


CORONAVIRUS ANXIETY LEVELS AND ASSOCIATED FACTORS OF HEALTHCARE WORKERS IN A UNIVERSITY HOSPITAL DURING THE PANDEMIC PERIOD

PANDEMİ DÖNEMİNDE BİR ÜNİVERSİTE HASTANESİNDEKİ SAĞLIK ÇALIŞANLARININ KORONAVİRÜS ANKSİYETE DÜZEYLERİ VE İLİŞKİLİ FAKTÖRLER

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ABSTRACT

Objective: We aimed to develop recommendations for detecting the anxiety status of healthcare workers working in various places in the university hospital during the pandemic period, identifying related factors, minimizing or eliminating the impact of these factors.

Methods: This study is a cross-sectional descriptive study conducted on a total of 312 healthcare professionals in a university hospital. Data were collected by face-to-face survey method. The questionnaire consisted of questions including sociodemographic characteristics and the Coronavirus Anxiety Scale (CAS).

Results: The mean age of the participants (n=312) was 30.51±6.16 (20-53). 154 of them are female, 174 of them are married, 148 of them have children, the spouses of 117 people are working. When the CAS score average is considered, the levels of the groups aged 30 and above, female gender, married, working spouse, having children, living with their families and having chronic diseases were found to be high and show a significant difference (p<0.01). A significant positive correlation was found between chronic disease- living with the family and the number of chronic disease-children (respectively; r= -0.118, p=0.038, r= -0.271, p<0.01).

Conclusion: Healthcare workers should be trained to recognize the anxiety they are experiencing, and flexible treatment models should be offered that are easily accessible for increased anxiety situations during this period. Working conditions should be improved, post-shift permits should be applied in the departments on duty. Potential anxiety-reducing strategies such as optimal workload management and risk communication should be considered.

Keywords: COVID-19, coronavirüs anxiety, pandemic.

ÖZET

Amaç: Pandemi döneminde bir üniversite hastanesinde çeşitli yerlerde görev alan sağlık çalışanlarının anksiyete durumlarını tespit etmek, ilişkili faktörleri belirlemek, bu faktörlerin etkisini minimuma indirmek veya ortadan kaldırılmasına yönelik öneriler geliştirmeyi amaçladık.

Yöntem: Bu çalışma bir üniversite hastanesinde toplam 312 sağlık çalışanı üzerinde yapılmış kesitsel tipte tanımlayıcı bir araştırmadır. Veriler, yüz yüze anket yöntemi ile toplanmıştır. Anket soyodemografik özellikleri ve Koronavirüs Anksiyete Ölçeğini (CAS) içeren sorulardan oluşmuştur.

Bulgular: Katılımcıların (n=312) yaş ortalamaları 30.51±6.16 idi (20-53). 154' ü kadın cinsiyette, 174' ü evli, 148' inin çocuğu mevcut, 117' sinin eşi çalışmaktadır. CAS puan ortalamasına bakıldığında 30 yaş ve üzeri, kadın cinsiyet, evli, eşi çalışan, çocuk sahibi olan, ailesiyle birlikte yaşayan ve kronik hastalığa sahip olan grupların düzeyi yüksek çıkmış olup anlamlı farklılık göstermektedir (p<0.01). Kronik hastalık- aileyle beraber yaşam ve kronik hastalık-çocuk sayısı arasında anlamlı pozitif korelasyon saptandı (sırası ile; r= -0.118, p=0.038, r= -0.271, p<0.01).

Sonuç: Sağlık çalışanlarının yaşadıkları anksiyeteleri fark edebilecekleri eğitimler verilmeli, bu dönemde artan anksiyete durumları için kolayca ulaşılabilen, esnek tedavi modelleri sunulmalıdır. Çalışma koşulları iyileştirilmeli, nöbetli bölümlerde nöbet ertesi izinler uygulanmalıdır. Optimal iş yükü yönetimi ve risk iletişimi gibi potansiyel anksiyeteyi azaltıcı stratejiler göz önünde bulundurulmalıdır.

Anahtar kelimeler: COVID-19, koronavirüs anksiyete, pandemi.

