Associação entre qualidade do sono, bruxismo do sono e sonolência diurna excessiva em adolescentes

Sleep quality and its association with sleep bruxism and daytime sleepiness in adolescents

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RESUMO
Objetivo: Este estudo teve como objetivo avaliar a qualidade do sono e a sua associação com o bruxismo do sono e a sonolência diurna excessiva em adolescentes. Metodologia: A amostra foi constituída por 548 escolares da rede pública de ensino, as quais foram escolhidas de modo aleatório. A coleta de dados foi realizada em forma de entrevista, aplicando-se os seguintes questionários: Sociodemográfico, Índice de Qualidade de Sono de Pittsburgh (PSQI), Escala de Sonolência Epworth (ESE). The diagnosis of sleep bruxism was based on the international classification of sleep disorders (ICSD) criteria. Resultados: A prevalência de má qualidade do sono, de distúrbios do sono, bruxismo do sono e sonolência diurna excessiva foram, respectivamente, de 57,1%, 9,9%, 7,5% e 31,6%. A qualidade do sono foi associada ao bruxismo do sono, a sonolência diurna excessiva, horas de sono, tosse ou ronco forte, turno que o adolescente estuda e ao sexo. Conclusão: A probabilidade do adolescente apresentar má qualidade do sono é mais elevada para os adolescentes do sexo feminino, com bruxismo do sono, que dormiam menos de 8 horas por noite e tossiam ou roncavam forte de uma ou mais vezes por semana.

Palavras-chave: Qualidade do Sono, Distúrbio do Movimento, Jovem, Bruxismo, Distúrbio do sono.

ABSTRACT
Objectives: This study was aimed at assessing sleep quality and its association with sleep bruxism and excessive daytime sleepiness in adolescents. Materials and Methods: The sample consisted of 688 students from public schools, who were chosen at random. Data collection was carried out in the form of an interview, using the following questionnaires: the Sociodemographic, Pittsburgh Sleep Quality Index (PSQI) and Epworth Sleepiness Scale (ESE). The diagnosis of sleep bruxism was based on the international classification criteria of sleep disorders (ICSD). Results: The prevalence of poor sleep quality, sleep disorders, sleep bruxism and excessive daytime sleepiness were of 57.1%, 9.9%, 7.5% and 31.6%, respectively. Sleep quality was associated with sleep bruxism, excessive daytime sleepiness, hours of sleep, coughing or heavy snoring, school shift that the adolescent studies and gender. Conclusion: The probability of an adolescent having a poor quality of sleep is higher for female adolescents with sleep bruxism, who slept less than 8 hours a night and coughed or snored loudly one or more times a week.

Keywords: Sleep Quality, Movement Disorder, Young, Bruxism, Sleep disturbance.

1 INTRODUCTION
Sleep is a complex physiological process influenced by intrinsic biological properties, temperament, expectations, cultural habits and environmental conditions (SERRA-NEGRA et al., 2014). It is characterized as a reversible behavioral state of perceptual disengagement from the external environment, with a change in the level of consciousness and intense reorganization of the central nervous system (ARAÚJO et al., 2014).
Sleep problems in children and adolescents can lead to serious health conditions, such as depression, attention deficit and hyperactivity, cognitive disorders, learning difficulties and emotional instability (NUNES, 2002; ARAÚJO et al. 2014; ZANUTO et al., 2015; KIM et al., 2017; BATISTA et al., 2018; ROSA et al., 2019). Despite the considerable impact that sleep disorders (SD) can have on the lives of children and adolescents, parents and doctors do not consider them as the main issues of concern (ITANI et al., 2013).

Bruxism is among the problems caused by SD, which is defined by the International Classification of Sleep Disorders (ICSD, 2014) as a movement disorder characterized by grinding (with the presence of noise) or tightening (without noise) of the teeth during sleep (ITANI et al., 2013). Sleep bruxism differs from the habit of grinding the teeth during the day, also called awake bruxism, which involves different states of consciousness. Therefore, daytime bruxism is a semi-voluntary activity, while sleep bruxism is unconscious, since the individual is sleeping (PONTES & PRIETSCH, 2019).

