Original article

Parental health information seeking online: How cyberchondria and health literacy shape pediatric health decisions

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ABSTRACT

Background: This study aims to determine parents' cyberchondria and health literacy levels and examine how these levels affect parents' behaviors regarding their own and their children's health.

Method: This descriptive cross-sectional study was conducted between January 1, 2023, and June 30, 2023. Survey forms were used, and the surveys were filled out face to face.

Results: 619 parents participated in the study. The parents' Cyberchondria Severity Scale (CSS) score was 71.51±22.46 (medium-high), and the Turkish Health Literacy Scale (THLS-32) score was 21.37±6.60 (insufficient); 92.2% of the parents stated that they diagnosed themselves and 91.1% of their children via the Internet, 14.2% of parents and 12% of their children stopped taking their medication due to information they read on the Internet.

Conclusion: Parental internet use for health purposes is very high. Inadequate health literacy and high levels of cyberchondria increase the risk of making wrong health decisions. Health professionals should prioritize efforts to increase parents' health literacy and reduce the severity of cyberchondria.

Keywords: behaviour; health literacy; media exposure; internet; child.

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INTRODUCTION

Cyberchondria refers to the compulsive online search for health information, often exacerbated by technological integration into daily life. This behavior is linked to heightened anxiety and can result in misdiagnoses, inappropriate treatments, or delayed medical care due to misleading online content. It reflects an underlying psychological tendency that amplifies health-related anxiety.[1]

Cyberchondria is increasingly visible in the digital age, where information overload and misinformation are widespread. It is directly linked to elevated anxiety, potentially leading to unnecessary interventions or avoidance of needed care.[2] As this phenomenon grows, health literacy emerges as a key factor in moderating its psychological and quality-of-life impacts.[2,3]

Health literacy is defined as individuals having the knowledge and skills needed to understand, interpret and use health information appropriately. This concept supports individuals' ability to manage their own health and make informed decisions.[4] According to the World Health Organization, inadequate health literacy is a significant problem that negatively affects individuals' access to health services, their level of utilization of these services and overall health outcomes.[5]

Current studies on health literacy levels worldwide indicate that even in developed countries, people struggle to access adequate information, revealing significant inequalities in this access.[6,7] To improve health literacy, it is essential to implement awareness campaigns and educational programs and provide more accessible health services.[8]

In pediatrics, parental cyberchondria and health literacy levels play a critical role in shaping children's health behaviors. Parents' ability to access and interpret health information directly affects medical decisions. Cyberchondria may cause misdiagnosis or delay in care, while low health literacy hampers comprehension of medical guidance.[9,10] This study investigates the interplay between these factors within the pediatric setting.

This study aims to determine the cyberchondria and health literacy levels of parents who apply to the pediatric outpatient clinic and to examine how these levels affect parents' behaviors regarding their own health and that of their children. We think the findings will significantly contribute to future studies to improve parents' health-related internet usage behaviors and reduce risky health behaviors.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted between January and June 2023 with ethical approval from the Bursa Uludağ University Clinical Studies Ethics Committee (Decision No: 2011-KAEK-26/404). The study included parents of children attending the general pediatrics outpatient clinic, who consented and completed all survey questions. Participants were informed about the study's purpose, methods, and confidentiality principles, and written informed consent was obtained before their participation.

Survey content

The questionnaire consisted of four sections. The first addressed demographic data, while the second included items based on clinical observations of parental behaviors, healthcare communication challenges, and internet and social media use (*Table 1*). Notably, no validated parent-report tools currently assess internet-related risks in health decision-making for parents and children. The third section used the Turkish Health Literacy Scale (THLS-32), and the fourth employed the Cyberchondria Severity Scale (CSS-33).