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INTRODUCTION

On 31 December 2019, the World Health Organization (WHO) reported these cases to the public as a growing number of cases of pneumonia began to appear in individuals working in the livestock market in Wuhan, China. On January 7, 2020, samples from the cases identified a type of coronavirus (2019-nCoV) that had not previously been detected in humans. The disease is caused by the new type of coronavirus Coronavirus Disease-2019 (COVID-19); The causative agent has been updated as "Severe Acute Respiratory Syndrome Coronavirus-2" (SARS-CoV-2) (Morrisette M, 2020; Mosheva et al., 2020, Peteet JR, 2020; Wei et al., 2020). In January 2020, the WHO described it as an "international public health emergency". In March 2020, it declared a pandemic due to the spread, severity of the virus and the occurrence of COVID-19 cases in 113 countries. Covid 19 infection, which is common enough to take the definition of pandemic, is transmitted through primary droplets. It can range from asymptomatic disease to severe viral pneumonia clinic, which can result in respiratory failure or death by involving the lungs (Bendau et al, 2021; Evren et al, 2020; Shanafelt et al, 2020). Individuals with comorbidities such as advanced age, hypertension, diabetes, malignancy, heart disease, COPD, and kidney disease are in the risk group for COVID 19, and the clinical course is more severe when they become infected. The first official case of COVID-19 in Turkey was detected on March 11, 2020. In the ongoing process, the number of cases has increased in Turkey as well as all over the world.

The occupational group that is at the forefront of the fight against COVID-19, taking on the greatest duty and responsibility, is undoubtedly healthcare workers (Zhang et al, 2020). With the increase in patient numbers and the effects of the pandemic, it is estimated that the anxiety already seen at a high-level increase in healthcare workers due to increased workload, inability to use a leave permission, infection and fear of infecting their relatives (Evren et al, 2020). The aim of our study is to determine the anxiety status of healthcare workers working during the pandemic period, to identify the related factors and to develop recommendations for eliminating the effect of these factors.

MATERIAL AND METHOD

Our study was cross-sectional descriptive study conducted in the third level university hospital. Permission from the local ethics committee (decision no:06 date:12/04/21) was obtained and carried out in accordance with the Helsinki declaration. 942 healthcare workers make up the universe of our research. Approximately 30% of healthcare workers are assistant physicians and 70% are auxiliary medical personnel (nurse, secretary, security guard, cleaning staff). The sample calculation was calculated in the epi info program and as a result of N=942, 97% trust level, 5% margin of error; A total of 312 people, including 106 assistant doctors and 206 assistant healthcare personnel (nurses, secretaries, security guards, cleaning staff), were included. Our data was collected over a 2-month period (01.10.2021-01.12.2021). Those who had difficulty in communicating, who were not healthcare professionals, and who did not work in a university hospital, were not included in our study. After the participants in the appropriate criteria to participate in the study are informed verbally, it is aimed to obtain their consent with the informed volunteer form. In our study, literature information was scanned in accordance with the purpose of the study to be applied to the participants and a face-to-face questionnaire consisting of 18 questions, including a questionnaire consisting of 13 questions and Coronavirus Anxiety Scale (CAS) consisting of 5 questions, was applied. The first part of the questionnaire to be applied to the participants in the "Personal Information Form", which includes sociodemographic characteristics, habits, working conditions, and some features related to working life and the second part consists of questions related to the Coronavirus Anxiety Scale consisting of 5 questions. Validity reliability of Coronavirus Anxiety Scale was made in Turkey (Peteet JR, 2020).

Statistical Analysis

All data were entered and analyzed using Statistical Package for Social Sciences (SPSS) for Windows version 20.0 (IBM Corp., Chicago). The suitability of the data to the normal distribution was evaluated by the Kolmogorov-Smirnov test. The analysis of the difference between the data in group comparisons was applied with the Mann-Whitney U and Kruskal-Wallis test. Spearman correlation analysis was applied for group correlations. Continuous data were expressed as average \pm standard deviation (SD) values and categorical data as numbers (n). The value of $P < 0.05$ was considered statistically significant.

