Assessment of The Incidence of Insomnia In The Group of Poles Aged 18-25 Years During The Covid-19 Pandemic

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Research Article

Keywords: insomnia, depression, 18-25 year olds, Covid -19

Posted Date: January 3rd, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1146042/v1>

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Abstract

Background: Insomnia is the most recognized sleep disorder. The time of the COVID-19 pandemic brings with it new challenges. During the COVID-19 pandemic, maintaining sleep hygiene is highly recommended as it helps to strengthen the immune system, and people infected with COVID-19 may be more prone to sleep problems. The aim of this study was to determine the incidence of insomnia among people aged 18-25 during the COVID-19 pandemic.

Methods: The study involved 302 individuals. It was conducted using Google Forms. The mean age of the respondents was 23 ± 1.84 years. The research instruments used in the study were the Athenian Insomnia Scale (AIS), the Beck Depression Inventory (BDI), and the author's questionnaire concerning sociodemographic data.

Results: Insomnia was found in 29.5% ($n = 89$) of the respondents. Higher mean values (8 ± 4.19) in the AIS were noted in the group of people with higher education and those currently studying. Moderate depression was demonstrated in 12.6% ($n = 38$) of the subjects. One third (30.1%; $n = 91$) of the respondents indicated greater sleep problems during the COVID-19 pandemic than before.

Conclusions: Insomnia and depression are significant problems in the study group of 18-25 year olds. Therefore, psychological and psychiatric care should be extended to this group of young people.

Background

Insomnia is the most recognized sleep disorder [1]. It affects approximately 30% of adults [2]. In the study conducted in Poland in 2016, 50.5% of the respondents reported insomnia, and 70% of these people showed impaired daytime functioning [3]. Studies show that sleep disorders are more common in women, who suffer from it up to 1.5 times more often than men [4, 5]. The risk of insomnia in women increases with age. In young women aged 15-30 years, the risk of developing insomnia was 1.28 times higher than in young men [6].

The time of the COVID-19 pandemic brings with it new challenges. During the COVID-19 pandemic, maintaining sleep hygiene is highly recommended as it helps to strengthen the immune system, and people infected with COVID-19 may be more prone to sleep problems [7]. Based on a meta-analysis from studies conducted in 2020 and 2021, 34% of patients with COVID-19 experienced sleep disorders of varying severity [8]. A similar study of 582 students in Saudi Arabia found that 22% of them had problems falling asleep, 17.9% woke up in the night, 8.8% woke up early in the morning, 25.9% had poor sleep quality, 22.7% felt tired during the day, and about 10% had nightmares [9]. The results of multicenter studies demonstrated that insomnia was found in 36.7% of the subjects, and these findings were about twice as high during the first wave of the pandemic as the prevalence rates typically reported in nonpandemic times [10].

The quality of sleep depends on the lifestyle. The circadian rhythm and the use of stimulants are of significant importance in the pandemic era. Caffeine in large doses, consumed late in the day, causes agitation and thus adversely affects sleep. Nicotine, similarly to caffeine, causes stimulation and promotes wakefulness. It extends the time needed to fall asleep, reduces total sleep time, and promotes premature awakenings. On the other hand, consuming large amounts of alcohol before going to bed reduces latency, but increases arousal in the second half of the night [11].

Research shows that using the media in the evening hours has a negative impact on sleep, reducing its quality, causing irregular sleep-wake cycles and worsening functioning during the day [12–15]. There are three reasons for this. First, exposure to blue light emitted by televisions, computer monitors or smartphone screens ultimately stops the release of melatonin [16, 17]. The second reason is over-stimulation caused by moving, violent or sexual content, which may make it difficult to fall asleep or cause a decrease in sleep quality [18]. A study conducted among young people (18-40 years old) by Exelmans et al. (2016) showed that the longer the time of using a smartphone in the bedroom, the shorter the sleep time, the greater the fatigue, and the later the hour to get up [19].

According to Pigeon et al. (2017) and Hertenstein et al. (2019), the consequence of sleep disorders in adults is depression [20, 21].

Depression is believed to be the third most common cause of disability in the world and its incidence is increasing [22]. Depression may begin in childhood and usually peaks in the age of 20 years [23–25]. In adolescents, sleep disorders and depression are often found in the results of various studies, with prevalence rates varying significantly depending on the methodology adopted [26, 27]. In a systematic review summarizing research on the association between insomnia and depression, carried out from 2014 to 2017, Pigeon et al. (2017) found that in three out of four children and adolescents insomnia was significantly related to depression [24].

