138 - INSTRUMENTS FOR ASSESSING SLEEP IN ADOLESCENTS: BRAZILIAN LITERATURE'S REVISION

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INTRODUCTION

Sleep can be defined as a complex physiological situation. During this state, modifications in the physiological and behavioral processes occur, like relative mobility and increase of the response limit to external stimuli. It is a discontinuous state organized in phases that are distinguished by specific electroencephalogram tracings (GEIB et al., 2003).

It can be divided in two types: NREM sleep (Sleep in slow waves) and REM sleep (rapid eye movement sleep). The REM sleep's duration may depend on the amount of energy available. REM sleep is known for increasing metabolic levels and spending cerebral energy. Muscle atony occurs and homeostatic mechanisms tend to decrease body temperature and to keep breathing relatively irresponsive to CO_2 variations in the blood. NREM sleep is characterized by the decrease of basal metabolism and body temperature. These conditions benefit protein synthesis and restore energy reserves to prepare the organism for the subsequent phases of REM sleep and the awakening. They are also responsible for cell repairing by replacing enzymes that had been modified by free radicals for others newly synthesized (GEIB, 2007).

The structure and physiology of sleep is a necessary process for physical and cognitive health of the human being. It is known that a poor condition of sleep openly intervenes with the quality of human life and can cause sleep disorders (ARAÚJO et al, 2013). Sleep disorders generally reflect in a negative way in human beings, affecting the quality of life, autonomic dysfunction, academic and professional performance, among others (VASCONCELOS et al., 2013). Some disorders related to sleep are fatigue, malaise, irritability, agility and mental efficiency disabilities (ARAÚJO and ALMONDES, 2012).

Sleep disorders (SD) can influence behavior, learning, school performance and family relationship of the individual. It is important to understand it for proper clinical follow up of the patient (ALMEIDA, NUNES and SCHLINDWEIN-ZANINI, 2014). Sleep is related to learning retention and has an important role in the restorative processes. Good sleep quality is indispensable for the occurrence of these processes (ARAÚJO and ALMONDES, 2012). The quality of sleep can be influenced by the sleeping place's conditions, by psychological factors and individual's life-style (MARTINI et al, 2012).

Studies show that a great number of adolescents have less sleep than their necessities, especially in big cities. Inadequate alimentary habits, school schedules, inactivity, too much time in front of electronic devices and insertion in the labor market are factors that affect sleep duration (PEREIRA et al., 2011). Adolescents are exposed to life-style and sleep-wake pattern changes. Natural alterations due to puberty occur and many other adolescents are introduced in new environments because of their studies (MARTINI et al, 2012). Inadequate hours of sleep can influence negatively resulting in low performance in daily activities, raising the risk of accidents, hindering the student's development at school (FERREIRA and MARTINO, 2012).

They also don't have healthful sleep habits. Many of them have unruly lifestyles which reflect in a sleep standard that is different from the rest of the population (VASCONCELOS et al., 2013).

Thus, it is relevant to analyze the main instruments used in the evaluation of sleep quality in adolescents, so we would be able to further estimate their most common sleep disorders. Our objective in this study is to analyze the main assessment instruments of sleep in Brazilian adolescents.

METHOD

Bibliographical research was done by searching scientific articles in the on-line databases LILACS (Caribbean Latin American Literature and in Sciences of the Health) and SCIELO (Scientific Electronic Library Online), using the following describers (in Portuguese) "sono" (sleep) and "adolescentes" (adolescents) or "estudantes" (students).

The literature review was carried through in the first semester of 2015, and the publication year varied between 2010 and 2015. The texts were analyzed and synthesized in order to compare the information found. The articles that were not in the period of publication, not in Portuguese, duplicate articles and that were unrelated to the subject were excluded.

RESULTS

A total of 102 articles that approached the describers above-mentioned had been initially found in the databases (SCIELO and LILACS). Only 10 of them had met the inclusion criteria, as presented in the flowchart (figure 1), based in the PRISMA (2009) criteria.
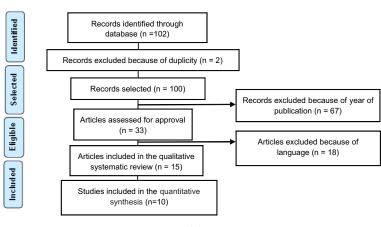
Image 1 - Flowchart of articles found.