RESULTS

312 volunteer healthcare workers were included in our study. The mean age is 30.51 ± 6.16 , minimum(min) 20, maximum(max) 53. The CAS value of the healthcare workers participating in our study was found to be 3.59 ± 2.90 , min 0, and max 13.00. Of the individuals participating in our study, 49.3% are women, 55.7% are married, 47.4% have children, and the spouses of 67 people are working. 58.7% of the participants with children have two or more children. 78.5% of the participants do not live alone. 84% do not have a chronic disease. (Table 1)

Table 1. Distribution of socio-demographic characteristics of healthcare workers

Groups (n=312)	n	%
Gender		
Female	154	49.3
Male	158	50.7
Marital Status		
Married	174	55.7
Single	138	44.3
Spouse's Working Status (n=173)		
Yes	117	67.6
No	56	32.4
Having Children		
Yes	148	47.4
No	164	52.6
Number of Children (n=148)		
1	61	41.3
2	52	35.1
≥3	35	23.6
Living with Their Families		
Alone	67	21.5
Small family	208	66.6
Extended family	33	10.6
Other(Subling)	4	1.3
Chronic Disease		
Yes	50	16
Diabetes Mellitus	5	10
Hypertension	10	20
Cardiovascular Disease	7	14
Other	28	56
No	262	84
Profession		
Assistant doctor	106	34
Nurse	98	31.5
Other (Secretary, Security Guard, Housekeeper)	108	34.5

Considering the average CAS score of the participants according to their sociodemographic characteristics, the levels of the groups aged 30 and over, female gender, married, working spouse, having children, living with their families, and having chronic diseases were found to be high and show a significant difference ($p < 0.01$). When the smoking status was examined, the CAS level of the non-smoker group was found to be higher and there was a significant difference ($p = 0.034$). When the professions are examined, the anxiety levels of the residents were found to be lower and there is a significant difference with the other occupational groups ($p < 0.01$) (Table 2)

There is no significant difference in the level of CAS according to the number of children ($p = 0.357$). No significant differences were found between night shifts and COVID intensive care-emergency and other COVID workplaces ($p = 0.417$, $p = 0.198$). (Table 2)

Table 2. Comparison of CAS scores of healthcare professionals according to sociodemographic characteristics

Groups (n=250)	CAS $\bar{X} \pm SD$	p
Age		
20-29	2,93 \pm 2,79	<0.01*
≥ 30	4,48 \pm 2,83	
Gender		
Female	4,77 \pm 2,93	<0.01*
Male	2,45 \pm 2,38	
Marital Status		
Married	4,37 \pm 2,81	<0.01*
Single	2,61 \pm 2,73	
Spouse's Working Status (n=173)		
Yes	4,72 \pm 2,88	<0.01*
No	3,62 \pm 2,54	
Having Children		
Yes	4,58 \pm 2,77	<0.01*
No	2,71 \pm 2,74	
Number of Children (n=148)		
1	4,24 \pm 2,82	0.357**
2	4,96 \pm 2,86	
≥ 3	4,60 \pm 2,77	
Living with Their Families		
Alone	2,44 \pm 2,44	<0.01**
Small family	3,93 \pm 2,95	
Extended family	4,00 \pm 3,03	
Other(Subling)	2,25 \pm 1,70	
Chronic Disease		
Yes	5.54 \pm 2.49	<0.01*
No	3.22 \pm 2,83	
Diabetes Mellitus	3.20\pm1.64	<0.01**
Hypertension	8.20 \pm 0.63	
Kardiovascular disease	7.85 \pm 1.06	
Other	4.41\pm2.00	
Smoking status		
Yes	3.22 \pm 2.81	0.034*
No	3.90 \pm 2.95	
Profession		
Assistant doctor	2.83\pm2.46	<0.01**
Nurse	4.23 \pm 3.25	
Other(Secretary,SecurityGuard,Housekeeper)	3.77 \pm 2.83	
Night shift		
Yes	3.72 \pm 3.07	0.417*
No	3.26 \pm 2.44	
COVID intensive care-emergency	3.28 \pm 2.85	0.198*
COVIDservice-polyclinic-outside the institution	3.73 \pm 2.89	

*Mann-Whitney U

**Kruskal-Wallis

Bold groups make a significant difference.

