ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

DOI: 10.5336/nurses.2022-89434

The Effect of Work Overload and Work-Related Strain on Compliance with Isolation Precautions in Healthcare Professionals Throughout the COVID-19 Pandemic

COVID-19 Pandemi Sürecinde Sağlık Çalışanlarında Aşırı İş Yükü ve İşe Bağlı Gerginliğin İzolasyon Önlemlerine Uyuma Etkisi

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ABSTRACT Objective: To aims determine the level of compliance with workload, work-related strain and isolation measures as well as the effect of work overload and work-related strain with isolation in physicians and nurses working in a state hospital throughout the COVID-19 pandemic. **Material and Methods:** The study was conducted in a descriptive design. The study was conducted in a descriptive design. The data were obtained from 91 physicians and 386 nurses (n=477) working in a public hospital in Istanbul between November 2020 and February 2021 who volunteered to participate in the study. Data were collected using personal information form, workload, work-related strain and compliance with isolation measures scales. **Results:** The work overload score and compliance with isolation measure scores perceived by physicians and nurses were higher than the average, and work-related stress scores perceived were average. There was a moderate positive relationship with participants' work-related strain scores and the work overload; while there was a weak and negative relationship with acompliance with isolation measures. The model was significant in the analyse performed for isolation measures. **Conclusion:** It was detected that there existed a significant relationship between the participants' work-related strain, work overload, and isolation measures.

Keywords: Workload; work-related strain; compliance with isolation measures; healthcare professionals

ÖZET Amaç: Bu çalışma, COVID-19 sürecinde bir kamu hastanesinde çalışan hekim ve hemşirelerin iş yükü, işe bağlı gerginlik ve izolasyon önlemlerine uyum düzeylerini ve iş yükü ve işe bağlı gerginliğin izolasyona uyuma etkisini belirlemek amacıyla yapıldı. **Gereç ve Yöntemler:** Tanımlayıcı bir çalışmadır. Araştırmanın verileri, Kasım 2020-Şubat 2021 tarihleri arasında İstanbul ilinde bulunan bir kamu hastanesinde çalışan ve çalışmaya katılmaya gönüllü olan 91 hekim ve 386 hemşireden (n=477) toplandı. Veriler; kişisel bilgi formu, iş yükü, işe bağlı gerginlik ve izolasyon önlemlerine uyum ölçekleri kullanılarak toplandı. **Bulgular:** Hekim ve hemşirelerde iş yükü ve işe bağlı gerginlik skoru ortalamanın üstünde, izolasyon önlemlerine uyum skoru ise yüksek düzeyde saptandı. Sağlık çalışanlarında iş yükü ile işe bağlı gerginlik arasında anlamlı ve pozitif yönlü, işe bağlı gerginlik ile izolasyon önlemlerine uyum arasında anlamlı ve negatif yönlü bir ilişkinin olduğu belirlendi. İş yükü ve işe bağlı gerginliğin izolasyon önlemlerine uyumu anlamlı bir şekilde etkilediği görüldü. **Sonuç:** Çalışmada, katılımcıların işe bağlı gerginliği, iş yükü ve izolasyon önlemlerine uyumları arasında anlamlı ilişki olduğu saptandı.

Anahtar Kelimeler: İş yükü; işe bağlı gerginlik; izolasyon önlemlerine uyum; sağlık çalışanları

Work life, which constitutes an important part of human life, affects the lives of individuals due to the conditions of the work or the characteristics of the work. While employees who have positive feelings about the job experience a feeling of success, self-confidence, motivation and satisfaction, on the con-

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Peer review under responsibility of Turkiye Klinikleri Journal of Nursing Sciences.

