Sleep disorders among master's degree students majoring in nursing

Monika Łabuzek[1A,B,C,F], Aneta Grochowska[1D,E,F], Maria Mika[1D,E,F], Iwona Rodzoń[2B,C,D]

[1]Department of Nursing, State Higher Vocational School in Tarnow, Poland
[2]II Psychiatric Ward, Hospital in Debica, Poland

Authors' contribution:

A. Study design/planning • B. Data collection/entry • C. Data analysis/statistics • D. Data interpretation • E. Preparation of manuscript • F. Literature analysis/search • G. Funds collection

ABSTRACT

Introduction: Sleep is a primary need of the body. Sleep deprivation may result in severe irregularities in the process of thinking, cognitive processes, and mental health, and it may even lead to death. Sleep disorders constitute a common problem in society, frequently defined as a public health problem. The objective of this article is to assess sleep disorders among master's degree students majoring in nursing.

Material and methods: The subject of the research was a group of 150 students of master's degree studies majoring in nursing at the State Higher Vocational School in Tarnow, aged 23 to 58 years, from 15.02.106 to 15.04.2016. The authors' survey, the Athens Insomnia Scale, and the Epworth Sleepiness Scale, were used in the research. Verification between the variables was conducted using the χ^2 independence test and the Kruskal-Wallis test. A significance level of $p < 0.05$ was assumed.

Results: Students mostly went to sleep between 22.00 and midnight (44%), and woke up at various hours (46%). The participants most frequently indicated physical consequences as consequences of sleep disorders (45.3%), and the most frequent behaviour in the last month among the participants was everyday consumption of stimulants (54.8%). Most of the participants knew the principles of sleep hygiene (74.7%), and application of the principles of the appropriate sleep hygiene was declared by a small number of the participants (10.7%).

Conclusions: Students of master's degree studies majoring in nursing had inappropriate sleep hygiene. The behaviours impacting the sleep quality of the participants were not satisfactory.

Key words: sleep, insomnia, sleep disorders, somnolence, sleep hygiene.

INTRODUCTION

Sleep is very important in the life of every human being. It is a primary need of the body. Sufficiently long and good-quality sleep ensures well-being for the next day as well as high intellectual and physical performance. It is also important for optimal working of the internal organs of the body. It takes up a large part of every person's life – just over 30%. The individual need for sleep, in terms of its duration, depends on many factors, including gender, age, lifestyle, stress factors, and health. With age, the night rest scheme, its length, and the number of episodes undergo modification. Sleep deprivation may result in serious in mental and cognitive abnormalities or psychiatric disorders, and it may even lead to death [1-3].

According to Prusinski, "Sleep is not a state of inaction, but an active phenomenon in which certain structures of the brain are active, and the metabo- lism of the brain is not only significantly reduced, but sometimes even increases" [4]. According to Wichniak, "Sleep, just like waking, is a basic state of consciousness in which an adult spends about 30% of his life. Sleep can be defined as a state of the body characterised by the acceptance of a resting posture, cessation of physical activity, reduced reactivity to external stimuli, and loss of conscious contact with the environment. A feature that makes sleep a physiological condition, rather than a pathological one, is the complete reversibility of this condition, the possibility of returning a sleeping person to a state of vigil under the influence of adequate stimuli, for example the sound of an alarm clock, or after exhausting the need for sleep" [5].

Sleep disorders are a common problem in society, often referred to as a public health problem. They result in other numerous health problems and high financial costs. The promotion of principles of sleep

hygiene and beneficial habits related to night-time rest should be addressed to the whole of society, with particular emphasis on higher risk groups. Sleep disorders are divided into insomnia, sleep-related breathing disorders, hypersomnia, circadian rhythm disorders, parasomnia, and sleep-related movement disorders. There are also isolated symptoms, symptoms being a variant of the norm, and unresolved problems [6, 7].

A special group of people who are additionally exposed to problems with sleep or falling asleep are shift workers, including nursing staff, who work most often in a system of 12-hour shifts. [8]. A review of the related literature shows that 39.8% of staff nurses have an insufficient sleep (IS) ratio [9]. Furthermore, prior research studies reveal that up to 57% of shift-working nurses have sleep problems [10].

The aim of the study was to assess sleep disorders among students of MA studies in nursing.

MATERIAL AND METHODS

The survey was conducted among 150 master's degree students of nursing at the State Higher Vocational School in Tarnow, who agreed orally to its implementation. The research was carried out in the period from February 15, 2016 to April 15, 2016. The study included students of the first year of full-time studies, the first year of part-time studies, and the second year of part-time studies. The respondents were informed about how to complete the questionnaire, its anonymity, and the purposes of the research. Students were informed about the voluntary completion of the questionnaire and the possibility of discontinuation of participation in the research at any time. Researchers obtained permission from the school authorities to conduct surveys among students.

