

**THE CORRELATION BETWEEN PARENTS' eHEALTH LITERACY AND CHILDREN'S SLEEP HABITS****Pınar BEKAR<sup>\*1</sup>**  **Emine EFE<sup>2</sup>** 

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**Abstract:** This study aimed to explore the correlation between parents' eHealth literacy and sleep habits of children. This descriptive and cross-sectional study was performed in the spring semester of the 2023-2024 academic year with parents who agreed to attend the research among the students studying in two kindergartens in the center of a district in Turkey (n=138). The "Personal Information Form" "the Children's Sleep Habits Questionnaire" and "the eHealth Literacy Scale" were used as assessment instruments. The data were analyzed with the SPSS 22.0 package program. 87.7% of the parents were women, 52.2% of children are girl. 70.3% of the children had clinically significant sleep-related problems. It was identified that there was a significant difference in the mean scores of the eHealth Literacy Scale according to the education level of the parents ( $p<0.05$ ). A negative, statistically significant correlation was identified between the Children's Sleep Habits Questionnaire mean score and parents's the eHealth Literacy Scale mean score ( $p<0.05$ ). The study identified that 70.3% of children had sleep-related problems. It has been determined that parents' e-health literacy levels differ according to their educational status. In addition, the study concluded that as parents' eHealth literacy level increases, children's sleep-related problems decrease.

**Keywords:** eHealth Literacy, Child, Parent, Sleep

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**1. Introduction**

Considering that preschool is a term of speedy cognitive and functional development, sleep is of crucial significance in preschool children [1]. Sleep problems are widespread in children and have been associated with obesity, poor school performance, and poor behavior [2]. Disrupted or insufficient sleep leads to morbidity and mortality in children and negatively influences their quality of life and their families [3].

Studies showed that parents play a significant role in preschool children's sleep [2,4]. A systematic review study found that more informed parents were more probably to state that their children demonstrated healthy sleep applications [5].

Health literacy (HL) is a significant decisive of health [6]. HL increases parents' capacity to participate in making decisions and take responsibility for their children's health [7]. Csima et al. [8] revealed that parental HL levels and parental education are associated with children's health-related habits systems. Ono et al. [1] appeared that parents' HL affects their children's sleep problems.

Parents are increasingly using digital resources when seeking knowledge regarding their children's health [9]. The aim of eHealth literacy (eHL) is to develop the health level by using electronic

knowledge resources on health matters [10]. Low eHL levels cause individuals to be unable to access correct knowledge about their health on the internet and to adopt incorrect diagnoses, treatments and health behaviors by believing in false information [11]. To make the most of the possible advantages of digital media for child health, parents' eHL is critical [9].

Parents play a critical role in ensuring healthy sleep patterns for children. In addition, children rely on their parents to recognize when they are experiencing sleep problems and to seek appropriate support and intervention from their healthcare professionals [5]. Improving parents' HL promotes improved living and sleep habits in their own lives and may help improve their children's sleep duration [4]. The behaviors of parents with low HL may play a role in their children's sleep problems [1]. Therefore, it is important to explore the correlation between sleep habits in children and parents' eHL. In one study, a positive relationship was found between the health literacy of parents in the low health literacy group and the sleep duration of their preschool children [4]. Another study found a significant negative relationship between parents' health literacy and preschool children's sleep problems [1]. However, as far as we know, no study has been found examining the correlation between sleep habits in children and parents' eHL. As a result of examining the relationship between e-health literacy and children's sleep problems in this study, it is expected that parents, nurses and educators will be made aware of this issue and as a result, this study will guide the development of various strategies related to improving parents' e-health literacy levels for children to acquire healthy sleep habits and also this study will contribute to the literature. Therefore, the objective of the present study is to explore the correlation between parents' eHealth literacy and the sleep habits of children.

## 2. Materials and Methods

### 2.1. Study Design and Participants

The research is descriptive and cross-sectional in type. The universe of the study contained parents of students studying in public kindergartens located in the center of a district in Turkey during the spring semester of the 2023-2024 academic year (N= 880). The sample of the research included 138 parents of students who agreed to attend the research and who were studying in two kindergartens selected by simple random sampling technique among the state kindergartens in the center of a district in Turkey.

