

The Use of Internet for Allergic Diseases: Which One is the First Step: Specialists or Google?

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Abstract

BACKGROUND/AIMS: Allergic diseases are one of the most common health problems worldwide affecting all ages and a popular topic on the internet. The aim of this study was to determine the tendency of internet use by those patients with allergic diseases and the parents of children with allergies.

MATERIALS AND METHODS: A cross-sectional observational study was conducted in two parts for pediatric and adult allergic patients, in two tertiary care academic hospitals in Northern Cyprus. Participants were recruited from adult patients and the parents of allergic children attending the outpatient clinics and the assessment of participants perspectives on internet use were evaluated by a written questionnaire.

RESULTS: Four hundred and fifty-two participants; 259 adults and 193 parents of pediatric patients were enrolled into the study. The only statistically significant parameter for the relation with internet use is the “age of patients”. In the adult group; younger patients (below the age 35) used internet sources more frequently. In the pediatric group “age of disease onset” was analyzed with cut-off points of 6 months of age and 12 months of age, with both of them having statistically significant p-values of 0.003 and 0.000 respectively. The type of allergic disease had no association with internet use in either group.

CONCLUSION: This study reported the only statistically significant factor associated with internet use is age for adult patients and age of onset for pediatric allergies. We would like to highlight the need for evidence-based online information for parents especially for the allergies concerning the first year of life.

Keywords: Allergies, e-health, digital health, internet use, Googling

INTRODUCTION

The use of internet sources for several health issues has grown tremendously in the last decades. The internet has become popular as a first-line reference to access information easily and quickly even in health issues. Approximately 35% of Americans use the internet to access information,¹ and this frequency can be up to 72% in different sources.² However, information on the web about health issues may not be accurate and its usefulness in health-related problems is controversial.

In the last 20 years, the usage of the internet has grown exponentially worldwide,³ and the effect of internet and social networks on “health” is a topic of growing interest. Information services supporting the self-management of chronic diseases may help patients to improve their knowledge about these diseases or to help them with preventive measures.

Allergic diseases are one of the most common health problems worldwide, affecting all ages. Worldwide, between 10% and 30 % of the population suffer from allergic rhinitis. Adverse drug reactions may

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affect up to 10% of the world's population and affect up to 20% of all hospitalized patients.⁴ A study of 38,480 children (infant to 18 years) indicated that 8% have a food allergy.⁵ Therefore, it is not surprising for allergies to be one of the most popular topics on the internet.

Therefore, the aim of this study was to determine the tendency of internet use by those individuals with allergic diseases and the parents of children with allergies.

MATERIALS AND METHODS

A cross-sectional observational study was conducted in two sections for pediatric and adult allergic patients in two tertiary care academic hospitals in Kyrenia and Nicosia, Northern Cyprus. Participants were recruited from February to June 2019, including all patients and parents of allergic children attending the outpatient clinics who agreed to be involved in this study. The assessment of the parents of children with allergies and the adult allergic patients' perspectives on internet use were evaluated by a written questionnaire of 7 multiple choice questions and a form to investigate the demographic characteristics of the study population. Three of the multiple-choice questions were about the information sources that they use regarding allergic diseases and the final four questions were about their internet sources. The participants gave written informed consent by filling out the questionnaire themselves. The study protocol was approved by the Ethics Committee of the University of Kyrenia with reference number 2021/01-003 and date: 31.03.2021.

Statistical Analysis

The data were statistically analyzed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics (frequencies, mean, \pm standard deviation values), chi-square test, and independent samples t-test were used and $p < 0.05$ was considered statistically significant.

Results

Four hundred and fifty-two patients (259 adult patients and 193 parents of pediatric patients) were enrolled in this study. The demographical characteristics of the study population are given in Table 1 for the adults and in Table 2 for the pediatric participants.

The first question was designed to determine the frequency of obtaining information from other sources rather than allergy specialists. Most of the participants stated that they try to obtain information about their health concerns from other sources before they come to an allergy clinic with 70.2% and 81.8% for pediatric and adult participants respectively. The question about the sources of information revealed that the adult participants mostly used web sources (36.5%), while the parents of pediatric patients stated that their first-line source is pediatricians (40.8%). The use of web sources as a first-line reference source was extremely low in parents (6.2%) compared to adult patients. The most preferred web sources were those web pages written by specialists with similar ratios both in the adult patients and the parents of children. In both the adult and child groups, approximately half of the participants said that they prefer to research general information related to their disease and almost one third of the participants stated that they research treatment methods. 60.8% in the pediatric group and 63.4% in the adult group expressed views that web-based sources are helpful. The detailed questions about internet use and the distribution of answers are given in Table 3.