These 10 scientific articles that had met all the inclusion criteria were carefully analyzed in order to approach the key data and information to write this review. The main information of the selected articles is presented in table 1.

Table 1 - Analysis of selected articles.

AUTHOR (YEAR)	SAMPLE	INSTRUMENTS	RESULTS	MAIN SLEEP DISORDER
ARAÚJO and ALMONDES (2012)	234 students	ESS and PSQI	Somnolence score of 9.4. PSQI scores were of 5.53 (poor sleep quality)	EDS
ARAÚJO and ALMONDES (2012)	234 students	ESS	Somnolence score of 9.4.	EDS
ARAÚJO et al. (2013)	701 colleges students	PSQI	95.3% show poor sleep quality	N/A
DRABOVICZ et al. (2012)	200 students	PSQI	Sleep quality was poor in 41% of the adolescents	N/A
FERREIRA and DE MARTINO (2012)	30 students	ESS and Day-to-day sleep	Somnolence score that varied between 7.2 and 15.9, average of 11.4	SDE
MARTINI et al. (2012)	199 students	PSQI	51.75% presented poor sleep quality; 48.75% shows good sleep quality	N/A
PEREIRA et al. (2011)	863 students/ workers	Sleep habits survey and socioeconomic analysis	Prevalence of low sleep duration was of 36.2% in the group of those who didn't work and 52% in the group of workers	N/A
RAMOS et al. (2011)	67 patients	Survey for sleep disorders analysis; Polysomnograph; Shwachman-Kulczycki (S-K) score and nutritional status of each patient was analyzed	Total time of sleep (TTS) in stages 4 and REM <21 e13%, respectively, latency of REM sleep > 144 minutes, the percentage of TTS with oxy-hemoglobin saturation measured by p ulse oxymeter (SpO2) < 90% higher than 0.28 seconds and the level oxygen desaturation ›0.92	OSAS
SOUZA et al (2012)	20 patients	BRIAN-K	CG presented higher alteration scores in their circadian cycles by the total score of BRIAN -K, when compared with EG (p=0.022)	N/A
VASCONCELOS et al. (2013)	702 colleges students	PSQI	95.2% presented poor sleep quality	N/A

Key to table: ESS - Epworth Sleepiness Scale; PSQI - Pittsburgh Sleep Quality Index;   OSAS - Obstructive Sleep Apnea Syndrome; EDS - Excessive daytime sleepiness; N/A- not applicable; CG - control group; EG - experimental group.

DISCUSSION

This study aimed to investigate the main assessment instruments of sleep in adolescents. In light of the eligibility filters seen in this study, we were able to find the instruments showed in the result section. From these studies, we were able to notice that the most used sleep assessment instruments in Brazil were the PSQI (Pittsburgh Sleep Quality Index), followed by ESS (Epworth Sleepiness Scale).

We could notice the diversity of studies by verifying the selected articles (Table 1). This points to limitations in the statistic analysis, specially due to the variety of objectives in these studies. Even considering these circumscriptions, the results had become relevant and useful, especially because the subject was not covered in Brazilian studies.

The PSQI (Pittsburgh Sleep Quality Index) was developed in 1989, by Buysse, Reynolds, Monk, Berman and Kupfer. It had its version translated, validated and adjusted to the Brazilian cultural standards. It is an instrument that consists in ten questions some of them are subdivided. These questions were developed to evaluate the subjective quality of sleep in the last month (DRABOVICZ et al., 2012; ARAÚJO and ALMONDES, 2012; ARAÚJO et al., 2013). The questions cover seven components: the subjective quality of sleep; latency of sleep; duration of sleep; habitual efficiency of sleep; disorders of sleep; the medication used to sleep; daytime sleepiness and disorders during the day. The answers must indicate as accurately as possible what happened in most of days and nights of the individual past month (DRABOVICZ et al., 2012; ARAÚJO and ALMONDES, 2012; ARAÚJO et al., 2013).

