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Sleep pattern in children aged 12 to 36 months age

Padrão de sono em crianças de 12 a 36 meses de idade

Patrón del sueño de niños de 12 a 36 meses de edad

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Abstract

Objective: To evaluate the sleep pattern in children aged 12 to 36 months. **Method:** Cross-sectional study, carried out in a sample of 808 children aged 12–36 months who attended day care centers in the district of Viseu, Portugal. The data was collected through a questionnaire applied to parents between November 2018 and September 2019. The study was approved by the Ethics Committee of Instituto de Ciências Biomédicas Abel Salazar, Portugal. **Results:** The children were found to sleep between 9 h 30 min and 18 h (M=12 h 25 min ±1 h 02 min) per day during the week and between 9 h and 19 h (M=12 h 49 min ±1 h 15 min) on weekends. The children went to bed and woke up later on weekends than during the week (M=21 h 42 min ±40 min, M=8 h 15 min ±50 min, respectively). Most did not take morning naps, but only afternoon naps. **Conclusion:** The results indicate that most children (91.5% on weekdays; 85.6% on the weekend) sleep the recommended number of hours. The youngest are the ones who sleep the most. **Implications for practice:** It is important that, during child health surveillance consultations, nurses provide health education to parents about the importance of maintaining a sleep pattern that is adequate for their child's age.

Keywords: Nursing; Infant; Preschool; Child health; Sleep.

Resumo

Objetivo: Avaliar o padrão de sono de crianças de 12 a 36 meses. **Método:** Estudo transversal, realizado em uma amostra de 808 crianças com 12–36 meses de idade, que frequentavam creches no distrito de Viseu, Portugal. Coleta de dados realizada por meio de questionário aplicado aos pais, entre novembro de 2018 e setembro de 2019. Estudo aprovado pela comissão de ética do Instituto de Ciências Biomédicas Abel Salazar, Portugal. **Resultados:** Verificou-se que durante a semana as crianças dormiam, por dia, entre 9h 30m e 18h (M=12h 25m ±1h 02m) e no fim de semana, entre 9h e 19h (M=12h 49m ±1h 15m). No fim de semana, as crianças deitavam-se e acordavam mais tarde que à semana (M=21h 42m ±40m, M=8h 15m ±50m, respetivamente). A maioria não dormia a sesta da manhã, somente a da tarde. **Conclusão:** Os resultados indicam que a maioria das crianças (91,5% semana; 85,6% fim de semana) dorme o número de horas recomendado. As mais novas são as que dormem mais. **Implicações para a prática:** É importante que, nas consultas de vigilância de saúde, os enfermeiros realizem educação para a saúde direcionada aos pais sobre a relevância de manter um padrão de sono adequado à criança.

Palavras chave: Enfermagem; Lactente; Pré-Escolar; Saúde da criança; Sono.

Resumen

Objetivo: Evaluar el patrón de sueño de niños de 12 a 36 meses. **Método:** Estudio transversal, realizado en una muestra de 808 niños de 12 a 36 meses que asistían a guarderías en el distrito de Viseu, Portugal. La recolección de datos se realizó mediante cuestionario aplicado a padres entre noviembre de 2018 y septiembre de 2019. El estudio fue aprobado por el Comité de Ética del Instituto de Ciências Biomédicas Abel Salazar, Portugal. **Resultados**: Se encontró que en los días laborables los niños dormían, por día, entre 9h 30m y 18h (M=12h 25m ±1h 02m) y los fines de semana entre 9h y 19h (M=12h 49m ±1h 15m). Los fines de semana los niños se acostaban y se despertaban más tarde que en la semana (M=21h 42m ±40m, M=8h 15m ±50m, respectivamente). La mayoría no dormía la siesta por la mañana, pero sí por la tarde. **Conclusión:** Los resultados indican que la mayoría de los niños (91,5% en días laborables, 85,6% en fines de semana) duermen el número de horas recomendado. Los más pequeños son los que más duermen. **Implicaciones para la práctica:** Es importante que, en las consultas de vigilancia de la salud infantil, las enfermeras brinden educación sanitaria a los padres sobre la importancia de mantener un patrón de sueño adecuado a la edad del niño.

Palabras clave: Enfermería; Infantil; Preescolar; Salud de los niños; Sueño.