The Turkish Health Literacy Scale (THLS-32) is adapted from the European Health Literacy Scale, developed by the HLS-EU Consortium in 2012.[11] Its Turkish version was validated by the Ministry of Health of Türkiye.[12]

The THLS-32 is a 32-item, 5-point Likert scale with excellent reliability (Cronbach's α = 0.927). Scores range from 0 (lowest health literacy) to 50 (highest), categorized as inadequate (0–25), limited (26–33), adequate (34–42), and perfect (43–50) health literacy.

The Cyberchondria Severity Scale (CSS-33), developed by McElroy et al. and validated in Turkish by Uzun et al., comprises 33 items rated on a 5-point Likert scale (Cronbach's α = 0.89).[13,14] Higher scores reflect greater cyberchondria severity, categorized as very low (0–33), low (34–66), medium (67–99), high (100–132), and very high (133–165).

Sample size

The sample size was calculated using Epi Info 7.2, with a 95% confidence level and a 4% margin of error, resulting in a minimum of 583 participants. To enhance statistical power and representativeness, 619 individuals were ultimately included in the study.

Statistical analysis

Data were analyzed using IBM SPSS Statistics 29. Normality was assessed with the Shapiro-Wilk test. For normally distributed data, the t-test was applied; otherwise, the Mann-Whitney U test was used. Categorical variables were evaluated with Pearson's Chi-square test, and correlations were examined using Pearson's and Spearman's coefficients. Statistical significance was set at $\alpha = 0.05$.

RESULTS

The study included 619 parents who applied to the Bursa Uludağ University, Faculty of Medicine, Department of Child Health and Diseases, general pediatrics outpatient clinic between January 1, 2023 and June 30, 2023, met the study criteria, and agreed to the study; 55.9% of the participants were female, and the average age of the participants' children was 6.49 ± 5.18 years. The parents' average daily social media use time was 2.11 ± 1.56 hours, and the average daily internet use time was 2.07 ± 1.92 hours. While the average number of visits to a health institution for the parents was 2.43 ± 1.17 times per year, the average annual frequency of visits to a health institution for their children was 3.41 ± 1.01 times. The sociodemographic characteristics of the parents and their responses to social media usage characteristics are detailed in *Table 2*.

The mean CSS score of the parents was 71.51 ± 22.46 (min-max; 33-143). When the CSS scores of the participants were examined, it was determined that 21 (3.39%) had very low scores, 264 (42.64%) had low scores, 266 (42.97%) had medium scores, 60 (9.69%) had high scores, and 8 (1.29%) had very high CSS scores.

The mean THLS score was 21.37 ± 6.60 (min-max; 0-39.39). When the THLS scores were examined, it was determined that 437 (70.59%) had inadequate health literacy, 164 (26.49%) had problematic/limited health literacy, and 18 (2.9%) had adequate health literacy. No participant (0%) had perfect health literacy.

While 14.2% (n: 88) of the parents stopped using their medication because of the information they read on the internet, 12% (n: 74) of them stopped using their child's medication because of the information they read on the internet. *Table 3* presents details of the effects of CSS and THLS scores on parents' medication discontinuation behavior.

It was observed that CSS scores increased as the frequency of internet use increased and that parents who thought the information on the Internet was reliable had significantly higher CSS scores. It was determined that parents who could not communicate comfortably with their doctor about themselves and their children had statistically significantly higher CSS scores; 92.2% of the participants stated that they diagnosed themselves and 91.1% of their children via the Internet. Data on the relationship between parental characteristics and CSS and THLS scores are presented in detail in *Table 4.*

The correlation between CSS and THLS scores and several variables was examined. A statistically significant positive relationship existed between parents' daily social media and internet usage time and cyberchondria scores. A statistically significant positive relationship was found between CSS and THLS scores; details of the data are presented in *Table 5.*

TABLE 1. Assessment Items for parental health-related internet use derived from clinical practice

Healthcare communication and trust	• Can you comfortably ask questions to your doctor/nurse? • Can you comfortably ask your doctor questions about your child?
Medication adherence influenced by online information	• Have you stopped taking your medication because of information you read on the internet? • Have you stopped your child's medication because of information you read on the internet?
Healthcare decision-making based on internet use	• Do you use the internet to choose a doctor/hospital? • Do you use the government's digital health monitoring system? • How often do you use the internet for health-related purposes?
Self-diagnosis and child health evaluation via internet	• Do you diagnose yourself using information from the internet? • Do you diagnose your child using internet information? • How do you evaluate your own health status? • How do you evaluate your child's health status?
Perceived credibility of online health information	• Do you find health information obtained from websites or discussion forums trustworthy?

