

SLEEP HABITS AND STARTING TIME TO SCHOOL IN BRAZILIAN CHILDREN

Tatiana A. Silva¹, Luciane B.C. Carvalho², Luciana Silva¹, Marilaine Medeiros¹, Vivian B. Natale³, Joao E.C. Carvalho⁴, Lucila B.F. Prado⁵, Gilmar F. Prado⁶

ABSTRACT - Objective: This study investigated the sleep habits in Brazilian children according to age, gender and starting time to school. **Method:** We investigated 2,482 scholars aged 7 to 10 years. We compared sleep habits, gender, and starting time to school (morning and afternoon). **Results:** Sixty-one per cent of the children presented sleep rituals before sleep. Milk drinking before sleep was more frequent among seven years old children. We found a progressive reduction with age in keeping the lights on. Girls used to leave an object to bed more than boys did. Children that studied in the morning presented reduced total sleep time, sleep earlier, and nap more frequently than children that studied in the afternoon. **Conclusion:** Starting time to school deeply influences sleep habits in Brazilian children from São Paulo City, in whom bed-time rituals are highly prevalent.

KEY WORDS: sleep habits, nap, total sleep time, bed-time, starting time to school, children.

Hábitos de sono e período escolar em crianças brasileiras

RESUMO - Objetivos: Estudar os hábitos de sono nas crianças brasileiras de acordo com a idade, sexo e período escolar. **Método:** Estudamos 2.482 crianças em idade escolar de 7 a 10 anos. Comparamos hábitos de sono, sexo e período escolar (matutino e vespertino). **Resultados:** 61% das crianças apresentaram rituais de sono antes de dormir. Beber leite antes de dormir foi mais freqüente entre as crianças de 7 anos de idade. Encontramos redução progressiva com a idade em se manter a luz acesa. Meninas possuíam mais objetos para dormir que os meninos. As crianças que estudavam no período matutino apresentaram redução do tempo total de sono, tinham sono mais cedo e os cochilos eram mais freqüentes do que as crianças que estudavam no período vespertino. **Conclusão:** O horário escolar tem muita influência nos hábitos de sono das crianças brasileiras da cidade de São Paulo, os rituais de sono sendo muito prevalentes.

PALAVRAS-CHAVE: hábitos de sono, cochilos, tempo total de sono, horário de ir para a cama, período escolar, crianças.

Sleep pattern in children differs physiologically and psychologically from adults' patterns. Evolution in sleep pattern follows the organic and functional maturation and brain electrogenesis variations. Sleep is a necessary stabilizer to reorganize and selectively reject some conflicts in terms of psychological regularity¹⁻³. Children understand sleep as a kind of separation from parents, what can be either feared or desired. Adaptive answers for defense and protection produce sleeping rituals in order to reduce distress. Getting ready for sleep requests mothers staying in the room, thumb sucking or milk drinking as well as demands for keeping lights or TV on, and taking a favorite toy to bed (transitional objects).

These rituals, in a magical way, calm down and are important for children's development. It allows them to work out the conflicts and gradually losing its strength to disappear completely with the time^{3,4}.

Age is an important factor considered when investigating children's sleep patterns. Children undergo alterations according to the age and some behaviors or attitudes (night feeding or enuresis) will be considered as normal or not^{1,2,5-7}. Sleep habits considerably reflect cultural differences like the time to go to bed and the total sleep time in children and adolescents⁶⁻¹³. Napping is a sleep habit that presents alterations according to the age^{1,2}. The frequency of naps is high in the first year of life,

Sleep Disorders Center, Federal University of Sao Paulo (UNIFESP), Sao Paulo SP, Brazil and Paulista University (UNIP), Sao Paulo, SP, Brazil; ¹PhD Department of Internal Medicine, UNIFESP; ²PhD Department of Neurology, UNIFESP; ³MD Department of Internal Medicine, UNIFESP; ⁴PhD Department of Psychology, UNIP; ⁵MD PhD Department of Neurology, UNIFESP; ⁶MD PhD Departments of Neurology and Internal Medicine, UNIFESP. Supported by Fundacao de Amparo a Pesquisa do Estado de Sao Paulo (FAPESP): 00/07513-3 and 98/11376-0).

