SPS-SPP Recommendations: The Practice of Naps for Nursery and Preschool Children

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Recommendation

Daytime napping should be encouraged for children up to 5-6 years of age.

Risks: There is an association of sleep deprivation in children with potentially short- and long-term consequences, including emotional and behavioral dysfunction, risk of accidental falls, low cognitive performance and learning, obesity, and hypertension.

Target groups: Children in nursery (3-36 months of age) and preschool (3 to 5-6 years of age)

Places: Nurseries, preschools, and public or private establishments.

Preliminary note

The *Secção de Pediatria Social* (SPS) of the Sociedade Portuguesa de Pediatria (SPP), in accordance with article 4 of its statutes, aims to protect and promote the defense of the rights of children and young individuals, as part of an evolving society. The current lack of clear recommendations on naps for children in nurseries and preschools puts the current and future health and well-being of our children at significant risk.

Children in Portugal, especially those attending public establishments, do not usually have a nap after 3 years of age.

The aim of these recommendations is to standardize and encourage best practice for daytime sleep or napping for children from 3 months to 36 months of age (nursery) and from 3 to 6 years of age (preschool) in public or private establishments.

Introduction

The duration of daily sleep decreases progressively with age and multiple population studies have been conducted in order to determine the optimum number of hours of sleep for each age group. Consensus on the duration of sleep emerged in June 2016 in the United States (US) from the American Academy of Sleep Medicine (AASM), which published a statement endorsed by the American Academy of Pediatrics.[1] This consensus was reached after a 10-month project headed by a panel of 13 leading pediatric sleep specialists from the US. This expert panel reviewed 864 published scientific articles addressing the relationship between sleep duration and health in children and used a formal classification system to assess the scientific evidence.

Most of the European Nordic countries recommend a number of hours of sleep similar to the number recommended by the AASM, but there is still no consensus among the rest of the European nations.[2,3]

In Portugal, most children do not have the number of hours of sleep that they should.[4-10] In nursery institutions, naps are a common practice until the age of 3, but for older children daytime sleeping is not encouraged and in many cases even disallowed. Sleep deprivation and a shortfall in the total daily sleeping hours are common problems in pediatric clinical practice and a cause of concern for pediatricians, family doctors, and families in general.[4-10]

The *Secção de Pediatria Social* (SPS) of the Sociedade Portuguesa de Pediatria (SPP) has, therefore, requested a panel of five recognized Portuguese experts in this area to issue a consensus statement on recommendations for daytime sleep (naps) for children until the end of the preschool phase (5-6 years old). These national level recommendations are intended to be used as a guide

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and were elaborated through the systematic analysis of published data, together with real-life clinical information and always considering the different characteristics and limitations of the relevant institutions in Portugal.
The Associação Portuguesa do Sono, member of the Assembly of National Sleep Societies of the European Sleep Research Society, endorses these recommendations.

Children and sleep

It is impossible to live without sleep, just as you cannot live without breathing. The sleep-wake cycle is very important in the development and homeostasis of the human species and plays a particularly important role in childhood.
Contrary to popular belief, sleep (to which we devote a third of our existence), is not merely the absence of wakefulness. Sleep is a highly complex state during which physical and psychological recovery is ensured together with the reorganization of many of the activities developed by the different organ systems throughout the day. Cell renewal, hormone and antibody production, protein synthesis, and metabolic regulation take place during sleep and, in children, sleep also contributes significantly to body growth.[11-18]
Sleep cycles at birth are not influenced by day/night cycles. Newborn babies sleep on average 17 hours per day and are woken by hunger. Gradually, after the first month of life, sleep settles into the night-time period. At around the age of 6 months, an infant should take two to three naps during the day. After the first year of life, sleep duration tends to drop to an average of 11-14 hours distributed between three periods, one at night and two during the day, in the morning and afternoon. Between the 15 and 30 months, the morning nap is naturally phased out, but the afternoon nap continues, until the ages of 3 to 5 years, sometimes even later.
The total hours of sleep per day according to the recommendations in the consensus statement published by the AASM[1] are as follows:
- Infants aged 4 to 12 months: 12 to 16 hours every 24 hours (including naps);
- Children aged 1 to 2 years: 11 to 14 hours every 24 hours (including naps);
- Children aged 3 to 5 years: 10 to 13 hours every 24 hours (including naps);
- Children aged 6 to 12 years: 9 to 12 hours of nocturnal sleep every 24 hours;
- Adolescents aged 13 to 18 years: 8 to 10 hours of nocturnal sleep every 24 hours.