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INTRODUCTION

Sleep is an important parameter for children's development and its relevance has been associated to a healthy physical, cognitive, and behavioral development. It has been shown to be as important to human survival as nutrition. Most small children (aged 12 to 36 months) spend half or more than half the day sleeping[1].

Sleep is a natural, basic function subject to continuous evolution throughout life. All human beings spend at least one-third of their lives sleeping[2].

As a physiological process, sleep is structured as REM (rapid eye movement – lighter sleep) and NREM (non-rapid eye movement – deeper sleep)[3]. Neuronal activity varies with sleep status: it is lower than when awake during NREM sleep and higher than when awake during REM[4].

Sleep pattern is known to present a circadian cycle every 24 hours and sleep is not a continuous process, being processed in cycles that change during the first years of life[4], with significant changes and individual variability in the sleep pattern throughout development[5]. The daily sleep-wake cycle depends on the interaction of two factors: the homeostatic process of sleep and the circadian process, named the "Two-process Model". In the sleep cycle, for 11-month-olds, REM sleep lasts 10–45 minutes, NREM lasts around 20 minutes, and transition lasts nearly 10 minutes[4].

It is impossible for individuals to survive without sleeping and, for a healthy physical, mental, and intellectual development, regular sleep is required.

There are many factors which may lead to sleep problems. The cause is sometimes unknown. In other cases, they are associated to certain medical conditions (heart failure, restless legs syndrome, headache), psychological conditions (depression, anxiety) or to other factors (environmental problems, use of medication, childhood trauma)[3].

In infants and preschoolers, the importance of sleep is related to the children's development factors in the areas of language, memory, and behavior[6-8].

Several entities, both national and international, estimate that children aged 12 to 36 months of age should sleep between 11 and 14 hours per day and, ideally, from 12 to 24 months, sleep 10 to 11 hours at night and 2 to 4 hours in daytime naps, whereas 36-month-olds should sleep from 10 to 11 hours per night and 1 to 3 hours in daytime naps[9-11].

Considering the child's age, the family will play a fundamental role in the acquisition of healthy sleep habits. Sleep is not always properly addressed in Nursing consultations[1]. In this context, health professionals, particularly nurses, also have the mission to point out the importance of this life activity, aiming at a healthy development of children and providing family support for awareness of possible consequences. This study aims at assessing the sleep pattern of children aged 12 to 36 months attending daycares in the district of Viseu, Portugal, during the week and on weekends, assessing the distribution of nighttime sleep and naps during these periods.

METHOD

Exploratory, cross-sectional, descriptive, and relational study. The target population included children aged 12 to 36 months attending daycares in the district of Viseu, Portugal, who constituted a non-probabilistic convenience sample. The 94 private institutions of social solidarity (IPSS as per its acronym in Portuguese) and private daycares in the district of Viseu were contacted. Out of the 68 (72.3%) which accepted study participation, 62 were IPSS and 6 were private daycares.

After a pre-test of the instrument in a sample of children in the same age group, the data collection was conducted through a questionnaire between November 2018 and September 2019.

The questionnaires were delivered to parents of all the children who attended the institutions accepting study participation. During delivery, the purpose and objectives of the study were explained. Out of the 2,036 sent questionnaires, 828 were returned and 808 were validated, given that 20 were incomplete.

The questionnaire included questions aimed at children's sociodemographic characterization and their sleep patterns. The data referring to sleeping hours were obtained through open questions: time of going to bed and waking up and duration of morning and afternoon naps during the weekly routine and on weekends. Subsequently, the data were recodified in three groups which took into account national and international recommendations related to sleep hours for children in this age group. For statistical data analysis, IBM Statistical Package for the Social Sciences (SPSS) 25 was used. The data were explored through descriptive statistics: absolute frequencies and percentages, measures of central tendency, namely the mean, and measures of dispersion, such as variation amplitude, coefficient of variation, and standard deviation. Inferential statistics was also employed, namely univariate and bivariate analysis. For all the analysis, the statistical significance was accepted for values $p < 0.05$ and adjusted residual values ≥1.96.

The study was approved by the Ethics Commission (CETI) of Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto (opinion n. 263/2018/CETI) and authorized by those in charge of the involved daycares. All participants signed an informed consent form.

RESULTS

The sample included 808 children, 46.5% of which were aged 12 to 23 months; 44.1%, between 24 and 35 months; and 9.4% were 36 months old. Most (50.4%) were male.