Received 22 September 2004, received in final form 1 December 2004. Accepted 1 February 2005.

Dra. Lucila B.F. Prado - Rua Claudio Rossi 394 - 01547-000 Sao Paulo SP - Brasil. E-mail: lucila.dmed@epm.br

decreasing throughout preschool period and finally disappearing in school age children¹⁴. Sleep researches have been increasing over the last two decades. Even though, there are still very few studies on children's sleeping habits and most of them limited by sample and sampling procedures making it difficult to generalize its results. In Brazil, there are few studies on children's sleeping habits yet^{15,16}, and what we have are some data on African-Brazilian children of country areas and the indigenous population of Terena and Bororo villages. Among 2 and 3 years old, African-Brazilian children 80% share the bed until 10 years old. We found the same habits among the indigenous population of Terena and Bororo, children sharing the bed with their parents are a remarkable characteristic of this society¹⁷⁻¹⁹.

This study aims to verify the sleep habits of 7 to 10 years old children in São Paulo City, Brazil, observing their evolution according to age, gender and starting time to school. The reason we have included the starting time to school variable in this study is that in Brazil there are insufficient facilities for schools, what forces half of the children to study in the morning and others in the afternoon^{20,21}.

METHOD

We evaluated sleep habits' pattern of 7 to 10 years-

old children from August 1999 to June 2000, at nine elementary public schools in the Center-South area of Sao Paulo, a city of about 12 million people. Among them 850 thousand children aged from 7 to 10 years old attend 980 public schools²². We chose schools randomly within the 35 possible ones, representing each neighborhood of the Federal University of Sao Paulo (UNIFESP). The Ethics Research Committee of UNIFESP (# 447/00) approved the protocol. The children's parents and school Principals signed the consent forms.

All children received a questionnaire to assess sleep disorders²³ translated and culturally adapted to Brazilian Portuguese and filled in by their parents. In this questionnaire, we have included some questions on clinical conditions and sleeping habits of the children.

Out of the 5,400 questionnaire forms, 3,612 (67%) returned. We excluded 277 unanswered, 125 filled in incorrectly, 88 of children up 10 years old, and 640 children with sleep disorders according to Bruni et al.²³ criteria. In the remaining 2,482 questionnaires (Table 1) we described sleep habits taking into account gender, age (7, 8, 9 and 10 years old), and starting time to school (morning and afternoon).

The dependent variables were: rituals before sleep (drinking milk or another beverage, lights or TV on, and transitional objects), naps during the day, sleeping alone, total sleep time (less than 8 hours, more than 8 hours), time to go to bed (7:00-7:50PM, 8:00-8:50PM, 9:00-9:50PM, 10:00-10:50PM, 11:00-11:50PM, 12:00-1:30AM).

Table 1. Demography distribution of 7 to 10 years old children in this study.

	Girls		Boys		Total	
	n	%	n	%	n	%
Gender	1,282	52	1,200	48	2,482	100
Starting time to school-morning	676	51	659	49	1,335	54
Starting time to school-afternoon	606	53	541	47	1,147	46