Received: 04 Mar 2022 ***Received in revised form:*** 17 Jan 2023 ***Accepted:*** 09 Feb 2023 ***Available online:*** 06 Mar 2023

trary, some behavioral and psychological problems arise in employees who have negative feelings. Studies have shown that stress factors in health care areas negatively affect both physical and mental health of health workers. As a result of exposure to stressors, physical and mental problems such as anxiety, depression, insomnia, fatigue, exhaustion, decrease in job satisfaction, leaving work, being late for work and absenteeism can be seen in health workers.[1,2]

As before the coroanvirus disease-2019 (COVID-19) pandemic, it is known that work-related problems cause many negative consequences on healthcare workers during the pandemic period. In this period, social responsibility was imposed on health workers along with work responsibilities, which caused health workers to be more affected by the society psychosocially.[3] Studies have shown that healthcare professionals responsible for the care and treatment of COVID-19 patients are concerned about the safety of themselves and their families, and that they have some fears and concerns have been reported. In a study conducted on healthcare workers in China during the pandemic period, half of the participants reported symptoms of depression, nearly half reported anxiety, and one third reported insomnia.[4-6] In some studies conducted in our country, it has been determined that the burnout of nurses caring for COVID-19 patients is high and they experience emotional exhaustion, anxiety and hopelessness.[7,8]

The COVID-19 pandemic still continues to affect the world. It has been and continues to shake the health systems of countries.[9,10] While the health systems are shaken, it is inevitable that it will continue to shake the hospitals and employees in the health system. Occupational Health and Safety Administration announced that health workers are in the very high risk group because they are the health personnel who are the closest to the virus.[11] Pandemic continues to be an even more pressing process on healthcare professionals.

Accordingly, one of the factors which cause employees to harbor negative feelings about their jobs by forming pressure on them is workload.[12] Excessive workload indicates the situation in which the personnel have a lot of work to do but do not have adequate time to do it.[13] It causes changes in work psychology of an employee to burden him with a task beyond his capacity, to expect him to do it in a shorter time than it normally takes, or to ask him to perform more than one task during normal work hours. These adverse changes cause employees to get stressed, resulting over time in distress.[14] Given that the workload of healthcare professionals has increased in our time, owing to the COVID-19 pandemic, it can be said that it has become inevitable for them to suffer from distress. It is reported in the literature that work-related strain has a direct or indirect effect on the administration of care and on elective surgery.[15]

One of the reasons for the workload and tension in the COVID-19 pandemic is the application of isolation measures to an ever-increasing number of patients. On the other hand, it is thought that the increasing workload and tension affect the care behaviors of nurses. One of the precautions dwelt upon since the onset of the pandemic, is protective behaviors.[16] One of the protective behaviors is isolation practices. The isolation of healthcare workers, such as supportive care, is also very important in the treatment or prevention of epidemics.[17] Vulnerability, perceived risk and fear are among the most important factors in individuals' tendency to protective behaviors.[18]

Social rules and prophylactic behaviors are capable of slowing the spread of diseases. On the other hand, it may not always be possible for the rules regarding isolation measures to be fully realized. Many individual and organizational reasons can prevent or disable the implementation of isolation measures. There has been an increase in the workload of nurses during the COVID-19 period, as well as many factors such as working long hours, stress, changes in work and social life, infected coworkers, and the risk of infecting their family have led to work-related strain in health professionals. It is thought that the increase in workload and work tension are effective in compliance with isolation measures, and as a result, the quality of health services will be adversely affected.

The pandemic, with its long lasting effects and the grave threat it poses, was changed people's lives from social life to work life. In this process, health

sector ranks first among the places where this change is experienced radically. With the onset of the pandemic, the workload of health professionals has increased, their work hours have changed, the restraints applied in many institutions and organizations to keep the pandemic at bay have not been observed in health sector, and hence health professionals have become workers at a distance closest to the virus. This situation has generated not only vital but also physiological and psychological effects on health professionals. Despite many precautions taken in the health institutions intended to prevent the spread of the virus, the virus continues to cause considerable apprehensions, stress and strains in the daily lives of workers. In these circumstances, when health professionals are considered to be individuals closest to the virus, it becomes inevitable that they should experience many problems. This study has been done to establish the relationship between the workload of physicians and nurses, their work-related strains and their level of compliance with isolation. Setting out from this point, the present study has been done to research the effect workload and work-related strain on the compliance with isolation measures in health professionals of a state hospital in the period of COVID-19 pandemic.

