

# Tendency to deviant reactions on the background of sleep disorders

Markovsky Alexander Viktorovich\*

Candidate of Medical Sciences, Research Institute of Molecular Medicine, Chita State Medical Academy, Russia

## SUMMARY

Recently, more and more attention has been paid to the problems of sleep disorders in the educational environment. Purpose: to assess the level of deviant reactions against the background of the influence of sleep disorders in high school students and students.

**Methods:** Subjective assessment of sleep indicators in 89 students was carried out using the Child Sleep Questionnaire and the Epworth Sleepiness Rating Scale. To identify deviant tendencies, A.N. Orel and "Methodology for detecting suicidal tendencies CP-45" P.I. Yunatskevich.

**Results:** The article presents the results of assessing the propensity of high school students and students to deviant and auto-aggressive behavior against the background of sleep disorders according to the survey data. There is an increase in the number of students with sleep disorders with a change in the level of education and under the influence of Internet addiction. 43 students have a tendency towards a violation of the quality of sleep, while: 37.1% experienced difficulty falling asleep, 34.8% woke up often at night, 24.4% had early morning awakenings, 38.7% did not like the night's sleep. The highest level of suicidal reactions was noted in the female population of schoolgirls. The results obtained allow us to state that sleep disorders in students are associated with a high risk of anti-vital activity, as well as a higher tendency to addictive and delinquent behavior. These disorders can lead to a deterioration in the mental and physical health of students, as well as a decrease in academic performance.

**Conclusion:** A more active identification and educational work among students of educational institutions in relation to somnological disorders as potential risk factors for deviant disorders is justified.

**Keywords:** Sleep disorders; Deviant reactions; Autoaggressive patterns and their predictors

## INTRODUCTION

In the era of new means, methods and technologies of education, students of schools and universities, and especially their psycho-emotional sphere, are subject to ever higher demands with a constant acceleration in the pace of life. This is largely due to an increase in the information load in the face of time pressure, which, along with a sedentary lifestyle and significant psycho-emotional stress, as well as a fairly significant waste of time on the Internet, video games and social networking (especially late in the evening and at night) can lead to disorders sleep. It is known that systematically poor quality of sleep (late falling asleep, early awakenings, shortening of sleep duration) is associated with deterioration in communicative function and poor academic performance [1]. At the same time, there is also an increase in psycho-emotional disorders, which, in turn, cause a violation of the body's ability to resist not only diseases, but also create conditions for the development of deviant behavior [2] and deforming motivation for vital existence (weakening of motivation for later life), especially among adolescents studying and young people [3,4]. This is clearly evidenced by the high suicide rates in the Trans-Baikal Territory - 43.7 and in the Republic of Buryatia - 42.5 per 100 thousand of the population, occupying sad 3rd and 4th places in this region, according to Rosstat in the first half of 2017. According to the WHO, about 877,000 people worldwide kill themselves each year, and sleep disturbances are thought to be associated with an increased risk of suicide only in people with mental disorders. The age category from 18 to 25 years ranks second among all age categories of people who commit suicide [5]. Thus, in modern conditions of comprehensive informatization of society, sleep has become an important factor of increased risk for the development of a tendency to deviant behavior, but the mechanisms that explain these relationships among students have not been studied enough. The purpose of the study was to assess the level of deviant reactions against the background of the influence of sleep disorders in high school students and students.

## MATERIAL AND METHODS

The object of the study were schoolchildren of the 9th, 10th and 11th grades of the MAOU Gymnasium No. 14 in Ulan-Ude of the Republic of Buryatia, as well as 1st and 2nd year students of the Faculty of Medicine and Dentistry of the Chita State Medical Academy, Chita. The total sample consisted of 89 people aged 14 to 20 years, the

### Address for correspondence:

Markovsky Alexander Viktorovich  
Candidate of Medical Sciences, Research Institute of Molecular Medicine, Chita State Medical Academy, Russia  
E-mail: sorcerer-asy@mail.ru

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average age was 16.7 years, including: 40 (44.9%) girls and 49 (55.1%) boys.

