European Journal of Occupational Health Nursing

EJOHN is the scientific journal of FOHNEU

Federation of Occupational Health Nurses within the European Union

Original Article

Sleep characteristics and self-perceived health in resident professionals of Specialized Health Training

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ABSTRACT

Objective: There is a positive correlation between the sleep quality index, self-perceived health status and adequate sleep hygiene habits. It was proposed to know the characteristics of sleep and the self-perceived health of the residents of Osakidetza Specialized Health Training.
Method: Multicenter cross-sectional observational study where 501 volunteer residents constituted the sample.
A sociodemographic questionnaire, the Pittsburgh Sleep Quality Index, the SF 12 Health Questionnaire and the Sleep Hygiene Scale were used.
Results: 81.06% (n=351) have poor sleep quality; Those who have anxiety, those who perform 24-hour shifts, those who live with dependent people and those who perform specialties of longer duration are more affected. The better the sleep hygiene habits, the better the quality of sleep ($p<0.001$) as well as self-perceived mental health ($p<0.001$). Being a woman and not having anxiety is related to better sleep hygiene habits. Conversely, as an individual's perceived mental health improves, their perceived physical health worsens, and vice versa ($p<0.001$).
Conclusions: There is a relationship between the quality of sleep and the self-perceived health of the residents of Specialized Health Training in Euskadi in addition to their sleep hygiene habits. It is important that occupational health execute educational programs according to the needs detected.

Keywords: Internship and Residency; Quality of Life; Sleep Hygiene; Sleep Wake Disorders.

Article history

Received: March 19, 2024

Revised: June 4, 2024

Accepted: July 16, 2024

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Amigo-Rodríguez J, Rodríguez-Cortés M, Oyarbide-Saralegui A, Olagaray-Ramírez M, Arrien-Bilbao A. Sleep characteristics and self-perceived health in resident professionals of Specialized Health Training.. *Eur J Occ Health Nurs*. 2024; 3(2):37-60. DOI: 10.70324/ejohn.v3i2.34

Introduction

Sleep is a very influential factor in a person's well-being and a clear indicator of health status (1)(2). Defined as the physiological-rhythmic state belonging to the circadian wake-sleep cycle, there is a loss of consciousness with a decrease in perception and response capacity (3).

Sleep quality is understood as good nighttime sleep associated with good daytime functioning and is affected by factors such as the total and actual amount of time asleep, latency, and sleep efficiency. Inappropriate times for going to bed and waking up cause an irregular sleep rhythm, resulting in ineffectiveness (3)(4). Circadian rhythms regulate several physiological systems of the body (body temperature, blood pressure, sleep-wake pattern, metabolic and hormonal processes, etc.). They have an oscillation period between 20-28 hours. They facilitate the development of greater activity during the day and less at night (5). It is an indicator of good quality of life (6).

Poor sleep quality is sleep deprivation that can cause excessive daytime sleepiness, fatigue, decreased concentration, and cognitive impairment. Sustained over time, it will have an impact on the behavior, mood, memory, attention span and cognition of the individual (3)(7).

Self-rated health is a widely used indicator in mental health research. It is associated with the probability of suffering from chronic diseases, the use of health services and could even behave as a powerful predictor of mortality (8). Different patterns of self-perceived health are observed depending on gender, socioeconomic situation or exposure to occupational risk factors (9)(10).

Sleep hygiene is a set of habits and behaviors that facilitate sleep and control external factors that can negatively interfere with it, such as environmental factors (light, noise, temperature, etc.) and health-related factors (nutrition, exercise). and substance use) (2)(11).

Poor sleep hygiene is defined by the International Classification of Sleep Disorders as a disorder secondary to carrying out activities of daily living (12) and can contribute to insomnia (13).

Regarding the relationship between sleep quality and hygiene and self-perceived health,

some articles show that there is a moderate correlation between the sleep quality index and self-perceived health status (14)(15)(16). The higher the quality of sleep, the healthier university students perceive themselves to be. Other research also suggests that the relationships between sleep quantity and health are weaker than those between sleep quality and health (17).

