

Factors Affecting Levels of Cyberchondria in Mothers of Children with Food Allergies

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ABSTRACT

Cyberchondria is a term used to assess the anxiety-inducing effects of online health-related searches. Most of the mothers were found to have obtained information from the internet, but the influence of the internet on maternal anxiety has not been sufficiently investigated. Therefore, our aim in the present study was to evaluate the relationship between cyberchondria experienced by mothers of children with food allergies and sociodemographic factors.

The study was carried out with mothers whose children had been diagnosed with a food allergy and mothers of healthy children. 'The Cyberchondria Severity Scale' was used to evaluate the anxiety of the mothers. In addition, the sociodemographic status of the participants was evaluated with a questionnaire.

The cyberchondria severity scores of 60 mothers with food-allergic children and 60 mothers with healthy children were compared. The most common diagnosis was atopic eczema (51.8%). The cyberchondria severity scores of mothers with food-allergic children (59 ± 23) were significantly higher than those for the healthy group (50 ± 13) ($p < 0.001$). The mean cyberchondria severity scores were significantly higher in working mothers ($p = 0.01$), families whose monthly income was the minimum wage and above ($p = 0.02$), and mothers who searched on the internet to choose a physician ($p = 0.03$).

Psychological problems in mothers of children with food allergies that may be caused by cyberchondria can often be overlooked in outpatient settings. To detect these problems, it is necessary to perform screening tests and to provide support to these mothers in a timely manner.

Keywords: Internet, cyberchondria, mother, food allergy, children

Introduction

Today, easy access to the internet means that people frequently search for information about health problems online. However, obtaining accurate medical information can be difficult and complex (1), and internet searches can sometimes increase uncertainty. Searching for health information online can make people who are intolerant of uncertainty even more anxious and experience intense anxiety about events that are unlikely to occur (2). Cyberchondria is a term used to assess the anxiety-inducing effects of online health-related searches (3). People who experience these effects tend to think the worst and worry about any situation, especially when searching for the cause of a health problem on the internet. Anxiety has been shown to be associated with cyberchondria and intolerance of uncertainty (3-6). People with greater intolerance of uncertainty seek more medical information online and are more likely to become anxious, but the opposite

may also be the case, as more anxious people may be more likely to search the internet for answers to problems (7).

With the increase in the use of the internet thanks to improved access, the number of mothers who research health problems frequently online about food allergies has increased significantly over the past decade. However, for some people, the health information obtained from the internet may increase their concerns instead of alleviating them (8,9). The lack of verification of much information published on the internet, together with the lack of proof or expert opinion, may also cause people to delay consulting their doctor or to not apply the treatment prescribed (10). There are few studies in the literature investigating the psychological effects of excessive internet use in mothers of children with food allergies (11). Most of these mothers were found to have obtained information from the internet (11), but the influence of the internet on maternal anxiety has not been sufficiently investigated. If the severity

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Received: 25.07.2022, Accepted: 22.12.2022

of the cyberchondria levels of these mothers can be evaluated and determined in a timely manner, the necessary psychosocial support can be provided. Therefore, our aim in the present study was to evaluate the relationship between cyberchondria experienced by mothers of children with food allergies and sociodemographic factors.

Material and Methods

The study was carried out with mothers whose children had been diagnosed with a food allergy and were being followed up at the Paediatric Allergy and Asthma Department. Mothers of healthy children who had made appointments at the general pediatric outpatient clinic for routine physical examinations were recruited as the control group. Ethical approval was obtained from the local ethical committee (date:15.02.2022, no:53), and written informed consent was obtained from all participants.

Mothers who were literate, and who did not have any physical or medical problems which could prevent them from completing the questionnaire were included in the study. Excluded from the study were mothers diagnosed with psychiatric disorders, mothers who were illiterate, mothers whose children had additional chronic diseases besides food allergies and other concomitant allergic diseases, and who did not use the internet for food-allergy research.

'The Cyberchondria Severity Scale', which has been proven to be effective in national and international studies, was used to evaluate the anxiety of mothers (4,12-14). It is a 33-item, 5-point Likert-type measurement tool (1 = *Never* to 5 = *Always*) with five dimensions. The dimensions are compulsion, extreme anxiety (distress), excess, reassurance, and distrust of the doctor.

