.49). When stress points of married and

**Fig 1.** Relationship between mistreatment/animal death stressor and age**Şekil 1.** Yanlış tedavi/hasta kaybı stresörleri ile yaş arasındaki ilişki**Table 5.** Mean points in subgroups of occupational stress scale among veterinary surgeons**Tablo 5.** Veteriner hekimler arasında iş stresi ölçeği alt grupları ortalama puanları

Swedish Demand-Control-Support Questionnaire	Civil Servant (n:82)	Private Sector Employee (n:117)	p*
	Mean ± SD	Mean ± SD	
Work load	9.65±1.73	9.26±1.94	0.080
Work control	10.73±2.94	9.95±2.51	0.065
Skill use	7.12±1.92	7.02±1.68	0.969
Decision latitude	3.61±1.84	2.94±1.42	<b>0.008</b>
Social support	11.46±3.58	11.12±4.19	0.195

\* Mann-Whitney U test,  $P < 0.05$  was considered



single participants were compared, work load stress point of married ones was higher (9.73 vs 8.67), whereas mean scores of work control (10.09 vs 10.96) and decision latitude (3.10 vs 3.69) were statistically significantly lower than the single ones ( $P < 0.001$ ,  $P < 0.05$ ,  $P < 0.05$ ,  $t = -3.65$ ,  $t = 2.02$ ,  $t = 2.25$ ). According to weekly working durations, the highest work load score was defined in 5-day working group ( $9.84 \pm 1.86$ ). In further analyses performed by Tukey test result, there was a significant difference between subjects working 5 days and 7 days in a week ( $P < 0.05$ ).

There were statistically significant differences in work load, skill, and social media between subjects who believed that working environments had negative and no negative effects on the physical health ( $P < 0.05$ ). On the contrary, subjects who reported that their physical health states were not affected. Mean work load scores were higher. When groups were compared in skill, points of subjects, who said "Yes", were higher (7.30). When groups were examined for skill, there was a statistically significant difference between them ( $P < 0.05$ ). When groups were examined for social support, stress scores of subjects who said "Yes" were higher (11.71). There was a significant difference between groups ( $P < 0.05$ ). According to correlation analyses, it was defined that there was a positive correlation between age and work load ( $P < 0.05$ ), but a negative correlation between age and work control as well as decision latitude ( $P < 0.05$ ,  $P < 0.05$ ). There was a positive, statistically significant correlation between years in occupation practice and work load ( $P < 0.05$ ).

## DISCUSSION

In the present study, it has been investigated how occupational stress is changed according to business place, gender, age and other risk factors, and also comparisons with the literature is presented in this section. There has been just few performed study on veterinary surgeons about occupational stress, which is one of the most important problems endangering occupational health. In a study performed on Belgian veterinary surgeons, which investigated occupational stress level and risk factors. Female/male ratio (24.5 vs. 75.5) was in line with our study results (28.3 vs. 71.7) [23]. According to studies investigating occupational stress in veterinary surgeons, the most important stress factor is extended working hours [14,23-25]. Weekly working hours were 54 h in the Belgian study [23] whereas 50 h in another study from Turkey, which was investigated occupational satisfaction and burnout levels of veterinary surgeons [15]. In our study, mean weekly working hours reported by veterinary surgeons was 45 h. Nearly half of veterinary surgeons (41.3%) reported that they have been working as a civil servant and 40 h in a week.

In a study performed on veterinary surgeons in Australia, it was reported that extended working duration,

inefficient break-time and holiday durations, and attitudes and behaviour of animal owners increased occupational stress [13,24]. Veterinary surgeons participated in our study reported similar stressors affected negatively their physical and mental health states. Working stress studies indicated that occupational stress level was increased by low decision latitude, low social support and high work load, and caused physical and mental health problems [2-4,22]. Occupation related stressors, which were reported by vets, were mistreatment/animal death, transmission risk of zoonosis diseases, animal owner pressure/superior pressure, animal attack, future/economic concerns and traffic accident in decreasing order. In the German study, vets also reported that they had high levels of concerns because of financial and social insufficiencies [14]. In the Australian study, it was reported that approximately 1/3 of veterinary surgeons had psychologically bad health [6]. Moreover variables like advanced age, extended working duration, time from graduation, male gender are related to stress, anxiety and depression [6].