Sleep disorders are underdiagnosed. Epidemiological studies support its prevalence in many people (18). The identification of these disorders will provide new diagnostic and therapeutic strategies that could improve quality of life (19).

Several studies quantify the negative impact of sleep deprivation in shift work and that it can sometimes lead to situations of chronodisruption that can affect the health of these workers by increasing cardiovascular risk, affecting mood, causing accelerated aging, etc.. (20). Night workers have altered circadian rhythms because they sleep when melatonin is low and cortisol is high (21).

Regarding occupations, doctors and medical students are groups that register higher levels of insomnia, however, there are other populations that present sleep disorders such as night workers or shift workers (22).

There is literature that states that Medicine and Nursing students have worse quality of sleep and a greater impact of the lack of it on quality of life (3). There is literature that reports that sleep problems in students impair learning, reduce academic performance and increase the presence of chronic health conditions (7). Studies show that medical students sleep little, study for long hours at night and consequently some suffer from excessive daytime sleepiness, leading to a decrease in attention that affects their quality of life and academic performance (23).

According to a study carried out in the USA, limiting the shifts of first-year residents to 16 hours significantly reduced preventable adverse events and the probability of committing medical errors, including those associated with patient death (24).

Specialized Health Training (SHT) is teaching with the residency system as a procedure to train specialists in health sciences (medicine, nursing, biology, pharmacy, psychology, chemistry...) (25). It is regulated by Law 44/2003, on the regulation of health professions (26) and Royal Decree 1146/2006, which regulates the special employment relationship of

residence for the training of these specialists, which is incompatible with any other professional and training activity (27).

Likewise, this study has been carried out in Osakidetza-Basque Health Service and has considered the legal obligations and imperatives derived from its operation. Article 3 of the Osakidetza statutes aims to "promote the training and updating of the specialized knowledge required by its health and non-health personnel, both in the specific field of health and in those of health management and administration" (28).

With this study, the aim is to know the quality and hygiene of sleep and the self-perceived health of SHT residents since these are workers who reduce the time dedicated to sleep and work long hours to satisfy their academic-work demands. In the bibliography consulted there were no updated publications about this relationship in SHT residents in Spain, which justifies carrying out the study.

Hypothesis: The true hypothesis was that there was a relationship between sleep quality, sleep hygiene and self-perceived health in the residents of the Osakidetza SHT and the null hypothesis was that there was no such relationship.

Main objective: To know the sleep characteristics and self-perceived health of Osakidetza SHT residents**.**

Specific objectives:

● Study the relationship between sociodemographic factors and sleep quality, sleep hygiene and self-perceived health.

● To know if there is a relationship between sleep quality and sleep hygiene in SHT residents of Osakidetza.

● Study the relationship between sleep quality and self-perceived health in residents of the Osakidetza SHT.

● Determine if there is a relationship between sleep hygiene and self-perceived health in residents of the Osakidetza SHT.

● To know the relationship between the mental health component and the physical health component in SHT residents of Osakidetza.

● Study the relationship between sleep quality, sleep hygiene and self-perceived health in

SHT residents of Osakidetza.

The aim is to study the quality and sleep hygiene habits, and the self-perception of health in these professionals with the aim of detecting health problems and alterations in the sleep pattern that may be related to some aspect derived from their residence.

Material and Methdos

Study design. Population. Sample.

Multicenter and cross-sectional observational study developed between February-March 2023. 1,465 residents in healthcare training of Euskadi who carry out their work day within 14 teaching units of Osakidetza. 541 people accessed the survey.

Eleqibility Criteria

Inclusion Criteria: Perform their workday in centers of the Basque Health Service Osakidetza

Exclusion Criteria:

- Being part of the research team
- Not being actively employed during the study period

Excluded cases (n=40):

- 11 people who were not actively employed
- 29 blank questionnaires

Final sample: 501 residents

Convenience sampling was used through voluntary self-selection. The population was expected to be homogeneous in terms of age, according to data on the age range of the people to whom the places were awarded, according to data extracted from the Ministry of Health and Consumer Affairs and Social Welfare (MSCBS) (29), and also at an academic level, since everyone had to have university studies in Health Sciences or Sciences (25).