Table 1. Demographical characteristics of adult patients

	Adults (n=259)		
Age (min–max, median, \pm SD) (years)	18–79, 35, \pm 11.6		
Age onset (min–max, median, \pm SD) (year)	2–76, 30 \pm 13.8		
Gender (M/F)	102/157		
Diagnosis (%)			
Asthma	24.2		
Rhinitis	72.4		
Eczema	6.2		
Anaphylaxis	3.2		
Food allergy	1.2		
Drug allergy	2.7		
Urticaria/angioedema	32.3		
Employment (employed/non-employed) (%)	91.5/8.5		
Education level (primary/secondary/graduate) (%)	14.7/21.9/63.4		
Income (low/middle/high) (%)	21.1/39.2/29.7/10		
Family history of allergies (%)			
	Mother	Father	Siblings
Asthma	12	3.5	7
Rhinitis	18.6	12.8	17.9
Eczema	2.7	2.7	3.9

min: minimum, max: maximum, SD: standard deviation, M: male, F: female, n: number.

Table 2. Demographical characteristics of pediatric patients

	Pediatric (n=193)		
Age (min–max, median, \pm SD) (months)	1–216, 53, \pm 53.2		
Age Onset (min–max, median, \pm SD) (months)	1–198, 24, SD \pm 58.5		
Gender (M/F)	80/113		
Diagnosis (%)			
Asthma	30.2		
Rhinitis	20.3		
Food allergy	2.6		
Allergic proctocolitis	17.7		
Urticaria/anaphylaxis	3.1		
Eczema	11.5		
Asthma + rhinitis	14.6		
Age	Mother	Father	
Employment (employed/unemployed) (%)	24-49/35/SD \pm 5.1 67/33	24-63/39/SD \pm 6.1 97.8/2.2	
Education level (primary/secondary/graduate) (%)	6.2/24.7/69.1		10.2/22.2/67.6
Income (very low/low/middle/high) (%)	24.3/32.4/29.4/14		9.9/34.1/34.6/21.4
Family history of allergies			
	Mother	Father	Siblings
Asthma	24.7	10	31.6
Rhinitis	65.8	66.7	57.9
Eczema	23.3	23.3	10.5

min: minimum, max: maximum, SD: standard deviation, M: male, F: female, n: number.

Questions	Pediatric (n=193)	Adult (n=259)
Did you try to get information from any other sources about your/your child's allergic disease before you attended the allergy clinic?		
Yes/no (%)	70.2/29.8	81.8/14.4
What were your sources for obtaining information about your/your child's allergic disease?		
General practitioner for adults/ Pediatrician for children	40.8	12.4
Allergy specialist	29.1	27.9
Friends, family members, people around with similar problems	9.1	16.4
Web sources	21	36.5
Others	-	6.9
What is your <u>first-line</u> source of information?		
General practitioner for adults/ Pediatrician for children	44.5	19.2
Allergy specialist	43.5	43.7
Friends, family members, people around with similar problems	5.8	5.7
Web sources	6.2	31.4
Are you using Google or similar search engines to get information about your/your child's allergic diseases?		
Yes/no	82.8/17.2	74.1/25.9
What kind of web sites do you prefer to read about your/your child's allergic diseases?		
Web-sites written by specialist allergists	52.2	53.8
Discussion forums	29.1	32.1
Newspapers/magazines	7	7.7
Social media (Facebook/ Instagram etc.)	11.5	6.4
What kind of information do you read from internet sources about your/your child's allergic diseases?		
General information about the course of the disease/symptom	50.3	49.2
Information about treatment methods	31.8	32.7
Disease specific diets	11.5	4.9
Alternative medicine	6.4	13.1
Did internet resources help you?		
Yes	23.7	23
Partly	60.8	63.4
No	15.5	13.6

Factors related with internet use	p-value (adults)	p-value (pediatric)
Gender	0.91	0.81
Age	0.05*	0.003 and 0.000**
Education (graduate vs. others)	0.63	0.54
Employment	0.09	0.14
Income	0.26	0.13

*Age cut-off point for adult patients is taken as 35 years of age, **For pediatric patients onset age of the disease is taken in two cut-off points, 12 months and 6 months of age.

When the factors associated with internet use are examined (Table 4), the only statistically significant parameter is the age of patients. In the adult group of allergic patients, the younger patients used internet sources more frequently and its analysis is statistically significant with a cut-off age of 35 years old. In the pediatric group, the “age of disease onset” was analyzed to reveal cut-off points of 6 months of age and 12 months of age, with both of them being statistically significant with p-values of 0.003 and 0.000 respectively. However, the type of allergic disease had no association with internet usage either in the adult patients or the parents according to this study.

DISCUSSION

The current study demonstrated that patients with allergies or the parents of children with allergic diseases tend to research health information online, which is similar to many other health issues.

The use of the internet, in other words, the “World Wide Web” for several health issues and medical purposes has been increasing worldwide in recent years. Several medical topics have been the subject of internet research including cancer, developmental disabilities, vaccines etc. A new term that we have come across in the last decade is Dr. Google. Dr. Google is the de facto second opinion for Americans according to many surveys.⁶ A study from Austria showed a rate of 21% in terms of internet use in the parents of children before attending a general pediatric outpatient clinic due to an acute illness.⁷ In another study by the same author, this rate was given as 94.4%.⁸ A study from Nigeria showed a level of 40% internet search in the parents of children with orofacial cleft with a majority of 80% of these using Google.⁹ Nevertheless, it is still unknown in which areas that internet usage is more needed or more useful regarding different health issues.