The minimum sample size for the study was calculated as 52 using the G\*Power (3.1.9.6) software package, based on the results reported by Ono et al. [1]. This calculation utilized the correlation between HL scores and Children's Sleep Habits Questionnaire scores, with a type I error of 0.05, a type II error of 0.20 (80% power), and an effect size of 0.332. The research was conducted with 138 parents who agreed to participate in the study. Parents were selected for the study using a convenience sampling method.

After obtaining the necessary permissions, the assessment instruments were distributed to the parents in the presence of the teacher and were filled out by the parents in about 15 minutes.

### 2.2. Assessment Instruments

**Personal Information Form:** The form comprised questions regarding demographic characteristics.

**eHealth Literacy Scale (eHEALS):** The eHEALS was developed by Norman and Skinner [12]. The scale included 8 items rated on a 5-point Likert-type scale. The total score ranges from 8 to 40, with higher scores stating higher levels of eHealth literacy. The Turkish validity and reliability research of the scale was performed by Tamer Gencer [13]. The Cronbach alpha coefficient was found to be 0.86 in a Turkish validity study [13]. In this study, Cronbach alpha value was found to be 0.96.

**Children's sleep habits Questionnaire (CSHQ):** The scale was developed by Owens et al. [14]. The CSHQ-short form included a total of 33 items and eight subscales. The subscales are bedtime resistance,

sleep onset delay, sleep duration, sleep anxiety, night wakings, parasomnias, sleep disordered breathing, and daytime somnolence. The Turkish validity and reliability research of the form was realized by Perdahlı Fiş (2010) [15]. The cut-off point of the form is accepted as 41 points, and values above this are evaluated “clinically significant” [15]. The Cronbach alpha coefficient was found to be 0.78 in a Turkish validity study [15]. In this study, Cronbach alpha value was found to be 0.74.

### 2.3. Ethical Consideration

Approval was obtained from the ethics committee of a university (Decision no: TBAEK-138, date: 29.02.2024) and written permission was obtained from the Provincial Directorate of National Education to which the schools where the study was conducted were affiliated. Parents’ verbal and written consents were obtained.

### 2.4. Statistical Analysis

The data were analyzed with the SPSS 22.0 package program. Data were analyzed using Shapiro-Wilk test, Mann-Whitney U Test, Spearman's correlation analysis, Kruskal-Wallis test (if it's significant, “the Mann–Whitney U test with Bonferroni adjustment”), descriptive statistics by SPSS 22.0 package program. The significance level was assessed as  $p < 0.05$ .

## 3. Results

Descriptive characteristics of the participants were examined and the results were presented in Table 1.

**Table 1.** Descriptive characteristics of participants (n=138)

	Mean $\pm$ SD	Min.-Max.
<b>Age of child</b>	5.16 $\pm$ 0.60	4-6
<b>Age of parent</b>	35.09 $\pm$ 5.53	22-50
	n	%
<b>Gender of parents</b>		
Female	121	87.7
Male	17	12.3
<b>Gender of child</b>		
Girl	72	52.2
Boy	66	47.8
<b>Parental education</b>		
Primary school	10	7.2
Secondary school	25	18.1
High school	41	29.7
University	62	44.9
<b>Children’s Sleep Habits Questionnaire</b>		
$\leq$ 41	41	29.7
$>$ 41	97	70.3

SD: Standart Deviation

Most of the parents comprised in the study (87.7%) were the mothers of the child, and the mean age of the parents was 35.09  $\pm$  5.53. 44.9% of the parents are university graduates. 52.2% of the children were girls. The mean age of the children was 5.16  $\pm$  0.60. 70.3% of the children had clinically significant sleep-related problems (Table 1).

Data of the participants regarding eHEALS were evaluated and presented in Table 2.

**Table 2.** Data regarding eHEALS

	n	%
<b>The useful of the Internet when coming to decisions regarding health</b>		
Not beneficial at all	5	3.6
Not beneficial	18	13.1
No idea	21	15.2
Beneficial	81	58.7
Very beneficial	13	9.4
<b>The significance of reaching health sources on the internet</b>		
Not useful at all	4	2.9
Not important	23	16.7
No idea	13	9.4
Important	81	58.7
Very important	17	12.3

58.7% of parents viewed the internet as “beneficial” when making health-related decisions. 58.7% of parents viewed accessing health sources on internet as “important.” (Table 2).

The eHEALS and CSHQ mean scores were compared based on some characteristics, and the results were reported in Table 3.