Veterinary surgeons face with many various occupational hazards during their working life. Being bitten, being scratched, other traumas, injuries, muscle-skeletal system diseases, car accidents, and having zoonosis diseases are the leading ones [13,26-29]. Data from Australia [13], New Zealand [25] and Germany studies [14,30] were similar to stressors reported from our study group. In a study performed on 160 vets in West Australia, 71% of veterinary surgeons were reported to be injured in the last decade. The most commonly reported injuries were cat-dog bites, cat scratching, incisions and lower back injuries due to lifting up heavy animals [27]. Chronic fatigue, leg-foot pain, head-neck pain, skin infections or skin irritation, animal attack and being bitten were other reported physical problems along with lower back and back pains, which were reported as occupation related physical problems by veterinary surgeons in our study, and they were placed in the first line (58%) in the list. When the literature is reviewed, factors like stress, X rays, anaesthetics, animal bites, cytotoxic drugs, exposure to pesticides, and radiation have been reported as risks endangering occupational health and safety in veterinary surgeon practice [27,31]. In our study group, although zoonosis diseases were reported in the leading orders as an occupational risk factor, differently from the literature, radiation, X rays and anaesthetics were not reported. This result suggested that veterinary surgeons in our study group did not perceive or value these risk factors as risks practically endangering occupational health and safety.

In studies investigating age and stress, stress levels in middle aged veterinary surgeon population were higher than those of advanced age [14,25]. No correlation was defined between stress and age in the Australia study. In our study, stressors of mistreatment/animal death were decreased in female and male veterinary surgeons as the

age was increased. In another Australian study, similar to the study from New Zealand, occupational stress was higher in young veterinary surgeons when compared with the older ones, and in females when compared with the males [17]. In studies from Finland and Australia, similar to the study from New Zealand, young veterinary surgeons had higher occupational stress levels than those in older ones as well as females had higher levels than males [17,25,32]. In our study group, young veterinary surgeons were defined to be affected more from stressor factors than their older counterparts. In the study conducted by Smith et al. [13], a strong correlation was defined between gender and all components of stress. In our study group, similar results were obtained with studies from the New Zealand and Australia [13,25]. Female veterinary surgeons are experiencing more stress in working hours. Employer/Colleague expectations, animal and animal owner expectations, communication, source support, upper management support, professional support and unexpected treatment outcomes than their male counterparts [30]. According to correlation analysis in our study, positive correlation was detected between age and work load ( $P < 0.05$ ) whereas a negative correlation in work control and decision latitude ( $P < 0.05$ ). Positive correlation was detected between time spent in the occupation and work load ( $P < 0.05$ ).

In the Australian study, it was reported that there was a correlation between working and stress level in small cattle veterinary surgery [13]. In the German study, stress levels in veterinary surgeons, who had their own clinics and were working in clinics, were defined higher [30]. Statistically significant difference was defined between veterinary surgeons, who had their own businesses and who worked for employers ( $P < 0.05$ ). Mean score of subjects working for employers were higher than the ones who owned their businesses (42.39 vs. 38.97). When stress score subscales were examined, statistically significant differences were defined in work control, skill, and decision latitude, and mean values of subjects who did not own their businesses were defined higher than the ones, who worked for employers. In the study from New Zealand, many of veterinary surgeons declared that good communication with their families and friends helped them more in tackling with the stress [25]. In our study group, it was reported that enough time could not be spared for families. This problem arose as an important stress factor preventing subjects from dealing with occupational stress. In a study investigating psychological stress from Turkey, it was reported that keeping animals and regular physical exercising could be effective in dealing with stress [33]. In our study, veterinary surgeons reported that keeping animals reduced occupational stress, and 19.7% of participants performed physical exercises regularly. In a Canadian study, which was conducted on web-base similar to our study, 2% of veterinary surgeons reported they experienced no occupational stress; 5% experienced severe and almost half of them (53%) expressed moderate

level of stress. No statistical difference was detected between median stress levels according to working environments [31]. In our study, 82% of the veterinary surgeons reported that they experienced occupational stress. Additionally, different from the literature, it was observed that there were differences in occupational stress subscale points according to working environments. According to results of occupational stress scale, decision latitude and social support levels of veterinary surgeons working for the government were statistically significantly lower than the ones working in the private sector. This result suggested that subjects working in the private sector had more latitude in making decision; and they gained more social support from their managers and colleagues. However, no statistically significant difference was detected when points of work load, work control and skill use were reviewed.