When the correlations between the groups were examined, it was determined that the CAS levels of healthcare workers with chronic diseases increased even more in those living with their families and showed a significant positive correlation ($p=0.038$, $r= -0.118$). As the number of children of healthcare professionals with chronic diseases increases, CAS levels increase and show a significant positive correlation ($p=0.01$, $r= -0.271$). There was no correlation between the presence of chronic disease while holding night shift, and holding night shift while living with the family ($p=0.209$ $r= -0.071$, $p=0.230$ $r= -0.068$). (Table 3)

Table 3. Intergroup correlation analysis

Groups	r*	p*
Chronic disease-Living with their family	-0.118	0.038
Chronic disease-Having children	-0.271	0.01
Chronic disease-Night shift	-0.071	0.209
Night shift- Living with their family	-0.068	0.230

*Spearman correlation analysis

DISCUSSION

Pandemics seen in almost every century in history have also come up with the covid-19 virus, which has just been identified from the coronavirus family in the 21st century. Pandemics have created serious problems for public health at all times. Healthcare workers constitute the most serious risk group during pandemic periods when deadly diseases affecting all mankind are spread. Healthcare workers who take an active role in the one-to-one examination, diagnosis, follow-up and treatment of patients can be expected to increase their anxiety and anxiety levels due to increased exposure to the factor and the intensity of working hours. For this reason, we believe that screening and evaluation of the anxiety levels of healthcare workers during the COVID-19 pandemic period plays a key role in eliminating irreversible damages through early diagnosis.

In a 2020 study conducted by Wu Y. and his colleagues in China (a cross-sectional survey study, n=100), he found that anxiety levels differed significantly in female sex and older age (Wu et al, 2020). In 2020, Awano N. and his colleagues found high levels of women's sex and older relationships in a study of the anxiety and depression of healthcare workers during the COVID-19 pandemic in Japan (n=848) (Awano et al, 2020). The results of our study were higher in CAS scores for those over 29 years of age and female gender and differed significantly ($p<0.01$). As the age increases, the body is not in its former form, symptoms develop earlier, and in women, the extra burdens of family life with workload are emotionally worn out and we think that it increases susceptibility to anxiety.

Mosheva M. and her colleagues found high levels of anxiety among married people during the COVID-19 pandemic in Israel in 2020 (4). Elbay and his friends and Özdin and their colleagues did not find any difference in the anxiety levels of those who were married in 2020 (Elbay et al, 2020; Özdin and Bayrak, 2020). In our study, the average CAS score of married healthcare workers and spouse healthcare workers was found to be higher than that of those who lived alone and whose spouses did not work, and it differed significantly ($p<0.01$). We believe this is due to the fear of infecting the family of married healthcare workers with the virus, and because the spouses of the healthcare workers are not able to spend enough time with their spouses, whom they consider to be supportive of them at a busy work pace.

In the study of Zheng R. et al., titled Anxiety Status of Pediatric Nurses and Related Factors During the COVID pandemic period in China in 2020 (n=617), it was determined that having a child did not differ in terms of anxiety among nurses (Zheng et al, 2021). In the study of Mosheva M. et al. on the state of anxiety among doctors during the COVID-19 pandemic, anxiety levels were found to be high in those who have children and live with their families (Mosheva et al, 2020). In our study the average CAS score of those who had children and lived with their families during the pandemic period was found to be higher than those who did not have children and lived alone, and there was a significant difference ($p<0.01$). We believe that healthcare workers who live with their families and have children have increased their anxiety due to the fear of transmitting the virus to their families and the feeling that they cannot give enough time to their family and children.

In 2020, Buselli R. and his colleagues conducted a study in Italy that found no significant difference between physicians and other healthcare workers (Buselli et al, 2020). In a 2020 study conducted by Lai J. and his colleagues in China, physician's anxiety levels were found to be low compared to other groups, indicating a significant difference (Lai et al, 2020). In our study, the anxiety levels of the assistant physicians were found to be low compared to nurses and other healthcare workers and they differed significantly ($p<0.01$). This may be due to the fact that doctors have better access to information about the disease and are more familiar with up-to-date follow-ups and treatments.

When the CAS level was compared according to the number of children, no significant difference was found in our study ($p=0.357$). In the study conducted by Mattila E. et al. in Finland in 2021 (n=10425), no difference was found between working night shifts and working hours in terms of anxiety (Mattila et al, 2021). In our study, no significant difference was found between the working in

night shifts and the place of the night shift (COVID intensive care-emergency and other COVID workplaces) (respectively, $p=0.417$, $p=0.198$). The reason for this may be because of exposure to the viral factor in every workplace regardless of the duration.