Aim Of The Study

The aim of this study was to determine the incidence of insomnia among people aged 18-25 during the COVID-19 pandemic.

We searched for an answer to the question: what is the incidence of insomnia among people aged 18-25?

Methods

Study design

This was a cross-sectional retrospective study.

Setting And Ethical Considerations

The survey was carried out from January 20 to February 27, 2021. The criteria for inclusion in the study were the age of respondents between 18 and 25 years, residence in the city of Szczecin, and consent to participate in the study. The selection of the study group was based on quota sampling, with quotas defined by age, sex, and place of residence.

The study was approved by the Bioethics Committee of the Pomeranian Medical University, Szczecin (KB-0012/63/20).

Participants

The survey was conducted using Google Forms and the link to the survey was sent via email, Facebook, and other social media. The form was compiled in such a way that responses were anonymous, and no identifying emails or contacts were given. A total of 302 people participated in the survey. The questionnaire was completed by 383 people. Eighty-one questionnaires were not eligible for the study due to failure to meet the inclusion criteria: age and place of residence. The mean age of the respondents was 23 ± 1.84 years. The fewest respondents were aged 18 (2%, $n = 7$), and the most numerous were aged 23 (28%, $n = 86$).

The majority of the study sample were women (73.5%, 222), men constituted 26.5% (80). The mean age was 22.3 ± 1.84 , the median was 23. 89.4% (270) of the respondents were studying or had completed higher education, 48.3% (146) were in school or university (Table 1).

Table 1
Characteristics of the respondents

Variable	n	%
Sex		
Woman	222	73.5
Man	80	26.5
Age	22.3 ± 1.84. (median—23)	
Level of education		
Lower secondary	6	2
Secondary	26	8.6
Third-level or in the process of studying	270	89.4
Type of education		
Medical	198	65.6
Natural sciences and sciences	14	4.6
The humanities and social sciences	31	10.3
Economy and business	13	4.3
Computer science	7	2.3
Technical	26	8.6
Art	6	2.0
General	6	2.0
Other	1	0.3
Employment status		
I'm a pupil/student. I don't work.	146	48.3
I'm a pupil/student. I work off and on.	111	36.8
I work	43	14.2
I'm unemployed.	2	0.7
Economic situation		
I support myself	47	15.6
I support myself partly on my own	85	28.1
I am supported by my parents or by social benefits	169	56.0

Variable	n	%
I am supported by my spouse	1	0.3
Performing shift or night work		
Yes	38	24.7
No	84	54.5
Sometimes	32	20.8

BMI was calculated for 96% of the respondents (n = 291). Most of them (72.5%, n = 211) had BMI within the normal range. Overweight was found in 17.5% (n = 51) of the subjects.

Data Sources

The research instruments used in the study were the Athenian Insomnia Scale (AIS), the Beck Depression Inventory (BDI), and the author's questionnaire concerning sociodemographic data.

The Athenian Insomnia Scale (AIS) consists of eight questions, including five concerning night sleep, and three—the assessment of daily functioning over the past month. Responses are scored from 0 (no difficulty) to 3 (severe difficulty). The score is the sum of the points obtained and ranges from 0-24, where 0-5 points indicates no insomnia, 6-10 points is the cut-off value, and a score higher than 10 points indicates insomnia [28].

The Beck Depression Inventory (BDI) comprises 21 questions about the past month. Each response is assigned a value from 0 to 3. The score is the sum of all points and ranges from 0 to 63. It was assumed that 0-11 points means no depression, 12-26 points—mild depression, 27-49 points—moderate depression, and 50-63 points—major depression [29].

Statistical analysis

The R program was used for statistical calculations. The Anderson-Darling test was employed to evaluate the data distribution. The Mann-Whitney U Test for nonparametric distribution data and the Kruskal-Wallis test were used. The significance level was set as $p \leq 0.05$.

Results

Insomnia was found in 29.5% (n = 89) of the respondents (Table 2). The relationship between insomnia and the age of the respondents was analyzed—the result was not statistically significant ($p > 0.19$). Fewer than one third of the respondents (30.1%, 115) reported a reduction in the quality of sleep.

Table 2
The AIS results

	n	%	X ± SD	M	Min-max
No insomnia (0-5 points)	177	58.6	8.1 ± 4.2	8	0-23
Cut-off value (6-10 points)	36	11.9			
Insomnia (> 10 points)	89	29.5			
Total	302	100			
n—number of respondents; X—arithmetic mean; M—median; SD—standard deviation; min—minimum value; max—maximum value					

Women indicated the presence of insomnia significantly more often than men (**p = 0.0007**) (Table 3).