The diagnostic survey method was used for the study, using the auditory survey technique.

The research tools were:
1. Authors' questionnaire consisting of 13 closed questions, including 10 one-time selection, three multiple-choice questions, and four open-ended questions.
2. The Athens Insomnia Scale – designed to assess the severity of insomnia symptoms by quantifying eight symptoms: falling asleep after going to bed and turning off the lights, waking up at night, waking up earlier than planned, total sleep time, quality sleep regardless of its duration, well-being the next day, mental and physical fitness the next day, and sleepiness during the next day. Interpretation of the result is as follows: obtaining 5 or fewer points – the norm, most likely not suffering from insomnia, reaching 6-10 points means borderline of the norm, obtaining more than 10 points indicates highly probable insomnia [11].

3. Epworth Severity Scale – involves estimating excessive daytime sleepiness by assessing the probability of falling asleep on a scale of 0 to 3 in eight situations: sitting and reading, watching television, passive sitting in public places (for example at the theatre, at a meeting), as a passenger in the car driving for an hour without resting, lying down and resting in the afternoon if circumstances allow, during a conversation sitting, quiet sitting after lunch without alcohol, and in the car during a few-minute stop in a traffic jam or at a red light. Interpretation of the result: 0-10 points – sleepiness within the normal range, 11-16 points – excessive sleepiness, 17-24 points – pathological sleepiness [3, 12, 13].

Verification of differences between variables was made using the χ^2 independence test and Kruskal-Wallis test. The level of $p < 0.05$ was considered significant. The calculations were made using the SPSS program.

RESULTS

There were 150 students in the study group. Most of them were women (98.0%). Men accounted for 2.0% of the respondents. The average age of the respondents was 31.65 years (SD = 10.60). The age of students ranged from 23 years to 58 years, and half of the respondents were at or below 25 years of age. The age group of 23-25 comprised 50.7% of people. 26.7% were 26-40-year-olds, and 22.7% were 41-58-year-olds.

20.7% of respondents designated a village as their place of residence, 19.3% of respondents lived in a small town (up to 10,000 inhabitants), 31.3% of the students lived in a medium-sized town, and 28.7% of the respondents indicated a large city as their place of living.

Most of the respondents (75.3%) were professionally active; 24.7% did not work.

In the case of 41.3% of respondents, the factor that reduced the quality of sleep was work, and in the second most numerous group (30.0% of people) it was socialising. Family and emotional problems reduced the quality of sleep in 25.3% of respondents, and financial problems in 20.0% of respondents. To a lesser extent, the factors that reduced the quality of student sleep were: disease (16.7%), other factors (including death of a loved one – 15.3%), stimulants (14.0%), change of residence (4.7%), feeling of low value (4.0%), or uncomfortable sleep conditions (2.7%).

The most commonly reported effects of sleep disorders were physical effects, most often fatigue (45.3%) and excessive daytime sleepiness (22.7%). The second frequently cited category of the effects of sleep disorders were psychological effects, most often concentration problems (18.0%) and irritability (16.0%). To a lesser extent, the respondents listed non-physical effects, most notably traffic accidents

(11.3%) and falls (8.0%). A few people mentioned social effects, including conflicts in the family (5.3%).

Among the behaviours most frequently manifested by the respondents during the last month was their daily consumption of stimulants (54.8%). Among the behaviours that the subjects did not admit to was taking sleeping tablets (66.0%), feeling pain of various origins at night (56.7%), having shallow sleep (50.7%), or waking up at night and feeling fearful or anxious (48.0%). Occasionally, the subjects had nightmares (58.0%), during their free days they slept more to make up for earlier sleep deficits (54.0%), they ate a rich meal, and watched TV just before bedtime (51.4%) (Table 1).

10.7% of people declared adhering to the principles of proper sleep hygiene. 26.7% of students did not apply these principles. Almost half of the respondents (49.3%) sometimes applied the principles of proper sleep hygiene. 13.3% did not know these rules.

The level of insomnia increased significantly with the presence of such behaviours as taking a nap during the day, taking sleeping pills, waking up at night and feeling fear and anxiety, eating a hearty meal at bedtime, experiencing pain of various origins at night, getting up at night to use the toilet, and having shallow sleep. The subjects who more often presented such behaviours were more likely to experience insomnia. People who consumed stimulants on a daily basis were less likely to suffer from insomnia (Table 2).

