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ORIGINAL ARTICLE

How Does Screen Exposure Affect Sleep Routines of Preschool Children?

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Abstract

Background: Sleep is crucial for children's development and is influenced by bedtime routines, screen exposure, and socioeconomic factors. Modern lifestyle changes, including increased screen use, may disrupt sleep quality. Cultural and socioeconomic conditions also shape sleep habits, such as co-sleeping and parental involvement. This study aimed to examine the sleep characteristics and routines of healthy children aged 3–6 years and their associations with screen exposure and socioeconomic factors.

Methods: This cross-sectional study included 114 healthy children aged 3-6 years. The sleep disorder section of a structured diagnostic interview (Preschool Age Psychiatric Assessment-PAPA) was administered to the parents. Sociodemographic features, sleep characteristics and routines, and screen time were noted. The correlation between sleep characteristics and sleep routines was analyzed. The statistical significance level was set at 0.05.

Results: 92.98% of children had at least one sleep routine, while 72% were exposed to screens for over an hour per day and 23.68% for over 3 hours per day. 26.3% of participants slept in their own room, 34.2% in a shared room, and 39.5% in their parents' bed. Bedtime resistance was prevalent in 73.69% of the participants. Education levels of parents ($p<.05$), monthly income ($p=.002$), and school attendance ($p=.01$) were correlated with sleeping in separate beds. Bedtime resistance was correlated with screen exposure longer than 1 h ($p=.01$). Bedtime resistance and separation dreams were more common in pre-sleep screen use ($p<.05$).

Conclusion: Factors related to bedtime routines play a key role in shaping sleep characteristics. Children's school attendance, education levels of parents, and monthly income may affect sleep routines. Screen exposure can disrupt sleep, so reducing screen time before bed is important. Parental education on healthy sleep habits helps promote better sleep and supports children's emotional and psychological development.

Keywords: Sleep, sleep routines, preschool children, screen exposure.

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INTRODUCTION

Sleep in children plays a critical role in ensuring health and well-being from infancy onward (1). The maturation of the sleep–wake cycle, which is regulated by the complex interaction between biological, environmental, behavioral, and social factors, begins in the first year of life and continues throughout childhood. As the baby grows older, the need for daily sleep decreases and daytime sleep ends after a while. Parents can contribute to the regulation of sleep by identifying social cues such as routines (2). In addition, a complex interaction of sociocultural, physiological, biological, and psychological factors plays a role in forming sleep patterns in early childhood (1,3).

The close relationship between sleep and healthy development is an important consideration for research on sleep patterns. Sleep problems are associated with a range of poor developmental outcomes in neurocognitive, social-emotional, physical health, and family functioning domains (4), and they are likely to continue through school age with accompanying behavioral and physical problems (5). Executive functions, reasoning, and problem-solving skills are particularly susceptible to insufficient sleep (6). Adequate sleep is crucial for children's overall health and development, especially in the early years. Specific links between sleep in the preschool years and later outcomes have been reported. For instance, short sleep duration in preschool children has been linked to obesity in later childhood (1,3). This suggests that sleep habits established early on can have significant long-term health implications. Moreover, the findings of a study conducted with toddlers suggested that they showed better performance in motor tasks when they had the opportunity to nap (7). These results support the functions and effects of sleep on the daily life and development of children.

