CROSS SECTIONAL STUDY

Sleep disorders in Italian nursing students: a pilot study

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Findings:

Approximately half of the nursing students surveyed would appear to suffer from sleep disturbances, possibly affecting their care during their internship.

ABSTRACT

BACKGROUND: The nursing profession is particularly susceptible to sleep disturbances due to altered circadian rhythms, frequent changes in shift patterns, and overtime work, resulting in fewer hours devoted to sleep and an increased risk of errors in care. Sleep disorders, however, seem to start as early as during undergraduate training: in fact, it has been found that the high teaching load and the sudden alternation between theory, exams, and internship can be a source of stress and anxiety, leading to these kinds of disorders even during basic training. This study, therefore, set out to investigate the incidence of sleep disorders and examine the factors associated with them among nursing students in Italy.

METHODS: A cross-sectional web-based study was conducted from January to August 2022, administering the Italian version of the Pittsburgh Sleep Quality Index (PSQI) was administered. The normality of the distribution was assessed using the Kolmogorov-Smirnov test. A binary logistic regression analysis was performed.

RESULTS: The survey was completed by 4898 students. The Kolmogorov-Smirnov test stated that the scores followed a normal distribution. The logistic regression found that being female, suffering from a disease, being a working student, regularly consuming tea or alcohol, and perceiving that sleep disorders impact academic performance are factors influencing the occurrence of sleep disorders.

CONCLUSIONS: Our results suggest nurse educators to implement strategies to facilitate the path of nursing students and reduce the risk of errors in nursing. Official studies of individual universities should confirm this pilot study's results.

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Studio Trasversale

Disturbi del sonno negli studenti di Infermieristica italiani: uno studio pilota

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Riscontri:

Circa metà degli studenti di infermieristica presi in esame potrebbe soffrire di disturbi del sonno, con possibili ripercussioni sull'assistenza durante il tirocinio.

ABSTRACT

INTRODUZIONE: La professione infermieristica è particolarmente esposta a disturbi del sonno a causa dell'alterazione dei ritmi circadiani, delle frequenti variazioni della turnistica e del lavoro straordinario, con riduzione del numero di ore dedicate a dormire ed aumentato rischio di errori nell'assistenza. I disturbi del sonno, tuttavia, sembrano iniziare già durante la formazione universitaria: l'elevato carico didattico e l'alternanza fra teoria, esami e tirocinio possono infatti essere fonte di stress e di ansia, portando a questo genere di disturbi. Questo studio si è quindi proposto di indagare l'incidenza dei disturbi del sonno ed i fattori ad essi associati fra gli studenti di infermieristica in Italia

METODI: E' stato condotto uno studio trasversale sul web da gennaio ad agosto 2022, somministrando la versione italiana del Pittsburgh Sleep Quality Index (PSQI). La normalità della distribuzione è stata valutata attraverso il test di Kolmogorov-Smirnov. È stata eseguita un'analisi di regressione logistica binaria.

RISULTATI: La survey è stata completata da 4898 studenti. Il test di Kolmogorov-Smirnov ha confermato la normalità della distribuzione. Le analisi hanno rilevato che essere di sesso femminile, soffrire di una malattia, essere uno studente lavoratore, consumare regolarmente tè o alcol e percepire che i disturbi del sonno hanno un impatto sul rendimento accademico, sono fattori che influenzano l'insorgenza dei disturbi del sonno.

CONCLUSIONI: I risultati di questo studio suggeriscono l'attuazione di strategie volte ad agevolare il percorso degli studenti di infermieristica e ridurre il rischio di errori nell'assistenza. I risultati di questo studio pilota dovrebbero essere confermati da studi ufficiali delle singole università

