ΕΡΕΥΝΗΤΙΚΗ ΕΡΓΑΣΙΑ - ORIGINAL PAPER

ΝΟΣΗΛΕΥΤΙΚΗ 2023, 62(4): 75-86 • HELLENIC JOURNAL OF NURSING 2023, 62(4): 75-86

Assessment of insomnia and fatigue in nursing staff during the COVID-19 pandemic

Christos Sikaras,[1] Sofia Zyga,[2] Maria Tsironi,[3] Aspasia Panagiotou[4]

Εκτίμηση της αϋπνίας και της κόπωσης του νοσηλευτικού προσωπικού κατά τη διάρκεια της πανδημίας COVID-19

Abstract at the end of the article

[1]RN, MSc, PhDc, Head Nurse of the Thoracic Surgery, Sotiria Thoracic Diseases Hospital of Athens, Greece
[2]Professor, Department of Nursing, University of the Peloponnese, Greece
[3]Professor, Department of Nursing, University of the Peloponnese, Greece
[4]Assistant Professor, Department of Nursing, University of the Peloponnese, Greece

Υποβλήθηκε:29/05/2023
Επανυποβλήθηκε:05/07/2023
Εγκρίθηκε:10/10/2023

Υπεύθυνος αλληλογραφίας:
Sikaras Christos, RN, MSc, PhDc Address: 20 Ymittou Street, Postal Code: 15561 City: Cholargos, Country: Greece,
Mobile: +306932522915,
E-mail: cris.sikaras@gmail.com

Introduction: The COVID-19 pandemic has caused unprecedented strain on health professionals and it is still a chronic stressor that continues to be in development, with unknown long-term psychological consequences.
Aim: To assess insomnia and fatigue in nursing staff almost two years after the onset of the COVID-19 pandemic, in relation to sociodemographic and occupational characteristics.
Materials and methods: This is a cross-sectional study, which was conducted from mid-November to mid-December 2021. The sample consisted of nursing staff (registered nurses and nursing assistants), from five tertiary public hospitals in Athens, who completed the questionnaire of socio-demographic and occupational characteristics, the Athens Insomnia Scale (AIS) and the Fatigue Assessment Scale (FAS).
Results: The sample consisted of 404 participants (335 females and 69 males) with a mean age of 42.88±10.90 years and with 17.96±12 years of work. 61.4% of participants experienced insomnia and 60.4% experienced fatigue. Regarding gender, women were found to present higher levels of insomnia and fatigue (t-test, $p<0.05$ and $p<0.001$ respectively). High positive correlations were shown between the Athens Insomnia Scale, the Fatigue Rating Scale and its subscales (Pearson's r, $p<0.001$). Age presented a negative correlation with the Physical Fatigue Subscale (Pearson's r, $p<0.05$). Working in rotating shifts, having a chronic health problem, non-compliance of 11hour resting period between two shifts, and not being satisfied with work were found to correlate with higher levels of insomnia and fatigue (t-test, $p<0.05$). Additionally, clinical nurses showed higher levels of fatigue (t-test, $p<0.05$). Working in the wards of patients with Covid-19 was not found to relate with the levels of insomnia and fatigue (t-test, $p>0.05$). Education level and marital status (number of family members) were not found relate with levels of insomnia and fatigue (Anova, $p>0.05$).
Conclusions: Nursing staff appear to continue experiencing high levels of

insomnia and fatigue, especially female. Occupational characteristics, such as shift work, not taking 11 hours of rest between shifts, job dissatisfaction and the presence of a chronic health condition, were found to correlate with higher levels of insomnia and fatigue, while clinical nurses appeared to have higher levels of fatigue.

Key–words: Insomnia, fatigue, nursing staff, COVID-19

Introduction

The COVID-19 pandemic has caused an unprecedented strain on health professionals and is still a chronic stressor that persists, with unknown long-term psychological effects.[1-3] According to recent literature, two years after the pandemic began, its effects on the physical and mental health of health professionals persist.[3,4] Previous studies have shown that the psychological effects of previous epidemics/pandemics on healthcare professionals lasted from 6 months to 3 years after their outbreak.[5]

According to the findings of recent studies, it appears that nurses are particularly vulnerable to developing physical and psychological problems and experience higher levels of anxiety, depression, fatigue, mental distress, emotional exhaustion,[5] post-traumatic stress disorder and insomnia[6-8] than other health professionals.

The nursing staff is a special professional group of health professionals, having a vital role in the health system practicing a profession with high and complex physical and psychological demands.[9] They experience a high level of stress due to various stressors, such as excessive workload, frequent work in rotating shifts and contact with death, resulting in a possible reduction in their quality of life and quality of care to patients.[9]

In addition, due to their frequent work in rotating shifts, their normal sleep function is disturbed - due to disturbed circadian rhythm and abnormal melatonin secretion at night - with a direct impact on their health.[10,11] Sleep is vital for human health and essential for life. According to the American Academy of Sleep Medicine and the Sleep Research Society, 7-9 hours of sleep is adequate to support optimal health in adults.[12]

Nursing staff are also at high risk of fatigue due to stressful work environments, high workloads, rotating shifts and non-standard work schedules.[13] It is known that high levels of anxiety and emotional distress predict sleep quality and all of these factors have been shown to predict the severity of fatigue.[14,15]

Aim

The aim of this study was to assess insomnia and fatigue in nursing staff almost two years after the onset of the COVID-19 pandemic, in relation to sociodemographic and occupational characteristics.