**Table 3.** Comparison of eHEALS and CSHQ mean scores based on the some characteristics of children and their parents

	eHEALS			CSHQ		
	Mean ± SD	Test	p	Mean ± SD	Test	p
<b>Gender of parents</b>						
Female	28.55 ± 7.43	951.00 <sup>b</sup>	0.612	7.36 ± 2.67	892.00 <sup>b</sup>	0.371
Male	30.47 ± 3.69			6.88 ± 2.15		
<b>Gender of child</b>						
Girl	29.93 ± 6.15	2081.50 <sup>b</sup>	0.205	6.85 ± 2.05	1811.50 <sup>b</sup>	<b>0.015*</b>
Boy	27.55 ± 7.86			7.80 ± 2.37		
<b>Parental education</b>						
Primary school	25.30 ± 6.62			6.30 ± 2.50		
Secondary school	25.12 ± 9.30	14.331 <sup>a</sup>	<b>0.002**</b>	7.32 ± 2.30	4.899 <sup>a</sup>	0.179
High school	28.29 ± 7.42			7.83 ± 2.32		
University	31.16 ± 4.81			7.11 ± 2.11		

**SD:** Standart Deviation, **CSHQ:** Children’s Sleep Habits Questionnaire, **eHEALS:** eHealth Literacy Scale, <sup>a</sup>Kruskal-Wallis test, <sup>b</sup> Mann-Whitney U Test; \*:p<0.05; \*\*:p<0.01

The mean eHEALS scores did not differ significantly based on the gender of the child and the gender of the parents (p>0.05). It was identified that the mean eHEALS scores differed significantly based on the education level of the parents. Parents who are university graduates were identified to have higher eHEALS scores than parents who are primary school graduates (p<0.05).

CSHQ mean scores did not differ significantly based on parental education level and gender of parents (p>0.05). CSHQ mean scores differed significantly based on the gender of the child (p<0.05). It was identified that boys had higher CSHQ score averages than girls (Table 3).

The relationship between the total and subscale scores of CSHQ, information about the child's sleep habits, parent and children’s ages, and the score of parents’ eHEALS were evaluated, and the results were reported in Table 4.

**Table 4.** The correlation between CSHQ total scale and subscales scores, information about the child's sleep habits, child's age, parent's age, and eHEALS total score

	Mean $\pm$ SD	Min.-Max.	eHEALS	
			$r_s$	p
<b>CSHQ's subscales</b>				
Bedtime resistance	10.73 $\pm$ 3.03	6-17	-0.166,	0.051
Sleep onset delay	1.41 $\pm$ 0.68	1-3	0.131,	0.125
Sleep duration	3.91 $\pm$ 1.17	3-7	-0.003,	0.974
Sleep anxiety	7.30 $\pm$ 2.25	4-12	-0.018,	0.831
Night wakings	4.31 $\pm$ 1.28	3-8	-0.115,	0.178
Parasomnias	8.32 $\pm$ 1.52	7-15	-0.097,	0.259
Sleep disordered breathing	3.49 $\pm$ 1.03	3-9	-0.096,	0.260
Daytime somnolence	10.37 $\pm$ 3.12	6-22	-0.184,	<b>0.030*</b>
CSHQ Total	45.66 $\pm$ 6.86	31-65	-0.221,	<b>0.009**</b>
Bedtime	21.80 $\pm$ 0.70	21-24	-0.144,	0.091
Daily sleep duration (hours)	9.76 $\pm$ 1.06	7-12	0.128,	0.135
The amount of time the child stays awake when waking up at night (minutes)	6.13 $\pm$ 6.48	0-30	0.012,	0.889
The time the child wakes up in the morning	4.31 $\pm$ 1.28	3-8	0.074,	0.391
Age of child	5.16 $\pm$ 0.60	4-6	0.041,	0.634
Age of parent	35.09 $\pm$ 5.53	22-50	-0.164,	0.055
eHEALS	28.79 $\pm$ 7.10	8-40	-	

SD: Standart Deviation,  $r_s$ : Spearman Correlation Coefficient, CSHQ: Children's Sleep Habits Questionnaire, eHEALS: eHealth Literacy Scale; \*:p<0.05; \*\*:p<0.01

When Table 4 considered, a negative, significant correlation was identified between the total score of CSHQ and the score of parents' eHEALS. A negative, significant correlation was identified between the score of the Daytime somnolence subscale and the score of parents' eHEALS (p<0.05; Table 4).