A range of behaviors and interaction patterns during bedtime may influence sleep characteristics and quality. Sleep routines include activities that are predictable and mostly regular behaviors occurring in the pre-bedtime period (8). These routines are usually related to getting ready for sleep and are considered to have a potential impact on a child’s sleep in both qualitative and quantitative dimensions (9). The potential associations between sleep and other factors, including naps in the daytime, and screen exposure, have also been investigated (10-14). Although the impact of screen time on sleep has been shown in the elderly population, knowledge in preschool age, which may be a decisive period in terms of developing healthy habits, is limited (1, 15). A meta-analysis, which was the first review, investigated the effects of screen exposure on sleep in childhood and showed that higher levels of screen time were associated with shorter sleep duration and poorer sleep quality (1). However, in preschoolers, the meta-analysis did not show a significant association, probably due to the heterogeneity of the included studies (1). According to another study, including preschool children, reported that increased TV time was associated with shorter sleep duration (10). Another study, which included infants, showed that watching TV at sleep initiation was associated with delayed bedtime (13). However, many studies have been criticized for their low quality of evidence, often resulting from the use of invalid or unreliable measurement tools (1). This underscores the need for more rigorous studies with better measurement methods to strengthen the evidence base regarding the association between screen time and sleep in young children. Furthermore, the review (1) emphasized that no studies were identified from lower-middle and low-income countries. Most of the studies conducted in North America, Europe, Asia, and Australasia, and one article included participants from multiple countries. While the review synthesizes findings across these international studies, cross-cultural differences in the sleep of preschool children have been noted in one of the included studies (1). The authors suggest that these countries are likely to have substantial differences in the home and wider environment, which could influence both the exposures (like screen time and physical activity) and sleep outcomes. This lack of representation underscores the potential for significant cultural and socioeconomic factors to impact sleep characteristics in ways that were not fully captured by the reviewed studies (1). Further research is needed to explore these nuances and understand how cultural factors might moderate the relationships between screen exposure, physical activity, sedentary time, and sleep in young children across diverse populations.

To highlight all these findings, the current study was designed to determine sleep characteristics and bedtime routines of a group of healthy children aged 3–6 years and to investigate the relationship of sleep features with screen exposure and socioeconomic factors in the context of culture. There are some studies from different countries and cultures on the sleep characteristics of children. However, to the best of our knowledge, in Turkey, which is located as a bridge between Asia and Europe, not only in terms of geographical location but also in cultural and social aspects, no previous study used a structured and valid questionnaire to assess sleep characteristics and bedtime routines. In this respect, the current study may contribute to the literature. Additionally, understanding sleep characteristics and bedtime routines of healthy children is also important in terms of enabling us to compare sleep characteristics and routines in children with psychopathology. For this purpose, we aimed to obtain a cross-sectional sleep routine profile by considering the sociodemographic features, sleep routines, and conditions of the sleep environment.

MATERIALS AND METHODS

Participants

A total of 114 children aged 3-6 were invited from the pediatric clinics in our region to participate in the study and assessed in the Child and Adolescent Psychiatry Department of our university hospital. Children with a psychiatric diagnosis, chronic neurological disease, or any other chronic illness, or those who refused to participate in the study were not included.

Instruments

The Sociodemographic Questionnaire was created by researchers to examine the sociodemographic features of children and their parents. The questions related to age, perinatal and developmental history, caregiving settings, sleeping routines, school attendance of the child, family structure, and parental features such as age, education level, and work status were directed to the parents in the initial interview. To evaluate the screen time, the total duration of screen exposure, including TV, computer, smartphone, and tablet, was noted.

The Preschool Age Psychiatric Assessment (PAPA): It is a structured parent-report instrument for assessing psychopathology in 2–6-year-old children (16). It is applied by the clinician to ensure that the parent understands the questions, provides clear information on behavior or feelings, and determines the level of severity as defined in an extensive glossary. A trained interviewer completes the PAPA with a parent and codes the PAPA items after the interview is completed. The PAPA includes an assessment of most DSM-V diagnostic criteria insofar as they are relevant to younger children, plus all items in the Diagnostic Classification: 0-5. The Turkish validity and reliability study has been completed (17). The "Sleep Disorders" section, which includes detailed questions that provide comprehensive information about sleep disorders, was applied.

Procedure

A sociodemographic data form was filled out with parents and clinicians, and the sleep disorder section of the PAPA interview was applied afterwards. This section included detailed questions related to sleep arrangements, bedtime, bedtime resistance and reasons, sleep rituals, awakings and reasons, medications used for sleep, behaviors such as thumb sucking, rocking before sleep.