In recent years, occupational exposure studies showed that veterinary surgeons were exposed to many physical, chemical hazards while they were working, and also that they did not use at all or not effectively use preventive measures [29-34]. One of the important stressors investigated in occupational stress studies is car accidents. It was reported that car accidents happened while going to or returning from work, and they were related to working environment, weekly working hours, duration of lunch break, distance to the work, gender, and number of children [16]. It was reported in the German study that weekly working duration of veterinary surgeons was 44.2 h [16]. While 69.9% of veterinary surgeons in the German study reported that they did not have any accidents in the last one year, 61.9% of male and 34.9% of female veterinary surgeons reported that they had an accident in the last one year in our study [16]. In another study, it was reported that risk of having a car accident was reported to be high in subjects, who worked for more than 48 hours a week in line with high occupational stress [14]. In our study, more than half of participants (54.3%) had a car accident, and it was determined that 14.4% of those accidents happened during animal/clinical visits. Working hours and high occupational stress might increase accidents related to the work and especially risk of car accidents [16]. However, in our study, only one participant reported that traffic accident was a stressor related to occupation (Table 4). This finding can be result from veterinary surgeons in our study group did not see occupational stress as a risk factor for traffic accident, although majority of the participants reported that they faced with at least one car accident.

### Study Limitations

Our study has some limitations. This is a web-based study with a small sample size; therefore, any conclusions maybe limited in their implications. Further, we sent an e-mail to the all member veterinary chambers of the Turkish Veterinary Medical Association. However, the questionnaire could not be send to higher numbers

of veterinary surgeons because there was no healthy communication link between chambers of veterinary surgeons and vets, and also mutual feedback system was absent between them. Another limiting factor in our study is, we believe, that "Veterinary Occupation Health" concept and its perception have not been improved in our country yet, so vets did not show sufficient interest in the issue. Although our study had some limitations like it was performed on subjects with a few in number, and its representative strength was weak, we believe that, it would provide contributions into the literature as it was the first study evaluating occupational stress among veterinary surgeons by via of stress scale in Turkey. As insufficient awareness between veterinary surgeons about occupation health and safety could negative effects on results of this type of study. Therefore, on the job training programs would be beneficial in prevention from occupational exposures, which had negative effects on occupational health and safety, as occupational stress had the priority, among veterinary surgeons in Turkey.

Majority of Turkish veterinary surgeons enrolled in our study group reported that they experienced occupational stress. According to occupational stress scale points, decision latitude and social support levels of veterinary surgeons working for the government were statistically significantly lower than those in subjects working for private sector. There was no statistically significant difference in work load, work control and skill using points between subjects working for the government and private sector. Daily work and cellular phone use durations of participants were high. More than half of vets were determined to have a car accident. While lower back and back pains were the most commonly reported physical health problems; stress, quick temperament, and depression were the most commonly reported mental health problems by vets. The most commonly reported stressors related to occupation were observed as mistreatment, death of animal, transmission risk of zoonosis diseases, animal owner pressure and superior pressure at work environment. It was also determined that as age increases, stressors of mistreatment and animal loss were decreased.

### Recommendations

Results of occupational stress studies performed on veterinary surgeons are consistent with our results, and results have indicated that interventions are required to decrease the occupational stress [7-9,12]. It is known that low job satisfaction and burnout appears to cause occupational stress in veterinary surgeons [35,36]. In a study performed on veterinary technicians, skill training programs performed in before and after graduation were emphasized to be beneficial in increasing job satisfaction and decreasing occupational stress [37]. Occupational risks observed in veterinary practices vary according to

working environments and works performed. Therefore, considering these separate interventional studies should be planned and trainings should be performed directed to vets working for private sector and for the government in the clinic and field [32]. In the working environment sources of stress can be defined, and they may be eradicated or preventive measures can be developed for the working staff. During periodical examination of working staff, work related problems can be investigated, and required preventive measures can be defined. These measures are consideration of work load, working hours and management of work, individualization of work (ergonomy) and increasing social support. Training programs may be beneficial in development of skills related to work, communication, management of stress and conflict. These training programs and supportive applications will decrease occupational stress. Communication tools like social media and remote training services may decrease occupational stress experienced by vets in their working environments.