In particular, the following research questions were asked:

1. What is the prevalence of insomnia and fatigue in nursing staff?
2. Is there a correlation between insomnia and fatigue?
3. Are insomnia and fatigue related to the socio-demographic characteristics of the
4. participants (gender, age, marital status)?
5. Are insomnia and fatigue related to participants' occupational characteristics (years of work, level of education, job position, working hours, job satisfaction)?

Materials and methods

Research design and process

This is a cross-sectional study. Data was collected through the distribution of questionnaires by the researchers to the participants who completed the questionnaires. Their participation in the study was voluntary and they were informed about the purpose of the study, its objectives and the procedures to be followed. The questionnaires were anonymous and were distributed in the months of November and December 2021. Participants had the right to voluntarily withdraw from the study. The criterion for inclusion in the study group was defined as at least one year of experience.

Participants

To calculate the sample size, with a target population of 27,103 people,[15] confidence level: 95%, confidence interval: 5%, percentage of the sample selecting a specific answer: 50%, the sample of the study is required to consist of at least 379 people.[16]

A total of 404 persons working as nursing staff (reg-

istered nurses and nursing assistants) from five tertiary public hospitals in Athens agreed and completed the anonymous questionnaires, out of 500 persons invited to respond, after random sampling (response rate 80.8%). The hospitals treated both COVID-19 and non-COVID-19 patients. Participants worked mainly in intensive care units (ICUs), pathology, pulmonology, surgery, psychiatry, emergency departments, operating rooms or other departments. Socio-demographic and occupational characteristics such as gender, age, marital status, years of work experience, level of education, job position, rotational or morning work, job satisfaction and the presence of a chronic health problem were recorded.

Data collection tools

1. A questionnaire of socio-demographic and occupational characteristics, in which the data deemed necessary to serve the aim of the study were recorded.

2. Athens Insomnia Scale (AIS)

The Athens Insomnia Scale is a psychometric self-assessment instrument designed to measure sleep difficulty. It is based on the Tenth Revision of the International Classification of Diseases and Related Health Problems (ICD-10). It consists of eight items, for example: (total sleep duration: adequate, slightly insufficient, significantly insufficient, very insufficient or did not sleep at all). The first five items relate to sleep induction, awakenings during the night, final awakenings, total duration and quality of sleep. The last three refer to well-being, functional capacity and sleepiness during the following day. The score is calculated using a 4-point Likert scale rating ranging from 0 (no problem) to 3 (there is a severe problem). A cut-off value of ≥6 is used for the clinical diagnosis of insomnia.[17] The internal consistency (Cronbach's alpha) for the overall scale was 0.89.[18] The scale is freely available online and is free to use.

3. The Fatigue Assessment Scale (FAS)

This scale consists of 10 Likert-type questions, for example: (I have enough energy for daily activities), and each question is rated from 1 to 5. Responses include "never, sometimes, often, quite often, always". Five questions reflect physical fatigue and 5 questions (questions 3 and 6-9) reflect mental fatigue. An overall score as well as individual scores on physical and mental fatigue should be provided. A response to each question should be provided, even if the person is not complaining of fatigue at this time. The total score may range from 10 to 50, with values ≥ 22 indicating fatigue. The questions aim to capture the fatigue of the last few weeks.[19] The reliability and validity of the Greek version of the Fatigue Assessment Scale (FAS) has been tested in a Greek population.[20] The internal consistency (Cronbach's alpha) for the overall scale was 0.761.[20] Permission to use the scale has been granted by the authors.

Procedure and ethical considerations

The present study was conducted in accordance with the ethical principles of the Declaration of Helsinki, the International Committee of Medical Journal Editors and the General Data Protection Regulation 2016/679 (GDPR) of the European Union. The study protocol was approved by the Ethics Committee of the University of the Peloponnese (protocol number 18699/11-10-2021), as well as by the Clinical Research Committees of the five hospitals participating in the study.

Statistical analysis

All variables were assessed using descriptive statistics. Continuous variables were expressed as mean and standard deviation (mean±SD). To describe the qualitative variables, frequencies (N) and relative frequencies (%) were used. The prevalence of insomnia and fatigue was determined as a percentage. We used Student's t-test for independent samples for a categorical variable with only two categories, after preceded by Levene's test to check for homogeneity of differences. We used the one-sample t-test to determine whether there was a significant difference between our sample mean and the mean of other studies, one-way ANOVA for a categorical variable with more than two categories, and correlation analysis using Pearson's r (r) coefficient to test a hypothesis involving two or more continuous variables. Statistical significance was set at $p < 0.05$ (two-tailed) and analyses were performed using IBM SPSS Statistics 23 (IBM SPSS Statistics for Windows, Version 23.0.).

Results

The study population consisted of 404 participants with an average age of 42.9 years. 82.9% of them were females, 58% were married or in a cohabitation and 18.8% lived alone. The following table details the socio-demographic characteristics of the participants (Table 1).