Table 3
The incidence of insomnia by sex

Sex	n	%	X ± SD	M	Min-Max	p
Women	222	73.5	8.57 ± 4.22	8	1-18	0.0007
Men	80	26.5	6.72 ± 3.77	6	0-23	
Total	302	100				
n—number of respondents; X—arithmetic mean; M—median; SD—standard deviation; min—minimum value; max—maximum value						

There was no statistically significant relationship between the adopted socioeconomic variables and insomnia. Higher average values (8 ± 4.19) in the AIS scale were recorded in the group of people with higher education and currently studying—23 points, in people studying and working at the same time, and in the group of people working in shifts—23 points (Table 4).

Table 4
The influence of socioeconomic data on the occurrence of insomnia

Variable	n	%	X ± SD	M	Min-max	p
Education						
Third-level or in the process of studying	270	89.4	8 ± 4.19	7	0-23	0.44
Secondary	26	8.6	8.73 ± 4.29	8	2-16	
Lower secondary	6	2	9 ± 2.96	9	4-12	
Employment status						
Study	146	48.3	8 ± 4.07	7.5	1-18	0.39
Study and work	111	36.8	8.36 ± 4.47	8	0-23	
Work	43	14.2	7.16 ± 3.49	6	2-16	
Unemployment	2	0.7	15 ± 1.41	15	14-16	
Shift or night work						
Yes	72	23.8	8.38 ± 4.28	8	0-23	0.49
No	230	76.2	7.98 ± 4.15	7.5	1-18	
n—number of respondents; X—arithmetic mean; M—median; SD—standard deviation; min—minimum value; max—maximum value						

Moderate depression was demonstrated in 12.6% (n = 38) of the subjects, mild depression in 32.5% (n = 98) (Table 5).

Table 5
The BDI results

	n	%	X ± SD	Min-Max
No depression (≤ 11 points)	166	55.0	12.58 ± 10.01	0-46
Mild depression (12-26 points)	98	32.5		
Moderate depression (27-49 points)	38	12.6		
Major depression (> 50 points)	0	0		
Total	302	100		
n—number of respondents; X—arithmetic mean; M—median; SD—standard deviation; min—minimum value; max—maximum value				

A strong positive correlation was observed between the AIS and the BDI results—the more severe the insomnia, the higher the level of depression (**p < 0.05**)(Figure 1).

Fewer than one-third (30.1%; 91) of the respondents indicated greater sleep problems during the COVID-19 pandemic than before. 123 (40.72%) people experienced sleep problems during the pandemic in 2020 (Tabela 6).

Table 6
Change in subjective assessment of sleep quality during the COVID-19 pandemic

Comparison of sleep quality during the COVID-19 pandemic (2020-2021)	n	%
I experience more sleep problems during the pandemic	91	30.1
I experience less sleep problems during the pandemic	32	10.6
I experience no change in the quality of my sleep during the pandemic	179	59.3
Total	302	100

In the study group, almost 45% of the respondents (n = 135) spent five to eight hours in front of the screen of an electronic device every day, and over 27% of the respondents (n = 82) more than eight hours a day. Over 50% of the respondents (n = 161) used a blue light filter in their electronic devices.

Discussion

The COVID-19 pandemic has changed social and work life. It forced everyone to make changes to previous habits, and these changes had a big impact on sleep and mental well-being. In Poland, the lockdown began with the closure of schools and universities in the first half of March 2020. This was followed by restrictions on meetings outside the family circle to two people, and a ban on traveling for purposes other than higher necessity. Such a sudden change in social functioning was associated with stress and anxiety. The primary sources of stress were isolation, restrictions on movement and traveling, the requirement to wear face masks, frequent hand washing and disinfection, avoiding social contacts and meetings, closed restaurants, pubs, and fitness clubs, limiting physical activity even outdoors, as well as remote learning and online work [30]. Young people are more vulnerable to the effects of lockdown. It was particularly difficult for them due to the limitation of social contacts, which contributed to the deterioration of their mental health [31].

Studies by other authors indicate that sleep problems in adolescence may be caused by lifestyle, especially intensive learning and consumption of energy drinks and coffee [32- 34]. The cause of insomnia may be the rhythm of the day imposed by school duties. A 2010 New England study of 357 students showed that even a half-hour shift in the start time of school (from 8:00 a.m. to 8:30 a.m.) helped reduce the feeling of sleepiness and fatigue during the day and increased motivation to learn. Moreover, the authors proved that the number of students exhibiting depressive symptoms and experiencing anxiety and irritability decreased by one-fifth. The results of this study support the potential benefits of adjusting school schedules to adolescents' sleep needs, circadian rhythms, and developmental stage [35].