### ACKNOWLEDGMENTS

We thank the Chamber of Izmir Veterinary Surgeon for helping us send the survey to physicians via internet; Assoc. Prof. Dr. Ahmet ÜNVER, the Chamber of Afyonkarahisar Veterinary Surgeon for uploading the announcement in their web site, and other chambers of veterinary surgeons that supported the study; and participants who completed the survey.

### REFERENCES

1. Leka S, Griffiths A, Cox T: Work organization and stress, Protecting workers' health series. *World Health Organization (Europe)*, 3, 5-7, 2004.
2. Karasek Jr RA: Job demands, job decision latitude, and mental strain: implications for job redesign. *Adm Sci Q*, 24 (2): 285-308, 1979.
3. Karasek R, Theorell T: Healthy Work: Stress, Productivity, and the Reconstruction of Working Life. New York: Basic Books, 31-82, 1990.
4. Siegrist J: Adverse health effects of high-effort/low-reward conditions. *J Occup Health Psychol*, 1, 27-41, 1996.
5. Shirangi A, Fritschi L: A review of occupational hazards in veterinary practice and possible effects on reproductive outcomes in female veterinarians. *Australasian Epidemiologist*, 12 (2): 18-23, 2005.
6. Fritschi L, Morrison D, Shirangi A, Day L: Psychological well-being of Australian veterinarians. *Aust Vet J*, 87 (3): 76-81, 2009.
7. Bartram DJ, Yadegarfar G, Baldwin DS: A cross-sectional study of mental health and well-being and their associations in the UK veterinary profession. *Soc Psychiatry Psychiatr Epidemiol*, 44 (12): 1075-1085, 2009.
8. Bartram DJ, Baldwin DS: Veterinary surgeons and suicide: A structured review of possible influences on increased risk. *Vet Rec*, 166 (13): 388-397, 2010.
9. Bartram DJ, Sinclair JM, Baldwin DS: Interventions with potential to improve the mental health and well being of UK veterinary surgeons. *Vet Rec*, 166 (17): 518-523, 2010.
10. Bartram DJ, Sinclair JM, Baldwin DS: Alcohol consumption among veterinary surgeons in the UK. *Occup Med (Lond)*, 59 (5): 323-326, 2009.
11. Platt B, Hawton K, Simkin S, Mellanby RJ: Systematic review of the prevalence of suicide in veterinary surgeons. *Occup Med (Lond)*, 60 (6): 436-446, 2010.