Regarding the professional characteristics of the participants, 31.7% were nursing assistants (secondary ed-

ucation), 39.1% were registered nurses and 29.2% held a master's and/or doctoral degree. The average length of service of the participants was 18 years, 68.5% worked in shift work, 69.6% were satisfied with their work, 10.9% were supervisors, 51.2% worked in care departments for patients with Covid - 19 disease and 36.4% suffered from at least one chronic health problem. The table below details the occupational characteristics of the participants (Table 2).

Regarding the assessment of participants' levels of insomnia and fatigue in relation to gender, it was found that women showed higher mean values in all scales compared to the male population with a statistically significant difference (Table 3).

The percentage of nursing staff who experienced insomnia (AIS≥ 6) was 61.4%. The mean of insomnia in this study, (AIS: mean=7.15) was statistically greater (sample t-test, p<0.01) than the mean (AIS: mean=5.98, SD=4.24, N=150) experienced by nursing staff in the first wave of the pandemic.[21] Calculating Hedges'g between the previous measurement and the present one, we found a small effect size (g: 0.269).

The percentage of nursing staff who experienced fatigue (FAS≥ 22) was 60.4%. The mean fatigue in this study, (FAS: mean=24.08) was statistically smaller (sample t-test, p<0.01) than the mean (FAS: mean=25.61, SD=7.37, N=701) experienced by nursing staff one year after the onset of the pandemic.[22] Calculating Hedges'g between the previous measurement and the present one we found a small effect size (g: 0.208).

High positive correlations were found between the Athens Insomnia Scale, the Fatigue Rating Scale and its subscales (p<0.001). Age showed a negative correlation with the Physical Fatigue Subscale (p<0.05) and a positive correlation (p<0.01) with years of work (Table 4).

Regarding occupational characteristics, it was found that those who worked in rotational work and those who suffered from a chronic health problem had higher scores on the insomnia scale with a statistically significant difference (p<0.05). It was also found that non-adherence to the 11-hour rest period between two shifts and job dissatisfaction were associated with higher levels of insomnia (p<0.001), [Table 5].

Similarly, those who worked in shift work and those who were not supervisors showed higher scores on the fatigue scale with a statistically significant difference (p<0.05). Not taking 11 hours of rest between two shifts, not being satisfied with work and having a chronic health problem were found to be associated with higher levels of fatigue (p<0.001), [Table 5]. Working on Covid-19 departments was not found to be associated with levels of insomnia and fatigue (p>0.05), [Table 5].

Education level and marital status (number of family members) were not found to be associated with levels of insomnia and fatigue (One-way ANOVA, p>0.05).

Discussion

The results of our study showed a high prevalence of both insomnia and fatigue in nursing staff two years after the start of the pandemic. These findings are consistent with literature supporting the long-term effects of the pandemic on the physical and mental health of health care professionals.[3,23] Compared with a study estimating the levels of insomnia experienced by nurses in Greek hospitals during the first pandemic wave,[21] our study showed higher levels of insomnia. This finding is consistent with the study of Trakada et al. in the general population in Greece, which showed that sleep duration decreased in the second lockdown compared with the first lockdown and sleep quality was reduced as pandemic restrictions continued.[24]

Also, compared to a study assessing the levels of fatigue experienced by nurses in Greek hospitals one year after the onset of the pandemic,[22] our study showed lower levels of fatigue. This finding may be due to better workload management and subsequent perceived control over work acquired after a year of working in pandemic conditions, as well as to nurses' familiarity with the disease and increased knowledge about it.[15]

In addition, full vaccination of all healthcare staff may have been beneficial in reducing fatigue, due to a reduction in the fear of virus infection, compared with the first year of the pandemic,[15] considering that only fully vaccinated nurses and those with a certificate of infection were working during the study.

Regarding gender, the results of our study showed higher levels of insomnia in female nurses compared to male nurses, a finding consistent with the results of recent studies.[25-27] Also regarding fatigue, female nurses showed higher levels of fatigue compared to male nurses, a finding consistent with the results of recent studies.[6,22] Considering the higher prevalence of insomnia and fatigue in female nurses compared to men, and the fact that female nurses constitute the vast majority of nursing staff internationally,[27] health policies aimed at protecting the physical and mental health of health professionals should always follow a gender-based ap-

proach.[27]

Also in this study, strong positive associations were found between insomnia and fatigue (physical and mental), a finding consistent with many studies supporting the effect of insomnia on fatigue.[13,14,23]

Regarding the relationship between age and fatigue, our study showed a negative association between age and the physical fatigue dimension. Similarly, regarding the relationship between work experience and fatigue, we found a negative correlation between work experience and the dimension of physical fatigue. These results are consistent with recent studies which suggest that younger nurses had higher levels of physical fatigue, a finding that suggests that physical fatigue may be reduced through work adaptation as age and experience increase.[28,29]