The study obtained a favorable report from the Clinical Research Ethics Committee of Euskadi.

Access to the participant information sheet and the cover letter were sent to the personal corporate email by the study heads to all residents.

Data collection was carried out and managed using the REDCap (Research Electronic Data Capture) platform of the Carlos III Health Institute (30)(31), creating a data collection notebook that contained the "ad-hoc" sociodemographic questionnaire., the Pittsburgh Sleep Quality Index (PSQI) questionnaire (32,33,34,35), the SF 12 Health questionnaire (36) and the Sleep Hygiene Scale. (2)

Analysis of data

The normality of continuous variables was checked using the Shapiro-Wilks test. Variables that follow a normal distribution are presented with mean and standard deviation; Otherwise, it is presented with median and interquartile range. To compare scores between variables with 2 categories, the Student T or Mann-Whitney U test was used, depending on the distribution of the variable, and to compare more than 2 categories, the ANOVA or Kruskal-Wallis test was used.

Linear regression models were carried out to see the variables that are associated with the scores and the variables that were significant in the univariate analysis were included.

All analyzes were performed with the statistical program R (version 4.2.2): A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria (37).

Results

The sample studied was 501 participants (34.46% of 1454 who met inclusion criteria), of which 76% (n=381) considered themselves women, 23.6% (n=118) men, and 2 people did not define its gender. Median age was 27 years [26.0;29.0]

94.41% do not live with dependent people, 1.99% do so with dependent elderly people, 3.19% with dependent minors and 0.2% live with elderly and minor dependent people.

74.1% (n=371) of the participants are MIR, 21.8% (n=109) EIR, 2.79% (n=14) FIR, 0.8% (n=4) PIR and 0.6 % (n=3) are BIR. No sample was obtained from the QIR.

21.8% (n=109) of those surveyed take a 2-year specialty, 62.7% (n=314) take a 4-year one and 15.6% (n=78) take a 5-year one. years. 29.3% (n=147) attend 1st grade, 32.9% (n= 165) 2nd grade, 17.4% (n=87) 3rd grade, 17% (n=85) 4th grade and 3.39% (n=17) 5th grade.

42.91% (n= 215) of the participants work in teaching units in Vizcaya, 17.76% (n=89) in

Álava, 33.73% (n=169) in Guipúzcoa, and 5. 58% (n=28) work in teaching units with presence in the three territories.

Regarding self-reported illnesses related to mental and behavioral disorders, 17.5% (n= 486) reported anxiety problems and 1.86% (n= 485) reported depression problems.

99.4% (n= 498) are on duty. 68.7% (n= 344) perform 24-hour shifts and 45.3% (n=156) perform 5 shifts per month. 20.9% (n=101) responded that their work day does not allow them to rest after shifts.

Regarding sleep quality, the results show that the median Pittsburgh score was 6 [5.00;8.00]. Considering poor sleep quality PSQI>5 and good quality PSQI≤5, 81.06% (n= 351) reported having poor sleep quality.

There are significant differences in sleep quality between residents who report having anxiety and those who do not ($p<0.001$) and between people who live with dependent people and those who do not ($p=0.01$). There are also differences between the duration of residency ($p=0.015$), with those who study specialties lasting 4-5 years having a worse quality of sleep, and those who work on duty ($p= 0.05$), with those who work on duty for 24 years. hours those with the worst scores. On the other hand, in relation to sleep quality, there are no significant differences based on gender.

Each component of the Pittsburgh Index was analyzed in Figure 1.

● Subjective sleep quality: 10.2% (n=47) of the sample reported having very good subjective sleep quality, 54.6% (n=253) good, 33% (n=153) poor and 2.16% (n=10) very bad.

● Sleep latency: (sum of the time the subject believes it takes to fall asleep, ≤15 minutes, between 16-30, 31-60, or >60 minutes, and the number of times the subject has not been able to fall asleep. sleep in the first half hour in the last month): 19.2% (n=89) of the population presented 0 points, 43.4% (n=201) 1 point, 26.8% (n= 124) 2 points and 10.6% (n=49) 3 points.