In a study conducted by Ozamiz-Etxebarria N. et al. in Spain in 2020 ($n=976$), the anxiety levels of those with chronic diseases were found to be high (Ozamiz-Etxebarria et al, 2020). In the study conducted by Çağ Y. et al. in 2020 ($n=1416$), the anxiety levels of healthcare workers with chronic diseases were found to be high (Cag et al, 2020). In our study, as the number of children of healthcare professionals with chronic diseases increases, CAS levels increase and show a significant positive correlation ($p=0.01$, $r= -0.271$). We believe that their anxiety has increased due to the high risk of contracting coronavirus due to their job, having a chronic disease with an increased risk of death, and an increase in the number of children who are responsible for it.

In our research, it was determined that healthcare workers with chronic diseases have increased CAS levels and show significant positive correlation in those living with their families ($p=0.038$, $r= -0.118$). Having chronic disease and living with his family can be due to the higher rate of potentially fatal risks of coronavirus on him and his family.

CONCLUSION

During the pandemic period, healthcare workers who work with their lives should be given trainings to recognize the anxiety they experience, and flexible treatment models should be offered that are easily accessible for increased anxiety situations during this period. Working conditions should be improved, post-shift permits should be applied in different departments. Even after the pandemic has ended or lost its effect, psychological monitoring of healthcare workers should continue. Strategies to mitigate potential relationships such as psychologically focused endurance training, optimal workload management and risk communication should be considered.

Our study was conducted in university hospital in the city center, and it was one of our limitations that it did not include health care workers working in primary care centers.

REFERENCES

- Awano N., Oyama N., Akiyama K., Inomata M., Kuse N., Tone M.,...Takada K. (2020). Anxiety, Depression, and Resilience of Healthcare Workers in Japan During the Coronavirus Disease 2019 Outbreak. *Intern Med.* 59(21):2693-2699. doi: 10.2169/internalmedicine.5694-20. Epub 2020 Nov 1. PMID: 33132305; PMCID: PMC7691033.
- Bendau A., Petzold M. B., Wyka S., Pyrkosch L., Plag J., Ströhle A. (2021). Ängste in Zeiten von COVID-19 und anderen Gesundheitskrisen [Anxiety in times of COVID-19 and other health crises]. *Nervenarzt.* May;92(5):417-425. German. doi: 10.1007/s00115-020-01030-8. Epub 2020 Nov 20. PMID: 33219467; PMCID: PMC7678577.
- Buselli R., Corsi M., Baldanzi S., Chiumiento M., Del Lupo E., Dell'Oste V.,... Bertelloni C. A. (2020). Professional Quality of Life and Mental Health Outcomes among Health Care Workers Exposed to Sars-Cov-2 (Covid-19). *Int J Environ Res Public Health.* Aug 26;17(17):6180. doi: 10.3390/ijerph17176180. PMID: 32858810; PMCID: PMC7504107.
- Çag Y., Erdem H., Gormez A., Ankarali H., Hargreaves S., Ferreira-Coimbra J.,...Rubulotta F. (2021). Anxiety among front-line health-care workers supporting patients with COVID-19: A global survey. *Gen Hosp Psychiatry.* Jan-Feb; 68:90-96. doi: 10.1016/j.genhosppsych.2020.12.010. Epub 2020 Dec 20. PMID: 33418193; PMCID: PMC7749993.
- Elbay R. Y., Kurtuluş A., Arpacioğlu S., Karadere E. (2020). Depression, anxiety, stress levels of physicians and associated factors in Covid-19 pandemics. *Psychiatry Res.* Aug; 290:113130. doi: 10.1016/j.psychres.2020.113130. Epub 2020 May 27. PMID: 32497969; PMCID: PMC7255248.
- Evren C., Evren B., Dalbudak E., Topcu M., Kutlu N. (2020). Measuring anxiety related to COVID-19: A Turkish validation study of the Coronavirus Anxiety Scale. *Death studies.* 2020:1-7.
- Lai J., Ma S., Wang Y., Cai Z., Hu J., Wei N.,...Wu J. (2020). Factors Associated With Mental Health Outcomes Among Health Care Workers Exposed to Coronavirus Disease 2019. *JAMA Netw Open.* Mar 2;3(3): e203976. doi: 10.1001/jamanetworkopen.2020.3976. PMID: 32202646; PMCID: PMC7090843.
- Mattila E., Peltokoski J., Neva M. H., Kaunonen M., Helminen M., Parkkila A. K. (2021) COVID-19: anxiety among hospital staff and associated factors. *Ann Med.* Dec;53(1):237-246. doi: 10.1080/07853890.2020.1862905. PMID: 33350869; PMCID: PMC7877952.
- Morrisette M. (2021). School Closures and Social Anxiety During the COVID-19 Pandemic. *J Am Acad Child Adolesc Psychiatry.* Jan;60(1):6-7. doi: 10.1016/j.jaac.2020.08.436. Epub 2020 Sep 2. PMID: 32890669; PMCID: PMC7467010.