These recommendations did not include ages under 4 months due to the wide range of normal patterns and duration of sleep in this age group as well as insufficient scientific evidence of the associated health consequences.
It is estimated that children between the ages of 1 and 2 years need 10-11 hours of nocturnal sleep and 2-4 hours of daytime sleep and children between the ages of 3 and 5 years need 10-11 hours of nocturnal sleep and 1-3 hours of afternoon naps.
Adequate duration, high quality, regularity, and an absence of disruptions or any disturbances are required for a healthy sleep.
It is the responsibility of the families to comply with the basic rules for sleep hygiene by:
- Setting a regular bedtime every day and maintaining this during weekends, with a maximum variation of 30 minutes;
- Establishing a bedtime routine with an identical ritual that precedes the bedtime (for instance putting on pajamas, brushing teeth, reading a story);
- Putting the child to bed while they are still awake and allowing the use of a transition object, such as a diaper, pacifier, or doll;
- Avoiding having the child fall asleep in a place other than the bed itself;
- Avoiding any stimulating activity such as physical exercise before falling asleep;
- Removing any screen use (television, mobile phone, tablet, or video games) before sleeping.

While it is up to families to foster the right quality and quantity of nocturnal sleep, nurseries and preschool establishments are responsible for ensuring the same for daytime sleep for the children under their care.

Sleep and Portuguese children

Given that naps at preschool age are not assured, there might be a high percentage of children with chronic sleep deprivation.[4-10]
Preschool children (3 to 5-6 years old) should ideally have 10 to 13 hours of sleep per day, of which between 10 to 11 hours of nocturnal sleep and one to three hours of afternoon nap.[1-3]
Children who start their day at the preschool institution between 8:00 and 9:00 am need about 1.5 hours to wake up, bathe, have a proper breakfast, and then be taken there. Therefore, they will need to be woken between 7:00 and 7:30 am. Given the general circumstances of daily family life, especially for families who live in urban areas, it is not uncommon for these children to go to sleep at night between 9:00 pm and 10:00 pm.

Therefore, average nocturnal sleep will only be 9 to 10 hours at best. If the total 24-hour sleep duration should be 10 to 13 hours, there is an immediate shortfall of two to four hours of sleep. Therefore, children who do not have an early-afternoon nap of a minimum of one to two hours are obviously sleep-deprived. In many children, this deprivation may result in naps occurring later in the day or even on the way home, which interferes with nocturnal sleep and causes behavioral changes that affect the well-being of the child and family.

It is, therefore, easy to conclude that if naps are not provided and encouraged in preschool settings (public or private), children will be subject to chronic sleep deprivation, which will affect their physical and mental health.[1-18]

One study showed that Portuguese preschool children sleep on average 10 hours and six minutes with a standard deviation (SD) of ± 56 minutes.[4] Their average bedtime is 21:00 (SD ± 30 minutes) and they get up at 7:20 (SD ± 28 minutes). During the weekend, children go to bed on average one hour later, despite the fact that the time they wake up at (at this age) is similar to that of during the week, which adds to the ongoing sleep deprivation. In other European countries, the average time of sleep is 11 hours and eight minutes (SD ± 60 minutes) at age 4 (ranging from 9.7 to 14 hours), and 11 hours and four minutes (SD ± 54 minutes) at age 5 (ranging from 9.5 to 13.3 hours), a significant difference from Portuguese children, to which daytime naps are certainly an important factor.

In another study performed in a Portuguese population, including 1,450 children, it was found that 97% of children at age 2 had a daytime nap, with this number decreasing to 68% at age 3, to 28.9% at age 4, and to only 7.8% at age 5.[5] However, at 8 years of age, 1.6% of the children still had a regular nap, which shows the individual variability of sleep requirements. These data are similar across cultures and reflect the universal need for daytime sleep for a large proportion of children under 5 years of age. Compared to other European countries, the study showed that the total daily time of sleep in Portuguese preschool children is among the lowest, especially between the ages of 4 and 5 years. The authors took a meta-analysis reference into account,[18] showing that Portuguese children sleep on average one hour less. The difference increases to 1.5 hours for the group of 4- and 5-year old children. The authors explain this phenomenon by referring to the fact that Portuguese preschool children do not go to bed much earlier than older children, unlike in other countries. Therefore, maintaining age-appropriate sleep time greatly depends on naps. In fact, at 4 and 5 years of age, the frequency of naps is drastically reduced, which leads to a shorter sleeping time. In their clinical experience, late bedtimes derive from flexibility on the part of parents, but also with the end-of-day schedules of families. Ideally, children should be put to bed early, but when this is not possible, we argue that a nap should be allowed or even encouraged after the age of 3.[18]

Interestingly, it seems that the total number of hours of sleep does not seem to be affected by naps because children who sleep during the day tend to go to bed a little later.[12-17] However, in a society where insufficient nocturnal sleep is frequent, naps may give preschoolers the chance to meet their sleep needs.