As for the relationship between job characteristics and levels of insomnia and fatigue, it was found that shift work, not taking the 11-hour rest between shifts, job dissatisfaction and the presence of a chronic health problem were associated with higher levels of insomnia and fatigue. A recent systematic review by Min et al. suggests that the studies reviewed provided mixed results on the associations between work schedule characteristics and nurses' fatigue, with more emphasis on the non-adherence to the 11-hour rest between shifts.[30] Additionally according to a recent systematic review by Querstret et al. longer shifts, rotating shifts including nights and insufficient recovery time between shifts (quick returns) were associated with poorer sleep, increased sleepiness and increased levels of fatigue.[23] According to the study by Johnston et al. night work was associated with higher levels of fatigue, although fatigue was not dependent on the physical energy expended nor on the perceived demands of the work. It was, however, related to perceived control of work and perceived work-related rewards.[31]

Regarding the relationship between fatigue and the presence of chronic problems, the systematic review by Brown et al. supports this relationship.[32] The study by Morin et al. also argues that insomnia is more common among people with poor physical or mental health and those with atypical sleep schedules.[33] According to the systematic review by Laserna Jiménez et al. on nurses' satisfaction with their professional quality of life, it appears that the factors influencing it include workload, fatigue and burnout.[34] In addition, according to the systematic review and meta-analysis by Xie et al., the relationship between compassion fatigue and compassion satisfaction was found to be inversely related.[35]

Our study showed that clinical nurses experience higher levels of fatigue than head nurses, a finding that is likely due to the fact that clinical nurses perform activities that require long hours of standing and performing activities that require physical effort. The literature suggests that physical effort does not contribute significantly to subjective fatigue and that even physical fatigue is largely due to psychological factors.[31]

Also, our study showed that nurses working in Covid - 19 departments, showed higher insomnia and fatigue scores compared to those working in non-Covid - 19 departments, but without statistically significant difference. Previous studies conducted in the early phase of the pandemic and at the start of coronavirus vaccination showed that nurses working in Covid - 19 departments had higher levels of fatigue[22] and insomnia[22,36] compared with those working in non-Covid - 19 departments. However, recent studies suggest that coronavirus vaccination was associated with reduced fatigue in clinical nurses,[6] possibly due to a reduction in fear of the risk of viral infection and transmission to family and friends. As previously reported, only fully vaccinated nurses and nurses with a certificate of infection were working during the study. In addition, due to the severe shortage of nursing staff in the country's National Health System,[37] working conditions were very difficult for all nurses, regardless of their workplace.

In conclusion, the prevalence of insomnia and fatigue was found to be very high among nursing staff in Greek hospitals almost two years after the start of the pandemic. To reduce the psychological impact of the pandemic on them, a number of studies highlight the positive role of family support,[21,38,39] social support,[40] organizational support,[35,36] appropriate nurse-patient ratios,[6] the correct arrangement of working time,[23] appropriate reward,[31] the development of fatigue risk management systems (FRMS)[23] and the enhancement of a sense of coherence.[41]

Because our study was cross-sectional, the cause-effect relationship between insomnia and fatigue could not be determined with certainty. Qualitative, longitudinal and/or intervention studies should be conducted in the future to further enrich our understanding of this relationship.

Study limitations

Although this study provided important results, there were some limitations:

The results of our study cannot be generalized to nursing staff throughout the country because it was conducted in five tertiary public hospitals in Athens.

The results relate to the specific time period of the study under the specific circumstances, so particular attention must be to interpret or generalize the results.

Because our study was cross-sectional, the cause-effect relationship between insomnia and fatigue could not be determined with certainty. Qualitative, longitudinal and/or intervention studies should be conducted in the future to further enrich our understanding of this relationship.

Conclusions

Two years after the onset of the pandemic, nursing staff continue to experience high levels of insomnia and fatigue, especially female nurses. Occupational characteristics such as shift work, practicing nursing in a clinical environment, not taking 11 hours of rest between shifts, job dissatisfaction and having a chronic health problem were found to be associated with higher levels of insomnia and fatigue.

Particularly for the psychosocial support of female nurses, who constitute the vast majority of nursing staff, immediate measures should be taken to provide psychosocial support through prevention and intervention programs.

Table 1. *Socio-demographic characteristics of participants*

		N	%
Gender	Male	69	17.1
	Female	335	82.9
Age (in years), mean±SD		42.9±10.9	
Marital status	Unmarried	130	32.2
	Married	216	53.5
	In cohabitation	18	4.5
	Divorced - Widower	40	9.8
I live alone	No	328	81.2
	Yes	76	18.8
If not, number of persons living in the family	2	16	5.5
	3	60	20.5
	4	94	32.1
	5	97	33.0
	>5	26	8.9

Table 2. *Occupational characteristics of the participants*

		N	%
Education level Nursing assistant		128	31.7
Registered nurse		158	39.1
MSc/PhD diploma		118	29.2
Total		404	100
Work experience (in years), mean±SD		18.0±12.0	
Shift work	Yes	276	68.5
	No	128	31.5
11-hour rest between shifts	Yes	166	41.7
	No	238	58.3
Job satisfaction	Yes	279	69.6
	No	125	30.4
Head Nurse	Yes	42	10.9
	No	362	89.1

Work in Covid-19 departments	Yes	207	51.2
	No	197	48.8
Chronic health problem	Yes	147	36.4
	No	257	63.6

Table 3. *Participants' assessment of insomnia and fatigue in relation to gender*