The approval of the Research Human Ethics Committee of the university was obtained (2021/192) for the study, and the protocols followed the Declaration of Helsinki. Parents who agreed to participate were invited and informed about the research procedures. Written and verbal consent of the parents was obtained.

Statistical Analysis

G*Power 3.1.9.6 program was used for sample size calculation and it was found to be 112 according to previous studies. The data obtained in this study were analyzed using the SPSS 26 package program. Descriptive statistics are summarized as mean ± standard deviation for continuous variables. Frequencies (percentages) are summarized for categorical variables. The Kolmogorov–Smirnov test was used to determine whether the variables were normally distributed. An independent sample

Table 1. Sociodemographic Features			
Demographic Feature	**N**	%	
Gender	Female	45	39.47
	Male	69	60.53
School attendance in the last 3 months	No	52	45.61
	Yes	62	54.39
Family type	Nuclear	93	81.58
	Extended	9	7.89
	Other	12	10.53
Monthly income	<460 $	12	10.53
	460- 910 $	40	35.09
	911-1365 $	25	21.93
	1366- 1820 $	24	21.05
	>1821 $	13	11.40
Sibling with a neurodevelopmental disease	No	81	71.1
	Yes	33	28.9
Mother's education level	Primary school	33	28.90
	High school	40	35.10
	University	41	36.00
Mother's employment	Housewife	85	74.60
	Public servant	13	11.40
	Worker	16	14.00
Mother's medical disease	No	93	81.58
	Yes	21	18.42
Mother's psychiatric disease	Yes	8	7.02
	No	106	92.98
Father's education level	Primary school	30	26.30
	High school	57	50.00
	University	27	23.70
Father's employment	Unemployment	15	13.20
	Self-employed	11	9.60
	Public servant	21	18.40
	Worker	67	58.80
Father's medical disease	No	97	85.09
	Yes	17	14.91
Father's psychiatric disease	No	111	97.37
	Yes	3	2.63

t-test was used to examine the differences in normally distributed variables of the groups. The chi-square or Fisher's exact test was used to examine the relationship between categorical variables such as screen time and sleep variables. Spearman correlation tests were also used for the correlations such as the ones between sociodemographic features and sleep characteristics. The statistical significance level was set at 0.05.

RESULTS

A total of 114 children, including 69 boys (60.53%) aged 53.97 months (±11.6) and 45 girls (39.47%) aged 55.15 months (±12.26), were assessed. The sociodemographic features of the participants are shown in Table 1. The primer caregivers of the children were evaluated, and according to our findings, mothers were primer caregivers in 73.68%, grandmothers in 3.51%, and other adults in 22.8% of the children.

Sleep arrangements: It was found that 26.3% of participants were sleeping in their own room/bed, 34.2% in a shared room, and 39.5% in their parents' bed. Seventy-one percent of children had their own bedroom.

The mean time of falling asleep was 5 min. The average sleep hour was 11.00 pm, and the sleep duration was 9 hours (7.5-12.5).

Bedtime resistance: Bedtime resistance, which means regular opposition to stopping daytime activities to go to bed, was examined. The frequency of bedtime resistance was 73.69%.

Seventy-eight percent of participants had a regular sleep time, and 43% resisted that time, whereas 41.23% of children were leaving the bed to go to "parent," either due to fear (3.92%) of being alone, desire for comfort from or contact with "parent" (33.3%), or resistance to going to sleep/bed (19.61%). The frequency of resistance to sleeping alone was 50% in the last 3 months, and in that case, the most common scenario was that the parent and child slept together in the child's bed. The results are shown

72.8% of children woke up during the night, and the most common reason was going to the toilet (47%), whereas 18% were waking up to check attachment figures and 0.88% were wandering around. The mean time for being awake per night was 5 min.

Screen exposure: The total duration of screen exposure was longer than 1 h per day in 72% and longer than 3 h in 23.68% of children.