Our study found that nearly one-third of the subjects experienced increased sleep problems. A similar study was conducted by Marelli et al. (2021), who examined the association of the COVID-19 pandemic with sleep disturbances in a group of 400 Italians. They observed a significant increase in insomnia compared to the pre-pandemic state in both the student and university employee groups. What's more, in this study, the authors showed that women felt the impact of the pandemic on sleep disorders more strongly than men, with over 30% of the subjects reporting depressive and anxiety symptoms for this reason [36].

Similarly, the presented studies showed a relationship between sex and insomnia—women reported insomnia and sleep disorders more often than men. Our results corresponded with those of Hasan et al. (2021) [37], who studied insomnia in young adults in Bangladesh and with a study by Taufiq et al. (2021) who examined students during the Covid-19 pandemic [38].

Silva et al. (2020) showed that sleep disturbances during the pandemic, caused by mental strain and changes in the circadian rhythm, worsen the body's immunity [39].

Based on the DSM-V criteria used in this study, insomnia was found in 29.5% of respondents aged 18-25, and the proportion of people reporting subjective sleep problems was 30.1%. In the AIS based study conducted by Nowak et al. (2015) in a group of 133 female public health students, 51% of the respondents had insomnia [40].

One of the factors that significantly influences sleep is shift work and studying, as pointed out by Ohayon (2001), who indicates that people working in shifts or night modes are more likely to struggle with sleep disorders [41]. A study by Wolinska (2020) comparing employed and unemployed individuals did not show any correlation between shift work and insomnia, but, interestingly, proved that insomnia was more common in unemployed ones ($p \leq 0.001$) [42].

Our study revealed a statistically significant relationship between the presence of insomnia and depression in a group of 18-25 year olds. Similarly, based on their meta-analysis, Hertenstein et al. (2019) demonstrated that insomnia is a predictor of depression and anxiety disorders [21]. Similar results were reported by Benbir et al. (2015). They found that 13% of the subjects suffering from insomnia exhibited symptoms of depression or other mental disorders [43]. In turn, Levenson et al. (2015) observed a marked worsening of insomnia in patients with depression [44].

Our study showed no relationship between insomnia and the time spent in front of the screen of electronic devices and exposure to blue light emitted from these media. A different conclusion was reached by Exelmans et al. (2016), who proved a significant impact of using smartphones in the evening on the occurrence of insomnia. The effects of this in the case of older individuals were different from those in younger ones, but in both groups, using such devices at bedtime resulted in insomnia and the feeling of fatigue during the day [19]. This problem was noted by Chellappa et al. (2013), who provided evidence that exposure to blue-saturated light in a not very brightly lit room has a significantly negative effect on sleep. Hence, care should be taken to ensure that working in front of electronic devices during

evening and night time is done with the light on [17]. On the other hand, Benbir et al. (2015) confirmed a relationship between insomnia and watching TV for 6-8 hours a day in 18.4% of the respondents [43].

Limitations

The limitations of the study were the size of the group, which meant that the results could not be generalized, and the way the questionnaire was distributed, which was chosen due to the pandemic restrictions.

Conclusions

Insomnia and depression are significant problems in the study group of 18-25 year olds. Therefore, psychological and psychiatric care should be extended to this group of young people.

List Of Abbreviations

BMI -Body Mass Index

AIS - Athenian Insomnia Scale

BDI - Beck Depression Inventory

DSM-V -Diagnostic and Statistical Manual of Mental Disorders

Declarations

Ethics approval and consent to participate

The study was approved by the Bioethics Committee of the Pomeranian Medical University, Szczecin (KB-0012/63/20). All methods were carried out in accordance with relevant guidelines and regulations. All participants gave written informed consent before recruited into the study.

Consent for publication

Not applicable.

Availability of data and materials

Readers who wish to gain access to the data can write to the corresponding author.

Competing interests

The authors declare that they have no competing interest.

Funding

Not applicable.

Authors' contributions

W.W. and A.G. – study design; A.G. – data collection; W.W., A.G. and B.M. – statistical analysis; W.W., A.G. and B.M. – data interpretation; W.W. and B.M. – manuscript preparation; W.W. and A.G.- literature search. All authors read and approved the final manuscript.

Acknowledgements

Not applicable.

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Figures

Figure 1

Correlation between insomnia and depression