It has been established that people with higher levels of sleepiness were more likely to take naps during the day, take sleeping pills, find it difficult to fall asleep at night, feel fear and anxiety at night, consume a hearty meal just before bedtime, feel pains

Table 1. Sleep-related behaviours

Factor	Yes		No		Sometimes	
	n	%	*n*	%	*n*	%
I take a nap during the day	29	19.3	61	40.7	60	40.0
I take sleeping pills	10	6.7	99	66.0	41	27.3
After waking up at night I find it difficult to fall asleep again	39	26.0	63	42.0	48	32.0
I wake up at night and I feel fearful and anxious	28	18.7	72	48.0	50	33.3
During my days off I sleep more to make up for earlier sleep deficits	33	22.0	36	24.0	81	54.0
Just before bedtime I eat a rich meal, I watch TV	38	25.3	35	23.3	77	51.3
I feel pain of various origins at night	21	14.0	85	56.7	44	29.3
I use stimulants daily (coffee, tea, cigarettes)	82	54.7	23	15.3	45	30.0
I get up at night because I have to go to the toilet	35	23.3	69	46.0	46	30.7
I have nightmares	22	14.7	41	27.3	87	58.0
My sleep is shallow	23	15.3	76	50.7	51	34.0

Table 2. Athens Insomnia Scale and dream-related behaviours

Athens Insomnia Scale	Norm		Norm borderline		Insomnia probability		Total		*p*
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
I take a nap during the day	1.53	0.64	1.77	0.70	2.08	0.80	1.79	0.75	0.0014
I take sleeping pills	1.08	0.27	1.23	0.43	1.92	0.70	1.41	0.61	< 0.0001
After waking up at night I find it difficult to fall asleep again	1.30	0.64	2.00	0.72	2.26	0.75	1.84	0.81	< 0.0001
I wake up at night and I feel fearful and anxious	1.25	0.43	1.64	0.67	2.26	0.78	1.71	0.76	< 0.0001
During my days off I sleep more to make up for earlier sleep deficits	2.06	0.50	2.00	078	1.88	0.75	1.98	0.68	0.3939
Just before bedtime I eat a rich meal, I watch TV	1.81	0.62	1.89	0.70	2.36	0.66	2.02	0.70	0.0001
I feel pain of various origins at night	1.19	0.39	1.55	0.65	2.00	0.83	1.57	0.73	< 0.0001
I use stimulants daily (coffee, tea, cigarettes)	2.53	0.80	2.40	0.71	2.24	0.69	2.39	0.74	0.0370
I get up at night because I have to go to the toilet	1.38	0.66	1.94	0.79	2.04	0.81	1.77	0.80	< 0.0001
I have nightmares	1.79	0.49	1.79	0.62	2.04	0.75	1.87	0.64	0.1147
My sleep is shallow	1.17	0.51	1.77	0.70	2.04	0.70	1.65	0.73	< 0.0001

of various origins, get up at night to use the toilet, and have nightmares and shallow sleep. Students who more frequently used stimulants more often felt sleepy within the normal range (Table 3).

Most students (57%) slept 5-6 hours a day. Less than a third of the respondents (29%) slept 7-8 hours a day, and a few people slept for more or less than 5-6 hours.

The probability of insomnia was higher among people who slept up to four hours a day and decreased with an increase in the number of hours of sleep. Also, respondents who slept longer were less at risk of falling asleep (Table 4).

According to the respondents, the main factor decreasing the quality of sleep was stress (74%), closely followed by studying (61%), irregular lifestyle (55%), drinking caffeinated beverages shortly before bedtime (53%), and fatigue (48%). To a lesser extent, the respondents mentioned other factors that lower the quality of their sleep.

The probability of insomnia was higher among working people (53.2%) than non-working people (19.3%). Similarly, a higher level of insomnia was demonstrated by people with financial problems (66.7%), illnesses (80.0%), fatigue (51.4%), and other factors that lower the quality of sleep. Students who used caffeinated beverages (50.0%) or those enjoying social events (75.6%) more often had a level of insomnia within the norm (Table 5).

It was found that a higher level of drowsiness was experienced by people experiencing stress (56.8%), students indicating work as a factor reducing their sleep quality (71.0%), disease (20.0%), fatigue (11.1%), stimulants (81.0%), and other factors that reduce the quality of sleep (21.7%). Sleepiness within the norm was more frequent among students who had an irregular lifestyle (53.7%), drinking caffeinated beverages shortly before bedtime (60.0%), and enjoying social events (93.3%) (Table 6).