In addition, the sociodemographic status of the participants was evaluated with a questionnaire considering the literature data together with the questions covering the different independent factors that may affect cyberchondria (2-4,7,8). The sociodemographic questionnaire created before the study was applied to 20 patients for each study group, and an evaluation was carried out to discover whether there were any incomprehensible expressions. As all the expressions in the questionnaire were understood by the participants, no corrections were made to the questions. Eight mothers with food-allergic children and 10 mothers with healthy children who filled in the questionnaire incompletely or

declined to give ethical consent were excluded from the study.

Statistical Method: Descriptive statistics were presented with the median for the numerically non-normally distributed variables and the mean for the normally distributed variables. Ratios or percentages were used for categorical variables. Whether the variables fit the normal distribution or not was evaluated with visual (histogram and probability graphs) and analytical (Kolmogorov Smirnov/Shapiro-Wilk tests) methods. The Chi-square test (χ^2) was used to compare categorical variables. Student's *t*-test was used to compare the numerical variables with normal distribution between the groups, and the Mann-Whitney U test was used to compare the numerical variables that did not show normal distribution. Spearman correlation analysis was used to evaluate the relationship between non-normally distributed and ordinal variables, and Pearson correlation analysis was used to evaluate the relationship between normally distributed variables and ordinal variables.

Results

The cyberchondria severity scores of 60 mothers with food-allergic children and 60 mothers with healthy children were compared. The sociodemographic characteristics of the food-allergic children are shown in Table 1. The median age of the children with a food allergy was 8.5 months (min-max: 2-30). The most common diagnosis was atopic eczema (51.8%). More than half of the patients (58.3%) were on multiple diets.

Table 2 compares the socio-demographic characteristics of mothers of food-allergic children with mothers of healthy children. There was no statistically significant difference between the groups in terms of maternal education level ($p=0.35$), monthly family income ($p=0.13$), the median age of children ($p=0.97$), or the mean age of mothers ($p=0.56$). It was determined that the cyberchondria severity scores of mothers with food-allergic children (59 ± 23) were significantly higher than those for the healthy group (50 ± 13) ($p<0.001$). Following the covariant analysis, it was noted that the child's age ($p=0.44$), the mother's age ($p=0.76$), a maternal education level ($p=0.58$), and family monthly income ($p=0.36$) had no effect on the difference in mean cyberchondria severity scores between two groups.

Table 3 shows the evaluation of the factors affecting the cyberchondria severity scores of

Table 1. Sociodemographic Characteristics of Food-Allergic Children

Characteristic features	Results
Age of the patients (month), median (min-max)	8.5 (2-30)
Diagnosis, n (%)	Proctocolitis 12 (20 %)
	Acute enterocolitis 2 (3.3 %)
	Chronic enterocolitis 8 (13.3 %)
	Eczema 31 (51.8 %)
	Anaphylaxis 2 (3.3 %)
	Urticaria-Angioedema 2 (3.3 %)
	Proctocolitis and eczema 1 (1.7 %)
	Other 2 (3.3 %)
The number of foods eliminated from the diet*, n (%)	One 25 (41.7%)
	Multiple 35(58.3%)

*Foods are grouped as dairy products, eggs, meat, fish, vegetables, fruits, and cereals. Multiple food eliminations are determinants of eliminating more than one food group

Table 2. The Comparison of Sociodemographic Features Between Groups

Parameters	Group 1 (Food allergic group) (n=60)	Group2 (Control group) (n=60)	p
Maternal education level			
Primary school n, (%)	12 (20)	12 (20)	
Secondary school n, (%)	12 (20)	14 (23.4)	
High school n, (%)	9 (15)	13 (21.6)	0.35
University n, (%)	27 (45)	21 (35)	
Monthly income of the family			
Minimum wage and below n, (%)	22 (36.7)	25 (41.7)	
Above the minimum wage n, (%)	38 (63.3)	35 (58.3)	0.13
Age of children (month), median (min-max)	8.5 (2-30)	9 (3-19)	0.97
Age of mothers (year), mean±standard deviation	29±5	31 ±4	0.85
Cybercornia severity, mean±standard deviation	59±23	50±13	<0.001