TABLE 2. Characteristics of parents

Features		n (%)
Gender	Female	346 (55.9)
	Male	273 (44.1)
Marital status	Married	571 (92.2)
	Single	27 (4.4)
	Divorced	21 (3.4)
Age (years)	18-24	37 (6)
	25-44	501 (80.9)
	45-65	81 (13.1)
Education level	Primary education	111 (17.9)
	Secondary Education	158 (25.5)
	High school	147 (23.7)
	University	161 (26)
	Postgraduate	42 (6.8)
Working status	Working	294 (47.5)
	Not working	325 (52.5)
Economic level	Income exceeds expenses	122 (19.7)
	Income and expense are in balance	314 (50.7)
	Income is less than expenses	183 (29.6)
Family type	Alone	22 (3.6)
	With friends	6 (1)
	Nuclear family	491 (79.3)
	Extended family	100 (16.2)
Can you comfortably ask questions to your doctor/nurse?	Yes	575 (92.9)
	No	44 (7.1)
Can you comfortably ask your doctor questions about your child?	Yes	573 (92.6)
	No	46 (7.4)
Have you stopped taking your medication because of information you read on the internet?	Yes	88 (14.2)
	No	531 (85.8)
Have you stopped your child's medication because of information you read on the internet?	Yes	74 (12)
	No	545 (88)
Do you use the internet to choose a doctor/hospital?	Yes	371 (59.9)
	No	248 (40.1)
Do you use the government's digital health monitoring system?	Yes	504 (81.4)
	No	115 (18.6)
How often do you use the internet for health-related purposes?	Never	66 (10.7)
	Rarely	112 (18.1)
	Sometimes	190 (30.7)
	Often	151 (24.4)
	Always	100 (16.2)
Do you diagnose yourself using information from the internet?	Yes	571 (92.2)
	No	48 (7.7)
Do you diagnose your child using internet information?	Yes	564 (91.1)
	No	55 (8.9)
How do you evaluate your own health status?	Too bad	27 (4.4)
	Bad	9 (1.5)
	Middle	175 (28.3)
	Good	304 (49.1)
	Very good	104 (16.8)
How do you evaluate your child's health status?	Too bad	27 (4.4)
	Bad	25 (4.0)
	Middle	172 (27.8)
	Good	276 (44.6)
	Very good	119 (19.2)
Do you find health information obtained from websites or discussion forums trustworthy?	Yes	98 (15.8)
	No	521 (84.2)

TABLE 3. Effect of CSS and THLS scores on parents' medication withdrawal behavior

		Have you stopped taking your medication because of information you read on the internet?			Have you stopped your child's medication because of information you read on the internet?		
		Yes	**No**	*P* value	**Yes**	**No**	*P* value
CSS	Very low	2 (9.5)	19 (90.5)	**<0.001**	2 (9.5)	19 (90.5)	**<0.001**
	Low	30 (11.4)	234 (88.6)	**<0.001**	23 (8.7)	241 (91.3)	**<0.001**
	Middle	45 (15.9)	221 (78.1)	**0.001**	39 (13.8)	227 (80.2)	**0.001**
	High	9 (15)	51 (85)	**0.04**	10 (16.7)	50 (83.3)	**0.04**
	Very high	2 (25)	6 (75)	0.053	0 (0)	8 (100)	**<0.001**
THLS	Inadequate	76 (17.4)	361 (82.6)	**<0.001**	50 (11.4)	387 (88.6)	**<0.001**
	limited	12 (7.3)	152 (92.7)	**<0.001**	22 (13.4)	142 (86.6)	**<0.001**
	Adequate	0 (0)	18 (100)	**0.001**	2 (11.1)	16 (88.9)	**0.001**

Chi-square test. For relation between categorical data, Pearson Chi-Square was used when the proportion of cells with an expected value of less than 5 was less than 20%, and Fisher's Exact Test was used when it was greater than 20%.