Variables	**Gender**	**N**	**Mean±SD**
Athens Insomnia Scale	Male	69	6.11*±4.64
	Female	335	7.35*±4.25
	Total	404	7.14±4.33
Fatigue Assessment Scale	Male	69	21.24**±7.42
	Female	335	24.65**±7.20
	Total	404	24.07±7.34
Physical Fatigue Subscale	Male	69	11.62**±3.88
	Female	335	13.72**±3.71
	Total	404	13.36±3.82
Mental Fatigue Subscale	Male	69	9.62*±3.95
	Female	335	10.93*3.99
	Total	404	10.71±4.01

Notes: * independent t-test p < 0.05; ** independent t-test p < 0.001

Table 4. *Correlations between continuous variables: age, work experience, Athens Insomnia Scale, Fatigue Assessment Scale and its subscales*

Person's Correlation N = 404		**Age** (in years)	**Work experience** (in years)	**Athens Insomnia Scale**	**Fatigue Assessment Scale**	**Physical Fatigue Subscale**
Work experience (in years)	r	0.885**				
	p	0.001				
Athens Insomnia	r	-0.034	-0.033			
Scale	p	0.49	0.51			
Fatigue Assessment	r	-0.096	-0.082	0.625**		
Scale	p	0.05	0.104	0.001		
Physical Fatigue Subscale	r	-0.098*	-0.083*	0.603**	0.934**	
	p	0.04	0.04	0.001	0.001	
Mental Fatigue Subscale	r	-0.082	-0.071	0.569**	0.940**	0.757**
	p	0.10	0.15	0.001	0.001	0.001

Notes: * Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed)

Table 5. *Assessment of participants' insomnia and fatigue in relation to occupational characteristics*

Variables		**N**	**Mean±SD**	**Mean±SD**
Total		404		
			Insomnia	**Fatigue**
Shift work	Yes	276	7.46*±4.40	24.65*±7.33
	No	128	6.44*±4.15	22.79*±7.26
Observance of the 11-hour rest period	Yes	106	6.24**±4.31	22.63**±7.26
	No	170	7.79**±4.25	25.11**±7.30
Job satisfaction	Yes	279	6.38**±4.14	22.64**±6.71
	No	122	8.81**±4.34	27.42**±7.72
Head Nurse	Yes	42	5.92±4.69	21.47*±7.20
	No	362	7.27±4.30	24.30*±7.26
Working in	Yes	207	7.52±4.40	24.52±7.20
Covid-19 departments	No	197	6.76±4.26	23.61±7.52
Presence of chronic	Yes	147	8.03*±4.37	25.83**±7.54
health problem	No	257	6.64*±4.25	23.07**±7.06

Notes: * independent t-test $p < 0.05$; ** independent t-test $p < 0.001$

ABSTRACT

Εκτίμηση της αϋπνίας και της κόπωσης του νοσηλευτικού προσωπικού κατά τη διάρκεια της πανδημίας COVID-19

Χρήστος Συκαράς,[1] Σοφία Ζυγά,[2] Μαρία Τσιρώνη,[3] Ασπασία Παναγιώτου[4]

[1]RN, MSc, PhDc, Προϊστάμενος Θωρακοχειρουργικής Κλινικής, Γ.Ν.Ν.Θ.Α. «Η ΣΩΤΗΡΙΑ», Αθήνα, Ελλάδα
[2]Καθηγήτρια Τμήματος Νοσηλευτικής, Πανεπιστήμιο Πελοποννήσου, Ελλάδα
[3]Καθηγήτρια Τμήματος Νοσηλευτικής, Πανεπιστήμιο Πελοποννήσου, Ελλάδα
[4]Επίκουρη Καθηγήτρια Τμήματος Νοσηλευτικής, Πανεπιστήμιο Πελοποννήσου, Ελλάδα

Εισαγωγή: Η πανδημία COVID-19 έχει προκαλέσει μια άνευ προηγουμένου καταπόνηση στους επαγγελματίες υγείας και αποτελεί πλέον έναν χρόνιο στρεσογόνο παράγοντα που εξακολουθεί να βρίσκεται σε εξέλιξη, με άγνωστες μακροπρόθεσμες ψυχολογικές επιπτώσεις.

Σκοπός: Η εκτίμηση της αϋπνίας και της κόπωσης του νοσηλευτικού προσωπικού δύο σχεδόν χρόνια από την έναρξη της πανδημίας COVID-19, σε σχέση με κοινωνικοδημογραφικά και επαγγελματικά χαρακτηριστικά.

Υλικό και μέθοδος: Πρόκειται για μία συγχρονική μελέτη, η οποία διεξήχθη από τα μέσα Νοεμβρίου ως τα μέσα Δεκεμβρίου του 2021. Το δείγμα αποτέλεσε νοσηλευτικό προσωπικό (νοσηλευτές και βοηθοί νοσηλευτών), πέντε τριτοβάθμιων δημόσιων νοσοκομείων της Αθήνας, το οποίο συμπλήρωσε το ερωτηματολόγιο κοινωνικοδημογραφικών και επαγγελματικών χαρακτηριστικών, την Κλίμακα Αϋπνίας Αθηνών (AIS) και την Κλίμακα Εκτίμησης Κόπωσης (FAS).