MATERIAL AND METHODS

Design: The study was conducted in a descriptive design.

Aim: This study has been done to determine (1) the level of compliance with workload, work-related strain and isolation measures (2) the relation of the compatibility of workload and work-related strain with isolation in the physicians and nurses working in a state hospital throughout the COVID-19 pandemic. In line with these aims, answers have been sought to the following questions.

- What are the workload, work-related strain, and the level of compliance with isolation?
- Are workload and work-related strain related to the levels of compliance with isolation?

SAMPLE AND PARTICIPANTS

The universe of the study consisted of the physicians (n=425) and nurses (n=642) working in a state hospital in the province of İstanbul in the COVID-19 outbreak (n=1067). Due to the increasing number of patients during the COVID-19 outbreak, the workload of physicians and nurses has increased more than other employees, and working hours and working conditions have changed. For this reason, it is planned to include these 2 health professionals in this study. Since other healthcare professionals are not directly involved in patient treatment and care, they were not included in the sample.

The hospital where the study was conducted is a tertiary education and research hospital serving in many main and sub-branches. It also served as a pandemic hospital in the COVID-19 outbreak. Nurses worked in 8, 16 and 24 hour shifts, and physicians worked on 8 and 24 hour shifts. The services of the hospital vary between 25 and 40 beds, with a total of 600 beds. The nurse/patient ratio in intensive care units is 1/2. In the study it was aimed to access to entire universe without sample selection. Data were collected from a total of 477 participants, 91 physicians and 386 nurses-who agreed to participate and filled out the data collection form completely. The rate of access was determined as 44.7%.

DATA COLLECTION AND INSTRUMENTS

The data for this study was collected, observing isolation precautions, through the forms consisting of 4 sections, between November 2020 and February 2021 8 months after the onset of COVID-19 pandemic. The data collection tool was distributed to the participants and collected back 2 days later. The response time of the data collection tool is 10-15 minutes in total.

INSTRUMENTS

Personal Information Form

There was a total of 14 items in the form which were prepared by the researchers, questioning the participants' personal (age, gender etc) and professional features (level of education, position, etc) - 7 items, and pandemia related 7 items (the change of work place, the clinic where the participant was working owing to COVID-19 pandemic).

Workload Scale

The specificity and reliability study of the Turkish version of this scale, developed by Duxbury and Higgins, has been done by Aycan and Eskin.[19,20] In the scale there are eleven items in 5 points likert type (1=I definitely agree, 5=I definitely disagree) and it does not have any subscale. As the mean score of the scale increases, it becomes manifest that the workload perceived by the individual is excess. The Cronbach alpha coefficient of the Turkish version of the scale has been reported to be 0.82.[20] In the current study, the Cronbach alpha coefficient has been found to be 0.89.

THE SCALE OF WORK-RELATED STRAIN

The specificity and reliability of the Turkish version of this scale developed by Revicki et al. (1991) has been determined by Aslan et al. (1996).[21,22] The scale composed of 18 items in 4 points Likert type (1=not at all suitable for me, 2=completely suitable for me) is self-report scale. In the scale, the items 2, 4, 8, 9, 11 and 15 are scored retrograde. The internal specificity coefficient of the scale has been found to be 0.78.[22] This scale assesses work-related strain in healthcare workers. In our study, the Cronbach coefficient has been calculated as 0.79.

The Scale of Compliance with Isolation Measures

The scale has been developed by Tayran and Ulupınar with a view to determining the compliance of nurses and physicians with isolation measures.[23] The scale is in 5 point Likert type, composed of 18 items. High mean scores indicate that the compliance with isolation measures is high. The items 18, 22, 24, and 34 in the sacale are scored retrograde. The reported Cronbach alpha coefficient is 0.85.[23] Cronbach alpha coefficient in the present study has been found as 0.85.