- Mosheva M., Hertz-Palmor N., Dorman Ilan S., Matalon N., Pessach I. M., Afek A.,...Ziv A. (2020). Anxiety, pandemic-related stress and resilience among physicians during the COVID-19 pandemic. *Depress Anxiety*. Oct;37(10):965-971. doi: 10.1002/da.23085. Epub 2020 Aug 12. PMID: 32789945; PMCID: PMC7436709.
- Ozamiz-Etxebarria N., Dosil-Santamaria M., Picaza-Gorrochategui M., Idoiaga-Mondragon N. (2020). Stress, anxiety, and depression levels in the initial stage of the COVID-19 outbreak in a population sample in the northern Spain. *Cad Saude Publica*. Apr 30;36(4): e00054020. English, Spanish. doi: 10.1590/0102-311X00054020. PMID: 32374806.
- Özdin S., Bayrak Özdin Ş. (2020) Levels and predictors of anxiety, depression and health anxiety during COVID-19 pandemic in Turkish society: The importance of gender. *Int J Soc Psychiatry*. Aug;66(5):504-511. doi: 10.1177/0020764020927051. Epub 2020 May 8. PMID: 32380879; PMCID: PMC7405629.
- Peteet J. R. (2020) COVID-19 Anxiety. *J Relig Health*. Oct;59(5):2203-2204. doi: 10.1007/s10943-020-01041-4. PMID: 32415426; PMCID: PMC7227179.
- Shanafelt T., Ripp J., Trockel M. (2020) Understanding and Addressing Sources of Anxiety Among Health Care Professionals During the COVID-19 Pandemic. *JAMA*. Jun 2;323(21):2133-2134. doi: 10.1001/jama.2020.5893.
- Zhang W. R., Wang K., Yin L., Zhao W. F., Xue Q., Peng M.,...Min B. Q. (2020). Mental Health and Psychosocial Problems of Medical Health Workers during the COVID-19 Epidemic in China. *Psychother Psychosom*. 89(4):242-250. doi: 10.1159/000507639.
- Zheng R., Zhou Y., Qiu M., Yan Y., Yue J., Yu L.,...Lei X. (2021). Prevalence and associated factors of depression, anxiety, and stress among Hubei pediatric nurses during COVID-19 pandemic. *Compr Psychiatry*. Jan; 104:152217. doi: 10.1016/j.comppsy.2020.152217. Epub 2020 Nov 10. PMID: 33217635; PMCID: PMC7654390
- Wei N., Huang B. C., Lu S. J., Hu J. B., Zhou X. Y., Hu C. C.,...Chen J. K. (2020). Efficacy of internet-based integrated intervention on depression and anxiety symptoms in patients with COVID-19. *J Zhejiang Univ Sci B*. May;21(5):400-404. doi: 10.1631/jzus.B2010013. Epub 2020 Apr 1. PMID: 32425006; PMCID: PMC7203540.
- Wu Y., Zhang C., Liu H., Duan C., Li C., Fan J.,...Li H.(2020). Perinatal depressive and anxiety symptoms of pregnant women during the coronavirus disease 2019 outbreak in China. *Am J Obstet Gynecol*. Aug;223(2):240.e1-240.e9. doi: 10.1016/j.ajog.2020.05.009. Epub 2020 May 11. PMID: 32437665; PMCID: PMC7211756.