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BACKGROUND

It is well known that sleep impairment is capable of causing physical and psychological alterations. The literature shows how sleep ineffectiveness has significant organic repercussions and can be correlated with endocrine, metabolic, and neurological dysfunctions; it is also a direct cause of a meaningful reduction in quality of life (QoL) (1). In 2014, the American Academy of Sleep Medicine (AASM), in collaboration with other international societies, compiled the third edition of the International Classification of Sleep Disorders (ICSD), a now landmark document concerning these issues, which allows the clinical and diagnostic classification of the main SDs, dividing them into seven main categories to which insomnia, sleep-related breathing problems, hypersomnolence, circadian rhythm alterations, sleep-related movement disorders, parasomnias, and other SDs belong (2). Through this categorization, it has recently been estimated that approximately 70 million people in the United States and 45 million in Europe are affected by chronic sleep disorders (SD) (3,4), an alarming figure when considering the impact this can have on population health and, therefore, on the increase in related spending.

Among the categories of workers at risk of developing sleep disorders, we find the nursing profession; in particular, it would seem that the alteration of circadian rhythms, the frequent variations to the periodicity of shift schedules, and the frequent need to stay at work beyond regular duty hours (resulting in a reduction in the number of hours devoted to sleep), may result in insufficient sleep quality and generate an increased release of adrenaline (5,6), imbalances in emotional regulation and mental well-being. It is also documented how this condition leads nurses to abuse caffeine and benzodiazepines occasionally (7,8). In this situation, nurses are often forced to use their days off to make up for lost sleep hours (9,10), and the end result is a tendency to increase sleep disturbances with alterations in its architecture and a decrease in the quality and quantity of sleep hours and quality of life (10,11). To understand the actual seriousness of the situation, however, it is necessary to take into account how insufficient quantity and quality of sleep can lead to a decrease in reasoning abilities (12) as well as in levels of attention, concentration, and vigilance potentially compromising the safety of nurses and that of patients, exposing both to the risk of errors (13,14).

Undergraduate students are also a category at risk for sleep disorders. Nursing students stand out among them: in addition to being exposed to the same risk factors as nurses during the clinical internship, it has been found that the high teaching load and the sudden alternation between theory, exams, and internship can be a source of stress and anxiety, altering sleep habits and significantly reducing sleep quality (15-20). Such issues would appear to harm students' academic performance (11,16,21-24). In order to better control the risk, as well as to more correctly and effectively educate nursing personnel, it is therefore of strategic importance to investigate the incidence of sleep disorders and the variables that influence the presence of such disorders in students in Italian Bachelor School of Nursing programs.

Aims

The primary objective of the study was to investigate sleep disorders affecting nursing students in Italy. The secondary objective was to examine the factors associated with sleep disorders.

METHODS

Study design

A cross-sectional web-based study was conducted from January to August, 2022. Nursing students were recruited through social networks or through student representatives who volunteered to distribute the survey among nursing degree courses. The Pittsburgh Sleep Quality Index (PSQI) was administered. In order to accomplish the secondary objective of this study, the researchers recorded the socio-demographic characteristics of the sample, including age, gender, course year attended, and the localization of the degree program. Additionally, the questionnaire explored the following additional variables: suffering from a disease, being a working student, engaging in night work, substance use (such as drugs, coffee, tea, alcohol, or soft drink), physical activity, using video terminals before sleep, having a

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family/children, sleeping alone or with someone, and students' perception of the impact of sleep disorders on academic performance.

Instrument

The PSQI is a self-report questionnaire designed to evaluate sleep quality over a one-month period. Developed by researchers at the University of Pittsburgh, the PSQI serves as a standardized sleep assessment tool for clinicians and researchers. It has been widely utilized in various settings, including research and clinical practice, aiding in the diagnosis of sleep disorders. It comprises 19 individual items that assess seven components, resulting in a single global score. The questionnaire evaluates seven clinically determined domains of sleep difficulties, which include sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction. A global score exceeding 5 indicates significant sleep disturbances in at least two domains or moderate difficulties in more than three domains. Completing the questionnaire typically takes around 5-10 minutes.