DATA ANALYSIS

Data were analyzed by means of SPSS Statistics 21 (IBM Corp., Armonk, NY, USA) program with a confidence interval of 95% and a significance level of $p<0.05$. Use was made of descriptive analyses (numbers, percentages, minimum, maximum, mean values, and standard deviation) to determine the scores that the nurses participating in the study obtained for their personal, professional features and from their scales; Internal reliability analysis (Cronbachs' alpha coefficient) to determine the reliability of the scores obtained from the scales; correlational analyses (scatter plots and Pearson Moment correlation, multiple regression analysis) to test the relationships between quantifications obtained from scales.

ETHICAL CONSIDERATIONS

Research ethics committee approval was obtained from the Clinical Research Ethics Committee of Health Sciences University, Kanuni Sultan Süleyman Training and Research Hospital (date: June 10, 2020, no: 77). The study was conducted in accordance with the principles of the Declaration of Helsinki. Consent to use the scales was obtained from the authors who had adapted them. Voluntary informed consent was taken from the participants by informing them, on the first page of the data collection form, of the objectives of the study, its scope, and ethical issues.

RESULTS

A great majority of the participants were nurses (80,9%), female (73%), single (58,1%), in the age range of 26-30 (38,8%) years, and undergraduates (62,3%). Of the participants, 43,4% were working in COVID-19 unit, (32,1% COVID-19 service, 11,3% COVID-19 intensive care unit) (Table 1).

While the participants' work overload score was found to be 3.42±0.83, the scores of work-related strain and compliance with isolation measures were found to be 2.56±0.39 and 4.43±0.47. These averages can be said to be above medium level for work overload and work-irelated stress and high for compliance with isolation measures (Table 2).

Correlation analysis was indicated that there was a linear relationship between the work overload and work-related strain. As a result of the analysis, it was found that there was a positive, weak and very significant relationship between the work overload and work-related strain ($r:0.392$; $p<0.001$). There was a negative, weak, and highly significant correlation between work-related strain and compliance with isolation measures ($r:-0.259$; $p<0.001$). In contrast, no

TABLE 1: Participant characteristics (n=477).

Variables		n	%
Gender	Female	348	73.0
	Male	129	27.0
Marital status	Married	200	41.9
	Single	277	58.1
Educational level	MVHS & associate	74	15.5
	Undergraduate	301	63.1
	Postgraduate	102	21.4
Profession	Doctor	86	18.1
	Nurse	390	81.9
Change in the working unit	Yes	166	34.8
	No	311	65.2
Working COVID-19 unit	COVID-19 service and intensive care	193	40.5
	Other service, polyclinics	284	59.5
The presence of persons who lived together	Lone	118	24.7
	Wife/husband/child	187	39.2
	Mother/father/sibling	108	22.6
	Friends	64	13.4
Where are you staying during the COVID 19 process?	At home	421	88.3
	Housing or hotel provided by the institution	12	2.5
	With my friend or other	44	9.2

COVID-19: Coronavirus disease-2019.

TABLE 2: Participants' descriptive statistics of workload, work-related strain and compliance with isolation measures (n=477).

	Minimum-maximum	Mean (SS)	α
1. Workload Scale	1-5	3.42 (0.83)	0.89
2. Scale of work-related strain	1-4	2.56 (0.39)	0.79
3. Scale of compliance with isolation measures	1-5	4.43 (0.47)	0.85

significant relationship was found between the work overload and compliance with isolation measures ($p>0.05$; Table 3).

A regression model was performed by including the variables that have a statistically significant relationship with compliance with isolation measures to the model (Table 4, Figure 1). The work overload affected isolation measures measurements significantly and positively ($\beta=0.126$; $p<0.001$), and work-related strain affected isolation measures measurements significantly and negativly ($\beta=-0.417$; $p<0.001$). The variables in the model accounted for the variance of the isolation measures score by 10.9% (Table 4). In this context, research questions developed in view of research model, and literature.