#### 4. Discussion

Healthy sleep in children is critical to their physical and mental health [16]. Sleep problems in preschoolers can hinder their growth and health [1]. Many families, especially parents with low health literacy, experience sleep problems in their children [2]. Parental HL is related to child health outcomes [7]. Therefore, this study investigated the correlation between parents' eHealth literacy and the sleep habits of children.

In the present study, it was discovered that 70.3% of the children had clinically significant sleep-related problems. Gültekin and Bayık-Temel [3] discovered the prevalence of sleep problems in children to be 43.4%, while Wang et al. [16] discovered it to be 89.81%. The difference in findings may be because the assessment tools used to determine sleep problems are not the same and due to regional differences in where the study was conducted. Additionally, according to these results, it can be said that sleep problems are common in preschool children.

In our study, it was explored that boys had more sleep-related problems than girls. Lewien et al. [17] discovered that sleep-related difficulties were more common in boys. Wang et al. [16] explored that the prevalence of sleep snoring, sleep teeth grinding, and inadequate sleep was higher in boys compared to girls. Chen et al. [18] discovered that the prevalence of inadequate sleep was higher in boys than in girls. The results of previous studies appear to be consistent with the results of the current study. These results show that boys have more sleep problems than girls. Increased screen time in children can cause sleep disorders [19, 20]. In this context, the reason for the results of these studies is thought to be that boys may be more exposed to factors that can cause sleep problems (such as excessive screen use) than girls.

In the current research, it was discovered that the eHealth literacy levels of university graduate parents were higher than those of primary school graduate parents. Ono et al. [1] revealed that parents with high HL had more years of education than parents with low health literacy. Aygun and Topcu (2023) identified that university graduate parents have higher and more significant levels of adequate health literacy compared to both high school and primary school graduates, and high school graduates have higher and more significant levels of adequate health literacy compared to primary school graduates [21]. Parents' level of education may have an impact on their ability to access, understand, evaluate, remember, and apply health information [22]. According to these results, it can be said that parents' education level affects their health literacy. In this context, health professionals need to take into account the health literacy skills of parents, especially those with low levels of education, so that parents can implement healthy behaviors in their children, such as maintaining healthy sleep habits.

A negative significant correlation was identified between children's sleep-related problems, daytime sleepiness, and parents' eHealth literacy, in our study. Ogi et al. [4] determined that parents' HL affects their children's sleep duration. Ono et al. [1] revealed that a negative significant relationship was explored between children's sleep problems and parents' HL. Bathory et al. [2] discovered that a low level of parental HL is related to low night sleep duration. According to these results, it can be said that improving parents' health literacy plays an important role in reducing children's sleep problems. In this context, the health literacy levels of parents should be taken into consideration in interventions to prevent sleep problems in children.

#### **4.1. Limitations**

All research data, including data on children, are based on the subjective responses of parents. This study was conducted only on parents of students studying in two kindergartens in one district in Turkey. These results cannot be generalized to all kindergarten students.

#### **5. Conclusion**

The study concluded that as parents' eHealth literacy level increases, children's sleep-related problems decrease. It was also found that boys had more sleep-related problems than girls. It is explored that parents' education level affects their eHealth literacy. It was discovered that 70.3% of the children had clinically significant sleep-related problems.

Additional interventions that will increase parents' eHL and reduce sleep-related problems in children may be recommended.

#### **Ethical Statement:**

Approval was obtained from the Akdeniz University Medical Scientific Research Ethics Committee (Decision no: TBAEK-138, date: 29.02.2024) and written permission was obtained from the Provincial Directorate of National Education to which the schools where the study was conducted were affiliated. Parents' verbal and written consents were obtained.

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#### **Conflict of Interest:**

The authors report no actual or potential conflicts of interest.

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#### **Authors' Contributions:**

P. B: Conceptualization, Methodology, Data Collection, Formal analysis, Writing - Original draft preparation, Investigation (%60)

E. E: Conceptualization, Methodology, Writing - Original draft preparation, Investigation (%40).  
All authors read and approved the final manuscript.

#### Note:

This study was presented as an oral presentation at the 4th International Congress of Healthy Growing Children and the 2nd PUADER Pediatrics Summit held in Isparta between 12-15 September 2024, and received the "Second Prize for Oral Presentation" in the Field of Nursing.

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