mothers with food-allergic children. The mean cyberchondria severity scores were significantly higher in working mothers ($p=0.01$), families whose monthly income was the minimum wage and above ($p=0.02$), and mothers who searched on the internet to choose a physician ($p=0.03$). In addition, the relationship between levels of maternal cyberchondria severity scores with food-allergic children and independent factors is shown in Table 4. A significant positive correlation was found between the mothers' cyberchondria severity scores and education level ($p=0.006$, $r=0.42$), and the frequency of mothers' weekly internet use ($p=0.05$, $r=0.41$). Table 5 shows the most common online sources used by mothers

with food-allergic children to research food allergies on the internet. Although the average cyberchondria severity scores in the group that exchanged information on social media (74 ± 14) and articles (73 ± 40) were higher than for videos (64 ± 16), it was not statistically significant ($p=0.18$).

Discussion

Being able to control the level of anxiety while seeking and accessing health-related information is a significant problem and has caused an increase in the levels of cyberchondria.¹⁵ Owing to the developing technology, increasing internet usage,

Table 3. Evaluation of The Factors Affecting The Levels of Cyberchondria In Mothers With Food-Allergic Children

Parameters		Mean±Standart deviation	p
Mother	Working, n=20 (33.3%)	68±22	0.01
	Not working, n=40 (66.7%)	55±19	
Monthly income	Below minimum wage, n=23 (38.3%)	47±20	0.02
	Minimum wage and above, n=37 (61,7%)	66±21	
Diet decision without physician recommendation	Yes, n=20 (33.3%)	59±23	0.68
	No, n=40 (66.7%)	63±22	
Trusting information about food allergies on the internet	Yes, n=33 (55%)	58±21	0.81
	No, n=27 (45%)	61±24	
Making decisions about the child's health with the information they learn from the internet	Never, n=34 (56.7%)	57±19	0.18
	Sometimes, n=26 (43.3%)	64±22	
Research on the internet when choosing a doctor	Yes, n=39 (65%)	66±19	0.03
	No, n=21 (35%)	52±25	
Multiple diets	Yes, n=35(58.3%)	58±23	0.41
	No, n=25 (41.7%)	63±24	

Table 4. Interaction Between Independent Factors and Cyberchondria Severity Score

		Age of mothers	Age of patients	Follow-up period	The number of children	Frequency of using the internet per week *	Maternal education levels**
Cyberchondria severity score	r	0.06	-0.16	0.02	-0.19	0.41	0.42
	p	0.68	0.26	0.89	0.17	0.05	0.006

* The frequency of weekly internet use was classified as less than one hour, 1-5 hours, 6-10 hours, and more than 10 hours per week.

** Maternal education levels are classified as primary school, secondary school, high school, and university

and the widespread use of internet communication with other people on websites (blogs, forums, etc.), a growing number of mothers of children with food allergies have easy access to health-related information. Many websites are not professionally designed and may not contain accurate information; inaccurate forms of internet communication may mislead parents with false and/or inappropriate information (1). Whether the information is true or false, it may increase or decrease anxiety. In addition to anxiety, negative consequences such as anxiety, depression, and self-diagnosis or treatment may also be seen (12). In our study, the severity of cyberchondria was

found to be higher in the food-allergy group than in the healthy group. Our study also shows that mothers of children with food allergies may experience anxiety because of the information they get from the internet.

In a study by Güleşen et al. which evaluated cyberchondria of adult patients with heart disease, cyberchondria severity scores were found to be higher in those who had researched the disease on the internet (p<0.001), those who had believed that the information on the internet was correct, and those who had made decisions about their health with the information they had obtained from the internet (8). In a study conducted on

Table 5. The Most Common Sources Used By The Participants When Researching Food Allergies On The Internet

	n (%)	Cybercornia severity score Mean± Standard deviasyon	p
Social media	10 (19.2)	74±14	0.13
Video	36 (69.3)	64±16	
Article	6 (11.5)	73±40	