DISCUSSION

This study has been done to establish the relationship between the workload of physicians and nurses, their work-related strains and their level of compliance with isolation. This study revealed that there is a significant and positive relationship between workload and work-related strain in physicians and nurses, and a significant and negative relationship between work-related strain and compliance with isolation measures.

In the study, workload and work-related strain affect compliance with isolation measures. In this study the workload and work-related strains of physicians and nurses have been found above medium level whereas their compliance with isolation measures has been found high. Oliveira, et al. have reported in their study that mean of the workload score of nurses is below the average.[24] Karacabay et al. have reported in their study that the workload perception of nurses was low.[25] In this case, the workload of health professionals can be said to have increased during the pandemic period compared to to the pre-pandemic period.

Another finding of this study is that the work-related strain of physicians and nurses is above the moderate level. It has been reported that health professionals experience high level of work-related strain owing to the factors such as death, contact with patients and their families, conflicts with their supervisors, and uncertainty about therapeutic impact.[15] Baye et al, have emphasized that two-thirds of the state hospital nurses experience work-related strain. In the current study also, similar to what is in the literature, it can be said that the work-related strain of health professionals is high.[15-26] Pandemic process has brought radical changes also in the distribution of tasks of health professionals. The changes of task distribution and workplace introduced in the pandemic period, swift contamination among health professionals are thought to have caused physicians' work-related strains to increase. Alyahya and AboGazalah, have reported in their study on health professionals that conflicts of role and uncertainty is an important risk factor for stress.[27]

TABLE 3: Relationship between workload, work-related strain, and compliance with isolation measures.

		Workload	Work-related strain	Compliance with isolation measures
1. Workload	r	1		
	p value			
2. Work-related strain	r	**0.392**	1	
	p value	**0.000**		
3 Compliance with isolation measures	r	0.088	**-0.259**	1
	p value	0.055	**0.000**	

TABLE 4: The effect of workload and work-relateded strain on compliance with isolation measures.

	Unstandardized coefficients		Standardized coefficients							
	B	Std. error	Beta (β)	t	Sig.	F	P	R	R^2	Adjusted R^2
Constant	5.069	0.140		6.326	0.000	29.103	0.000	0.331	0.109	0.106
Work-related strain	-0.417	0.057	-0.347	-7.355	0.000					
Workload	0.126	0.027	0.224	4.752	0.000					

In this study, it was determined that the compliance with the isolation measures of the physicians and nurses was at a high level. Baydın et al have reported that in their study on nurses the mean of compliance with isolation precautions of nurses is above the average.[28] In another study, it was emphasized that the compliance with isolation precautions of emergency health professionals was above average.[29] That the scores of compliance with the isolation precautions have proven to be high suggests that health professionals strive to prevent infection, that their in-service trainings were conducted effectively, and that they comply with the national and international guidelines in this respect. Infection with severe acute respiratory syndrome coronavirus-2 (severe acute respiratory syndrome-coronavirus-2), experienced in previous years, has been reported in the literature to have a significant impact on public health and expose healthcare professionals to high risk.[30] Due to these experiences, it can be said that health workers adapt to isolation measures.

In a study, it was emphasized that there is a relationship between stress and isolation for the prevention of transmission.[31] Etim et al have demonstrated in the study they made that there is a significant difference between the health professionals' workoverload and the increase in the workplace stress.[32] Work-related strain can be affected by a multitude of variables such as uncertainty, conflict of roles and increasing workload. In a study, it has been reported that workload, uncertainty of role, and conflict of roles are factors related with work-related strain and that these factors reduce the work satisfaction and performance of an individual working.[27] Galehdar et al have reported that nurses experienced various psychological problems while caring COVID-19 patients (such as distress about time wasting, anxiety related to corpse burial, emotional distress for delivering bad news, public ignorance of preventive measures, conflict between fear and conscience, fear of being contaminated etc).[33]

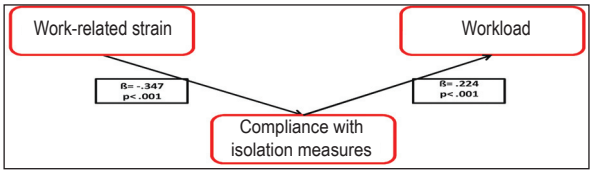

FIGURE 1: Research model.