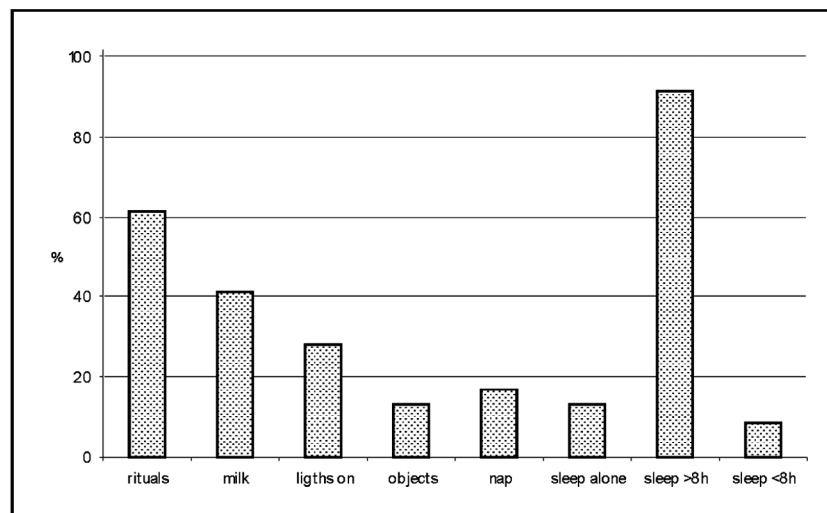


Fig 1. Frequency of sleep habits in 7 to 10 years old children (n=2,482).

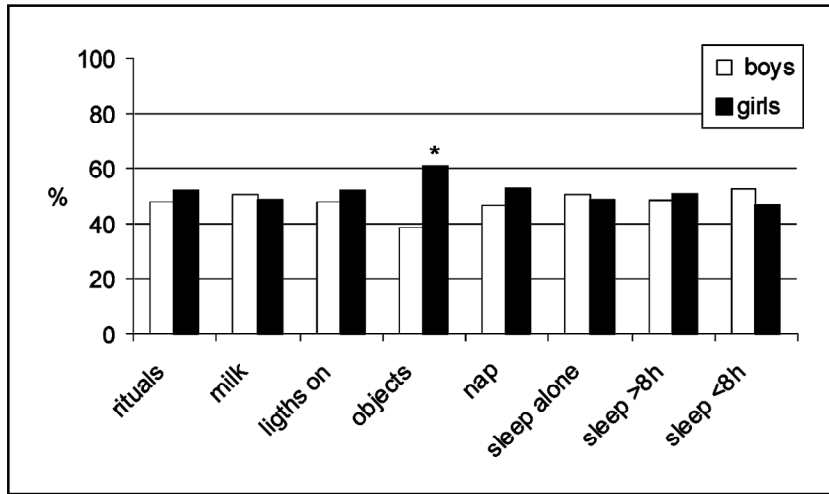


Fig 2. Frequency of sleep habits in boys (n=1,200) and girls (n=1,282). * p < 0.05

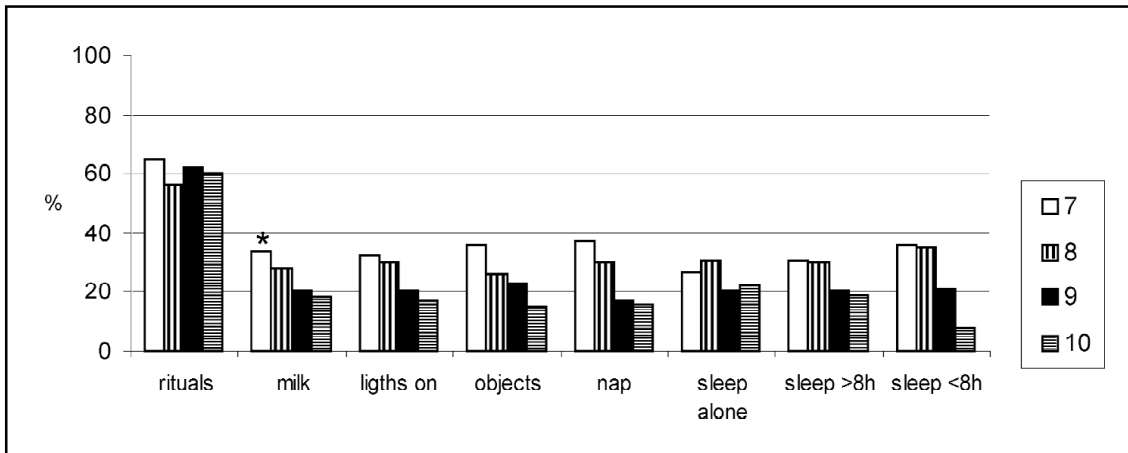


Fig 3. Frequency of sleep habits by age: 7 (n=780), 8 (n=754), 9 (n=503), and 10-years-old children (n=444). * p < 0.05