*8 of 60 (13.3%) participants stated that they had no opinion and were not included in the analysis

university employees, cyberchondria severity was found to be higher in those who did research on the internet before consulting a physician (16). Beken et al. found that mothers of food-allergic children who had eliminated foods themselves prior to admission to the hospital had done more web searches for food allergies than mothers who had not followed a diet without the doctor's recommendation (11). Studies in the literature show that internet research of people before consulting a doctor and the information they find from the Web may affect both the treatment decision and their anxiety related to the internet. In our study, mothers with food-allergic children who had searched on the Web before choosing a doctor had higher mean cyberchondria severity scores. The concerns of the families could lead them to find more experienced and reputable physicians. In our study, no significant association was found between mothers' mean cyberchondria severity scores and their trust in online information about food allergies, making decisions about their children's health with the information they had found on the internet, or their dietary decisions taken without the physician's recommendation. The increasing use of the internet thanks to developing technologies, and the ability to investigate all the symptoms of food allergies, has led to an increase in mothers' anxiety about their children's health and in cyberchondria severity. This issue needs to be clarified by different studies.

In a study conducted on adults with heart disease, cyberchondria severity was found to be higher in patients who had been followed up for less than one year (14). It can be concluded that children with food allergies have just been diagnosed with the disease, and uncertainty about the future of the disease may increase the mothers' cyberchondria. Newly diagnosed individuals may experience intense anxiety about their disease and do more research on the internet. After the diagnosis, mothers of food-allergic children learn to live with the allergy, and their fears might decrease, and they feel safer as time passes (17). In

our study, however, no relationship was found between the duration of follow-up and the severity of cyberchondria.

Individuals who are younger have more cyberchondria severity scores owing to more internet use (8). Also, it was shown that the severity of cyberchondria scores is independent of age (18). Since young individuals make more use of smartphones and the internet, they may be expected to have higher cyberchondria severity scores, but in our study, no significant relationship was found between mean cyberchondria severity scores and maternal age. In our study, the mean ages of mothers were 29 ± 5 years, whereas studies in the literature indicate that cyberchondria severity is more common in young and middle-aged people (8). Therefore, it is difficult to evaluate the relationship between maternal age and cyberchondria severity in our study. Studies with mothers in different age groups will help clarify this issue.

Studies conducted with adults showed that the level of cyberchondria is higher in people who work full-time (14). It may be expected that families with a higher socioeconomic level seek more health information. Our study revealed that mothers who were working and were socioeconomically better off had higher cyberchondria severity scores. This could be explained by the mothers having more economic opportunities to spend time online.

There are limited studies in the literature showing a positive relationship between education level and cyberchondria severity (18,19). Our results are similar to the literature. The education level of mothers may affect their ability to process information and obtain technological information from the internet. As education level increases, the increase in internet use and health literacy level may increase cyberchondria severity.

According to a study conducted by Karmppaul on university students in 2014, a positive correlation was found between time spent on the internet and health anxiety (20). In Rice's study, it was found that people who spent more time on the internet

conducted more health-related research online (21). Our study supports the results of the literature. As time spent on the internet increases, mean cyberchondria severity scores of mothers are also expected to increase.

The Limitations of Our Study; the biggest limitation of our study is that it was a single-center study. There is a need for involving multi-center studies with more patients. This study was designed as a cross-sectional study. We think that prospective studies may better reflect the changes in cyberchondria severity of the mothers over time. A complete psychiatric examination of mothers was not performed for other psychiatric diseases that may accompany cyberchondria. We did not assess the severity of the cyberchondria of other family members.

Psychological problems in mothers of children with food allergies that may be caused by cyberchondria can often be overlooked in outpatient and clinical settings. In our study, the mean cyberchondria scores of mothers with food-allergic children were higher than those of mothers with healthy children. Training should be provided to mothers on the internet, on how to recognize websites that offer accurate information about health, and on how to evaluate the information obtained from these websites. To detect these problems, it is necessary to perform screening tests and provide support to these mothers in a timely manner. Thus, it is expected that when the quality of life of mothers with cyberchondria increases, they can contribute more actively to their children's treatment.

Conflict of Interest: The authors declare no conflict of interest.

Funding: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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