The results of the PSQI are interpreted in a way that the scores below 5 are classified as good sleep quality, above five points indicate poor sleep quality and, above ten points, sleep disorder diagnosis. The instrument's maximum score is twenty-one points and it is determined by the addition of seven components. Each component receives a score established between zero and three points. Vasconcelos et al. (2013) and Araújo et al. (2013), had adopted the PSQI in their research and they had a sample of little more than 700 college students. They had assessed the correlation between anthropometric indicators and the quality of sleep of Brazilian college students, suggesting that, of those investigated, 95.2% had showed poor sleep quality, in other words: PSQI>5. The following study evaluated the quality of sleep in university students of Fortaleza, Ceará, Brazil, and showed that 95.3% of the sample showed poor sleep quality. Both studies had practically identical results in terms of sleep quality.

Martini et al. (2012) and Drabovicz et al. (2012) used a similar sample of about 200 people, using PSQI as evaluation instrument. However, the comparison between the studies is impracticable due to the fact that the difference in its objectives change the way the results are presented. The research of Drabovicz et al. (2012) aimed to determinate the frequency of temperomandibular dysfunctions and to investigate its relation with quality of sleep in adolescents of 18 and 19 years. The results indicated that, of the participants without dysfunctions, 82% had presented good sleep quality and, of those with dysfunctions, the percentage was of 17%, which doesn't allow concluding if poor sleep quality is cause or consequence of the temperomandibular dysfunctions. In the meantime, Martini et al. (2012), had analyzed the sleep standard of university students of Physiotherapy and the factors associated to sleep quality. The global average was of 51.75% of the students showing poor sleep quality, and 48.75% showing good sleep quality. This information confirms that the factors associated to sleep quality can have multifactorial causes.

The ESS (Epworth Sleepiness Scale) on the other hand, was developed in 1991 by John W. Murray with the intention of quantifying the individual's tendency of falling asleep. It is a questionnaire consisting of eight situations, as much active as passive, associated with different degrees of sleepiness. The answers are scored from zero (no possibility) to three (high possibility). It reaches maximum value of twenty-four and minimum value of zero; the divisor for normality is ten points. The scores above ten are diagnostic of extreme daytime sleepiness (ARAÚJO and ALMONDES, 2012; FERREIRA and DE MARTINO, 2012). Araújo and Almondes (2012) examined over 200 students. They used two instruments, PSQI and ESS to analyze the correlation between sleepiness levels, quality of sleep and academic income of undergraduate students. By using PSQI, they showed that students in both school shifts have poor sleep quality. Additionally, by using ESS, they noticed that only the tendency for excessive daytime sleepiness was identified in both school shifts, although the values were relatively high. The results had indicated that the correlation between sleep quality, excessive sleepiness and academic performance didn't exist in both shifts.

Araújo and Almondes (2012), using the same sample of the previous study, had carried through different analyzes using only ESS. They verified the levels of excessive daytime sleepiness in undergraduate students in classes of different shifts. The results showed high averages, with tendency for excessive daytime sleepiness diagnosis with significant differences in the levels of sleepiness between shifts. Ferreira and Martino (2012) in turn, with a sample of 30 students, aimed to identify, with ESS, the levels of sleepiness and standards of sleep of daytime students of Nursing classes that worked at night, concluding that these individuals showed prevalence of excessive daytime sleepiness.

The research's objective of Pereira et al. (2011) was to investigate the duration of sleep and factors associated with students that worked and those who didn't. They used as evaluation instrument the "Questionnaire of sleep habits and socioeconomic evaluation", with a sampling of 863 students. They had results indicating the prevalence of low sleep duration of 36.2% in the group of students who didn't work and 52% in the group of workers. It is not possible for the reader to identify the same effectiveness of the questionnaire of sleep habits because of the little information about it.

Souza et al (2012) used another instrument of evaluation in their study. Their main objective was to adapt the BRIAN scale, previously validated for adults with BMD (bipolar mood disorder), to a population of children and adolescents, as well as investigating possible alterations of the circadian cycles between patients and healthful controls. The results showed that children or adolescents with BMD present higher alterations of the circadian cycles, compared with the control group. This suggests that the BRIAN-K scale is capable of discriminating patients and healthful controls.