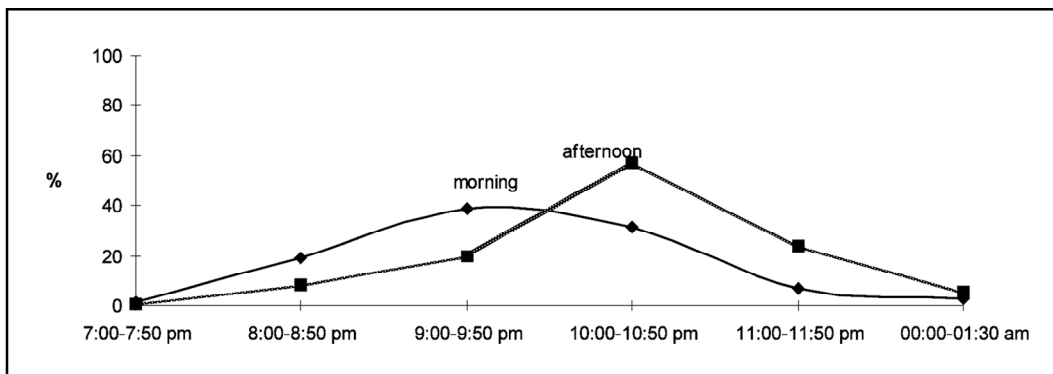


Fig 4. Time to go to bed in 7 to 10 years old Brazilian children according to starting time to school (morning and afternoon, N=2,482).

In Brazil due to the reduced number of school installations there are two starting time to school: morning starts at 7:00AM and finishes at 12:00PM, and afternoon starts at 1:00PM and finishes at 6:00PM. This practice forces the children to wake up earlier in order to get to school. We analyzed children' sleep habits within starting time to

school (morning and afternoon) comparing them to detect possible differences.

We performed a descriptive statistic and used Chi-square and Student t-test to compare categorical or quantitative variables. We adopted p<0.05 to decide about variable's association.

RESULTS

Rituals before sleep – We observed that 1,504 (61%) children had at least one ritual before sleep: drinking milk, demanding lights or TV on, take an object to bed (Fig 1). Fifty-seven (2.3%) children presented all the three rituals before sleep. We found the habit of drinking milk, chocolate or soda before bedtime in 1,019 (41%) children without significant difference between boys and girls (Fig 2), and we noticed the prevalence of this behavior in 7 years old children ($p < 0.001$). Seven hundred and one children (28%) needed lights or TV on to sleep, and there was no significant difference in gender (Fig 2). We found a progressive reduction of this behavior as children grow older (Fig 3). We observed that 321 children (13%) left an object to bed (Fig 1), this is more prevalent in girls ($p = 0.003$; Fig 2), and there is no significant difference among ages (Fig 3).

Naps – We observed that 423 children (17%) took nap (Fig 1), and there is a similar distribution between girls and boys (Fig 2). There was no significant difference of napping frequency according to age (Fig 3). Napping was more prevalent among children that studied in the morning (81%; $p < 0.001$).

Sleep alone – Three hundred and seventy-seven children (13%) of the 7 to 10 years old children slept alone in the bedroom (Fig 1). Out of these, 120 children (37%) were the only children. There was no significant difference in gender and age (Figs 2 and 3).

Total sleep time – The mean total sleep time for all children was 570 ± 95.6 minutes, mode of 440 minutes, ranging from 300 to 930 minutes.

Total sleep time more than 8 hours – Two thousand, two hundred and seventy-one children (91.5%) had total sleep time more than 8 hours (Fig 1). There was no significant difference within gender (Fig 2) and age (Fig 3).

Total sleep time less than 8 hours – Two hundred and ten children (8.5%) had total sleep time less than 8 hours (Fig 1). There was no significant difference between gender (Fig 2). The comparison among ages showed a significant reduction of total sleep time in 10 years old children ($p < 0.001$; Fig 3).