The benefits of a daytime nap

There is clear scientific evidence that a good quality sleep, for the recommended number of hours, on a regular basis, is associated with better health outcomes, including aspects such as attention, behavior, learning capabilities, memory, emotional balance, quality of life, and general mental and physical health.[19-28]

Daytime sleep seems to nurture qualitative changes in memory which involve abstraction. Abstraction is particularly important for infants, as it is essential for cognitive and language development and enabling a greater plasticity in learning.[19] At preschool age, napping has been reported as being a valuable resource for memory consolidation.[28]

Indeed, studies conducted on various age groups indicate that, as children grow and reach greater neurological maturity, they can cope with increasingly longer waking intervals between an initial learning period and the sleep-dependent memory consolidation. Therefore, the time window during which sleep impacts memory is much narrower in infants and, therefore, there are benefits in taking a nap within the first four hours after learning in order to better define and retain the information received.[19-28] More frequent periods of sleep enable them to encode and consolidate the continuous influx of information to which they are exposed on a daily basis.

One study found that naps in preschool children enhance learning by enabling early daytime memorization when compared with equivalent waking intervals.[24] These benefits of napping are greater in children who usually nap, regardless of their age. The authors state that, when deprived of a nap, the decrease in performance is not recovered during the following night. They conclude that naps enhance academic achievements in early education and that safeguards should be provided for this to take place. The authors go so far as to recommend naps to aid children with learning disabilities.

Until what age should naps continue?

As with adults, there are long and short sleepers. Some 4-year-olds are fully awake after only 10 hours of sleep and are unable to nap, while others have difficulty waking after 11 hours of nocturnal sleep and need a one to two hours nap in the early afternoon.[18]

Indicators that a child is ready for a single daily sleep cycle at night are:

- A prolonged resistance to fall asleep at bedtime because the child is not tired;
- Waking during the night or much earlier in the morning compared to the previous routine;
- Inability to fall asleep during the initial 30 to 40 minutes of the nap period;
- Ability to spend the entire day awake with adequate attention, good mood, and activity maintained without the need for a nap.

Although insufficient sleep is linked to a variety of behavioral, attention, and cognitive problems, not all children undergo the same changes which may occur as a result of sleep loss associated with shorter sleep.[12-14]

Individual variability in the need for sleep is influenced by genetic, behavioral, medical, and environmental factors. Further scientific research is still required for a clearer understanding of the biological mechanisms underlying the need for sleep.

As previously noted, most children have a biological need to follow a biphasic sleep cycle (nocturnal sleep + nap) during the preschool period. From the age of 4-5 years, some children begin the transition to a single-phase sleep cycle (nocturnal sleep only), although most still need a nap until 5-6 years of age for appropriate and full physical development and well-being.

Long- and short-term repercussions of sleep deprivation

In light of the current scientific knowledge, children who are deprived of naps at preschool age can experience a wide range of metabolic, physical, psychological, and emotional disorders, with potentially irreversible short- and long-term consequences (Table 1).[29-35]

Families who are concerned about the quality or the amount of sleep of their children, be it sleeping too little or in excess of the above-mentioned recommended hours, should consult their pediatrician or family doctor for an assessment of any possible sleep pathologies.

Loss and fragmentation of sleep are known to directly affect mood and its regulation, with irritability and emotional dysregulation.[29] Manifestations of sleep deprivation range from the usual signs of drowsiness, such as eye rubbing or laying head on the desk, to externalized behaviors, such as increased impulsivity, motor agitation and aggression, distraction, and inability to complete tasks.[29-31]

In children, unlike adults, sleep deprivation is more often related to symptoms of impulsivity and low attention levels that can be confused with attention deficit hyperactivity disorder.

Sleep deprivation also affects neurocognitive functions with a reduction in mental flexibility, abstract thinking, motor dexterity and memory, with the subsequent learning impairment.