TABLE 4. Effect of parental characteristics on CSS and THLS Scores

Features		CSS score M ± SD	*p* value	THLS score M ± SD	*p* value
Education level	Primary education	70.00 ± 24.51	**<0.001[a]**	20.95 ± 5.69	0.555[a]
	Secondary Education	69.44 ± 19.65		21.31 ± 6.14	
	High school	69.36 ± 23.55		21.01 ± 7.67	
	University	72.29 ± 21.11		21.70 ± 6.35	
	Postgraduate	87.85 ± 22.00		22.71 ± 7.45	
Can you comfortably ask questions to your doctor/nurse?	Yes	70.32 ± 21.43	**<0.001[b]**	21.20 ± 8.88	**0.022[b]**
	No	87.13 ± 29.13		23.56 ± 7.52	
Can you comfortably ask your doctor questions about your child?	Yes	70.97 ± 22.17	**0.034[b]**	21.16 ± 6.63	**0.005[b]**
	No	78.28 ± 25.07		23.99 ± 5.61	
Have you stopped taking your medication because of information you read on the internet?	Yes	76.28 ± 24.14	**0.031[b]**	19.93 ± 6.24	**0.028[b]**
	No	70.72 ± 22.09		21.61 ± 6.64	
Have you stopped your child's medication because of information you read on the internet?	Yes	77.55 ± 21.57	**0.014[b]**	22.12 ± 6.23	0.299[b]
	No	70.69 ± 22.47		21.27 ± 6.65	
Do you use the internet to choose a doctor/hospital?	Yes	74.47 ± 22.09	**<0.001[b]**	21.51 ± 6.82	0.513[b]
	No	67.08 ± 22.32		21.16 ± 6.27	
Do you use the government's digital health monitoring system?	Yes	73.72 ± 22.20	**<0.001[b]**	21.59 ± 6.37	0.080[b]
	No	61.82 ± 21.06		20.40 ± 7.47	
How often do you use the internet for health-related purposes?	Never	61.28 ± 23.38	**<0.001[a]**	20.86 ± 6.37	0.216[a]
	Rarely	64.38 ± 19.52		20.40 ± 8.05	
	Sometimes	72.68 ± 24.19		22.05 ± 6.23	
	Often	74.79 ± 20.24		21.75 ± 6.24	
	Always	79.07 ± 20.53		20.93 ± 6.10	
Do you diagnose yourself using information from the internet?	Yes	82.39 ± 25.08	**<0.001[b]**	22.40 ± 6.70	0.259[b]
	No	70.60 ± 22.01		21.28 ± 6.59	
Do you diagnose your child using internet information?	Yes	81.20 ± 23.69	**0.001[b]**	23.23 ± 6.18	**0.028[b]**
	No	70.57 ± 22.13		21.19 ± 6.62	
Do you find health information obtained from websites or discussion forums trustworthy?	Yes	78.04 ± 23.21	**0.002[b]**	22.15 ± 6.65	0.203[b]
	No	70.28 ± 22.12		21.22 ± 6.59	

[a] *One way Anova test*

[b] *Independent samples t test*

p: Significance level

TABLE 5. Relationships between parental characteristics, CSS and THLS scores

	Age of the child		Social media usage time (hours/day)		Internet usage time (hours/day)		Number of hospital admissions for oneself		Number of hospital admissions for their child		THLS score	
	r	p	r	p	r	p	r	p	r	p	r	p
CSS score	-0.005	0.907	0.136	**0.001**	0.139	**0.001**	-0.029	0.470	0.049	0.224	0.287	**<0.001**
THLS score	0.075	0.062	-0.017	0.678	0.146	**<0.001**	-0.029	0.476	-0.085	0.034	-	-

r: Pearson correlation coefficient, p: level of significance.