Sleep routines: The most common rituals in bed were talking (58%), hugging (57%) and reading (56%). Sleep routines in bed are shown in Table 4.

Other features: The sleep periods during the day were examined, and it was reported that 38.6% of participants had naps. Among all samples, falling asleep in the car was seen in 25.4%, nightmares in 33%, separation dreams in 4.4%, and night terrors in 13.1% of children.

The relationship between sociodemographic features and sleep characteristics: Correlations were found between sleep settings and school attendance, mothers' and fathers' educational level, and family income. We found that as the mother's and father's level of education, monthly income level and school attendance increased, the child was more likely to have his/her own bed ($p<.05$) (Table 3).

The relationship between sleep routines and sleep characteristics: The presence of sleep routines was more common among children who fell asleep in their bed compared with those who slept elsewhere ($p=.002$). There was no significant difference between the variety of routines and sociodemographic variables ($p>.05$). The reading routine was correlated with the education level of mothers ($p=.004$).

The relationship between screen and sleep characteristics: One-quarter of the patients were found to have pre-sleep screen use as a routine. We evaluated the effect of evening pre-sleep screen use, which may have negative effects, on sleep characteristics. We found that resistance to bedtime and separation dreams were more common in pre-sleep screen use ($p<.05$) (Table 5).

According to the American Academy of Pediatrics' (18) recommendation of 1 h of screen time on weekdays for children aged 2-5, our sample was divided into 2 groups based on a daily screen time of 1 h or longer, and sleep characteristics were assessed (Table 6). We found that bedtime resistance was more common in the >1-h group.

Table 2. A) Sleep Characteristics of Children			
Sleep Characteristics		**N**	%
Sleep setting	Own room/bed	30	26.30
	Shared room	39	34.20
	Parent's room/bed	45	39.50
Location of sleep initiation	Own bed	72	63.16
	Parent's bed	25	21.93
	Couch/sofa	8	7.02
	Other	9	7.89
Reluctance to initiate sleep alone	No	30	26.32
	Sometimes	29	25.44
	Always	55	48.25
Sleeping with family members	No	62	54.39
	Yes	52	45.61
Regular bedtime	No	25	21.93
	Yes	89	78.07
Resistance to bedtime	No	65	57.00
	Yes	49	43.00
Thumb sucking	No	109	95.61
	Yes	5	4.39
Use of a pacifier	No	112	98.25
	Yes	2	1.75
Special object	No	81	71.05
	Yes	33	28.95
Self-rocking	No	110	96.49
	Yes	4	3.51
Head banging	No	113	99.12
	Yes	1	0.88

Table 2. B) Sleep Characteristics of Children			
Sleep Characteristics		**N**	%
Night waking	No	31	27.19
	Yes	83	72.81
Rising to check on family members	No	93	81.58
	Yes	21	18.42
Increased need for sleep	No	100	87.72
	Yes	14	12.28
Restless sleep	No	91	79.82
	Yes	23	20.18
Inadequately rested by sleep	No	113	99.12
	Yes	1	0.88
Daytime sleepiness	No	95	83.33
	Yes	19	16.67
Tiredness	No	106	92.98
	Sometimes	7	6.14
	Always	1	0.88
Fatigability	No	98	85.96
	Yes	13	11.40
	Every night	3	2.63
Nightmare	No	76	66.67
	Yes	38	33.33
Separation dreams	No	109	95.61
	Yes	5	4.38
Night terror	No	99	86.84
	Yes	15	13.16

Table 3. Correlations Between Sociodemographic Features and Sleep Characteristics of Children