Ramos et al. (2011) used the "Questionnaire for sleep disorders evaluation" (previouly validated), polysomnography, Shwachman-Kulczycki score (S-K) and evaluated the nutritional status of each patient (67 individuals were submitted to polysomnography). They used these instruments to assess the architecture of sleep in children and adolescents with both Cystic Fibrosis (CF) and clinical suspicion of Sleep-Disordered Breathing (SDB), and to identify the respiratory polysomnographic profile of these patients. The results suggest that clinically stable patients with CF have high prevalence of SDB. We were able to present these results through a complementary polysomnography examination, but they have a high cost, which makes it difficult to include a bigger quantity of samples. Besides the differential use of polysomnography, this study made use of a sampling that presented an established pathology while comparing it with the others.

Of the instruments used in all research here pointed out, the great majority applied instruments of subjective evaluation of sleep, not providing diagnostic for sleep disorders. Such diagnostic needs a complementary examination, as the polysomnography, which was used in only one of the studies, because of its high cost.

CONCLUSION

The results show that the main instruments currently used for sleep disorders assessment are PSQI (Pittsburgh Sleep Quality Index), followed by ESS (Epworth Sleepiness Scale). This study has demonstrated that the validated Brazilian's PSQI is easily accessed and applied by the professionals.

The analysis of the most recent studies carried through in Brazil suggests a predominance of the use of the instrument of evaluation PSQI in five of the studies analyzed, indicating a possible standardization in the Brazilian research. However, new research covering the subject is necessary, considering its scarcity in Brazilian literature. We can distinguish the importance of an adequate evaluation of sleep disorders, knowing that they have repercussions in the daily life of the individual affected, worsening their performance in labor and leisure activities, increasing the propensity for psychiatric and neuropsychological disorders, metabolic alterations, among others. Considering the physiological functions that sleep plays in the human organism, and that a poor condition of sleep clearly intervenes in the life quality of the human being (being the adolescents the most affected population in terms of structuring and hygiene of sleep), the choice of an adequate questionnaire, coupled with anamnesis, is of great importance for their assessment and, later, to efficiently provide treatment.

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INSTRUMENTS FOR ASSESSING SLEEP IN ADOLESCENTS: BRAZILIAN LITERATURE'S REVISION.
ABSTRACT
Introduction: sleep has a vital role in the human being's survival and it has diverse functions. Poor sleep conditions clearly intervene in a person's quality of life and it can also generate sleep disorders. The aftereffects of sleep disorders in human beings are negative. They influence quality of life, autonomic dysfunction, academic and professional performance, among others. Adolescents, particularly college students, don't always have healthful sleep habits. A large number of adolescents have less sleep than their physiological and cognitive needs. Objective: To assess the instruments of sleep analysis in Brazilian adolescents. Method: scientific articles in the SCIELO and LILACS databases were searched, the inclusion criterion was the year of publication (2010-2015) and the approach was directed to the subject. Duplicate articles were excluded. Results: initially, 102 articles were found, in which 10 fulfilled the criterion. Conclusion: the analysis of the most recent studies made in Brazil show predominance of the use of the evaluation instrument PSQI (Pittsburgh Sleep Quality Index) in five of the studies analyzed, which indicates a possible standard in the Brazilian research.
KEYWORDS: sleep disorders, instruments, adolescents.