Time to go to bed – The more frequent bedtime was at 10:00-10:50PM. Children that studied in the

morning went to bed more frequently at 9:00-9:50PM ($p < 0.001$; Fig 4). There was no significant difference related to gender, but when we observed children who went to bed after midnight (5.5%) there was a predominance of this pattern among boys (60%; $p < 0.003$) and among 10 years old children (33.8%; $p < 0.005$).

DISCUSSION

There are few studies describing sleeping habits in school-aged children. The quantitative studies are quite rare and limit to a certain age range. Preschool children are typical in insisting on a specific routine by the time of going to sleep. They demand to take a favorite toy, drinking milk, lights or TV on and the mother's presence in order to be able to sleep²⁴.

Although some studies showed those rituals are quite rare or absent among school-aged children, we observed these rituals in 61% of our children^{3,4,24}.

Napping is a sleep habit that changes according to the age^{1,2,5,6,9,12,14}. During the first year of children's life when the circadian rhythm is developing, sleep consists in many daily sleep episodes that gradually consolidate in only one sleep episode during the night. The frequency of children who sleep during the day is extremely high in the first year of life. Naps go down as they grow older and almost disappear in school-aged children, remaining just some episodes of napping.

In this study, the habit of napping was present in school aged-children with a higher frequency in girls and in 7 years old children, prevailing in children that studied in the morning. This finding may be related to compensation for sleep deprivation once this group had a reduced total sleep time when compared to children that studied in the afternoon. Other researches also reported this fact^{13, 24,25}.

Only 7% of the children slept alone, most of them were only child and the habit of sleeping alone had no influence in the child's sleeping pattern. Literature describes age as being the most important factor in determining the time to go to bed and total sleep time in the first year of life⁹. As the child grows older, the total sleep time reduces. This phenomenon is featured by the sleep phase delay that is a particular adolescent's characteristic¹².

Brazilian children in our study went to sleep among 9:00-9:50PM. Starting time to school also determined the sleeping time, because children that studied in the morning went to bed 1 hour earlier than the others. Although 10 years old children need

more time to sleep they tended to go to sleep among 00:00 and 1:30AM with a higher frequency in boys.

These natural changes in sleeping time during transition from childhood to adolescence are associated to physiologic modifications. It makes people to feel sleepy later at night, and as a consequence, to wake up later in the morning²⁴⁻²⁶. However school attendance in the morning starting at some time between 7:00 - 7:30AM forces the children that studied in the morning to wake up quite early and go against endogenous tendencies to sleep and wake up later²⁴.

We know that poor sleep can modify children's mental conditions, causing problems of behavior and attention^{15,27-28}, disturbing cognitive functioning even after a single night of sleep restriction²⁶, compromising their ability to fulfill school demands.

Regarding starting time to school, these results also showed in a different perspective how population has been neglected as governments decide policies on education²⁰. Due to a chronic lack of facilities, Brazilian children health needs follow unsuited²¹.

In this study, we used answers given by the parents in a questionnaire that evaluates sleeping habits in children. It might happen that parents overestimate some information and underestimate others when they are not totally aware of the child's habits. They can mistake for example the time the child goes to bed by the time the child actually falls asleep.

Although measurements allowed by electroencephalography and polysomnography are quite precise, a sleep questionnaire in adults has shown good agreement with that methods²⁹. In spite of criticisms, questionnaires are largely used when researching big samples and the questionnaire in this study proved it quite useful. It also presented very few difficulties to answer by parents with low formal education.

The habits of Brazilian children do not differ from the data we found in literature for other populations. The adopted starting time to school (morning and afternoon) has changed sleep patterns in these children, mostly the sleeping time, total sleep time and naps, suggesting that some attention from the Brazilian authorities should be addressed to this important issue.