According to the International Classification of Sleep Disorders (ICSD, 2014), published by the American Academy of Sleep Medicine, the presence of sleep bruxism is defined by the habit of clenching or gritting teeth at night associated with at least one of the following signs and symptoms: excessive tooth wear, pain in the jaw muscles, pain in the temples and / or difficulty in opening the mouth upon waking up.

Most episodes of sleep bruxism occur during N-REM sleep, being often associated with transitions from N-REM to REM sleep, suggesting that a mechanism related to the transition in these stages influences motor neurons that would facilitate the onset of sleep (ITANI et al., 2013; DEL CIAMPO et al., 2017).

The prevalence of sleep bruxism in society is imprecise and underestimated, since studies usually involve different populations and methodologies (PONTES & PRIETSCH, 2019), with prevalence ranging from 9.2% to 15.0% being found in the literature (CARRA et al., 2011; PERLMAN et al., 2016). Etiology is considered multifactorial, and may be related to sleep disorders, pathologies of the central nervous system, drugs, chronic pain, emotional changes, anxiety, depression and stress conditions (DEL CIAMPO et al., 2017; BISCHHOFFSHAUSEN et al., 2019).

The presence of BS during growth and development can contribute to the appearance of craniofacial and temporomandibular changes, such as muscle fatigue, headaches, breathing difficulties, dental wear, as well as deleterious effects on the quality of life (CARRA et al., 2011; SERRA-NEGRA et al., 2014; CARVALHO et al., 2015).
Thus, the present study aimed to assess sleep quality and its association with sleep bruxism and excessive daytime sleepiness in adolescents.

2 MATERIALS AND METHODS

The present study was carried out with adolescents aged between 11 and 15 years old, both female and male, regularly enrolled in the public school system in the city of Recife, in the Brazilian State of Pernambuco, between the months of August and December 2018, and was approved by the Research Ethics of the University of Pernambuco - UPE, under grant number 1.432.302. All participants had a Free and Informed Consent Term - TCLE signed by their guardians, granting them permission to participate in the study.

Students who were undergoing any treatment on any type of sleep disorder and/or had neuropsychomotor deficiencies (as referred by the teachers) that could compromise the application of the instruments were excluded.

The sample calculation was performed using the Epi info version 7 statistical software, using the following criteria: sample universe of 60,385 adolescents; 95% confidence interval; sampling error of 5%; 1.5 drawing effect. In addition, 20% was added to compensate for possible losses, resulting in a final sample of 688 adolescents. A prevalence of 50% was used due to the possibility of making multiple outcomes in future studies.

The sample was carried out in a conglomerate in two stages. In the first, the municipal and state schools were randomized, ensuring that the research was carried out, in proportion to the number of schools, in the six Political-Administrative Regions (RPA) and in the northern and southern territorial area. In the second stage, after the definition of the schools, the students were drawn, taking care of the proportionality between the classes. Randomization in all stages was performed through the website randomizer.

In the form of an interview, the following questionnaires were applied: the Sociodemographic, Pittsburgh Sleep Quality Index (PSQI) and the Epworth Sleepiness Scale (ESE). Sleep quality during the previous month was assessed using the Pittsburgh Sleep Quality Index (PSQI), translated and validated for Portuguese (PASSOS et al., 2017). This questionnaire consists of 19 questions grouped into seven domains, with a global score ranging from 0 to 21 points. When the total score ranges from 0 to 4, the quality of sleep is considered good; while from 5 to 10, sleep quality is poor; and > 10, means that there is a sleep disorder (BARBOSA, 2011). In this study, sleep quality was categorized as good (≤ 4) and poor (≥ 5) (poor sleep quality + sleep disorder).
Excessive daytime sleepiness was assessed using the Epworth Sleepiness Scale (ESE), which is a questionnaire consisting of eight different scenarios that are associated with varying degrees of sleepiness, aiming at quantifying the subject's chances of falling asleep. The questionnaire can reach a maximum of 24 points and a minimum of zero, with up to 10 points being considered normal. Values greater than 10 are considered cases of excessive daytime sleepiness and above 16 severe sleepiness (BERTOLZAZI, 2008; COSTA et al., 2017; LOBBEZOO et al., 2013). For this study, sleepiness was divided into two categories: Yes (≥10) and No (<10).