Analysing the results of individual questions in the Epworth Sleepiness Scale (scale 0-3 points), it was found that the greatest probability of falling asleep was related to lying and resting in the after-

Table 3. Epworth Sleepiness Scale and sleep-related behaviours

Epworth Sleepiness Scale	Sleepiness within the norm		Excessive sleepiness		Pathological sleepiness		Total		p
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
I take a nap during the day	1.51	0.66	1.99	0.74	2.25	0.71	1.79	0.75	0.0001
I take sleeping pills	1.07	0.32	1.64	0.67	2.00	0.53	1.41	0.61	< 0.0001
After waking up at night I find it difficult to fall asleep again	1.42	0.68	2.16	0.77	2.38	0.52	1.84	0.81	< 0.0001
I wake up at night and I feel fearful and anxious	1.27	0.54	1.97	0.72	2.88	0.35	1.71	0.76	< 0.0001
During my days off I sleep more to make up for earlier sleep deficits	2.04	0.53	1.96	0.78	1.63	0.74	1.98	0.68	0.2309
Just before bedtime I eat a rich meal, I watch TV	1.90	0.63	2.05	0.73	2.75	0.46	2.02	0.70	0.0038
I feel pain of various origins at night	1.19	0.40	1.79	0.74	2.75	0.71	1.57	0.73	< 0.0001
I use stimulants daily (coffee, tea, cigarettes)	2.60	0.72	2.20	0.74	2.50	0.53	2.39	0.74	0.0015
I get up at night because I have to go to the toilet	1.45	0.68	2.03	0.84	2.13	0.35	1.77	0.80	< 0.0001
I have nightmares	1.70	0.52	1.95	0.68	2.63	0.52	1.87	0.64	0.0004
My sleep is shallow	1.27	0.62	1.95	0.70	2.00	0.53	1.65	0.73	< 0.0001

Table 4. The level of insomnia and sleepiness and the average sleep time per day

		Up to 4 hours		5-6 hours		7-8 hours		9-10 hours		More than 10 hours		p
		n	%	n	%	n	%	n	%	n	%	
Athens Insomnia Scale	Norm	0	0.0	19	22.1	24	55.8	8	66.7	2	100.0	< 0.0001
	Borderline of norm	1	14.3	28	32.6	15	34.9	3	25.0	0	0.0	
	Probability of insomnia	6	85.7	39	45.3	4	9.3	1	8.3	0	0.0	
Epworth Sleepiness Scale	Sleepiness within the norm	1	14.3	22	25.6	33	76.7	9	75.0	2	100.0	< 0.0001
	Excessive sleepiness	4	57.1	58	67.4	10	23.3	3	25.0	0	0.0	
	Pathological sleepiness	2	28.6	6	7.0	0	0.0	0	0.0	0	0.0	

Table 5. Athens Insomnia Scale and factors affecting reduced quality of sleep

Factor		Athens Insomnia Scale						p
		Norm		Norm borderline		Probability of insomnia		
		n	%	n	%	n	%	
Stress	No	17	43.6	8	20.5	14	35.9	0.2133
	Yes	36	32.4	39	35.1	36	32.4	
Work	No	48	54.5	23	26.1	17	19.3	< 0.0001
	Yes	5	8.1	24	38.7	33	53.2	
Financial problems	No	49	40.8	41	34.2	30	25.0	0.0001
	Yes	4	13.3	6	20.0	20	66.7	
Studies	No	24	41.4	13	22.4	21	36.2	0.1642
	Yes	29	31.5	34	37.0	29	31.5	
Family, emotional problems	No	40	35.7	32	28.6	40	35.7	0.3973
	Yes	13	34.2	15	39.5	10	26.3	
Illness	No	51	40.8	44	35.2	30	24.0	< 0.0001
	Yes	2	8.0	3	12.0	20	80.0	
Tiredness	No	47	60.3	18	231	13	16.7	< 0.0001
	Yes	6	8.3	29	40.3	37	51.4	
Change of place of residence	No	51	35.7	43	30.1	49	34.3	0.2930
	Yes	2	28.6	4	57.1	1	14.3	
Irregular lifestyle	No	21	30.9	22	32.4	25	36.8	0.5549
	Yes	32	39.0	25	30.5	25	30.5	
Drugs/stimulants	No	48	37.2	38	29.5	43	33.3	0.3767
	Yes	5	23.8	9	42.9	7	33.3	
Drinking caffeinated beverages shortly before bedtime	No	13	18.6	32	45.7	25	35.7	0.0001
	Yes	40	50.0	15	18.8	25	31.3	
Uncomfortable sleep conditions	No	52	35.6	44	30.1	50	34.2	0.1357
	Yes	1	25.0	3	75.0	0	0.0	
Social events	No	19	18.1	38	36.2	48	45.7	< 0.0001
	Yes	34	75.6	9	20.0	2	4.4	
The feeling of low value	No	50	34.7	47	32.6	47	32.6	0.2393
	Yes	3	50.0	0	0.0	3	50.0	
Other	No	50	39.4	42	33.1	35	27.6	0.0016
	Yes	3	13.0	5	21.7	15	65.2	