REFERENCES

1. Kryger MH, Roth T, Dement WC. Principles and practice of sleep medicine. Philadelphia: WB Saunders Company 2000:428-431.
2. Guilleminault C. Sleep and its disorders in children. New York Raven Press: 1986:46-48.
3. Ajuriaguerra J. Manual de Psiquiatria Infantil. New York: Masson Press 1986:215-238.
4. Winnicott D. Transitional objects and transitional phenomena. Int J Psychoanal 1953;34:89.
5. Beltramini AU, Hertzog ME. Sleep and bedtime behavior in preschool-aged children. Pediatrics 1983;71:153-158.
6. Ellis EM. Watchers in the night: an anthropological look at sleep disorders. Am J Psychother 1991;45:211-220.
7. Rona RJ, Li L, Guilliford MC, Chinn S. Disturbed sleep: effects of sociocultural factors and illness. Arch Dis Child 1998;78:20-25.
8. Ottavino S, Giannotti F, Cortesi F, Bruni O, Ottavino C. Sleep characteristic in health children from birth to 6 years of age in the urban area of Rome. Sleep 1996;19:1-3.
9. Klackenberg G. Sleep behavior studied longitudinally: data from 4-16 years on duration, night awakening and bed-sharing. Acta Paediatr Scand 1982;71:501-506.
10. Thorleifsdottir B. Sleep and sleep habits from childhood to young adulthood over a 10-year period. J Psychosom Res 2002;53:529-537.
11. Guilliford MC, Price CE, Rona RJ, Chinn S. Sleep habits and height at age 5 to 11. Arch Dis Child 1990;65:119-122.
12. Sierol NV. Hábitos del sueño en niños. An Esp Pediatr 2002;57:127-130.
13. Kelman BB. The sleep needs of adolescents. J Sch Nurs 1999;15:14-19.
14. Weissbluth M. Naps in children: 6 months-7 years. Sleep 1995;18:82-87.
15. Carvalho LBC, Prado LBF, Prado GF, et al. Cognitive dysfunction in children with sleep disorders. Arq Neuropsiquiatr 2004;62:212-216.
16. Almeida MM, Carvalho LBC, Prado GF, et al. Association between emotional disorders and sleep disorders in Brazilian elementary school children. Sleep 2004;27(Abstract):A108.
17. Reimão R, Souza JCRP, Gaudioso CE. Sleep characteristics in children in the isolated rural African descendant community of Furnas do Dionisio, state of Mato Grosso do Sul, Brasil. Arq Neuropsiquiatr 1999;57:556-560.
18. Reimão R, Souza JCRP, Gaudioso CEV. Sleep habits in Native Brazilian Terena children in the state of Mato Grosso. Arq Neuropsiquiatr 1998;56:703-707.
19. Reimão R, Souza JCRP, Gaudioso CEV, Almirão RI, Medeiros MM. Sleep habits in Native Brazilian Bororo children. Arq Neuropsiquiatr 1999;57:14-17.
20. Souza RF. Childhood times, school times: the ordering of school time in the Sao Paulo State School System (1892-1933). Educação e Pesquisa 1999;25:127-143.
21. Altmann H. Influences of the World Bank on the Brazilian education project. Educação e Pesquisa 2002;28:77-89.
22. Castro MHG. Avaliação do sistema educacional brasileiro, tendências e perspectiva. Brasília: Instituto Nacional de Estudos e Pesquisas Educacionais, Guimaraes de Castro. <http://www.Inep.gov.br> Accessed in July, 2003.
23. Bruni O, Ottavino S. The sleep disturbance scale for children (SDSC): childhood and adolescence. J Sleep Res 1996;5:251-261.
24. Carskadon MA. Adolescents sleep pattern, circadian timing, and sleepiness at a transition to early school days. Sleep 1998;21:871-881.
25. Strauch I, Meier B. Sleep need in adolescents: a longitudinal approach. Sleep 1988;11:378-386.
26. Carskadon MA, Vieira C, Acebo C. Association between puberty and delayed phase preference. Sleep 1993;16:258-262.
27. Randazzo AC, Muehlbach MJ, Schweitzer PK, Walsh JK. Cognitive function and sleep restriction. Sleep 1998;21:861-867.
28. Paavonen EJ, Aronen ET, Moilanen I, et al. Sleep problems of school-aged children: A complementary view. Acta Paediatr 2000;89:223-228.
29. Lewis AS. Subjective estimates of sleep: an EEG evaluation. Br F Psychol 1969;60:203-208.