● Duration of sleep (number of hours the subject believes they have slept): 6.48% (n=30) reported sleeping more than 7 hours, 79.7% (n=369) between 6-7 hours, 11.4%(n=53) between 5-6 hours and 2.38%(n=11) less than 5 hours.

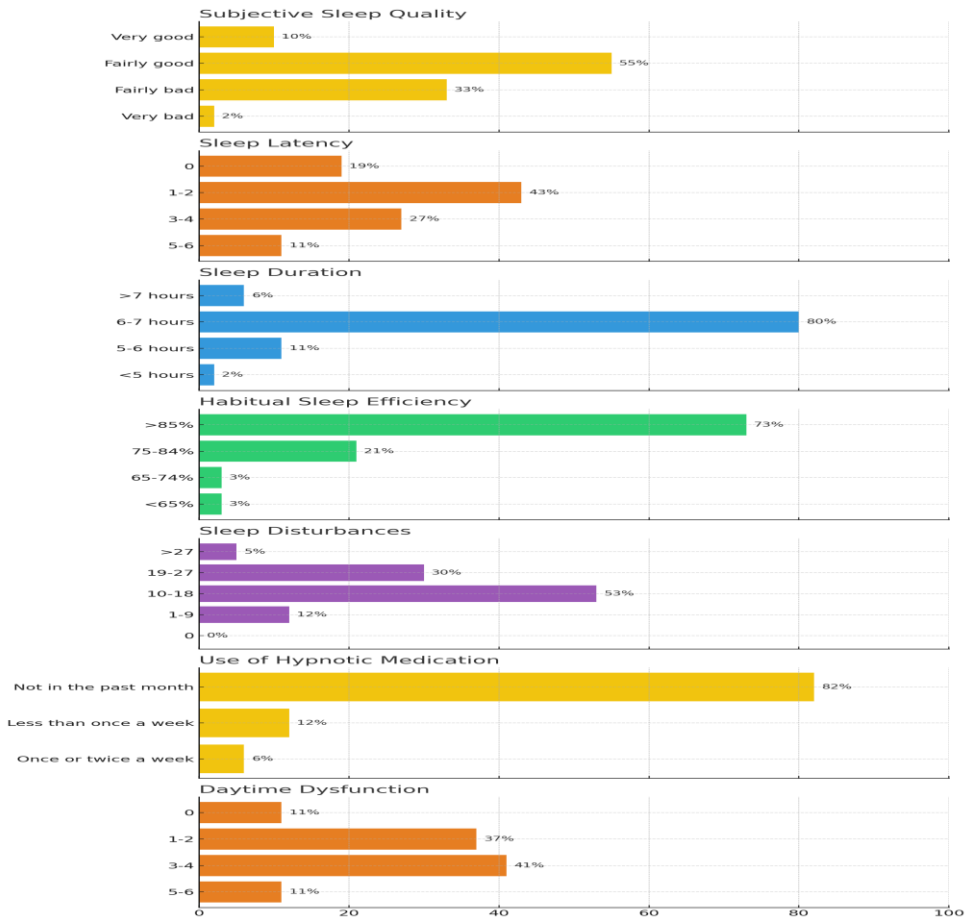

Figure 1. Sleep Quality Component Scores

● Habitual sleep efficiency (quotient between the time the subject believes he is sleeping and the time he declares he remains lying down): 72.7%(n=327) of residents have a habitual sleep efficiency >85%, 20. 9%(n=94) have an efficiency between 75-84%, 3.33%(n=15) between 65-74% and 3.11%(n=14) <65% efficiency.

● Extrinsic sleep disturbances (include nocturnal awakenings, urination disturbances, coughing episodes, breathing problems, snoring, dysthermic sensation, nightmares and pain): 4.97% (n=23) stated no. having suffered any disturbance, 82.5% (n=382) reported mild disturbances, 12.3% (n=57) reported moderate disturbances, and 0.22% (n=1) reported severe disturbances.