The diagnosis of sleep bruxism was based on the International Classification of Sleep Disorders (ICSD, 2014). The presence of sleep bruxism was defined when the adolescent reported that the parents or roommates referred to the occurrence of frequent or regular teeth clenching or grinding during their sleep, evidenced by audible characteristics. In addition, it should be associated with one or more of the following signs and symptoms: excessive wear of the teeth, pain in the jaw muscles, pain in the temples and/or difficulty in opening the mouth upon waking up.

The clinical examination to assess the presence of dental wear was carried out in a private school environment, with natural light, individually and consisted of a visual inspection of the incisal / occlusal edges of the teeth, classifying the wear as: (0) without wear, (1 ) wear on enamel, (2) wear on dentin and (3) extensive wear on dentin (20). The examiner was trained and calibrated against a gold standard, obtaining, an inter and intra-examiner kappa of 0.85 and 0.9, respectively.

Pearson's chi-square test or Fisher's exact test were used to assess the association of categorical variables. A two-stage multivariate logistic regression model was adjusted. In the first stage, variables that showed a significant association of up to 20% (p <0.20) were included in the bivariate study. In the second step, through a backward selection process, variables with p <0.20 were maintained. The degree of adjustment of the data was assessed using the Lemeshow test. The Odds Ratio value and respective confidence intervals were obtained to assess the strength of the associations.

The significance level used in the decision of the statistical tests was of 5% and the intervals were obtained with 95% confidence. The program used to obtain the statistical calculations was the Statistical Package for Social Science (SPSS) in version 23.

3 RESULTS

The final sample of this study consisted of 548 adolescents. Most participants studied in the afternoon (56.8%), were male (50.2%), 13 years old (27.2%) and whose parents worked (72.3%). The majority (57.1%) had a poor sleep quality, with bruxism seen in 7.5% of the participants, 31.6%
had excessive daytime sleepiness, 33.4% slept less than 8 hours a night and 13.9% reported coughing or snoring 1 to 3 or more times a week (Table 1).

| Table 1 - Characteristics of respondents. |
|-------------------------------------------|
| Variable                                  | n  | %     |
|-------------------------------------------|----|-------|
| **Total**                                 | 548| 100.0 |
| **School Shift of Students**              |    |       |
| Morning                                   | 237| 43.2  |
| Afternoon                                 | 311| 56.8  |
| **Student’s age group**                   |    |       |
| 11 and 12                                 | 160| 29.2  |
| 13 to 15                                  | 388| 70.8  |
| **Gender**                                |    |       |
| Male                                      | 275| 50.2  |
| Female                                    | 273| 49.8  |
| **Marital situation of parent/guardian**  |    |       |
| Without companion                         | 241| 44.0  |
| With a companion                          | 307| 56.0  |
| **Professional situation of parent and/or guardian** |    |       |
| Employed                                  | 396| 72.3  |
| Unemployed / retired                      | 152| 27.7  |
| **Sleep quality**                         |    |       |
| Good sleep quality                        | 181| 33.0  |
| Poor sleep quality                        | 313| 57.1  |
| Sleep disorder                            | 54 | 9.9   |
| **Bruxism**                               |    |       |
| Yes                                       | 41 | 7.5   |
| No                                        | 507| 92.5  |
| **Daytime sleepiness**                    |    |       |
| Yes                                       | 173| 31.6  |
| No                                        | 375| 68.4  |
| **Sleep duration**                        |    |       |
| Less than 8 hours                         | 183| 33.4  |
| 8 hours or more                           | 365| 66.6  |
| **Strong coughing or snoring**            |    |       |
| None in the last month                    | 384| 70.1  |
| Less than once / week                     | 88 | 16.1  |
| Once or twice a week                      | 48 | 8.8   |
| 3 or more times / week                    | 28 | 5.1   |
Sleep quality was associated with the school shift ($p = 0.024$), gender ($p = 0.042$), excessive daytime sleepiness ($p < 0.001$), sleep bruxism ($p < 0.003$), hours of sleep ($p < 0.001$), cough or strong snoring ($p < 0.001$) (Table 2).