The number of nighttime sleep hours during the week ranged from 8 h to 13 h (M=10 h 22 min ±42min) and on weekends, from 8 h 30 min to 13 h 30 min (M=10 h 36 min ±49 min).

Going to bed and waking time

During the week, 42.8% of children were found to sleep before or at 9 PM and 26.7% went to bed after 9:30 PM (38.0% aged 12–23 months, 50.0% aged 24–35 months, 12.0% aged

Table 1. Time of sleeping and waking up during the week and on the weekend per child age. Viseu, Portugal, 2019.

Age	12-23 months		24-35 months		36 months		Total		Residuals			X^2(p)
Variables	n (376)	% (46.5)	n (356)	% (44.1)	n (76)	% (9.4)	n (808)	% (100.0)	1	2	3	
Time going to bed – Week												
≤ 9:00 PM	182	52.6	136	39.3	28	8.1	346	42.8	**3.0**	-2.4	-1.1	
>9 PM ≤ 9:30 PM	112	45.5	112	45.5	22	8.9	246	30.4	-.4	.6	-.3	**12.1(*)**
> 9:30 PM	82	38.0	108	50.0	26	12.0	216	26.7	-3.0	**2.1**	1.5	
Time going to bed – Weekend												
≤ 9:00 PM	134	61.5	75	34.4	9	4.1	218	27.0	**5.2**	-3.4	-3.1	
>9 PM ≤ 9:30 PM	76	47.8	72	45.3	11	6.9	159	19.7	.4	.3	-1.2	**36.4(***)**
> 9:30 PM	166	38.5	209	48.5	56	13.0	431	53.3	-4.9	**2.7**	**3.7**	
Time waking up – Week												
≤ 7:30 AM	162	46.3	160	45.7	28	8.0	350	43.3	-.1	.8	-1.2	
> 7:30 AM ≤ 8:00 AM	161	46.5	148	42.8	37	10.7	346	42.8	.0	-.6	1.1	1.8
> 8h	53	47.3	48	42.9	11	9.8	112	13.9	.2	-.3	.2	
Time waking up – Weekend												
≤ 7:30 AM	83	54.2	65	42.5	5	3.3	153	18.9	**2.1**	-.4	-2.9	
> 7:30 AM ≤ 8:00 AM	137	46.0	136	45.6	25	8.4	298	36.9	-.2	.7	-.8	**13.9(**)**
> 8h	156	43.7	155	43.4	46	12.9	357	44.2	-1.4	-.3	**3.0**	

Acronyms: X^2- Chi-squared test; ***p<0.001. **p<0.01. *p<0.05; **Source:** Research data

36 months). Statistically significant differences were observed (p=0.017), and a trend for younger children to go to bed earlier (≤ 9 PM) was verified, whereas children aged 24 to 35 months went to bed later (> 9:30 PM).

On the weekend, most children (53.3%) were observed to go to bed after 9:30 PM (38.5% aged 12–23 months, 48.5% aged 24–35 months, 13.0% aged 36 months) and 27.0% before or at 9 PM. The statistically significant differences (p=0.000) suggest that younger children (12–23 months) tend to go to bed earlier (≤ 9 PM) than the older ones (24–35 months and 36 months).

A prevalence of 43.3% of children who woke up before or at 7:30 AM during the week was identified. Statistically significant differences were observed in relation to waking up time during the weekend (p=0.008), observing the trend for younger children (12–23 months) to wake up earlier (≤ 7:30 AM) than the older ones (36 months) (Table 1).

Age was verified to be associated with time of going to bed and waking up of children; the older ones went to bed and woke up later, with statistically significant differences in relation to time of going to sleep during the week (p=0.003) and on weekends (p=0.000) and, also in relation to time of waking up during the weekend (p=0.002) (Table 2).

Regarding time of waking up during the week, children aged 24 to 35 months were found to wake up earlier (MO=397.97) and 36-month-olds woke up later (MO=428.43), with no statistically significant differences (Table 2).

Table 2. Kruskal-Wallis test between time of going to bed and waking up during the week and on the weekend and child's age. Viseu, Portugal, 2019.