Determination of the duration and quality of sleep, as well as daytime sleepiness, was carried out using the Child Sleep Questionnaire of the Children's National Medical Center Washington (2006), as well as the Epworth sleepiness scale [6], with slight modifications to assess the average student performance, workload in an educational institution, the duration of communication in social networks [7]. In parallel, standardized test questionnaires by P.I. Yunatskevich ("SR-45") to identify a tendency to suicidal reactions and A.N. Eagle (SOP) to measure readiness to implement various forms of deviant behavior. The study used raw scores and conversion to test norms. The survey was conducted anonymously, once. Statistical processing of the database was carried out using the application package STATISTICA v.10.0 (StatSoft, USA). Descriptive statistics for qualitative accounting features are presented as absolute values, percentages, and  $M \pm SD$  (mean  $\pm$  standard deviation). The type of distribution was determined using the Shapiro-Wilk test. To compare the proportions, the  $\chi^2$  test was used, to compare the averages, the Mann-Whitney U-test at a significance level of  $p \leq 0.05$ . Spearman's rank correlation coefficient ( $r_s$ ) was used to assess the relationship between quantitative traits. Its significance was determined using the Student's t-test, and the degree of statistical significance was assessed using the Chaddock scale.

## RESULTS AND DISCUSSION

42.7% of respondents are dissatisfied with the quality of sleep, and more so among students ( $p=0.03$ ). The duration of sleep disturbances ranged from 1 week to 3 years. The main problem with the quality of sleep in 33.7% of the respondents is the lack of time for a night's sleep. The duration of night sleep on weekdays was 7 hours 43 minutes and 9 hours 43 minutes, on weekends - 6 hours 22 minutes and 9 hours 7 minutes for schoolchildren and students, respectively. It is shown that 46.8% of schoolchildren and 73.8% of students sleep less than 8 hours a day on weekdays, which is 59.5% of the total number of students. After midnight on weekdays, 36.2% of schoolchildren and 69% of students go to bed, on weekends - 72.3% and 80.9% of respondents, respectively, however, only 38.3% of schoolchildren and 33.3% of students manage to keep a sleep schedule and wakefulness. 36% of respondents have conditions for quality sleep at home, including a separate sleeping room - 40.4% of schoolchildren and 30.9% of students.

51.1% of schoolchildren and 73.8% of students wake up at the alarm signal, 25.5% of pupils and 7.1% of students wake up their parents, of which 6.4% and 4.8% of students, respectively, noted that parents have to wake them up several times and only 17% of schoolchildren and 14.3% of students wake up on their own. The 89 respondents who took part in the study were asked to choose their own schedule for changing sleep and wakefulness. Thus, 44.7% and 54.7% preferred the schedule "going to

bed early and getting up early", 12.7% and 14.3% chose the schedule "going to bed late and getting up late", there were no preferences 38.3% and 28.6%, respectively, of schoolchildren and students.

The average time for students to wake up was 9.96 minutes and the average time to fall asleep was 27.9 minutes. Daytime siesta was observed by more than half of the respondents (51.1% of schoolchildren and 59.5% of students) with a daytime sleep duration of 2-2.5 hours. It takes schoolchildren an average of 3 hours 20 minutes to complete homework, students 4 hours 30 minutes, and communication on social networks is much longer - an average of 6 hours 20 minutes and 5 hours and 16 minutes, respectively. The majority of respondents (52.8%) additionally attend sports and/or dance classes, and among tonic drinks they drink coffee more often (59.5%). In the room, students, respectively, schoolchildren and students, have a TV (23.4% and 11.9%), video set-top boxes (21.2% and 9.5%), a personal computer (44.6% and 35.7%), as well as the ability to use the Internet (61.7% and 69%). The average grade score was higher in schoolchildren ( $p=0.0001$ ), and the average value according to the Epworth sleepiness scale in students ( $p=0.01$ ).