Sleep Characteristics		Gender	School attendance	Family type	Mother education level	Father education level	Monthly income
Sleep setting	r	0.07	-0.22	0.26	-0.34	-0.19	-0.28
	p	.46	.01*	.004**	<.001***	.03*	.002*
Location of sleep initiation	r	.008	-0.2	0.24	-0.27	-0.7	-0.16
	p	.35	.02*	.01*	.003**	.42	.08
Reluctance to initiate sleep alone	r	0.07	-0.4	-0.6	-0.43	0.12	0.16
	p	.41	.66	.49	.64	.18	.07
Sleeping with family members	r	0.09	-0.15	0.15	-0.19	-0.07	-0.08
	p	.33	.1	.1	.03*	.42	.37
Regular bedtime	r	0.06	0.08	-0.23	0.17	0.4	0.14
	p	.51	.39	.01*	.07	.65	.11
Resistance to bedtime	r	0.06	0.14	0.02	0.14	0.08	-0.05
	p	.47	.13	.8	.13	.38	.54
Night waking	r	0.03	-0.04	-0.12	0.02	0.14	0.17
	p	.74	.63	.2	.79	.13	.05
Rising to check on family members	r	0.05	-0.01	0.07	-0.03	0.05	0.04
	p	.53	.9	.45	.69	.55	.65
Increased need for sleep	r	-0.02	0.02	0.02	-0.06	-0.15	-0.13
	p	.78	.82	.82	.5	.09	.15
Restless sleep	r	0.04	-0.06	0.08	-0.04	-0.15	-0.002
	p	.98	.48	.34	.66	.09	.98
Daytime sleepiness	r	0.24	0.12	0.03	0.06	-0.11	-0.12
	p	.79	.18	.71	.5	.24	.19
Tiredness	r	-0.12	0.11	0.03	0.006	-0.07	-0.14
	p	.18	.22	.68	.94	.42	.12
Fatigability	r	-0.08	0.15	0.06	0.15	-0.01	-0.01
	p	.37	.22	.48	.22	.96	.88
Nightmare	r	-0.76	0.27	0.05	0.25	0.12	0.12
	p	.42	.003**	.55	.007**	.19	.17
Separation dreams	r	-0.91	-0.06	0.009	-0.007	-0.12	-0.12
	p	.33	.5	.92	.94	.18	.19
Night terror	r	0.04	0.004	0.07	-0.006	-0.02	0.14
	p	.6	.64	.41	.94	.79	.12

Spearman Correlation test, *p<.05, **p<.01, ***p<.001

Table 4. Sleeping routines of children			
Variables		**N**	%
Sleep routine in bed	No	15	13.16
	Yes	99	86.84
Singing ritual	No	77	67.54
	Yes	37	32.46
Praying ritual	No	64	56.14
	Yes	50	43.86
Telling a story	No	72	63.16
	Yes	42	36.84
Reading ritual	No	50	43.86
	Yes	64	56.14
Massage	No	82	71.93
	Yes	32	28.07
Sleeping object	No	84	73.68
	Yes	30	26.32
Swinging	No	104	91.23
	Yes	10	8.77
Hugging	No	49	42.98
	Yes	65	57.02
Breastfeeding	No	109	95.61
	Yes	5	4.39
Talking ritual	No	47	41.23
	Yes	67	58.77
Listening to music	No	104	91.23
	Yes	10	8.77
Watching TV	No	104	91.23
	Yes	10	8.77
Watching a video	No	108	94.74
	Yes	6	5.26
Watching any screen	No	101	88.60
	Yes	13	11.40
Needs light on	No	94	82.46
	Yes	20	17.54
Uses Night light	No	88	77.19
	Yes	26	22.81
Needs door left open	No	80	70.18
	Yes	34	29.82

Table 5. The relationship between evening screen time and sleep variables

Variables		Screen time in the evening				
		Yes		No		
		N	%	N	%	P
Sleeping with family members	No	34	41.5	48	58.5	.11
	Yes	18	56.3	14	43.8	
Regular Bedtime	No	8	25	17	20.7	.73
	Yes	24	75	65	79.2	
Resistance to bedtime	No	12	37.5	53	64.6	.01*
	Yes	20	62.5	29	35.4	
Special object	No	21	65.6	59	72	.32
	Yes	11	34.4	23	28	
Restless sleep	No	23	71.9	68	82.9	.14
	Yes	9	28.1	14	17.1	
Nightmare	No	24	75	52	6.34	.16
	Yes	8	25	30	36.6	
Separation dreams	No	30	93.8	79	96.3	.04b*
	Yes	2	6.3	3	3.7	
Night terror	No	25	78.1	74	90.2	.08
	Yes	7	21.9	8	9.8	