Statistical analysis

The mean and standard deviation (SD) were utilized to describe the continuous variables and the distribution of responses on the Likert scale. For categorical variables and professional activities related to distress, frequencies and percentages were analyzed. The normality of the distribution was assessed using the Kolmogorov-Smirnov test, which indicated that the scores followed a normal distribution. Therefore, to examine the factors associated with sleep disorders, a binary logistic regression analysis was performed, with the PSQI score as the dependent variable (> 5=yes, < or equal to 5=no). The significance level was set at $p = 0.05$. All statistical analyses were performed using SPSS Version 22 (IBM, Armonk, NY, USA).

Ethics

The survey was carried out in compliance with Italian data protection laws and the principles outlined in the Declaration of Helsinki. The Institutional Review Board of the Bachelor School of Nursing of the University of Turin – Asti Campus approved the survey. The eligible participants were provided with information about the study objectives, and measures were taken to ensure the confidentiality of the collected data. The students who willingly participated in the survey provided their informed consent.

RESULTS

Sample characteristics

The survey was completed by 4898 students. **Table 1** provides a summary of the characteristics of the respondents. The average age of the sample was 22.92 ± 4.63. The majority of respondents were female (84.2%) and in their third year of the nursing program (37.8%). The majority of the sample reported being enrolled in the Nursing Degree Course in Northern Italy (59.4%), not suffering from a disease (87.3%), and not being a working student (75.5%). Predominantly, the sample did not have a regular use of drugs (96.9%) or tea (52.8%), but regularly consumed coffee (78.2%). Most of the sample stated not consuming soft drinks (36.4%), consuming alcohol 1/2 times a week (60.3%), and not engaging in physical activity (43.2%). A significant portion of the students used video terminals before going to sleep (96.0%), did not have a family/children (84.1%), and slept alone (81.7%). The majority of the students (51.3%) claimed that their sleep disorders had an impact on their academic performance (51.3%)

VARIABLES	MEAN	SD
Age	22.92	4.63
	N.	**%**
Course year		
first year	1676	34
second year	1364	27.8
third year	1858	37.8
Gender		
male	776	15.8
female	4122	84.2

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Localization of the degree program		
north	2908	59.4
central	1343	27.4
south	440	9.0
island	175	3.6
undeclared	32	0.6
Suffering from a desease		
yes	622	12.7
no	4276	87.3
Being a working student		
yes	1198	24.5
no	3700	75.5
Engaging in night work		
yes	2516	51.4
no	2382	48.6
Substance use: drugs		
yes	154	3.1
no	4744	96.9
Substance use: coffee		
yes	3829	78.2
no	1069	21.8
Substance use: tea		
yes	2312	47.2
no	2586	52.8
Frequency of consumption of soft drinks		
never	1781	36.4
½ times a week	1603	32.7
often	1514	30.9
Frequency of alcohol consumption		
never	1685	34.4
½ times a week	2954	60.3
often	259	5.3
Frequency of physical activity		
never	2116	43.2
½ times a week	1920	39.2
often	862	17.6
Using video terminals before sleeping		
yes	4703	96.0
no	195	4.0

Having a family/children		
yes	779	15.9
no	4119	84.1
Sleeping alone or with someone		
alone	4004	81.7
with someone	894	18.3
Students' perception of the impact of sleep disorders on academic performance		
yes	2514	51.3
no	2384	48.7

Table1: Characteristics of the sample

Sleep disorders and its associated factors

A number of 2052 students (41.89%) obtained a score higher than 5 on the PSQI scale, indicating the presence of sleep disorders.

Regarding the binary logistic regression analysis, the backward technique was employed to select the optimal model. The Omnibus test of the model's coefficients indicated statistical significance, confirming the suitability of the model. Nagelkerke's R^2 showed that the model explained the 23% of the variance. As shown in Table 2, being female, suffering from a disease, being a working student, regularly consuming tea or alcohol, and perceiving that sleep disorders have an impact on academic performance are factors influencing the occurrence of sleep disorders.