Most of the students after waking up felt lethargic and noted daytime sleepiness - 66.3%, increased fatigue during normal physical and mental stress - 33.7%, low mood - 46.1%, irritability - 40.4%, anxiety - 25, 8%, difficulty in mastering the school curriculum - 35.9%, memory loss - 28.1%, headaches - 16.8%. A third of students woke up in the middle of the night - 34.8% of students, 4.5% of the respondents complained about the fear of not falling asleep, 37.1% - about difficulty falling asleep, 24.7% - about restless sleep, 26.9% - about early awakenings, unrefreshing sleep - 35.9%. The presence of disturbing thoughts when falling asleep was noted by 48.3% of students. Breathing disorders during sleep were less common: snoring - 12.3%, snoring - 10.1%, respiratory arrest during sleep - 3.4%, nocturnal asthma attacks - 6.7%.

Thus, there are statistically significant differences in the severity of sleep disturbance indicators between students of the gymnasium and the university. A qualitative analysis of the data obtained showed that students, in comparison with schoolchildren, are more prone to such disorders as night sweats ( $\chi^2=7.19$ ,  $p=0.007$ ), unrefreshing sleep ( $\chi^2=4.69$ ,  $p=0.03$ ), headache in the morning ( $\chi^2=4.94$ ,  $p=0.02$ ), difficulty in assimilation of the program ( $\chi^2=9.31$ ,  $p=0.002$ ), memory loss ( $\chi^2=3.94$ ,  $p=0.04$ ), as well as anxiety ( $\chi^2=8.88$ ,  $p=0.002$ ). Similar data are described in their study by M. Wojnar and his colleagues, who examined the relationship between sleep problems and suicidal behavior among 5692 men and women in the United States, where the most stable association of suicide with early awakening was identified [8].

Under stress, sleep disorders may be associated with the development of functional cognitive disorders [9]. To assess the relationship between the cognitive level (average grade) and the consequences of sleep and wakefulness disturbances, two groups were selected from the total

sample among schoolchildren and students: the first group with an average score of less than "4" (n=29 schoolchildren, n=24 students), the second group - excellent students (n=18 schoolchildren, n=18 students). With academic performance below "4" points, the duration of night sleep on weekdays was less than 8 hours a day in 55.5% of schoolchildren and 78.2% of students. Among the excellent students, 50% of schoolchildren and 72.2% of students, the duration of night sleep on weekdays was less than 8 hours a day. Daytime sleepiness in the first group was noted in 72.2% of schoolchildren and 63.1% of students, in the second group - in 62.1% of schoolchildren and 71.4% of students, irritability in the first group was in schoolchildren 33.3% and 47.3% of students, in the second - 41.3% and 35.7% of students. Students with an average score below 4 believe that they are not coping with the educational program: schoolchildren in a third of cases - 33.3%, and students - in half - 52.6%. Thus, the obtained survey data showed insignificant differences between the level of cognitive abilities and sleep and wakefulness disorders of this type ( $p>0.05$ ).

According to modern concepts, suicidal behavior is considered as a continuous process, which is based on a predisposition to such behavior, based on four groups of factors for the emergence and development of the suicidal process: biological, clinical, social and personal-psychological [10]. In the course of assessing the latter, it can be seen that in the group of schoolchildren, the number of those who received the average level of propensity to Sr according to the "SR-45" test is significantly higher than among students. As a result, schoolchildren have a higher level of manifestation of a tendency to auto-aggressive reactions, according to the value of the coefficient  $Sr=0.42\pm 0.09$ ,  $p=0.01$ . Moreover, the highest level of suicidal reactions ( $Sr=0.56\pm 0.17$ ,  $p=0.009$ ) was observed in schoolgirls, and the lowest - in female students. Estimated lie ratio (L) did not differ between groups.

The level of propensity to suicidal reactions above the average was observed only in three, which is 3.4% of the total number of study participants. This risk group of students should additionally be diagnosed with the mental states of the individual and stress resistance, since the "CP-45" test states only the initial level of development of a person's tendency to suicide during the period of her examination.