There is also a clearly established relationship between increasing accidental injuries and frequency of falls, often toward the end of the afternoon.[32]

Sleep deficit during the early years of life may induce long-term consequences during adolescence and adulthood. Short-duration sleep in children has been shown to be associated with high body mass index years later and through adulthood.[33-35] A longitudinal study by Snell et al. showed that children who slept longer had a lower body mass index and lower rates of overweight five years later, mainly in the group of younger children (3 to 7.9 years of age).[34] A 32-year longitudinal study by Landhuis et al. suggested that a shorter time of sleep in childhood is inversely related

Table 1. Repercussions of sleep deprivation in children

Short-term consequences	
Mood and affect modulation disturbances	Irritability/tantrums Greater emotional reactivity Fluctuating mood Loss of emotional control
Neurocognitive function disruption	Lack of attention/distraction Inability to complete tasks Reduced mental flexibility Reduced abstract reasoning Memory disturbances
Behavioral changes	Daytime sleepiness Aggression Impulsivity/hyperactivity
Motor changes	Reduced motor skills Increased number of accidental injuries and frequency of falls
Long-term consequences	
Learning	Poor school performance
Behavioral	Hyperactivity and attention deficit
Psychological	Anxiety Depression
Metabolic changes	Disturbed endocrine function Disturbed immune function Disturbed glucose metabolism Excess weight/obesity Hypertension
Disturbance of family life	Higher risk of maternal depression Higher risk of family dysfunction

to the risk of obesity in adulthood, regardless of other associated factors.[35] In addition to the consequences for neurodevelopment and behavior, a link has been found between child sleeping disorders and the occurrence of cardiovascular and immunologic diseases, changes in glucose metabolism and endocrine dysfunctions, with a particular risk for obesity and hypertension.[33-35]

Sleep disruption in children and young people can also negatively affect parents with the risk of maternal depression and family dysfunction being notably higher.

Recommendations

The aim of these recommendations is to standardize and help to promote the practice of daytime sleep or napping for children from 3 months to 36 months (nursery) and from 3 to 6 years of age (preschool) in public or private establishments.

Given the enormous interindividual variability in sleep needs, a rule cannot be established only based on age, and it is important to emphasize that napping should not be mandatory.

In view of the balance of the benefits and harmful consequences that the deprivation of naps can have for a child, there should be provision for naps until school age, and the individual need for sleep of each child should be considered.

The priority is currently to ensure that all children have enough high-quality sleep at the appropriate times, according to their individual needs.

General recommendations

A. Suitable conditions (a bed/mattress, a calm, dark environment, appropriate temperature, low noise levels and surveillance) should be provided for all preschool children in order to ensure quality sleep when napping.

B. Each child should have an individual nap plan agreed with the family.

C. Naps should be encouraged by the preschool teacher upon signs of sleep deprivation.

Naps in nursery

Children under 24 months of age (< 2 years)

- Individualized plan that is suitable for the child: number, schedule, and length of naps.
- Duration of daytime sleep: two to three hours (split between one and three naps).

In this age group, children usually have two periods of daytime sleep: morning and afternoon. From 15 to 30 months of age, the morning nap will be naturally phased out.

Children between 24 and 36 months of age (2 to 3 years)

- Only one nap, ideally at the beginning of the afternoon.
- Duration of nap: about two hours.

Naps in preschoolers

Children between 3 and 5-6 years old

- A single nap, preferably in the early afternoon.
- Duration of nap: 90 minutes or less.
- The child may be awakened after this period.

After the age of 4 years, not all children need to take a nap on a regular basis, so the family and kindergarten teacher should assess together the need for their practice in each child.

In cases where it is decided not to take a regular nap, it should be facilitated and encouraged in the early afternoon whenever the child shows signs of drowsiness or tiredness.

Keywords: Child, Preschool; Infant; Portugal; Practice Guidelines as Topic; Child Day Care Centers; Nurseries, Infant; Schools, Nursery; Sleep

Conflicts of Interest

The authors declare that there were no conflicts of interest in conducting this work.

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Consent for publication

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Recomendação: A sesta deverá ser facilitada e promovida nas crianças até aos 5-6 anos de idade.
Riscos: A privação do sono na criança está associada a efeitos negativos a curto e a longo prazo em diversos domínios, tais como o desempenho cognitivo e aprendizagem, a regulação emocional e do comportamento, o risco de quedas acidentais, de obesidade e hipertensão arterial.
Grupos-alvo: Crianças em creche (3 meses aos 36 meses de idade) e crianças em idade pré-escolar (3 aos 5-6 anos de idade).
Locais: Creches e infantários, estabelecimentos públicos ou privados.

Palavras-Chave: Creches; Criança Pré-Escolar; Escolas Maternais; Guias de Prática Clínica como Assunto; Infantário; Lactente; Portugal; Sono