**Table 2** - Assessment of sleep quality according to the characteristics of students and guardians, excessive daytime sleepiness, probable sleep bruxism, hours of sleep and strong snoring.

| Variable                                  | Sleep quality | Total | P Value | OR (IC 95%)        |
|-------------------------------------------|---------------|-------|---------|-------------------|
|                                           | Bad | Good | Total |       |                   |
|                                           | n   | %    | n     | %    |                   |
| School shift                              |     |      |       |      |                   |
| Morning                                   | 171 | 72.2 | 66    | 27.8 | 237 100.0          |
| Afternoon                                 | 196 | 63.0 | 115   | 37.0 | 311 100.0          |
| Student’s age range (age range)           |     |      |       |      |                   |
| 11 and 12                                 | 98  | 61.3 | 62    | 38.8 | 160 100.0          |
| 13 to 15                                  | 269 | 69.3 | 119   | 30.7 | 388 100.0          |
| Gender                                    |     |      |       |      |                   |
| Male                                      | 173 | 62.9 | 102   | 37.1 | 275 100.0          |
| Female                                    | 194 | 71.1 | 79    | 28.9 | 273 100.0          |
| Marital situation of parent/guardian      |     |      |       |      |                   |
| Without companion                         | 159 | 66.0 | 82    | 34.0 | 241 100.0          |
| With a companion                          | 208 | 67.8 | 99    | 32.2 | 307 100.0          |
| Professional situation of parent and/or guardian |         |       |       |      |                   |
| Employed                                  | 265 | 66.9 | 131   | 33.1 | 396 100.0          |
| Unemployed/retired                        | 102 | 67.1 | 50    | 32.9 | 152 100.0          |
| Daytime sleepiness                        |     |      |       |      |                   |
| Yes                                       | 137 | 79.2 | 36    | 20.8 | 173 100.0          |
| No                                        | 230 | 61.3 | 145   | 38.7 | 375 100.0          |
| Bruxism                                   |     |      |       |      |                   |
| Yes                                       | 36  | 87.8 | 5     | 12.2 | 41 100.0           |
| No                                        | 331 | 65.3 | 176   | 34.7 | 507 100.0          |
| Sleep duration                            |     |      |       |      |                   |
| Less than 8 hours                         | 142 | 77.6 | 41    | 22.4 | 183 100.0          |
| 8 hours or more                           | 225 | 61.6 | 140   | 38.4 | 365 100.0          |
| Strong coughing or snoring                |     |      |       |      |                   |
| None in the last month                    | 240 | 62.5 | 144   | 37.5 | 384 100.0          |
| Less than once/week                       | 62  | 70.5 | 26    | 29.5 | 88 100.0           |
| Once or twice a week                      | 65  | 85.5 | 11    | 14.5 | 76 100.0           |
The logistic regression model demonstrated that the probability of presenting a poorer sleep quality is higher for female adolescents with sleep bruxism, who slept less than 8 hours a night and who coughed or snored hard one or more times per week. It is worth pointing out that the variable daytime sleepiness was not included in the model, as it is a consequence and not a cause of poor sleep quality (Table 3).