With the help of the Mann-Whitney U-criterion, the averages were compared according to the data obtained from the method "Tendency to deviant behavior" by A.N. Orel and determined the readiness to implement such forms of deviant behavior as an attitude towards social desirability (SS), a tendency to overcome norms and rules (PN), to addictive behavior (AP), to self-damaging and self-destructive behavior (SP), to aggression and violence (AN), to volitional control of emotional reactions (EC), to delinquent behavior (DP) and acceptance of a female social role (SR).

An analysis of the average scores shows that girls from schoolchildren, compared with students, showed more

pronounced tendencies to volitional control of emotional reactions ( $p=0.002$ ), to self-injurious and self-destructive behavior ( $p=0.043$ ), to aggression and violence ( $p=0.019$ ), as well as the degree of acceptance of the female social role ( $p=0.014$ ). At the same time, female students more often showed a tendency to violate social norms and rules, delinquent behavior, and also demonstrated attitudes towards the social desirability of answers. The results on the eighth scale - "SR" indicate that the majority of girls (83%) tend to accept the norms and values associated with the fulfillment of a female role, and students of schools and universities differed in behavior ( $p=0.01$ ).

The data obtained also indicate that students differ from schoolchildren by an increased tendency to give socially desirable (service scale) answers when filling out the questionnaire ( $p=0.04$ ), while the results of the answers of some subjects: 10 schoolchildren and 14 students (who scored over 70 points) can be questioned.

Additionally, we compared the data obtained by students using the SOP method, taking into account gender differences. Among students, girls, unlike boys, more often show a tendency to social desirability, to overcome norms and rules, to delinquent behavior ( $p=0.016$ ). In the group of schoolchildren, girls are more likely than boys to focus on overcoming norms and rules, delinquent behavior, and they are also more prone to aggression and violence, to self-damaging and self-destructive behavior and to low volitional control of emotional reactions ( $p=0.001$ ). It should be noted that no significant differences were found between young men.

Between the group of schoolchildren and students, depending on the level of manifestation of a tendency to deviant behavior, there were no significant differences, except for the tendency to set social desirability, which is more pronounced among high school students (42.6%). At the same time, when distributing subjects according to the level of severity of the scales of this SOP technique, we proceeded from the fact that indicators  $<50$  T-points indicate the non-expression of this property, indicators of 50-60 T-points indicate the severity of the property, and those in the zone 60-70 T-points indicate the extreme severity of this property.

Generalization of the data presented in Table 6 shows that: 1) among the subjects, both among schoolchildren and in the group of students, the highest level of inclination to aggression and violence (2.1%), to delinquent behavior (2.3%), as well as volitional control of emotional reactions (average 8.9%); 2) in subjects of both groups, a low level is predominant, the most pronounced on a scale to addictive behavior (average 89.9%), to self-injurious and self-destructive behavior (average 92.3%); 3) the second position in terms of degree is occupied by the average level, the most pronounced on the scale of aggression and violence (on average - 26.6%) and inclination to delinquent behavior (on average - 23.5%); 4) comparing the results of the groups of schoolchildren and students, it can be noted that there are both some improvements and some difficulties in overcoming the deviant behavior of students with an

increase in the level of education: the general thing is that the low level dominates in the studied groups (78-79%), and the least represented is high (5.3-5.8%).

To study the relationship between sleep disturbances and the tendency to deviant reactions in students, the initial sample was divided into two groups according to the results of the Epworth Sleepiness Rating Scale and other indicators of sleep disturbance in the Child Sleep Questionnaire. The first group included subjects with sleep problems (42.2%). They showed higher scores on the addictive behavior scale ( $39.4 \pm 6.3$  versus  $36.8 \pm 7.8$ ;  $p < 0.05$ ) compared to students without sleep disorders (57.8%). Students from the first group had a higher level of propensity for delinquent behavior, as well as aggression and violence, in comparison with students without sleep disorders, as well as schoolchildren ( $p = 0.04$ ). On other scales, the analysis of data obtained using the questionnaire for diagnosing the propensity to deviant behavior did not show statistically significant differences ( $p > 0.1$ ). It is also worth noting that the analysis of sleep disturbance indicators recorded using the questionnaire indicates that there are significant differences between students and schoolchildren not only according to the Epworth scale, but also in terms of satisfaction with the quality of night sleep, the number of sleepless nights, sleep duration, and others. Indicators ( $p < 0.01$ ).