- 12. Bartram DJ, Yadegarfar G, Baldwin DS:** Psychosocial working conditions and work-related stressors among UK veterinary surgeons. *Occup Med (Lond)*, 59 (5): 334-341, 2009.
- 13. Smith DR, Leggat PA, Speare R, Townley-Jones M:** Examining the dimensions and correlates of workplace stress among Australian veterinarians. *J Occup Med Toxicol*, 4 (32): 1-8, 2009. DOI: 10.1186/1745-6673-4-32
- 14. Trimpop R, Kirkcaldy B, Athanasou J, Cooper C:** Individual differences in working hours, work perceptions and accident rates in veterinary surgeries. *Work Stress*, 14 (2): 181-188, 2000.
- 15. Babaoğlu ÜT, Cevizci S, Arslan M:** İstanbul'da çalışan veteriner hekimlerin iş doyumunu ve tükenmişlik düzeyleri. *Kafkas Univ Vet Fak Derg*, 18 (4): 599-604, 2012.
- 16. Trimpop R, Austin EJ, Kirkcaldy BD:** Occupational and traffic accidents among veterinary surgeons. *Stress Med*, 16 (4): 243-257, 2000.
- 17. Williams S, Davis H:** Stress in the Veterinary Profession. [http://www.vpb.nsw.gov.au/Boardtalk/2002/August2002\\_9.htm](http://www.vpb.nsw.gov.au/Boardtalk/2002/August2002_9.htm), Accessed: 22.02.2012.
- 18. Michie S, Williams S:** Reducing work related psychological ill health and sickness absence: A systematic literature review. *Occup Environ Med*, 60: 3-9, 2003.
- 19. Sanne B, Torp S, Mykletun A, Dahl AA:** The Swedish Demand-Control-Support Questionnaire (DCSQ): Factor structure, item analyses, and internal consistency in a large population. *Scand J Public Health*, 33 (3): 166-174, 2005.
- 20. Johnson JV, Hall EM, Theorell T:** Combined effects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. *Scand J Work Environ Health*, 15 (4): 271-279, 1989.
- 21. Theorell T:** The demand-control-support model for studying health in relation to work environment. An interactive model. In, Orth-Gomer K, Schneiderman N (Eds): Behavioral Medicine Approaches to Cardiovascular Disease Prevention. 69-85, Lawrence Erlbaum Associates, New Jersey, 1996.
- 22. Demiral Y, Ünal B, Kılıç B, Soysal A, Bilgin AC, Uçku R, Theorell T:** İş stresi ölçeğinin İzmir Konak Belediyesi'nde çalışan erkek işçilerde geçerlik ve güvenilirliğinin incelenmesi. *Toplum Hekimliği Bülteni*, 26 (1): 11-18, 2007.
- 23. Hanzel I, Schins F, Rollin F:** Occupational stress, work-home interference and burnout among Belgian veterinary practitioners. *Ir Vet J*, 61 (4): 233-241, 2008.
- 24. Hatch PH, Winefield HR, Christie BA, Lievaart JJ:** Work place stress, mental health, and burnout of veterinarians in Australia. *Aust Vet J*, 89 (11): 460-468, 2011.
- 25. Gardner DH, Hini D:** Work-related stress in the veterinary profession in New Zealand. *NZ Vet J*, 54 (3): 119-124, 2006.
- 26. Fritschi L, Day L, Shirangi A, Robertson I, Lucas M, Vizard A:** Injury in Australian veterinarians. *Occup Med (Lond)*, 56 (3): 199-203, 2006.
- 27. Jeyaretnam J, Jones H, Phillips M:** Disease and injury among veterinarians. *Aust Vet J*, 78 (9): 625-9, 2000.
- 28. Nienhaus A, Skudlik C, Seidler A:** Work-related accidents and occupational diseases in veterinarians and their staff. *Int Arch Occup Environ Health*, 78 (3): 230-8, 2005.
- 29. Shirangi A, Fritschi L, Holman CD:** Prevalence of occupational exposures and protective practices in Australian female veterinarians. *Aust Vet J*, 85 (1-2): 32-38, 2007.
- 30. Harling M, Strehmel P, Schablon A, Nienhaus A:** Psychosocial stress, demoralization and the consumption of tobacco, alcohol and medical drugs by veterinarians. *J Occup Med Toxicol*, 4 (1): 4, 2009.
- 31. Epp T, Waldner C:** Occupational health hazards in veterinary medicine: physical, psychological, and chemical hazards. *Can Vet J*, 53 (2): 151-7, 2012.
- 32. Reijula K, Räsänen K, Hämäläinen M, Juntunen K, Lindbohm ML, Taskinen H, Bergborn B, Jouppi MR:** Work environment and occupational health of Finnish veterinarians. *Am J Ind Med*, 44 (1): 46-57, 2003.
- 33. Cevizci S, Babaoğlu UT, Erginoz E, İşsever H:** İstanbul'un Beşiktaş ilçesinde özel bir firmada beyaz yakalı çalışanlarda hayvan beslemenin psikolojik stres, düzenli fiziksel egzersiz ve sigara içme ile ilişkisi. *Nobel Med*, 8 (3): 52-59, 2012.
- 34. Fritschi L, Shirangi A, Robertson ID, Day LM:** Trends in exposure of veterinarians to physical and chemical hazards and use of protection practices. *Int Arch Occup Environ Health*, 81 (3): 371-378, 2008.
- 35. Özen A, Yüksel E, Özen R, Atıl E, Yaşa A, Yerlikaya H:** A study on life satisfaction of Turkish veterinary practitioners. *F.Ü. Sağ Bil Tıp Derg*, 21 (1): 5-10, 2007.
- 36. Ünal S, Karlıdağ R, Yoloğlu S:** Hekimlerde tükenmişlik ve iş doyumunu düzeylerinin yaşam doyumunu düzeyleri ile ilişkisi. *Klinik Psikiyatri*, 4, 113-118, 2001.
- 37. Black AF, Winefield HR, Chur-Hansen A:** Occupational stress in veterinary nurses: Roles of the work environment and own companion animal. *Anthrozoos*, 24 (2): 191-202, 2011.