● Use of hypnotic medication in the last month: 81.8% (n=365) did not consume any medication, 12.3% (n=55) less than one a week, 5.86% (n= 26) 1 to 2 per week and no more

than 3 per week.

● Daytime dysfunction (sum of the presence or absence of daytime sleepiness and the existence or not of reluctance in daytime activities): 11.4% (n=53) of the population did not present daytime dysfunction (0 points), 37 .1%(n=172) mild (1 point), 40.8%(n=189) moderate (2 points) and 10.6%(n=49) severe (3 points).

Regarding sleep hygiene habits, participants who obtained a score ≥ the 75th percentile (38 points) were categorized as having poor sleep hygiene; resulting in 30.51% (n=137). There is a statistically significant difference (p=0.022) between men and women regarding sleep hygiene habits. In the same way as between those who report having anxiety and those who do not (p=0.031). See Table 1.

Table 1. Descriptive summary by groups "categorized hygiene score"

	[ALL]	Good sleep hygiene	Bad sleep hygiene	p.overall	N
	N=449	*N=312*	*N=137*		
Age median, (Q1:Q3)	27.0(26.0;29.0)	27.0(26.0;29.0)	28.0(26.0;29.0)	0.059	449
Gender, N (%):				0.022	449
Female	342 (76.2%)	245 (78.5%)	97 (70.8%)		
Male	105 (23.4%)	67 (21.5%)	38 (27.7%)		
Other	2 (0.45%)	0 (0.00%)	2 (1.46%)		
¿Do you do guards? N (%):				0.570	449
No	2 (0.45%)	2 (0.64%)	0 (0.00%)		
Yes	447 (99.6%)	310 (99.4%)	137 (100%)		
Anxiety, N (%):				0.031	449
No	348 (77.5%)	247 (79.2%)	101 (73.7%)		
NK/NA	24 (5.35%)	20 (6.41%)	4 (2.92%)		
Yes	77 (17.1%)	45 (14.4%)	32 (23.4%)		

In the linear regression analysis it was seen that as the Pittsburgh score increases, the sleep hygiene score also increases and is statistically significant (p<0.001). Regarding the mental health sum (MCS12) of the SF12 questionnaire, there is a negative association; The lower the score in Pittsburgh, the higher the score in MCS12 (p<0.001). There is a negative association between sleep hygiene and MCS12 (p<0.001). Between the summation variables mental health and summation physical health, there is a negative association (p<0.01). See Table 2.

Table 2. Linear regression model to see the association between scale scores

		Beta 95%IC	p-value
Pittsburgh Index	MCS12	-0.14 (-0.16, -0.12)	<0.001
	PCS12	-0.03 (-0.08, 0.02)	0.2
	Sleep hygiene	0.84 (0.67, 1.0)	<0.001
Sleep Hygiene			
	MCS12	-0.14 (-0.19, -0.09)	<0.001
	PCS12	-0.06 (-0.15, 0.04)	0.2
MCS12 (addition mental SF12)			
	PCS12	-0.16 (-0.20, -0.11)	<0.001

Those over 28 years old score on average 1.12 points higher than those under 28 on the Pittsburgh Index score. Compared to the participants who do evening shifts, those who do 24h shifts score on average 0.94 points higher. Also, those who suffer from anxiety or do not answer this question, score on average almost 2 points higher than those who do not suffer from anxiety (Table 3).

Table 3. Linear regression model with the (continuous) Pittsburgh score variables, including the variables that were found to be significant.

Variable	Beta	95%IC	p-value
Age	0.16	0.08, 0.25	<0.001
Guard type			
24h	0.97	0.30, 1.6	0.005
Nights	0.56	-0.43, 1.5	0.3
Other	1.1	-0.52, 2.8	0.2
Evenings	----	----	
Anxiety			
No	----	----	
NK/NA	1.8	0.70, 3.0	0.002
Yes	2.0	1.3, 2.7	<0.001

Those in third grade obtain on average 2.4 points more than those in first grade in the sleep hygiene questionnaire. The same thing happens with people who suffer from anxiety or do not answer this question, they obtain 1.8 and 0.96 points more on average respectively than those who do not have anxiety (Tabla 4).