In this study, while the participants' work-related strain affects their compliance with isolation measures negatively, their compliance with isolation

measures affects their perception of workload positively. The concern that occurs during or as a result of crisis intervention in health workers impair mental judgment and abstract thinking, leading to reduced problem solving capability and effectiveness of services provided.[34] Therefore, it may have reduced compliance with the isolation measures in the participants. In a study, it is emphasized that adequate safety procedures and the need to work in isolation, as well as the increased workload are the most important determinants of work-related strain in the low confidence range.[35]

The anxiety which arises in health professionals, during or after intervention with crisis, can impair their mental reasoning and concrete thinking skills, possibly resulting in lack of attention and coordination. Various emotions such as fear and anxiety can affect their problem solving performances. It has been stressed that the decrease in problem solving ability causes the services, provided to preserve individual and society health and to facilitate living conditions, to lose their efficacy.[34] It is thought that in health professionals having had direct contact with confirmed or suspected COVID-19 patients, source and manpower shortage, and high workload perceptions are effective in their compliance with isolation measures. This situation can be interpreted to affect health professionals' compliance with isolation measures. The factors such as wearing and taking off personal protective equipment, which is on the top of the isolation methods implemented owing to the pandemic, and having to work with this equipment on for long hours are thought to increase the workload of health workers. This, in turn, can explain the lack of protective material, mansource, timely assistance, which is necessary in fighting against COVID-19.

LIMITATIONS

Data collection for the study while COVID-19 pandemic was continuing caused limitations in reaching the universe of our study. Moreover, collecting data from one single institution can be considered an additional limitation. It cannot be generalized for Türkiye. In addition, the literature does not show that these three concepts are in one place. That's another limitation of work. Lastly, the use of self-reported instruments in measuring the compliance levels of physicians and nurses with workload, work related strain and isolation precautions caused the results obtained to be limited to what they had reported.

CONCLUSION

As a result of this descriptive and relationship-seeking study conducted with 477 physicians and nurses a working in İstanbul, the work overload score and compliance with isolation measure scores perceived by participants were higher than the average, and work-related strain scores perceived by participants were average. There was a moderate positive relationship with participants' work-related strain scores and the work overload; while there was a weak and negative relationship with acompliance with isolation measures. The model was significant in the analyse performed for isolation measures. Increased tension and stress can distract individuals, disrupt their concentration. In this case, compliance levels with the isolation measures can be degraded. However, employees need to feel that their needs are met and safe with adequate equipment and materials in all environments where health and social care are provided. Health professionals have been trying to comply with isolation measures to protect themselves and their families against the virus. However, adverse working environment resulting from the pandemic, has caused great changes in health institutions for 2 years, health professionals work related strains are on the rise. Increasing strain and stress can divert individuals' attention away and impair their concentrations, in which case their level of compliance with isolation measures may be impaired. Yet, it is necessary that health professionals feel that all their needs are met in every environment where health and social care are provided, and that they are safe with adequate equipment and materials. It is important to recognize the internal stress and emotional strain that health professionals bear in the name of society and to provide them with necessary support. Hospital management should organize work environment in a sustainable way, create a work environment which regulates health professional work-related strains, provide possibilities appropriate for the standards of service, reward those who work, develop man source through

training and education. In addition, it should be able to realize the harmful effects the pandemic on health professionals, reduce work hours, and be willing to implement flexible work schedule and to distribute roles and responsibilities equally.

Acknowledgements

The authors thank all the healthcare professionals participated in the study.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

All authors contributed equally while this study preparing.

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