DISCUSSION

According to the Digital 2024 Global Statshot Report, 67.5% of the global population (5.52 billion people) are internet users, with an average daily usage of 6 hours and 36 minutes. In Turkey, these figures rise to 86.5% and 6 hours 51 minutes, respectively. Globally, 35.3% of internet users aged 16–64 seek health information online.[15] Digital health literacy (a composite of computer, media, and information literacy) is critical for effectively navigating e-health platforms.[16] Parents with low digital health literacy may struggle to assess the reliability and relevance of online health content, risking reliance on inaccurate sources.[17] The proliferation of online health information, while promising, can contribute to misinformation and phenomena such as cyberchondria, underscoring the need for robust digital health competencies.[18]

Studies consistently demonstrate a significant association between health literacy and cyberchondria. Parents with lower health literacy often seek child-related health information with heightened anxiety, increasing susceptibility to misinformation and cyberchondria.[10,19-21] Our study evaluated the impact of parents' cyberchondria and health literacy levels on their health-related decisions. Findings revealed that 14.2% of parents discontinued their own medication and 12% stopped their child's medication based on online information. These behaviors were more prevalent among those with high cyberchondria scores, whereas none of the parents with adequate health literacy reported discontinuing prescribed medications. The results indicate that inadequate health literacy, combined with elevated cyberchondria, heightens the risk of inappropriate health decisions.

In our study, contrary to the literature, we found a positive correlation between CSS and THLS scores. This result was surprising because we expected cyberchondria scores to decrease as health literacy increased. However, this finding reflects the complex nature of the relationship between health literacy and cyberchondria. Recent study has shown that individuals with higher e-health literacy may engage in more frequent health-related online searches, which may actually increase anxiety and cyberchondria, especially when their ability to evaluate information critically is limited.[22] In our sample, 97% of parents had inadequate or limited health literacy. Therefore, even participants with relatively higher scores may lack sufficient skills to critically assess or filter online health information. This may lead to information overload, confusion, and increased anxiety. Similar outcomes have been reported in prior studies involving teachers and university students.[23,24]

Moreover, research suggests that health anxiety plays an important mediating role in this relationship. Parents with high health anxiety may be more prone to misinterpreting or obsessively seeking online health information, regardless of their literacy levels.[25,26] These findings point to a threshold effect that only high levels of both digital and critical health literacy may provide real protection against cyberchondria. Therefore, interventions should not only aim to improve health literacy but also help individuals build emotional regulation skills and learn how to identify reliable online health sources.[27]

However, one of the study's most important findings was that only 18 (2.9%) of 619 participants had adequate health literacy, while none of the participants (0%) had excellent health literacy. Almost all participants (97.08%) had limited or lower levels of health literacy.

In pediatric healthcare, the combination of parents' limited health knowledge and high levels of cyberchondria presents a significant challenge, potentially leading to poor health

decisions for their children. Parents susceptible to cyberchondria may misinterpret online information, self-diagnose their children with unfounded ailments, and pursue unnecessary medical interventions, thereby straining healthcare resources and potentially subjecting their children to unwarranted risks.[9]

Parents with low health literacy are more prone to misinterpreting online information, which can lead to misguided medical decisions examinations.[20,21] Health literacy was found to significantly influence pediatric healthcare utilization and outcomes. Notably, 14% of parents reported behaviors potentially disrupting diagnosis or treatment. Prior research also links higher parental health literacy with better chronic disease management, increased healthcare access, and reduced vaccine hesitancy issues increasingly associated with cyberchondria.[7,28,29]

And other research indicates that individuals with high levels of digital literacy are better equipped to challenge misinterpretations of information online and are less susceptible to health anxiety.[30] Both scenarios pose risks to both child and parental health. Our study has enhanced our understanding of the relationship between health literacy and cyberchondria, demonstrating that the health literacy levels of parents significantly impact the health outcomes of both themselves and their children.