Table 3 - Results of logistic regression for the prevalence of poor sleep quality.

| Variable                      | Bivariate OR and IC of 95.0% | Adjusted OR and IC of 95.0% | P Value |
|-------------------------------|------------------------------|-----------------------------|---------|
| Student's age range           |                              |                            |         |
| 11 and 12                     | 1.00 (0.97 to 2.10)          | 1.44 (0.96 to 2.16)        | 0.067   |
| 13 to 15                      | 1.00                         | 1.00                        | 0.77    |
| Gender                        |                              |                            |         |
| Male                          | 1.00                         | 1.00                        | 0.042*  |
| Female                        | 1.45 (1.01 to 2.07)          | 1.51 (1.04 to 2.20)        | 0.30*   |
| Bruxism                       |                              |                            |         |
| Yes                           | 3.83 (1.48 to 9.93)          | 3.90 (1.47 to 10.34)       | 0.003*  |
| No                            | 1.00                         | 1.00                        | 0.006*  |
| Sleep duration                |                              |                            |         |
| Less than 8 hours             | 2.15 (1.43 to 3.24)          | 2.08 (1.37 to 3.16)        | < 0.001*|
| Greater than or equal to 8 hours | 1.00                      | 1.00                        |         |
| Strong coughing or snoring    |                              |                            |         |
| None in the last month        | 1.00                         | 1.00                        | < 0.001*|
| Less than 1 time / week       | 1.42 (0.87 to 2.34)          | 1.41 (0.84 to 2.37)        | 0.001*  |
| 1 or more times / week        | 3.55 (1.81 to 6.94)          | 3.52 (1.77 to 7.01)        | 0.200   |

(*) Significant at 5.0%.

4 DISCUSSION
The present study observed that the majority of adolescents had a poor sleep quality (57.1%), which corroborates with the study carried out by Fonseca et al. (2015), who registered a similar prevalence (57.6%). In turn, Schlarb et al. (2015), when evaluating 17,641 participants from childhood to adolescence, through questionnaires answered by parents of children aged between 0 and 10 years old and by adolescents aged from 11 to 17 years old, found that sleep...
problems were reported by 23.1% of adolescents. The probable reason for the great divergence found may be related to the sample and age difference, as well as to the different diagnostic criteria used.

With regard to sleep bruxism, the prevalence found was of 7.5%, in line with the low prevalence observed in the aforementioned studies (SOUZA et al., 2007; CARRA et al., 2011; PRADO et al., 2018). This fact may be related to the various evaluation criteria used (CAMOIN et al., 2017), since data collection in epidemiological studies ranged from self-reports to their association with clinical evaluations (SOUZA et al., 2007; PEREIRA, TEIXEIRA & LOUZADA, 2010; CARRA et al., 2011; PRADO et al., 2018). In addition, the multifactorial etiology of the studied condition (SERRA-NEGRA et al., 2014) and the failure to distinguish between sleep and wake bruxism can also influence the prevalence rate (CARRA et al., 2011).

Previous studies indicate that female adolescents are more affected by sleep problems (FONSECA et al., 2015; GUO et al., 2014; XU et al., 2012; CHUNG & CHEUNG, 2008), which is in accordance with the results of the present study. According to Mong e Cusmano (2016), changes in the production of ovarian steroids common to the period of puberty and menopause are associated with an increased prevalence of insomnia and poorer quality of sleep.

Data in the literature show that adolescents who study or work in the morning have greater sleep deprivation (THOLEIFSDOTTIR et al., 2002; PEREZ-CHADA et al., 2007), corroborating with the results found in the study in question, which demonstrated an association between poor sleep quality and the morning school shift. This fact can be explained by the need to wake up earlier during the week, due to school activities, for those who study in the morning. In a survey conducted at 14 schools in the Brazilian city of Ribeirão Preto (State of São Paulo), including 535 adolescents aged between 10 and 19, 38% of the sample studied in the morning shift and slept less than 9 hours a night during the week, whereas only 6.3% of adolescents who studied in the afternoon shift demonstrated sleeping less than 9 hours a night (DEL CIAMPO et al., 2017).