Αποτελέσματα: Το δείγμα αποτέλεσαν 404 άτομα (335 γυναίκες και 69 άνδρες) με μέση ηλικία τα 42,88±10,90 έτη και με 17,96±12 έτη εργασίας. Το 61,4% των συμμετεχόντων παρουσίασε αϋπνία και το 60,4% παρουσίασε κόπωση. Σχετικά με το φύλο, οι γυναίκες βρέθηκε να παρουσιάζουν υψηλότερα επίπεδα αϋπνίας και κόπωσης (t-test, $p<0,05$ και $p<0,001$ αντίστοιχα). Υψηλές θετικές συσχετίσεις παρουσιάστηκαν μεταξύ της Κλίμακας Αϋπνίας Αθηνών, της Κλίμακας Εκτίμησης Κόπωσης και των υποκλιμάκων της (Pearson's r, $p<0,001$). Η ηλικία παρουσίασε αρνητική συσχέτιση με την Υποκλίμακα Σωματικής Κόπωσης (Pearson's r, $p<0,05$). Η εργασία σε κυκλικό ωράριο, η ύπαρξη χρόνιου προβλήματος υγείας, η μη τήρηση του 11ώρου ανάπαυσης μεταξύ δύο βαρδιών και η μη ικανοποίηση από την εργασία βρέθηκε να σχετίζονται με υψηλότερα επίπεδα αϋπνίας και κόπωσης (t-test, $p<0,05$). Επίσης η άσκηση της νοσηλευτικής σε κλινικό επίπεδο, βρέθηκε να σχετίζεται με υψηλότερα επίπεδα κόπωσης (t-test, $p<0,05$). Η εργασία σε χώρο νοσηλείας ασθενών με Covid – 19, δεν βρέθηκε να σχετίζεται με τα επίπεδα της αϋπνίας και της κόπωσης (t-test, $p>0,05$). Η βαθμίδα εκπαίδευσης και η οικογενειακή κατάσταση (αριθμός μελών οικογένειας), δεν βρέθηκε να σχετίζονται με τα επίπεδα της αϋπνίας και της κόπωσης (Anova, $p>0,05$).

Συμπεράσματα: Το νοσηλευτικό προσωπικό φαίνεται ότι εξακολουθεί να βιώνει υψηλά επίπεδα αϋπνίας και κόπωσης και ιδιαίτερα οι γυναίκες. Επαγγελματικά χαρακτηριστικά, όπως η εργασία σε βάρδιες, η μη τήρηση του 11ώρου ανάπαυσης μεταξύ δύο βαρδιών, η μη ικανοποίηση από την εργασία και η παρουσία χρόνιου προβλήματος υγείας, βρέθηκε να σχετίζονται με υψηλότερα επίπεδα αϋπνίας και κόπωσης ενώ η άσκηση της νοσηλευτικής σε κλινικό επίπεδο φαίνεται να σχετίζεται με υψηλότερα επίπεδα κόπωσης.

Λέξεις-ευρετηρίου: Αϋπνία, κόπωση, νοσηλευτικό προσωπικό, COVID-19

✉ **Corresponding Author:** Συκαράς Χρήστος, RN, MSc, PhDc, Διεύθυνση: Υμηττού 20, Τ.Κ.: 15561 Πόλη: Χολαργός, Χώρα: Ελλάδα, Κινητό: 6932522915, E-mail: cris.sikaras@gmail.com