noon (2.46), sitting and reading (2.03), and watching television (1.82). The likelihood of falling asleep in other situations was significantly lower (at the level of 1 point or less on a scale of 0-3 points).

Analysing the results of individual questions included in the Athens Insomnia Scale (range 0-3 points), it was established that students had the greatest problems with waking up during the night (1.31 points) and sleepiness during the day (1.28 points). To a lesser extent, there appeared a problem with falling asleep after going to bed and turning off the light (1.13 points). The remaining problems were below 1 point on a scale of 0-3 points, so these problems were of minor importance. Among

these problems was lower mental and physical fitness the next day (0.96). Sleepiness within the normal range occurred in 44.7% of students. Half of the respondents had excessive sleepiness. A few persons (5.3%) suffered from pathological sleepiness.

The level of sleepiness increased significantly with the age of the subjects. Pathological sleepiness was experienced only by people aged 41-58 years (23.5%), while sleepiness within the normal range was more likely for people aged 23-25 years (72.4%). Excessive sleepiness was felt more often by professionally active people (63.7%), while inactive people more often had a sleepiness level within the norm (91.9%). The differences were statistically significant (Table 7).

Table 6. Epworth Sleepiness Scale and factors affecting reduced quality of sleep

Factor		Epworth Sleepiness Scale						p
		Sleepiness within the norm		Excessive sleepiness		Pathological sleepiness		
		n	%	n	%	n	%	
Stress	No	25	64.1	12	30.8	2	5.1	0.0153
	Yes	42	37.8	63	56.8	6	5.4	
Work	No	55	62.5	31	35.2	2	2.3	< 0.0001
	Yes	12	19.4	44	71.0	6	9.7	
Financial problems	No	59	49.2	56	46.7	5	4.2	0.0613
	Yes	8	26.7	19	63.3	3	10.0	
Studies	No	29	50.0	27	46.6	2	3.4	0.4826
	Yes	38	41.3	48	52.2	6	6.5	
Family, emotional problems	No	50	44.6	55	49.1	7	6.3	0.6814
	Yes	17	44.7	20	52.6	1	2.6	
Illness	No	61	48.8	61	48.8	3	2.4	0.0005
	Yes	6	24.0	14	56.0	5	20.0	
Tiredness	No	56	71.8	22	28.2	0	0.0	< 0.0001
	Yes	11	15.3	53	73.6	8	11.1	
Change of place of residence	No	64	44.8	71	49.7	8	5.6	0.7898
	Yes	3	42.9	4	57.1	0	0.0	
Irregular lifestyle	No	23	33.8	40	58.8	5	7.4	0.0459
	Yes	44	53.7	35	42.7	3	3.7	
Drugs/stimulants	No	63	48.8	58	45.0	8	6.2	0.0084
	Yes	4	19.0	17	81.0	0	0.0	
Drinking caffeinated beverages shortly before bedtime	No	19	27.1	44	62.9	7	10.0	0.0001
	Yes	48	60.0	31	38.8	1	1.3	
Uncomfortable sleep conditions	No	63	43.2	75	51.4	8	5.5	0.0784
	Yes	4	100.0	0	0.0	0	0.0	
Social events	No	25	23.8	72	68.6	8	7.6	< 0.0001
	Yes	42	93.3	3	6.7	0	0.0	
The feeling of low value	No	66	45.8	70	48.6	8	5.6	0.2442
	Yes	1	16.7	5	83.3	0	0.0	
Other	No	62	48.8	62	48.8	3	2.4	0.0002
	Yes	5	21.7	13	56.5	5	21.7	

Table 7. Epworth Sleepiness Scale and the age and professional activity of the subjects

Epworth Sleepiness Scale			Sleepiness within the normal range	Excessive sleepiness	Pathological sleepiness	p
Age	23-25 years	n	55	21	0	< 0.0001
		%	72.4	27.6	0.0	
	26-40 years	n	11	29	0	
		%	27.5	72.5	0.0	
	41-58 years	n	1	25	8	
		%	2.9	73.5	23.5	
Professional activity	Yes	n	33	72	8	< 0.0001
		%	29.2	63.7	7.1	
	No	n	34	3	0	
		%	91.9	8.1	0.0	

The analysis of the current research results showed that the place of residence of the respondents did not significantly affect their sleepiness ($p > 0.05$).