With regard to the binomial sleep deprivation and occupational situation, the tendency is for adolescents from families with less favored socioeconomic conditions to be inserted in the labor market in order to contribute to the household income and maintenance of the family’s needs (PINTO et al., 2018). Studies have found that adolescents who work tend to have a poor sleep quality (FISCHER et al., 2014; PINTO et al., 2018), since they feel more tired after having a double shift. In addition, concerns related to work and studies can lead to night awakening, contributing to the decrease in total sleep time and the development of non-restorative sleep.

Regarding the professional situation of parents and/or guardians, there were no associations with the sleep quality of adolescents, in disagreement with the study carried out by
Buckhalt et al. (2007), who demonstrated that children and adolescents with lower socioeconomic statuses are more likely to share a room, with more people living in the same household, a poor diet and an inadequate sleeping environment, which can lead to a worse quality of sleep.

Regarding excessive daytime sleepiness, the literature shows a wide variation in its prevalence (7.8% - 55%), due to different methodologies and instruments used (Pereira et al., 2010). In this study, the prevalence observed was similar to that found by Gibson et al. (2006) (31.6% and 41.5%, respectively), which can be justified by the similarity between the methodologies, since the aforementioned author also assessed excessive daytime sleepiness by applying the Epworth Sleepiness Scale. There was an association between sleep quality and excessive daytime sleepiness, corroborating with Lopes et al. (2016), who also observed an insufficient sleep duration among adolescents, confirming the existing trend of reduced nighttime sleep in adolescence (average 7 hours), with a difference between the days with school activity and weekends (Nunes et al., 2002).

Ferrari Júnior et al. (2019) also found a difference in total sleep duration between weekdays and weekends. The results show that on weekdays, teenagers go to bed at around 0:00 ± 1:36 and wake up at around 7:54 ± 2:00; on weekends, the bedtime is of around 1:50 ± 2:06 and they wake up on average at 11:00 ± 1:54, with the total bed time during the weekdays being of 7:54 ± 1:48 hours and on the weekends of 9:12 ± 1:48 hours (Ferrari Júnior et al., 2019). As previously stated, a higher sleep deprivation during the days of the week is related to the need of waking up earlier due to school duties, especially when the teenager studies in the morning school shift (Del Ciampo et al., 2017).

Differently than in other studies (Huang et al., 2010; Pereira et al., 2015; Felden et al., 2016; Mendonça & Andrade, 2017), there was no association between sleep quality and age group. However, it is worth noting that these studies included older adolescents, who tend to have less family rules regarding their daily routine, such as, for example, control over bedtime and waking up times, easier access to digital media before bedtime, which directly influences the quality of sleep (Mendonça & Andrade, 2017).

This research showed an association between reduced hours of sleep and poor sleep quality. The literature shows that young people experience a decrease in sleep hours with the advancement of adolescence, as, at puberty, a delay in the phase of sleep can be identified, characterized by late sleeping and waking up hours, in addition to social activities and morning class times, leading to a significant decrease in sleep duration (Bernardo et al., 2009). Despite the longer time that adolescents usually spend in the bedroom or lying in bed, there is a reduction in the amount of hours of sleep due to involvement in other activities of greater interest, such as the use of...
electronic media (television, video games) and the internet. These habits are related to increased sleep latency and shorter sleep durations (JIANG et al., 2015; VAN DEL BULCK, 2004).

Several factors can contribute to sleep deprivation at this stage, such as school pressure, socioeconomic factors and excessive use of computers and cell phones (BATISTA et al., 2018). Fobian, Anis & Schwebel (2016) indicated that the use of social media at bedtime and keeping the cell phone on during sleep are associated with lower levels of sleep efficiency in adolescents. According to Batista (2018), the low quality of sleep leads to increased fatigue, stress and excessive daytime sleepiness, which can hinder, among other factors, the learning process.