Βιβλιογραφία

1. Qi T, Hu T, Ge QQ, Zhou XN, Li JM, Jiang CL, et al. COVID-19 pandemic related long-term chronic stress on the prevalence of depression and anxiety in the general population. *BMC Psychiatry*. 2021;21(1):380. doi:10.1186/s12888-021-03385-x.
2. Tselebis A, Pachi A. Primary Mental Health Care in a New Era. *Healthcare (Basel, Switzerland)*. 2022;10(10):2025. doi.org/10.3390/healthcare10102025.
3. Štěpánek L, Nakládalová M, Janošíková M, Ulbrichtová R, Švihrová V, Hudečková H, et al. Prevalence of Burnout in Healthcare Workers of Tertiary-Care Hospitals during the COVID-19 Pandemic: A Cross-Sectional Survey from Two Central European Countries. *International Journal of Environmental Research and Public Health*. 2023;20(4):3720. doi.org/10.3390/ijerph20043720.
4. Liu Y, Zou L, Yan S, Zhang P, Zhang J, Wen J, et al. Burnout and post-traumatic stress disorder symptoms among medical staff two years after the COVID-19 pandemic in Wuhan, China: Social support and resilience as mediators. *J Affect Disord*. 2023;321:126-133. doi: 10.1016/j.jad.2022.10.027.
5. Preti E, Di Mattei V, Perego G, Ferrari F, Mazzetti M, Taranto P, et al. The Psychological Impact of Epidemic and Pandemic Outbreaks on Healthcare Workers: Rapid Review of the Evidence. *Curr Psychiatry Rep*. 2020;22(8):43. doi:10.1007/s11920-020-01166-z.
6. Labrague LJ. Pandemic fatigue and clinical nurses' mental health, sleep quality and job contentment during the covid-19 pandemic: The mediating role of resilience. *J Nurs Manag*. 2021;29:1992-2001. doi:10.1111/jonm.13383.
7. Jahrami HA, Alhaj OA, Humood AM, Alenezi AF, Fekih-Romdhane F, AlRasheed MM, et al. Sleep disturbances during the COVID-19 pandemic: A systematic review, meta-analysis, and meta-regression. *Sleep Med Rev*. 2022;62:101591. doi:10.1016/j.smrv.2022.101591.
8. Perego G, Cugnata F, Brombin C, Milano F, Preti E, Di Pierro R, et al. The "Healthcare Workers' Wellbeing [Benessere Operatori]" Project: A Longitudinal Evaluation of Psychological Responses of Italian Healthcare Workers during the COVID-19 Pandemic. *J Clin Med*. 2022;11(9):2317. doi: 10.3390/jcm11092317.
9. Sarafis P, Rousaki E, Tsounis A, Malliarou M, Lahana L, Bamidis P, et al. The impact of occupational stress on nurses' caring behaviors and their health related quality of life. *BMC Nurs*. 2016;15:56. doi: 10.1186/s12912-016-0178-y.
10. Tselebis A, Zoumakis E, Ilias I. Dream Recall/Affect and the Hypothalamic-Pituitary-Adrenal Axis. *Clocks Sleep*. 2021;3(3):403-408. doi:10.3390/clockssleep3030027.
11. Knap M, Maciąg D, Trzeciak-Bereza E, Knap B, Czop M, Krupa S. Sleep Disturbances and Health Consequences Induced by the Specificity of Nurses' Work. *Int J Environ Res Public Health*. 2022;19(16):9802. doi:10.3390/ijerph19169802.
12. Consensus Conference Panel; Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Buysse D, et al. Joint Consensus Statement of the American Academy of Sleep Medicine and Sleep Research Society on the Recommended Amount of Sleep for a Healthy Adult: Methodology and Discussion. *Sleep*. 2015;38(8):1161-1183. doi.org/10.5665/sleep.4886.
13. Cho H, Steege LM. Nurse Fatigue and Nurse, Patient Safety, and Organizational Outcomes: A Systematic Review. *West J Nurs Res*. 2021;43(12):1157-1168. doi:10.1177/0193945921990892.
14. Thorsteinsson EB, Brown RF, Owens MT. Modeling the Effects of Stress, Anxiety, and Depression on Rumination, Sleep, and Fatigue in a Nonclinical Sample. *J Nerv Ment Dis*. 2019;207(5):355-359. doi:10.1097/NMD.0000000000000973.
15. Sikaras C, Zyga S, Tsironi M, Tselebis A, Pachi A, Ilias I, et al. The Mediating Role of Depression and of State Anxiety on the Relationship between Trait Anxiety and Fatigue in Nurses during the Pandemic Crisis. *Healthcare*. 2023;11(3):367. doi.org/10.3390/healthcare11030367.
16. Anonymous. Creative Research Systems - Sample Size Calculator. Available at http://www.surveysystem.com/sscalc.htm. Accessed April 2, 2023.
17. Soldatos CR, Dikeos DG, Paparrigopoulos TJ. The diagnostic validity of the Athens Insomnia Scale. *J Psychosom Res*. 2003;55(3):263-267. doi:10.1016/s0022-3999(02)00604-9.
18. Soldatos CR, Dikeos DG, Paparrigopoulos TJ. Athens Insomnia Scale: validation of an instrument based on ICD-10 criteria. *J Psychosom*