INSTRUMENTS D'ÉVALUATION DU SOMMEIL CHEZ LES ADOLESCENTS: REVUE DE LITTÉRATURE BRÉSILIENNE.
RÉSUMÉ
Introduction : le sommeil est un élément fondamental à la survie humaine, ayant diverses fonctions. Une mauvaise condition de sommeil interfère clairement sur la qualité de vie humaine, pouvant générer des troubles du sommeil. Les troubles du sommeil se répercutent sur les êtres humains de façon négative, affectant la qualité de vie, le dysfonctionnement du système nerveux autonome, la performance académique et professionnelle, entre autre. Les adolescents, en particulier les étudiants universitaires, ne possèdent pas toujours de bonnes habitudes de sommeil. Un grand nombre d'adolescents présente une durée de sommeil inférieure aux besoins physiologiques et cognitifs. Objectif: Examiner les instruments d'évaluation du sommeil sur les adolescents brésiliens. Méthode: Des articles scientifiques ont été recherchés sur les bases de données SCIELO et LILACS, ayant comme critère d'inclusion l'année de publication (2010-2015) et l'approche directe du sujet. Résultat: 102 articles ont initialement été trouvés, sachant que 10 répondaient aux critères. Conclusion : L'analyse des études les plus récentes réalisées au Brésil montre une prédominance dans l'utilisation de l'instrument d'évaluation PSQI - Indice de Qualité du Sommeil de Pittsburgh (Pittsburgh Sleep Quality Index) sur 5 des études évaluées, indiquant une possible uniformisation dans les recherches brésiliennes.
Mots clés: troubles du sommeil, instruments, adolescents

INSTRUMENTOS DE EVALUACIÓN DEL SUEÑO EN ADOLESCENTES: REVISIÓN DE LA LITERATURA BRASILEÑA.
RESUMEN
Introducción: El sueño es un elemento fundamental para la sobrevivencia humana, teniendo diversas funciones. Una mala condición de sueño interfiere abiertamente en la calidad de vida humana, pudiendo generar disturbios de sueño. Los disturbios de sueño repercuten en los seres humanos de forma negativa, afectando la calidad de vida, disfunciones autonómicas, desempeño académico y profesional, entre otros. Los adolescentes, en especial los universitarios, no siempre poseen hábitos saludables de sueño. Un gran número de adolescentes presenta una duración de sueño menor que sus necesidades fisiológicas y cognitivas. Objetivo: Investigar los instrumentos de evaluación del sueño en adolescentes brasileños. Método: Fueron investigados artículos científicos en las bases de datos SCIELO y LILACS, teniendo como criterios de inclusión el año de publicación (2010-2015) y el abordaje directo al tema. Fueron excluidos artículos duplicados. Resultados: Inicialmente fueron encontrados 102 artículos, de los cuales 10 atendieron a los criterios. Conclusión: El análisis de los estudios más recientes realizados en el Brasil, demuestra una predominancia del uso del instrumento de evaluación PSQI – Índice de Calidad de Sueño Pittsburgh (Pittsburgh Sleep Quality Index) en cinco de los estudios evaluados, indicando una posible uniformización en las investigaciones brasileñas.
PALABRAS CLAVE: disturbios de sueño, instrumentos, adolescentes.

INSTRUMENTOS DE AVALIAÇÃO DO SONO EM ADOLESCENTES: REVISÃO DA LITERATURA BRASILEIRA.
RESUMO
Introdução: O sono é um elemento fundamental a sobrevivência humana, tendo diversas funções. Uma má condição do sono interfere abertamente na qualidade de vida humana, podendo gerar distúrbios do sono. Os distúrbios do sono repercutem aos seres humanos de forma negativa, afetando a qualidade de vida, disfunções autonômica, o desempenho acadêmico e profissional, entre outras. Os adolescentes em especial os universitários, nem sempre possuem hábitos saudáveis de sono. Um grande número de adolescentes apresentam uma duração do sono menor que suas necessidades fisiológicas e cognitivas. Objetivo: Investigar os instrumentos de avaliação do sono em adolescentes brasileiros. Método: foram pesquisados artigos científicos nas bases de dados SCIELO e LILACS, tendo como critérios de inclusão o ano de publicação (2010-2015) e a abordagem direta ao tema. Foram excluídos artigos duplicados. Resultados: Foram inicialmente encontrados 102 artigos, sendo que 10 atenderam aos critérios. Conclusão: A análise dos estudos mais recentes realizados no Brasil demonstra uma predominância do uso do instrumento de avaliação PSQI - Índice de Qualidade de Sono de Pittsburgh (Pittsburgh Sleep Quality Index) em cinco dos estudos avaliados, indicando uma possível uniformização nas pesquisas brasileiras.
PALAVRAS-CHAVE: distúrbios do sono, instrumentos, adolescentes.