Assessment of the propensity to suicidal reactions according to the "CP-45" test among the students of the selected two groups, taking into account the presence of sleep disorders, did not reveal obvious differences ( $p = 0.19$ ). However, among students, in persons with sleep disorders, the average value of the suicidality coefficient is significantly higher than in the group without them ( $Sr = 0.39 \pm 0.10$  versus  $Sr = 0.31 \pm 0.13$ ;  $p = 0.02$ ).

Using the Spearman rank correlation coefficient, a weak correlation was determined between sleep disturbance and a tendency to addictive behavior ( $r_s = 0.262$ ,  $t(N-2) = 2.53$ ,  $p = 0.01$ ), as well as a negative relationship between the tendency to manifest suicidal behavior. reactions and delinquent behavior ( $r_s = -0.246$ ,  $t(N-2) = -2.37$ ,  $p = 0.01$ ).

Thus, first-year students, among whom the majority sleep less than eight hours a day and do not observe the alternation of sleep and wakefulness, who find themselves in conditions of university adaptation, are more prone to various types of deviant behavior than schoolchildren. The most common forms of deviant behavior in the presence of sleep disorders (exogenous) are a tendency to addictive and delinquent behavior, as well as to aggression and violence. Between students with and without sleep disorders, no statistically significant differences were found in the spectrum of suicidal auto-aggression, which dictates

the need for a more thorough study of the contribution of professional and personal characteristics in conjunction with the level of education in modern society.

Most students have pre- and post-somnic symptoms, the main reasons for which are a large study load, which, in general, is consistent with the data of other authors [11]. At the same time, sleep quality disorders and a fairly high percentage of daytime sleepiness (71.4% among excellent students) were most often recorded among students (61.9%), compared with high school students (36.2%), who at the same time coped with schoolwork. program and had a high GPA. Therefore, excellent students, against the background of night sleep disturbances, have a greater risk of developing psycho-emotional disorders that can cause deviant behavior, and the value of the suicidality coefficient and age-related characteristics of somnological disorders can be considered as potentially independent predictors of the risk of auto-aggressive behavior.

These studies emphasize the important role of prevention of deviant behavior of students, which is also evidenced, according to other authors [12-14], by a high percentage of medical students in the high-risk group (7.4-26.5%), as well as the presence of suicidal thoughts and low resistance to the influence of pro-suicidal factors in students from other cities [15]. Suicide is an extreme form of deviant behavior. The reason for such shifts in stress tolerance may be somnological disorders, which in most cases are nonspecific, which is a serious problem for the early detection and prevention of suicidal and non-suicidal reactions associated with them.

## CONCLUSION

Data from a questionnaire survey of students revealed a high frequency of sleep disorders (42.2%), which are mainly based on stress associated with learning. At the same time, boys and girls are significantly more likely to register addictive behavior (57.8%) associated with sleep disturbances and frequent awakenings, which allows them to be classified as risk factors and indicates the need for more active detection. Sleep disturbances in the student environment significantly accompany a high level of propensity to delinquent behavior and a level of suicidality. At the same time, the highest level of suicidal reactions is noted in schoolgirls with low volitional control, and the lowest level is in female students, who more often than others showed a tendency to delinquent behavior and violation of social norms and rules. Violation of the rules of sleep hygiene affects the level of risk of auto-aggression, and also determines the age and gender characteristics of the development of deviant behavior among students, among whom, regardless of the educational institution, the average level of manifestation of such a tendency prevails.

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