Child age	Mean Ordination	KW (p)
Time going to bed – Week		
12-23 months	376.6	
24-35 months	426.5	**11.7(**)**
36 months	439.5	
Time going to bed – Weekend		
12-23 months	361.1	
24-35 months	431.5	**34.9(***)**
36 months	493.1	
Time waking up – Week		
12-23 months	405.8	
24-35 months	397.9	1.3
36 months	428.4	
Time waking up – Weekend		
12-23 months	388.6	
24-35 months	403.9	**12.8(**)**
36 months	485.9	

Acronyms: KW- Kruskal-Wallis test; ***p<0.001. **p<0.01; **Source:** Research data

Table 3. Duration of morning and afternoon nap during the week and on the weekend per child age. Viseu, Portugal, 2019

Age	12-23 months		24-35 months		36 months		Total		Residuals			Fisher's test (p)
Variables	n (376)	% (46.5)	n (356)	% (44.1)	n (76)	% (9.4)	n (808)	% (100.0)	1	2	3	
Morning nap – Week												
No nap	278	40.1	342	49.3	74	10.7	694	85.9	-9.1	**7.4**	**3.0**	
≤1h	52	91.2	4	7.0	1	1.8	57	7.1	**7.0**	-5.8	-2.1	**84.5(***)**
>1h-<3h	40	80.0	9	18.0	1	2.0	50	6.2	**4.9**	-3.8	-1.9	
≥3h	6	85.7	1	14.3	0	0.0	7	0.9	**2.1**	-1.6	-.9	
Morning nap – Weekend												
No nap	230	35.8	337	52.4	76	11.8	643	79.6	-12.1	**9.4**	**4.6**	
≤1h	89	91.8	8	8.2	0	0.0	97	12.0	**9.5**	-7.6	-3.4	**149.8(***)**
>1h-<3h	50	82.0	11	18.0	0	0.0	61	7.5	**5.8**	-4.3	-2.6	
≥3h	7	100.0	0	0.0	0	0.0	7	0.9	**2.8**	-2.4	-.9	
Afternoon nap – Week												**X^2(p)**
No nap	21	48.8	18	41.9	4	9.3	43	5.3	.3	-.3	.0	
≤1h	58	51.3	44	38.9	11	9.7	113	14.0	1.1	-1.2	.1	2.9
>1h-<3h	254	44.7	260	45.8	54	9.5	568	70.3	-1.6	1.5	.2	
≥3h	43	51.2	34	40.5	7	8.3	84	10.4	.9	-.7	-.4	
Afternoon nap– Weekend												
No nap	11	19.6	35	62.5	10	17.9	56	6.9	-4.2	**2.9**	**2.2**	
≤1h	50	58.8	28	32.9	7	8.2	85	10.5	**2.4**	-2.2	-.4	**23.3(***)**
>1h-<3h	248	48.1	219	42.4	49	9.5	516	63.9	1.2	-1.2	.1	
≥3h	67	44.4	74	49.0	10	6.6	151	18.7	-.6	1.4	-1.3	

Acronyms: Fisher's test- Exact Fisher's Test; X^2- Chi-squared test; ***p<0.001; **Source:** Research data

Nap duration

Most children were found not to take the morning nap neither during the week nor on the weekend (85.9% *vs.* 79.6%), and statistically significant differences were observed between taking the morning nap during the week (p=0.000) and on the weekend (p=0.000), per child age. Both during the week and on the weekend, there was a trend for younger children to take the morning nap, regardless of duration, whereas the older children (24–35 months and 36 months) did not take the morning nap (Table 3).

Most children were observed to take the afternoon nap during the week (94.7%) and on weekends (93.1%), with statistical significance only for the weekend (p=0.000). Younger children (12–23 months) tend to nap up to one hour and older children (24–35 months and 36 months) do not take the nap (Table 3).

Time of sleep in 24 h

In conclusion, there are statistically significant differences per child age in the number of hours they sleep in 24 h, both during the week (p=0.000) and on weekends (p=0.000).

Younger children (12–23 months) tend to sleep longer in a single day (> 14h) during the week. On weekends, this trend is maintained and younger children tend to sleep for longer (> 14h per day) and the older ones, less (< 11 h or 11–14 h) (Table 4).