[b]Fisher-Exact test, *p<.05

Table 6. Relationship Between Daily Screen Time and Sleep Variables

		Daily Screen Time				
		<1 hour		>1 hour		
		N	%	N	%	P
Sleeping with family members	No	19	57.6	43	53.1	.4
	Yes	14	42.4	38	46.9	
Regular Bedtime	No	6	18.2	19	23.5	.25b
	Yes	27	81.8	62	76.5	
Resistance to bedtime	No	24	72.7	41	50.6	.04*
	Yes	9	27.3	40	49.4	
Special object	No	26	78.8	54	66.7	.2
	Yes	7	21.2	27	33.3	
Increased need for sleep	No	29	87.9	71	87.7	.62b
	Yes	4	12.1	10	12.3	
Restless sleep	No	25	75.8	66	81.5	.49
	Yes	8	24.2	15	18.5	
Tiredness	No	31	93.9	75	92.6	.7b
	Yes	2	6.1	6	7.4	
Nightmare	No	24	72.7	52	64.2	.25
	Yes	9	27.3	29	35.8	
Night Terror	No	27	81.8	72	88.9	.23
	Yes	6	18.2	9	11.1	

[b]Fisher-Exact test, *p<.05

DISCUSSION

The findings of the current study reflected that a significant proportion of preschool children experienced bedtime resistance, frequent night awakenings, and shared sleep arrangements, with these sleep challenges associated with caregiver education level, household income, screen exposure, and the presence or absence of consistent sleep routines.

In our study, the average sleep hour was 11.00 pm and sleep duration was 9 h, which is not consistent with the recommendations of international guidelines suggesting that preschoolers should sleep 10–14 h a day (20). More recent studies have suggested a general decrease in sleep duration and an increase in the frequency of sleep difficulties compared with the past years (21). In fact, in the digitalized world, lifestyle changes along with less physical activity and more screen exposure may be responsible for the reduction in sleep duration in both direct and indirect ways.

Moreover, certain characteristics of sleep may vary among different cultures. For instance, a previous study comparing sleep characteristics in Western and Eastern cultures showed that sleep duration per night was significantly longer in infants from Western countries, and infants in Eastern countries were likely to sleep later and stay longer with their families (21). In this context, our results indicating shorter sleep duration are in line with the literature suggesting similar findings in other Eastern cultures.

The frequency of sleeping with parents was found to be 50%. The children of mothers with lower education levels were sleeping with their parents. The education levels of parents, family income, and school attendance correlated with the child sleeping in his/her own bed. Historically, the mammalian pattern of mothers sleeping in proximity to their young was followed. Many cultures still practice bed sharing and consider it necessary. However, shifting cultural values, encouraging independence at an early age, and the availability of cribs have made bed sharing less common (31,32). Several studies conducted in the US reported that sleeping with parents is more common among families with lower socioeconomic status and parental education (31). Some studies with non-clinical preschool samples showed that sleeping with family members was associated with sleep problems and further psychiatric disorders, anxiety, and depression (33). In the current study, no significant relationship between bed sharing and sleep problems may be due to the inclusion of healthy participants and a relatively small sample size. However, a child's resistance to sleep alone may be considered as an indicator of further sleep and internalizing disorders. Most of the young children in the Middle East countries shared a room with their parents (86%) and approximately half shared a bed with their parents (34). It was reported that parents seem to be highly involved in bedtime, most parents present at sleep initiation (85-89%) (34). Higher resistance to sleeping alone and bedtime in our sample is consistent with the rather cultural features of Eastern countries (34) that the thought of interdependency, sleeping together, enforces the relationship between parent and child is not rare (23). However, the correlation between school attendance and sleeping alone may indicate a link between independence and sleeping characteristics.