33.3% of students probably suffered from insomnia. In 31.3% of the subjects, the level of insomnia was on the borderline of the norm. In the case of 35.3% of people, sleepiness was normal.

DISCUSSION

The importance of sleep in physiological processes is not fully understood, but it can certainly be said that it is very important. The human need for sleep is an element of paramount priority among physiological states. This is the moment when the brain replenishes its energy reserves. The term "good sleep" refers to deep sleep more closely, because then the stress response is largely absent. Thus, it plays the role of physical renewal, it is biologically necessary, and it maintains psychic functionality [14-16].

Good sleep depends, among other things, on ourselves. Sleep hygiene is a list of behaviours containing tips that positively affect the quality of sleep, as well as limiting behaviour that has a negative effect on sleep. It is a way of modifying habits, environmental conditions, and lifestyle. Observing the rules of sleep hygiene has a positive effect on maintaining a normal circadian rhythm. The length of sleep and its depth are significantly improved. The stimulus control technique aims to establish a favourable rhythm of sleep and wakefulness, and sets the rules for the use of bed and bedroom. In practice, the principles of sleep hygiene and stimulus control technique are used together because they overlap and complement each other [17, 18].

In studies by Zieba *et al.*, 64.1% of nursing students experienced difficulty falling asleep [12]. Blonska and Gotlib's research indicated a slightly smaller group. According to them, almost a half of the respondents (48%) had problems falling asleep [19]. Similar results were obtained in research by Meyer-Szary *et al.* Among the students studying at Gdansk, Sopot, and Gdynia universities, 42.6% declared problems with falling asleep [20], and similar results were presented by Ariapooran [21]. Research by Kasperczyk *et al.* indicates that 29.5% of youths living in Upper Silesia often had problems falling asleep, and a daily occurrence of this problem was declared by 21.8% of adolescents [22]. The current research does not confirm these results. It showed that a problem falling asleep after getting into bed and turning off the light appeared to a lesser extent.

According to Zieba *et al.* waking up at night was common in 32.5% of respondents and sometimes in 45.3% [12]. The current research confirms these results, the biggest problems for respondents being waking up at night and sleepiness during the day.

Zieba *et al.* indicate that nursing students most often had difficulty sleeping due to nervousness and stress [12]. According to Blonska and Gotlib, 52% of respondents rated their studies, including classes until late at the university, as a cause of insomnia and a factor hindering falling asleep [19]. The current research confirmed the above data. Among the factors that affected the respondents' lower quality of sleep, they most often mentioned stress (74%). Studies, including failures, too many classes, and tests, were the main factors decreasing the quality of sleep in students (61%), causing them to wake up at night, and leading to difficulties in falling asleep and insomnia.

According to Blonska and Gotlib, sleep disorders worsen with age [19]. The current research confirmed that a higher probability of insomnia occurred in people aged 41-58 years (88.2%) rather than in those aged 23-25 years (11.8%). The level of sleepiness increased significantly with age; pathological sleepiness was experienced only by people aged 41-58 years (23.5%).

Blonska and Gotlib's research also showed that the factors influencing sleep disorders were to a large extent related to lifestyle-related factors. Failure to observe the rules of sleep hygiene was the main reason for insomnia and sleep disorders [19]. According to Meyer-Szara *et al.*, a vast majority of respondents (71.3%) did not observe regular hours of sleep, and 43.8% of people drank coffee every day [20]. The analysis of the current research showed that the level of insomnia increased significantly with the presence of such behaviours as taking a nap during the day, taking sleeping pills, and eating a hearty meal just before bedtime. It was found that people with higher levels of sleepiness were more likely to take naps during the day, take sleeping pills, and consume a rich meal just before bedtime. The application of the principles of proper sleep hygiene was declared by a small number of respondents (10.7%). Almost a half of the respondents (49.3%) sometimes applied the principles of proper sleep hygiene. Research by Nena *et al.* revealed the following independent determinants for sleep impairment: parenthood, age 36-45 years, more than three night shifts per week, and working longer than five years in an irregular shift system [23].

