Investigation of Sleep Quality and Mental Health of Greek Physicians During the COVID-19 Pandemic

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Abstract. The global outbreak of COVID-19 has had an impact on physicians, not only as a time of great concern and responsibility, but also as a human performance factor influencing their sleep quality and mental health. However, studies have not yet defined the frequency and the interplay of sleep and mental issues. The purpose of this study was to explore the anxiety and sleep disturbances prevalence in Greek physicians, as well as their relationship with sociodemographic and profession-related traits, aiming to raise awareness for changes in healthcare management and policy making.

Keywords. Sleep quality, Mental health, Anxiety, Physicians

1. Introduction

The COVID-19 pandemic has already left its mark on doctors not only as a period of great responsibility but also as a challenging factor for their mental health and stability. Healthcare management should aim in identifying the problems of physicians that affect their productivity in order to provide evidence-based policy feedback. Physicians' anxiety management and everyday functioning including sleep quality were all challenged. Healthcare personnel in Greece confronted unprecedented times, resulting in stress augmentation and sleep quality deterioration. Nevertheless, sleep and mental problems' prevalence has not yet been clarified among studies. The present study sought to determine the frequency of poor sleep quality and anxiety levels among Greek doctors during the COVID-19 pandemic and investigate their interactions with and sociodemographic and profession-related characteristics.

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2. Methods

2.1. Study design

A cross-sectional survey-based study was conducted using a Greek-language online survey for Greek medical doctors. The survey included: sociodemographic characteristics; gender, age, Body Mass Index (BMI), educational and marital status, profession-related characteristics; specialty type, employment in COVID-19 clinics, sleep quality and anxiety state and trait scores.

2.2. Assessments and scoring

Assessment of sleep quality (SQ) was performed using the Greek version of Pittsburgh Sleep Quality Index (PSQI, range 0-21 points).PSQI is a self-reported assessment that measures SQ over a 1-month period (1-2).

Anxiety level was assessed as a state and as a trait with the Greek version of State Trait Anxiety Inventory (STAI). State anxiety subscale (Y1) part of STAI evaluates the current mood of the respondent. Trait anxiety subscale (Y2) showcases how the assessed person feels usually (3-4). Cut-off values were chosen as 41, for the STAI-Y1 and, a value of 44, for the STAI-Y2, as shown by Ercan et al (5).

2.3. Participants

The sample of healthcare workers was recruited via web-link invitation to participate in the online survey in December 2022. The responses were recorded anonymously.

2.4. Ethical approval

Ethical approval was granted by the Human Research Ethics Committee of the Aristotle University of Thessaloniki (2/08.11.2022). The study was performed in accordance with the Declaration of Helsinki.

2.5. Statistical analysis

Statistical analysis was conducted using R-4.2.2 Software. Statistical significance was set as $p<0.05$. Variables with a Wald's test p-value less than 0.2 were included in the multivariable linear regression.

3. Results

3.1. Participant Characteristics - Sleep quality outcomes

In total, one hundred fifteen physicians were included in the final analysis. The baseline characteristics of physicians can be seen in **Table 1**.

Of all participants, 64% were having poor SQ. The sociodemographic and profession-related characteristics of physicians were compared depending on their SQ but resulted in not statistically significant results.

Table 1. Sample Characteristics

Characteristic	N = 115
Age, Median (IQR)	26 (25, 30)
Gender, n (%)	
Female	66 (57%)
Male	49 (43%)
BMI, Median (IQR)	23.5(21.2, 26.0)
Education, n (%)	
Bachelor	81 (70%)
Master or PhD	34 (30%)
Specialty, n (%)	
Clinical	75 (65%)
Laboratory	7 (6.1%)
Surgical	33 (29%)
Marital Status, n (%)	
Divorced	3 (2.6%)
Married	17 (15%)
Single	95 (83%)
COVID-19 Clinic, n (%)	
Did not work	76 (66%)
Worked	39 (34%)

3.2. Anxiety state and trait outcomes

High anxiety state was reported at 94% while trait was contrarily noted at 44% of physicians. The characteristics and their comparisons of physicians depending on their anxiety trait are shown in **Table 2.** Age and PSQI score differences between anxiety trait groups were found significantly different ($p<0.05$) indicating that high anxiety trait is associated with younger age and poorer SQ. STAI-Trait score and PSQI had a linear positive correlation ($R=0.26$, $p<0.05$).

Table 2. Anxiety trait correlations

Characteristic	High, N = 67	Low, N = 48	p-value[1]
Age, n (%)			**0.002**
Older than 35	7 (10%)	16 (33%)	
Younger than 35	60 (90%)	32 (67%)	
PSQI, Median (IQR)	8.0 (5.0, 9.5)	6.0 (5.0, 8.0)	**0.020**

[1] Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

3.3. Linear regression for STAI state score

We chose to perform linear regression for possible predictors of high anxiety state score in physicians. In the multivariate linear regression analysis (**Table 3**) we included variables that were significant($p<0.2$) in the univariate analysis.

Table 3. Linear regression STAI-Anxiety State Score

Characteristic	Univariate analysis			Multivariate analysis		
	Beta	**95% CI[1]**	**p-value**	**Beta**	**95% CI[1]**	**p-value**
Specialty						
Clinical	—	—		—	—	
Laboratory	2.8	-0.61, 6.2	**0.11**	2.6	-0.80, 6.0	0.13
Surgical	1.3	-0.47, 3.1	**0.15**	1.2	-0.59, 2.9	0.2
Actual sleep duration hours	-0.48	-1.1, 0.16	**0.14**	-0.64	-1.3, 0.00	**0.05**
Sleep efficiency	7.2	-1.4, 16	**0.10**	7.6	-1.1, 16	0.086

Table 3. Linear regression STAI-Anxiety State Score

Characteristic	Univariate analysis			Multivariate analysis		
	Beta	**95% CI**[1]	**p-value**	**Beta**	**95% CI**[1]	**p-value**
BMI category						
Normal	—	—		—	—	
Overweight	-1.4	-3.1, 0.26	**0.10**	-1.1	-2.8, 0.66	0.2

4. Discussion

The frequency of anxiety and sleep disturbance symptoms in our group was higher than in other healthcare workers studies (6). High percentages can be explained not only by the pandemic but also due to high risk of emotional exhaustion in physicians working in Greece (7). It is important to recognize the negative effect of the COVID-19 pandemic on younger physicians who joined the field during a crisis.

Possible confounding factors such as family history were not measured while also, the sample size was relatively small and could justify the absence of significant results in the multivariate analysis.

5. Conclusions

Healthcare systems' administration and healthcare management should focus on supporting the healthcare workers with psychological monitoring and organizational changes that could possibly act as relievers of their stress. Lessons learnt during the pandemic can be built upon for establishing an appropriate working environment and generate solutions for tomorrow's health professionals. The findings of this study can spur cocreation through focus groups and the participation of key stakeholders in the synthesis of complex physicians' problems solutions.

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