Table 4. Linear regression model with the (continuous) sleep hygiene scoring variables, including the variables that were significant in the univariate analysis.

Variables	Beta	95%IC	p-value
What year of residency are you in?			
1	----	----	
2	0.54	-0.78, 1.9	0.4
3	2.4	-0.83, 4.1	0.003
4	1.1	-0.47, 2.8	0.2
5	1.4	-1.7, 4.5	0.4
Anxiety			
No	----	----	
NK/NA	0.96	-1.4, 3.3	0.4
Yes	1.8	0.36, 3.2	0.014

Discussion

It is observed that >80% of the study subjects have poor sleep quality, although 65% perceive it as good or very good, coinciding with other studies (38)(39).

The median Pittsburgh scale score is 6 (5.00;8:00), which is 2 points worse than the general population of another study (34).

The sleep duration of SHT residents is below the values of the general population. Moderate and severe daytime dysfunction of residents is greater compared to the dysfunction of the general population (34).

In relation to sleep quality, no significant differences by gender have been found. However, there is both literature that states that women report lower quality of sleep and have a greater risk of suffering from insomnia compared to men (40)(41), and literature that does not find a significant relationship with age and sex and related to possible multifactorial causes (5). It has been observed that those over 28 years of age have on average a worse quality of sleep.

The age of the participants, with a median of 27 years and an interquartile range between 26-29, is similar to what can be extracted from the data managed by the MSCBS, Figure 2 (29).

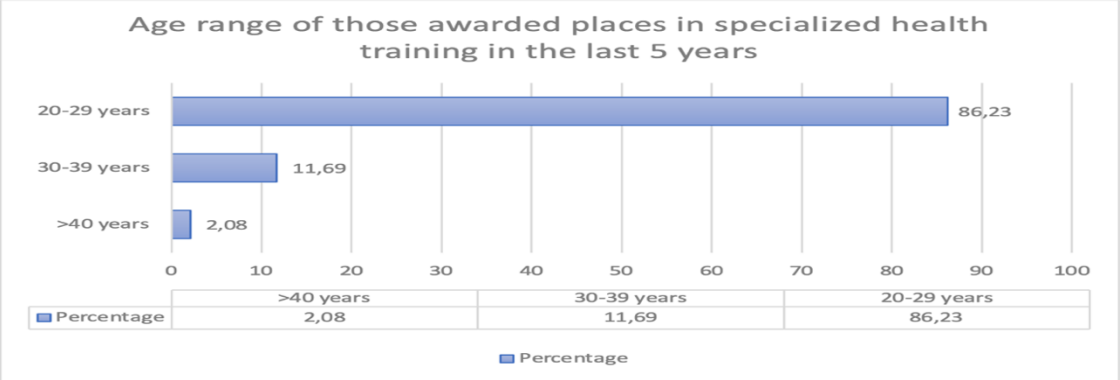

Figure 2. Age range of those awarded places in Specialized Health Training (SHT). Own elaboration, based on data on age and sex extracted from the Ministry of Health and Consumer Affairs and Social Welfare.

Regarding gender, the data extracted from the residents of the sample correspond to the trend observed in the data from the Ministry of Health and Consumer Affairs and Social Welfare. Figure 3 (29).