Blonska and Gotlib indicated in their research that a small number of students (12%) took sleeping pills to help them fall asleep [19]. Our current study confirms these results. Sleeping pills were consumed often by a small proportion of the subjects (6.7%) and sometimes by 27.3% of people taking part in the study.

According to Zieba *et al.*, the average sleep time of nursing students was 7 hours 50 minutes, 47.8% of the subjects slept 7-9 hours, and 47% 5-6 hours [12]. According to Blonska and Gotlib, in the case of a majority of respondents (67%) the average sleep time per day was 5-7.5 hours, and over 7.5 hours of sleep was indicated by 21% of respondents [19]. The research

of Meyer-Szary *et al.* shows that the majority of students from Gdansk, Sopot, and Gdynia universities (55.6%) slept for less than six hours [20]. Research by Kasperczyk *et al.* indicates that only 5% of high school students from Upper Silesia usually slept less than six hours a day; one in three of those claimed that it happened frequently [22]. The results of our current research partially confirmed these results. Most people (57.3%) slept between five and six hours a day. 28.7% of the respondents slept between seven and eight hours a day.

Blonska and Gotlib indicated that almost a half of the students (45%) declared sleeping during the day after a sleepless night. Every weekend, most of the respondents made up for lack of sleep by sleeping more (56%) [19]. Kasperczyk *et al.* point out that frequent naps among adolescents were found in 23.7% of respondents, daily naps occurred in 4.3% of respondents, and longer sleep happened at weekends and on days off from school [22]. Our own research confirmed this data. The majority of respondents stated that sometimes on weekdays they would fall asleep if they had not slept enough (54%), and 22% of the students admitted to doing it frequently.

The occurrence of uncontrolled factors during night rest according to Blonska and Gotlib was as follows: awakening at night with anxiety in every fourth subject, talking in one's sleep 41%, walking in one's sleep 21%, snoring 64%, and shortness of breath 12% [19]. The results obtained in the current study partially confirm the above data. 18.7% of respondents woke up and felt fear and anxiety during the night, and every third respondent experienced those symptoms sometimes. 37.3% of the respondents talked in their sleep, every third person fidgeted and kicked during sleep, and 28.7% of the subjects snored. 26.0% of the students sleepwalked, and 13.3% had long interruptions in breathing.

According to Zieba *et al.*, the highest probability of falling asleep using the Epworth Sleepiness Scale (0-3 points scale) was in the following situations: lying and resting in the afternoon (2.1), sitting and reading (1.7), and watching television (1.6) [12]. Our own study confirms these results. The greatest probability of falling asleep was related to lying and resting in the afternoon (2.46), sitting and reading (2.03), and watching television (1.82).

Also, studies by Zieba *et al.* show that the respondents usually had the level of sleepiness within the normal range (about 60%), excessive sleepiness was indicated in 32.5% of the cases, and pathological sleepiness was rare – in 8.5% of the respondents [12]. Our own tests confirmed only the result of pathological sleepiness. The analysis showed that sleepiness within the normal range occurred in 44.7% of students. Half of the respondents had excessive sleepiness. A few persons (5.3%) suffered from pathological sleepiness.

Sleep, comparably to other physiological processes, can be disorganised and disturbed. Sleep disorders are phenomena commonly found in the population, especially among adults, women, and the elderly who are significantly prone, so it is a social aspect and an economic problem. In Poland, the phenomenon of sleep disorders affects about 20% of the population of the country, and in the world it is about 30-40%. In many countries, this problem is considered as a key issue in the field of public health. Prevention of this phenomenon, as well as appropriate and early treatment, has a positive effect on improving the quality of life, reduces expenses in many medical spheres, and counteracts the occurrence of social costs. The medicine of sleep requires a better understanding, professional treatment, and commitment from the health service. Accurately made decisions of a therapeutic nature are influenced by detailed diagnostics and proper recognition of the cause and nature of disorders [6, 7, 22, 24].

PRACTICAL IMPLICATIONS

Advice should be included in both undergraduate programmes and continuing education to help nurses to recognise and improve their own sleep quality. One should think about developing systemic changes that help nurses lead a more healthy lifestyle and deal with shift work.

CONCLUSIONS

It was found that students of master's degrees in nursing had poor sleep hygiene. The behaviours affecting the sleep quality of the subjects were unsatisfactory.

The lower quality of sleep in students of master's studies in nursing was most often affected by stress, studies, irregular lifestyle, drinking caffeinated beverages shortly before sleep, and fatigue.

The knowledge of the respondents of sleep hygiene principles is at a good level.

The respondents most often felt a high likelihood of falling asleep in the following situations: lying down and resting in the afternoon – if circumstances allowed, sitting and reading, watching TV.