	B	Std. Error	Wald	df	OR	p
Gender: male	-0.48	0.092	26.47	1	0.62	0.000
Suffering from a disease: yes	0.43	0.095	20.64	1	1.54	0.000
Being a working student: yes	0.218	0.074	8.70	1	1.24	0.003
Consume of tea: yes	0.160	0.064	6.17	1	1.17	0.013
Consume of alcohol: often	0.14	0.058	5.48	1	1.15	0.019
Influence of sleep disorders on academic performance: yes	1.75	0.065	712.49	1	5.77	0.000

Table 2: Factors connected with sleep disorders

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DISCUSSIONS

This study aimed to investigate the incidence of sleep disorders and the variables influencing the presence of such disorders in students in Italian Bachelor of Science in Nursing programs. In this pilot study from the sample of c.ca 5000 students, it was found that almost one out of every two students (41.89%) suffered from sleep disorders; this result is in line with the literature where it's stated that health professional students seem to be more affected and predisposed to the development of SD (15-20). This finding is significant if we take into account that reduced sleep hours produce three major safety problems: reduced vigilance with a consequent risk of errors in patient care, increased risk of occupational and commuting injuries (including motor vehicle accidents on the way home from work), and compromised health of the nurse with increased work absences and health care costs (25).

The findings support other authors' results stating that sleep disorders increase significantly in the presence of comorbidities (24,26). It should also be considered, however, how some diseases (such as depression, for example) already involve sleep disruption and thus how the figure, at this juncture, might be overestimated.

In line with the literature, the female sex seems to be more predisposed to the issue under study with repercussions on school performance (16); a greater vulnerability to depression, physical and psychological stress, and anxiety disorders, as well as the complex activity of sex hormones (27), could explain this predisposition.

In the survey, sleep quality seems worse in students with concurrent work activities and is often attributable to difficulties reconciling duty hours with learning. This hypothesis is also confirmed by other authors' findings relating sleep quality to being a working student (18,28,29).

In line with the results of previous studies, our results confirm that the frequent use of psychotropic substances such as alcohol or tea have an effect on the onset of sleep disorders (30).

Finally, it is interesting to note how students who have sleep problems perceive the negative influence these have on their academic performance; such an awareness should be confirmed with validated instruments suitable for the purpose (such as the Grit-S questionnaire, already used among nursing students by Perry & Black(31)).

In future studies, it would be interesting to investigate how students deal with this issue after becoming aware of it; if the occasional abuse of benzodiazepines by nursing staff is reported in the literature, this study, on the other hand, found that 3.1% of the report using drugs and that 5.5% frequently use alcohol.

In a historical time when the nursing shortage is a severe global problem, however, it would be counterproductive for Italian universities to miss the dual opportunity that may arise from this pilot study. On the one hand, the phenomenon needs to be investigated more broadly and through official sources in order to define the dependent variables more punctually and, on the other hand, there is an opportunity to act on some of the factors that affect academic performance, student safety, and patient safety. One possible intervention could be the establishment of facilitated educational pathways for student workers, for example. It seems clear that if nursing students are already engaged in poor behaviors concerning the management of sleep and rest rhythms in the undergraduate setting, they are unlikely to change their habits once they graduate.

Limits

While this study reports interesting results, it certainly has its limitations. First, the logistic regression model explains only 23% of the variance; this implies that several covariates still need to be taken into account and properly investigated, suggesting some caution in interpreting the reported results. Second, having also disseminated an online survey by unofficial channels (social media and the web in general), the authors need to confirm that the responses were all derived from nursing students or that 4898 separate subjects responded. This fact, which needs to be taken into necessary consideration, is what most connotes the study presented as a "pilot study," having drawn its data also from unofficial sources.

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CONCLUSIONS

This study's results help identify a significant risk for nursing students: nearly one in two students suffer from sleep disorders, leading to increased physical and psychological risks, worsened quality of life, and increased risk of errors in patient care. In addition to questioning the structure of the educational pathway as it currently stands, universities are now called upon to take up a twofold challenge: to conduct studies that systematically investigate the prevalence of the phenomenon highlighted by this pilot study and to identify pathways to reduce as much as possible the factors that contribute to its development.

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