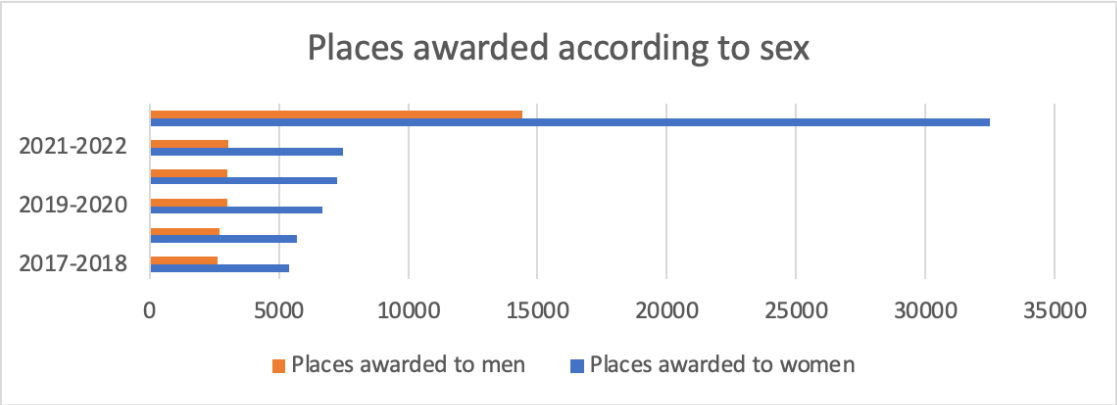

Figure 3. Distribution by sex of those awarded places in Specialized Health Training (SHT). Own elaboration, based on data on age and sex extracted from the Ministry of Health and Consumer Affairs and Social Welfare

Those who study 4-5 year specialties (p= 0.05), and those who work on duty (p= 0.05) have a worse quality of sleep, with those who work on 24-hour duty having the worst score. In a study of medical residents, it was observed that working 24 hours continuously was related to a greater risk of suffering from stress, sleep disorders, and depression (42).

The results analyzed show, in contrast to a study carried out with the staff of the Urgent Health Transport Network (RTSU) of the Basque Country, that only 24-hour shifts are associated with a worse quality of sleep, given that afternoon shifts, night and others do not become significant. When RTSU staff worked 12-hour night shifts, they had worse sleep quality compared to when they worked 12-hour daytime shifts, improving when they were in off periods compared to these 12-hour daytime shifts (5).

There is a positive relationship between sleep quality and sleep hygiene, suggesting that promoting healthy sleep habits, especially adequate schedule maintenance and a more comfortable bedroom environment, could improve sleep quality in children. residents (23).

17.5% (n= 486) of residents reported having anxiety and 1.86% (n= 485) reported

depression. In comparison with the data obtained from the report 'The situation of mental health in Spain' of March 2023, from the Spanish Mental Health Confederation and Mutua Madrileña Foundation, the study subjects report having more anxiety problems than the Spanish population in the same age group, 25 to 34 years old and less depression (43)(44).

As strengths, it is worth noting that a large sample has been used, which includes centers spread throughout the Basque Country, and with representation of different health training specialties. The dissemination of the surveys was carried out through the teaching units, and those responsible collaborated to guarantee the anonymity of the participants.

From the Basic Prevention Units, measures could be implemented to increase rest and sleep. The NIOSH “National Institute for Occupational Safety and Health” proposes a training course for nurses on shift work and long work hours that could serve as a guide (46).

Conclusions

It has been proven that there is a relationship between sleep quality, sleep hygiene and the mental component of self-perceived health in residents of the Osakidetza Specialized Health Training.

In compliance with the objectives of the study carried out, it is concluded that 81.06% of the sample has poor quality of sleep and it has been shown that there is an association with variables related to the work environment such as the fact of working 24-hour shifts and with duration of specialties.

One of the functions of the professionals of the Basic Prevention Units is to inform and train workers about their occupational risks, planning, executing and evaluating educational programs according to the needs detected. Making professionals aware of the importance of good sleep hygiene as a form of correct self-care of health should be an objective of occupational nursing specialists.

An exploratory study was intended because to date there is no research that analyzes in depth the relationship between psychological symptoms and sleep hygiene behaviors and their relationship with sleep quality in SHT residents. It is proposed to carry out a study with a longitudinal design that allows cross-sectional analysis, with probabilistic sampling that

guarantees that the results are inferable to all residents.

Conflict of intereset: We declare that there is no funding nor has it been received to carry out this study.

Acknowledgements: We appreciate the participation of the SHT residents and the collaboration of the teaching units and the statistics department of Biocruces and the tutor Elvira Casado.

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