Disclosure
The authors declare no conflict of interest.

References
1. Finc K. Fizjologia snu oraz jej znaczenie dla konsolidacji śladów pamięciowych. 8. Poznańskie Forum Kognitywistyczne 2013; 7: 37-42.
2. Kasperczyk J, Jośko J, Analiza czynników odpowiedzialnych za złą jakość snu u studentów Śląskiego Uniwersytetu Medycznego. Hyg Publ Health 2012; 47: 191-195.
3. Lech J. Cierpienie pacjentów z zaburzeniami oddychania w czasie snu. Stud Med 2013; 29: 95-101.

4. Prusiński A. Bezsenność i inne zaburzenia snu. PZWL, Warszawa 2007.

5. Wichniak A. Zaburzenia snu. In: Psychiatria. Podręcznik dla studentów medycyny. Jarema M, Rabe-Jabłońska J (eds.). PZWL, Warszawa 2011.

6. Kasperczyk J, Kasperczyk J, Tyrpień M, et al. Jakość snu u śląskich licealistów a ich obowiązki szkolne. Probl Hig Epidemiol 2010; 91: 428-432.

7. Lau K, Jośko J. Zaburzenia snu jako problem zdrowia publicznego. Zdr Publ 2010; 120: 199-202.

8. Dębska G, Jabłońska P, Ławska W, et al. Jakość snu studiującej młodzieży na przykładzie studentów pielęgniarstwa Podhalańskiej Wyższej Szkoły Zawodowej w Nowym Targu. Probl Piel 2008; 16: 374-378.

9. Chien PL, Su HF, Hsieh PC, et al. Sleep quality among female hospital staff nurses. Sleep Disord 2013; 2013: 283490.

10. Shao MF, Chou YC, Yeh MY, et al. Sleep quality and quality of life in female shift-working nurses. J Adv Nurs 2010; 66: 1565-1572.

11. Fornal-Pawłowska M, Wołyńczyk-Gmaj D, Szelenberger W. Walidacja Ateńskiej Skali Bezsenności. Psychiatr Pol 2011; 45: 211-221.

12. Zięba M, Dębska G, Ławska W, et al. Jakość snu studiującej młodzieży na przykładzie studentów pielęgniarstwa Podhalańskiej Państwowej Wyższej Szkoły Zawodowej w Nowym Targu. Probl Piel 2008; 16: 374-378.

13. Chazan R. Klasyfikacja, obraz kliniczny i diagnostyka zaburzeń oddychania w czasie snu. Pneumon Alergol Pol 2007; 75: 15-19.

14. Sapolsky RM. Dlaczego zebry nie mają wrzodów?: Psychofizjologia stresu. Wydawnictwo Naukowe PWN, Warszawa 2010.

15. Iwańczuk W, Guźniczak P. Neurofizjologiczne uwarunkowania procesów snu, czuwania, świadomości i przytomności. Część 2. Anaesthesiol Intensive Ther 2015; 47: 174-180.

16. Kawada T. Noise and Health- Sleep Disturbance in Adults. J Occup Health 2011; 53: 413-416.

17. Grabowski K. Terapia poznawczo-behawioralna bezsenności. Psychiatria 2011; 8: 53-63.

18. Wichniak A, Wierzbicka A, Jernajczyk W. Zasady rozpoznawania i leczenia bezsenności. Psychiatria w Praktyce Klinicznej 2008; 1: 30-39.

19. Błońska BK, Gotlib J. Występowanie zaburzeń snu wśród studentów. Prz Med Uniw Rzesz Inst Leków 2012; 4: 485-497.

20. Meyer-Szary J, Jakitowicz M, Sieczkowski M, et al. Jakość snu u studentów trójmiejskich uczelni. Sen 2008; 8: 15-21.

21. Ariapooran S. Sleep Problems and Depression in Iranian Nurses: The Predictive Role of Workaholism. Iran J Nurs Midwifery Res 2019; 24: 30-37.

22. Kasperczyk J, Jośko J, Cichoń-Lenart A, Lenart J. Epidemiologia zaburzeń snu u młodzieży mieszkającej na Górnym Śląsku. Sen 2006; 6: 8-13.

23. Nena E, Katsaouni M, Steiropoulos P, et al. Effect of Shift Work on Sleep, Health, and Quality of Life of Health-care Workers. Indian J Occup Environ Med 2018; 22: 29-34.

24. Grabowski K, Jakitowicz J. Zaburzenia snu jako problem społeczny i ekonomiczny. Sen 2006; 6: 41-46.