In the current study sample, approximately all participants had bedtime routines and 80% had a certain amount of sleep time. Implementation of a constant sleeping time and routine is recommended for sleep health and well-being (19).

In the current study, the total screen time was found to be longer than 1 h in 72% and longer than 3 h in 23.6% of participants. It was found that the children exposed to screens for longer durations were more likely to show resistance to sleep, and the children exposed to screens in the evening were more likely to have separation dreams. A higher duration of screen exposure was associated with poorer sleep quality, shorter sleep duration, and longer sleep latency (1).

A previous study (22) investigated the impact of screen time on sleep and reported that a longer duration of screen time was associated with longer sleep onset latency, later bedtime and wake-up time, more frequent awakenings, and nocturnal sleep duration in preschool children. However, the association between screen time and bedtime was considered to be cultural, and there was no separate analysis for each region or culture (23).

A study investigating the relationship between screen time and sleep problems in different countries found

that watching TV at bedtime was associated with increased sleep problems in one country, but not in children from another country (24). This difference was thought to be related to various factors, including the availability of devices in the bedroom and parental control (23). Therefore, it is important to consider this association in the context of culture.

On the other hand, the association between screen time and night terrors was not found to be significant, in contrast with a study reporting a correlation between screen time and night terrors and nightmares (25). The lack of a significant correlation between screen exposure and night terror in the current study may be explained by the relatively small sample size. Conversely, since our study found that sleep resistance and separation dreams, which are associated with screen exposure, have been linked to anxiety disorders in previous studies (26,27), further research is needed to explore the potential role of screen exposure in alleviating anxiety.

In our sample, the most common sleep routines were found to be talking, hugging, and reading.

Language-based bedtime routines including reading, praying, singing, and talking were thought to occur with other language-stimulating behaviors (28). Reading routine, which was found to be correlated with the education levels of mothers in our findings, is an increasingly popular practice that supports cognitive and language development and strengthens child–parent interaction (29, 30).

While this study investigates the sleep characteristics of preschool children through an objective and structured interview, contributing to the existing literature, our findings should be interpreted with caution due to certain limitations. Because of the small sample size and cross-sectional design of the study, the findings referred to the features of a certain group who were found to be healthy according to our psychiatric assessment; thus, those findings cannot be generalized. The sleep characteristics of children were reported by parents and not measured using an objective instrument, which may have led to biased and subjective answers.

The variety of activities included in a bedtime routine may differ both within and across cultural contexts. In addition to cultural beliefs about sleep and sleep routines, many factors, such as individual differences and family features, may impact bedtime routines, sleep and its outcomes. Thus, considering cultural characteristics and differences, means of parental psychoeducation about the importance of such a bedtime routine should be provided to promote bedtime routine engagement, support the development of healthy habits, and improve the lifelong psychological well-being and mental health of children and young people.

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Abbreviations List

h: Hour
min: Minute
PAPA: Preschool Age Psychiatric Assessment
TV: Television

Ethics Approval and Consent to Participate

The approval of the Research Human Ethics Committee of the university was obtained (2021/192) for the study, and the protocols followed the Declaration of Helsinki. Parents who agreed to participate were invited and informed about the research procedures. Written and verbal consent of the parents was obtained.

Consent for Publication

Consent for publication was obtained from all authors.

Availability of Data and Materials

Data available from the corresponding author on request due to privacy/ethical restrictions.

Competing Interests

None to declare.

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Author Contributions

The authors confirm contribution to the paper as follows: study conception and design: EY, EA, MC, MCU and DBO; data collection: EA, MC; analysis and interpretation of results: EY, EA, MCU; draft manuscript preparation: EY, EA, MC, MCU, DBO. All authors reviewed the results and approved the final version of the manuscript.

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