Issues related to sleep quality are common symptomatic consequences reported in individuals with bruxism (SOUSA Et al., 2018; PONTES & PRIETSCH, 2019). This fact was confirmed by the findings of the present study, which observed an association between poor sleep quality and sleep bruxism, which may be motivated by micro-awakenings and sleep fragmentation, culminating in non-restorative sleep, consequently interfering with its quality, leading to daytime sleepiness of the adolescent on the following day (SERRA-NEGRA et al., 2017). The presence of these micro-awakenings is linked to an increase in the frequency of masticatory muscle activity, which, in turn, has its magnitude related to the differentiation between individuals who suffer from BS and those who do not have the condition, since this activity is found three times more often in bruxists (DIAS et al., 2014). This finding can be justified by the very characteristic of the condition, which is described as a complex response of excitation of the central nervous system, which occurs in the midst of changes in sleep phases and is linked to body movements, increased heart rate and respiratory changes, as well as muscle activities (AHLBERG et al., 2013).

It is important to highlight that the prevalence of sleep bruxism varies widely among the different age groups, with its epidemiology being still rather unknown in adolescence. Another factor that can influence this reduction in prevalence in adolescence is underreporting, since, in this age group, parents tend not to sleep as close to their children. Therefore, they no longer watch their children sleep and, consequently, do not notice any possible changes in their sleep patterns (FIRMANI et al., 2015).

In this study, a significant association was found between poor sleep quality and the presence of cough or strong snoring in the adolescents evaluated. Snoring has important medical implications, which can compromise the individual's quality of sleep and evolve into more important pathologies, such as obstructive sleep apnea (NOAL et al., 2008). Such respiratory disorder is considered a predictor of sleep bruxism, as children / adolescents who snore are up to 8.2 times more likely to be inserted in the group of individuals with BS (KIM et al., 2017). The literature states that in the presence of an obstruction, BS favors the restoration of normal breathing, having a
protective action in cases of apnea. However, this association needs to be better elucidated (LOPES et al., 2016; RIBEIRO et al., 2018; SOUZA & TOMAZ, 2018). It is worth mentioning that, in the present study, the question of the instrument which assesses the presence of snoring is associated with cough. Therefore, it cannot be stated as an isolated factor.

In the present study, sleep quality was associated with excessive daytime sleepiness (EDS) (p <0.001). This result is in line with the study carried out by Capelani e Dias (2017), who verified the indirect proportionality between the two variables in question, that is, the higher the value of daytime sleepiness, the lower the value of sleep quality. It is known that the interruption of the circadian rhythm can result in the fragmentation of sleep, influencing its quality and contributing to the presence of excessive daytime sleepiness (VIDENOVIC et al., 2017). There are several factors that influence daytime sleepiness, such as irregular sleep, systemic conditions, depression and anxiety, as well as low sleep duration and the quality of sleep, with the latter being one of the main consequences related to sleep disorders (MEYER et al., 2017).

Regarding the impact of these conditions on the quality of life, since adolescence is marked by changes in sleep patterns that can have negative implications on quality and recovering properties, non-restorative sleep can allegedly have a negatively influence on the performance of daily activities, including school tasks, contributing to the development of behavioral and attention deficit. In addition, it favors the development of somatic and psychological disorders, such as anxiety and depression, resulting in a negative perception of quality of life (DIAS et al., 2014; CAPELANI & DIAS, 2017; MEYER et al., 2017; HERRERA et al., 2006; KARADAG et al., 2015).

5 CONCLUSION

The main limitations of this study regard the design of the investigation. Since it is a transversal study, it is not possible to establish a cause and effect relationship. Another limitation is the non-use of polysomnography, which is the gold standard for assessing sleep. However, the ICSD diagnostic criterion (2014) was followed to assess sleep bruxism, which does not condition the diagnosis of sleep bruxism to the use of polysomnography.

Finally, it can be concluded that sleep quality is associated with sleep bruxism, excessive daytime sleepiness, school shift, gender, hours of sleep and strong coughing or snoring. The probability of adolescents presenting poor sleep quality is higher for female adolescents with sleep bruxism, who slept less than 8 hours a night and coughed or snored loudly one or more times a week.
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