The total hours of sleep per day during the week in relation to child age ranged from 9 h 30 min and 18 h (M=12 h 25 min ±1 h 02 min). Children aged between 12–23 months slept longer per day during the week (M=12 h 40 min ±1 h 07 min). On weekends, a variation between 9 h and 19 h (M=12 h 49 min ±1 h 15 min) was observed; children aged 12–23 months were those who slept more (M=13 h 13 min ±1 h 16 min). This was the age group in which the minimum and maximum values (10 h and 19 h) of total hours of sleep per day were observed (Table 5).

DISCUSSION

In this study, the sleep pattern of children aged 12 to 36 months was assessed, considering, during the week and on weekends, nighttime sleep (time of going to bed and waking up), daytime sleep (duration of morning and afternoon naps)

Table 4. Sleeping time in 24 h during the week and on weekends per child age. Viseu, Portugal, 2019.

Age	12-23 months		24-35 months		36 months		Total		Residuals			Fisher's test (p)
Variables	n (376)	% (46.5)	n (356)	% (44.1)	n (76)	% (9.4)	n (808)	% (100.0)	1	2	3	
Total sleeping hours in 24 h – Week												
<11 h	11	30.6	20	55.6	5	13.9	36	4.5	-2.0	1.4	.9	
11h-14h	338	45.7	331	44.8	70	9.5	739	91.5	-1.5	1.4	.2	***
>14 h	27	81.8	5	15.2	1	3.0	33	4.1	**4.1**	-3.1	-1.3	
Total sleeping hours in 24 h – Weekend												**X^2(p)**
<11 h	4	12.5	20	62.5	8	25.0	32	4.0	-3.9	**2.1**	**3.1**	
11h-14h	309	44.7	318	46.0	65	9.4	692	85.6	-2.6	**2.6**	.0	**47.2(***)**
>14h	63	75.0	18	21.4	3	3.6	84	10.4	**5.5**	-4.4	-1.9	

Acronyms: Fisher's test - Exact Fisher's Test; X**2**- Chi-squared test; ***p<0.001; **Source:** Research data

Table 5. Statistics on the total sleeping hours in 24 hours during the week and on weekends per child age. Viseu, Portugal, 2019.

Child age	n	Min.	Max.	x	SD	CV%
Total sleeping hours in 24 h – Week						
12-23 months	376	10h	18h	12h 40m	1h 07m	8.63
24-35 months	365	9h 30m	14h30m	12h 13m	55m	4.53
36 months	76	10h	14h 30m	12h 08m	52m	4.30
Total	808	9h 30m	18h	12h 25m	1h 02m	8.33
Total sleeping hours in 24 h – Weekend						
12-23 months	376	10h	19h	13h 13m	1h 16m	8.83
24-35 months	356	9h	17h	12h 31m	1h 08m	8.77
36 months	76	9h	15h	12h 18m	1h 09m	8.95
Total	808	9h	19h	12h 49m	1h 15m	9.21

Source: Research data

and total sleep hours (in 24 h). The results were analyzed for a sample of 808 children.

Sleep is a necessity, and its duration, regularity, and quality may often be associated to family habits[12]. Sleep patterns start to better define approximately at five or six months of age, when sleep is consolidated. Daytime sleep patterns become more consistent and consolidated later in comparison with nighttime sleep.

Healthy sleep imposes duration and time to be adapted to the children's age and a recurring time for sending children to bed, during the week and on the weekend, with a maximum difference of 30 minutes[10]. In this study, the difference between the mean hour when children were sent to bed during the week and on weekends was 20 minutes (9:22 PM during the week *vs* 9:42 PM on weekends). This variation may imply a correct sleep hygiene. Min Ahn and collaborators[13], in a study conducted with Korean children and in predominantly Asian (P-A) and predominantly Caucasian (P-C) countries and regions, from birth to 36 months, revealed, among others, results on the sleep patterns of small children. The authors verified that the mean time for P-C children to go to bed was 8:25 PM and that they went to bed earlier (P-A=9:25 PM and Korean=10:20 PM).

In conclusion, this study's children slept a mean of 10 h 22 min ±42 min per night during the week and 10 h 36 min ±49 min on weekends, which is compatible with recommendations by national and international entities[10,11] that nighttime sleep must have a duration of 10 to 11 hours, verifying thus that the children's sleep pattern was suitable for their age.