Res. 2000;48(6):555-560. doi:10.1016/s0022-3999(00)00095-7.
19. De Vries J, Michielsen H, Van Heck GL, Drent M. Measuring fatigue in sarcoidosis: the Fatigue Assessment Scale (FAS). *Br J Health Psychol.* 2004;9(Pt 3):279-291. doi:10.1348/1359107041557048.
20. Alikari V, Fradelos E, Sachlas A, Panoutsopoulos G, Lavdaniti M, Palla P, et al. Reliability and validity of the Greek version of "The Fatigue Assessment Scale". *Archives of Hellenic Medicine*. 2016;33(2):231–238.
21. Tselebis A, Lekka D, Sikaras C, Tsomaka E, Tassopoulos A, Ilias I, et al. Insomnia, Perceived Stress, and Family Support among Nursing Staff during the Pandemic Crisis. *Healthcare (Basel)*. 2020;8(4):434. doi:10.3390/healthcare8040434.
22. Sikaras C, Ilias I, Tselebis A, Pachi A, Zyga S, Tsironi M, et al. Nursing staff fatigue and burnout during the COVID-19 pandemic in Greece. *AIMS Public Health*. 2021;9(1):94-105. doi:10.3934/publichealth.2022008.
23. Querstret D, O'Brien K, Skene DJ, Maben J. Improving fatigue risk management in healthcare: A systematic scoping review of sleep-related/fatigue-management interventions for nurses and midwives. *Int J Nurs Stud.* 2020;106:103513. doi:10.1016/j.ijnurstu.2019.103513.
24. Trakada A, Nikolaidis PT, Economou NT, Kallianos A, Nena E, Steiropoulos P, et al. Comparison of sleep characteristics during the first and second period of restrictive measures due to COVID-19 pandemic in Greece. *Eur Rev Med Pharmacol Sci.* 2022;26(4):1382-1387. doi:10.26355/eurrev_202202_28131.
25. Morin CM, Bjorvatn B, Chung F, Holzinger B, Partinen M, Penzel T, et al. "Insomnia, anxiety, and depression during the COVID-19 pandemic: an international collaborative study." *Sleep Med.* 2021;87:38-45. doi:10.1016/j.sleep.2021.07.035.
26. Boer J, Höhle N, Rosenblum L, Fietze I. Impact of Gender on Insomnia. *Brain Sciences.* 2023;13(3):480. doi.org/10.3390/brainsci13030480.
27. Morgan R, Tan HL, Oveisi N, Memmott C, Korzuchowski A, Hawkins K, et al. Women healthcare workers' experiences during COVID-19 and other crises: A scoping review. *Int J Nurs Stud Adv.* 2022;4:100066. doi:10.1016/j.ijnsa.2022.100066.
28. Jang HJ, Kim O, Kim S, Kim MS, Choi JA, Kim B, et al. Factors Affecting Physical and Mental Fatigue among Female Hospital Nurses: The Korea Nurses' Health Study. *Healthcare (Basel).* 2021;9(2):201. doi:10.3390/healthcare9020201.
29. Tung TH, Hsiung MC. Work Fatigue in a Hospital Setting: The Experience at Cheng Hsin General Hospital. *Healthcare (Basel).* 2021;9(6):776. doi:10.3390/healthcare9060776.
30. Min A, Min H, Hong HC. Work schedule characteristics and fatigue among rotating shift nurses in hospital setting: An integrative review. *J Nurs Manag.* 2019;27(5):884-895. doi:10.1111/jonm.12756.
31. Johnston DW, Allan JL, Powell DJH, Jones MC, Farquharson B, Bell C, et al. Why does work cause fatigue? A real-time investigation of fatigue, and determinants of fatigue in nurses working 12-hour shifts. *Ann Behav Med.* 2019;53(6):551-562. doi:10.1093/abm/kay065.
32. Brown LF, Kroenke K. Cancer-related fatigue and its associations with depression and anxiety: a systematic review. *Psychosomatics.* 2009;50(5):440-447. doi:10.1176/appi.psy.50.5.440.
33. Morin CM, Bertisch SM, Pelayo R, Watson NF, Winkelman JW, Zee PC, et al. What Should Be the Focus of Treatment When Insomnia Disorder Is Comorbid with Depression or Anxiety Disorder? *Journal of Clinical Medicine.* 2023;12(5):1975. doi.org/10.3390/jcm12051975.
34. Laserna Jiménez C, Casado Montañés I, Carol M, Guix-Comellas EM, Fabrellas N. Quality of professional life of primary healthcare nurses: A systematic review. *J Clin Nurs.* 2022;31(9-10):1097-1112. doi:10.1111/jocn.16015.
35. Xie W, Chen L, Feng F, Okoli CTC, Tang P, Zeng L, et al. The prevalence of compassion satisfaction and compassion fatigue among nurses: A systematic review and meta-analysis. *Int J Nurs Stud.* 2021;120:103973. doi:10.1016/j.ijnurstu.2021.103973.
36. Zou X, Liu S, Li J, Chen W, Ye J, Yang Y, et al. Factors Associated With Healthcare Workers' Insomnia Symptoms and Fatigue in the Fight Against COVID-19, and the Role of Organizational Support. *Front Psychiatry.* 2021;12:652717. doi:10.3389/fpsyt.2021.652717.
37. Anonymous. Health at a Glance: Europe 2020

STATE OF HEALTH IN THE EU CYCLE. Available at https://ec.europa.eu/health/system/files/2020-healthatglance_rep_en _0.pdf. Accessed April 2, 2023.

38. Sikaras C, Tsironi M, Zyga S, Panagiotou A. Anxiety, insomnia and family support in nurses, two years after the onset of the pandemic crisis. *AIMS Public Health*. 2023;10(2): 252-267. doi: 10.3934/publichealth.2023019.
39. Pachi A, Anagnostopoulou M, Antoniou A, Papageorgiou SM, Tsomaka E, Sikaras C, et al. Family support, anger and aggression in health workers during the first wave of the pandemic[J]. *AIMS Public Health*. 2023;10(3):524-537. doi: 10.3934/publichealth.2023037.
40. Galanis P, Katsiroumpa A, Sourtzi P, Siskou O, Konstantakopoulou O, Katsoulas T, et al. Social Support Mediates the Relationship between COVID-19-Related Burnout and Booster Vaccination Willingness among Fully Vaccinated Nurses. *Vaccines (Basel)*. 2022;11(1):46. doi:10.3390/vaccines11010046.
41. Pachi A, Sikaras C, Ilias I, Panagiotou A, Zyga S, Tsironi M, et al. Burnout, Depression and Sense of Coherence in Nurses during the Pandemic Crisis. *Healthcare (Basel)*. 2022;10(1):134. doi:10.3390/healthcare10010134.