Our study showed that parents use the internet intensively to search for health information and diagnose themselves (92.2%) and their children (91.1%) via the internet. Similarly as studies in the literature[6,9,28,29] we found that parents with higher levels of education have higher CSS scores. A study by Eastin and Guinsler indicated that seeking health information increases, rather than decreases, individuals' health concerns.[31] We emphasize the need for further studies to improve parents' health literacy and raise awareness about the dangers of seeking medical information online.

Parents with elevated cyberchondria scores are more likely to engage in repetitive online health searches, contributing to an anxiety cycle. Cyberchondria has been consistently linked to psychological conditions such as anxiety, OCD, and hypochondriasis. Notably, pandemic-related anxiety further amplified these tendencies.[9,10,29,31] This study also found higher cyberchondria scores among parents who relied on the internet when selecting doctors or hospitals. These results underscore the significant influence of digital media on parental health decisions and highlight the need for targeted health literacy interventions and improved accuracy of online health information.

Our study revealed that individuals uneasy about discussing health concerns with physicians exhibited significantly higher CSS scores than those more communicative. Limited trust or dialogue with healthcare professionals may drive parents to seek information online.[32] Pediatricians are crucial in mitigating cyberchondria by enhancing digital health literacy through continuous care and public education. By correcting misinformation and offering evidence-based advice, they promote informed decisions.[9] Directing families to reliable online sources also helps avoid misinformation. Furthermore, national strategies and medical home models addressing social determinants such as poverty can improve overall child and family health outcomes.[18]

It has been shown that individuals do not have sufficient health literacy levels, even in developed countries.[6,7] These results indicate that comprehensive education studies for health literacy should be carried out in Türkiye and other countries, including developed countries. Moreover, pediatric healthcare professionals can leverage their expertise to educate parents about the potential pitfalls of self-diagnosis and the importance of seeking professional medical advice for their children's health concerns.[9] By fostering a trusting relationship with families and establishing open lines of communication, pediatricians and pediatric nurses can encourage parents to seek guidance and support rather than resorting to online self-diagnosis. As we all know, partnerships with parents are essential to improving the health of children and adolescents.[33]

This study addresses a critical gap in cyberchondria research by examining how parental cyberchondria may contribute to risky health behaviors that impact child health. One important limitation of this study concerns the behavioral assessment items related to parental actions, such as discontinuing medications or self-diagnosing their children through the internet. These items were developed based on clinical experience and real-life observations encountered in pediatric outpatient practice. Although The Children's Health Internet Research, Parental Inventory (CHIRPI) is validated it doesn't have a Turkish validation and does not fully meet the context of the questions asked.

Although the items used in this study were

carefully formulated in consultation with pediatric health expert autors, the lack of formal validation means that the findings related to these behaviors should be interpreted with caution. Develop standardized tools to assess parental decision-making in digital health contexts in future studies will enhance measurement reliability and enable better study comparisons. The findings underscores the need for effective clinician-parent communication to mitigate cyberchondria and highlights the importance of targeted education efforts to combat misinformation in pediatric healthcare. However, the cross-sectional design, reliance on self-reported data, and the lack of formal validation for behavioral items warrant a cautious interpretation of the results.

CONCLUSION

This study provided new data on cyberchondria and health literacy levels in the pediatric field and helped us better understand the effects of these two variables on parents' health decisions. According to the results of our study, inadequate health literacy and high levels of cyberchondria increase the risk of making wrong health decisions. We should focus on reducing cyberchondria, increasing parents' digital literacy, and encouraging access to accurate information sources. ∎

Acknowledgements

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