These results are superior to those of other authors, such as Zhang and collaborators[5], who concluded that nighttime sleep duration of 173 children aged 12 to 36 months participating in that study was a mean of 10 h 09 min, as well as those of Min Ahn and collaborators[13] which found values to oscillate between 9 h 12 min in P-A children, 9 h 42 min in Korean children and 10 h 01 min in P-C children and, also, identical to those of Chindamo and collaborators[14] who, in a study conducted in Italy with 1,117 children aged 12–36 months, observed a mean of 10 h 37 min. However, the results of the present study are inferior to those of McDonald and collaborators[15], who verified a mean duration of

nighttime sleep of 11 h 06 min in children between 14 and 27 months participating in their study.

The Portuguese Society of Pediatrics (*Sociedade Portuguesa de Pediatria* – SPP)[10] indicates that, from 12 months of age onwards, children must have three periods of sleep: one at night (nighttime sleep) and two during the day (morning and afternoon naps). Between 15 and 30 months of age, the child normally spontaneously suspends the morning nap, preserving the afternoon one, which will only be abandoned between three and five years of age, or later, depending on the child. Daytime sleep is emphasized to possibly last from 2 to 4 hours in younger children and 1 to 3 hours in older children. In this study, most children were verified to no longer take the morning nap while maintaining the afternoon nap; statistically significant differences were found for older children and those which did not take the morning nap. The mean duration of the naps, during the week, was 2 h 07 min and, on weekends, 2 h 21 min, data which corroborated those of SPP, and superior to those found in other studies[15] in which the mean daytime sleep of children was 1 h 09 min.

The total hours of daily sleep, according to the literature[10,11], is reduced after 12 months of age, varying from 11 h to 14 h. In this sample, the mean sleeping hours of children both during the week and on weekends was verified to be within this interval (12 h 25 min *vs* 12 h 49 min, respectively); corroborating the scientific evidence, older children slept less. These results lead to the conclusion that, on average, children sleep the recommended number of hours. Williamson and collaborators[16], in a study conducted with a sample of 1,983 children aged 18 to 36 months from several countries (Australia, Canada, New Zealand, United Kingdom, and United States), similarly concluded that in all of these countries the rates of sleep linearly decreased with age.

FINAL CONSIDERATIONS

This study enabled assessing daytime, nighttime, and global sleep patterns of children aged 12 to 36 months during the week and on weekends. Thus, in agreement with the theoretical framework, which defines a daily sleep time for this age group between 11 h and 14 h, this study concluded, in the overall sample, that on average children slept the recommended number of hours, although a small percentage slept less or more than the recommended. A large share of the sample did not take the morning nap, regardless of age. Reinforcement by nurses on the benefits of this nap, either for child development or to achieve the appropriate number of sleep hours, is fundamental.

The assessed results also confirm that, as children age, their need for sleep is lower, i.e., the mean duration of sleep reduces progressively with their growth.

Promoting a good sleep hygiene for small children must be seen as an important public health and nursing objective, given the severe consequences that its absence may cause to their development level. The results of this investigation enable concluding that it is fundamental for health professionals, particularly nurses, to continue directing their attention to defining specific intervention strategies for parents of small children, aiming at acquisition, maintenance, and reinforcement of information on the appropriate sleep pattern, emphasizing the benefits for the health and development of children. Good sleep hygiene practices may promote healthy sleep for children, influencing health outcomes and reducing social burden of treatments.

This **study's limitations** include the fact that the collected information is solely on the hours of going to bed and waking up and nap duration, not questioning the sleep habits and routines of children; and also the fact that the data collection instrument was a self-reported questionnaire, which may be taken as a methodological limitation, given that the reliability of the results depends on the sincerity of the parents' answers, i.e., their answers may have been oriented to conducts they understand to be socially desirable, not corresponding to real conducts, which influences the study's results.

AUTHOR'S CONTRIBUTIONS

Study design. Catarina Andreia Rosa Saraiva Marinho. Cândida Koch. Margarida Reis Santos

Data collection or production. Catarina Andreia Rosa Saraiva Marinho.

Data analysis. Catarina Andreia Rosa Saraiva Marinho. João Carvalho Duarte.

Interpretation of results. Catarina Andreia Rosa Saraiva Marinho. Cândida Koch. Margarida Reis Santos. João Carvalho Duarte.

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Responsibility for all aspects of the content and integrity of the published article. Catarina Andreia Rosa Saraiva Marinho. João Carvalho Duarte. Cândida Koch. Margarida Reis Santos.

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