When we evaluate the studies about internet use in terms of allergic diseases, there are few studies from developed countries.¹⁰⁻¹² We thought our study can be a pioneering study to reveal the deficiency and the need in the field of internet sources about both adult and childhood allergic diseases. We have not encountered any other studies investigating this issue in the literature to date.

A study from Ireland revealed the high demand for web-based information relating to allergic diseases in Ireland.¹¹ This study also evaluated and compared the searches regarding allergies in the years 2015 and 2019 and concluded with two dramatic outcomes. Firstly, over 60% of websites promoted nonevidence-based diagnostics, and secondly, Government-funded Department of Health websites did not feature in the top five results for “allergy testing”, “food allergy” or “food intolerance” in either 2015 or 2019.¹¹ In current study, unlike the study

in Ireland, the participants stated that they mostly prefer to obtain information from web pages written by experts.

Another study from the United States of America (USA) investigating the educational quality of videos on YouTube about food allergy concluded that the videos frequently recommend controversial diagnostics and commonly identify non-IgE mediated reactions.¹⁰ They underlined the fact that there is a need for high-quality educational videos on food allergy.¹⁰ These striking results from several countries made us think how important it is for reliable sites with evidence based information to provide knowledge in the native language for each country.

We did not question whether the information obtained from internet sources had an effect on the follow-up or treatment process of the allergic diseases in our study. However, there are a large number of studies questioning this issue specific to other diseases in the literature.^{7,13,14} In early 2019, the World Health Organization stated vaccine hesitancy to be one of the most severe threats to global health. It is fueled by nonevidence-based misinformation spread by celebrities and politicians via the internet.¹⁵ Similarly, allergic conditions are susceptible to misinformation, non-validated testing procedures and personalized treatment methods that are not supported by evidence-based literature.¹⁶

In a study evaluating the role of health information sources in decision making with Hispanic mothers during their child's first 1000 days, Criss et al.¹³ stated the trusted information sources in their study to be healthcare providers (doctors, nurses, nutritionists), but the participants in all different groups mentioned the need to use other sources such as the internet and family members for immediate information.¹³ This study mentioned the importance for healthcare workers to be aware of the health information environment of their patients and provide easy to read, printed handouts or lists of trustworthy internet sources.¹⁷ In another review by Stukus¹⁶, the author underlined the importance for medical professionals to be aware of their patients' need to obtain information online and recommended medical professionals to spend time searching information online from a patient perspective and suggested that this could help to better understand their patients' needs.¹⁶

Allergic diseases in early infancy are usually very challenging for new mothers. The most striking result of our study is the relationship between disease onset and internet use, which was statistically shown to be higher for the mothers of younger children. One of the studies evaluating the accuracy of online discussion forums used by mothers for common childhood ailments revealed that the most common health topics listed are bowel movements (e.g., constipation, diarrhea, abnormal color), reflux, gas, vomiting, rash and eczema.¹⁴ These symptoms appear to be so similar with the symptoms of allergic diseases usually seen in early infancy. The study concluded that nearly half of the health-related advice provided in online discussion forums is accurate but there is also incorrect advice available and these sources are not verified through evidence-based resources.¹⁴ In our study, the rate of parents using discussion forums was 29.1%, and these were the second most preferred internet resource after those web-sites written by experts.

There are also some studies evaluating the "Googling" habits of people according to their different types of allergic diseases.^{12,18} Kornafeld et al.¹² reported the search interest and search volume

on anaphylaxis in their study. They found similar trends worldwide and in the USA. The top three topics were anaphylaxis, anaphylactic shock and food allergies. They also analyzed search interests on anaphylaxis by country and the top three countries showing the highest activity of "Googling" were Austria, New Zealand and the United Kingdom (UK). In that study, the researchers reported on the risk of misinformation regarding anaphylaxis caused by search engines and social media and concluded that high quality information is obligatory to be presented to the public by healthcare professionals.¹² Another study evaluating the Google trends regarding rhinitis and related topics in European countries revealed that significant spikes in Google searches were found with the increased awareness of this disease. There were differences in the searches between countries but similarities between different regions of the same country so their findings call for uniform nomenclature or self-management guidelines for each country.¹⁸

The limitations of this study are that the allergic diseases were not classified according to their severity and the effect of internet use on the follow-up and treatment of the disease were not investigated.

CONCLUSION

Patients with allergies or the parents of children with allergic diseases tend to research health information online in a similar way to many other health issues. This study reported the only statistically significant factor associated with this tendency is age for adult patients and onset age of the disease for pediatric allergies. We clearly demonstrated that the frequency of parents' internet usage is increasing as the onset age of the allergic disease gets younger. There are other studies in the literature which support this finding, reporting that the rate of online research is higher in new mothers. Despite the fact that the type of allergic disease has no relation to internet usage according to our study, we would like to underline the need for evidence-based online information on food allergy and atopic dermatitis, which are the most common allergic diseases in the first year of life.

MAIN POINTS

- Most of the participants stated that they try to obtain information regarding their health concerns from other sources before they come to an allergy clinic with 70.2% and 81.8% for pediatric and adult participants respectively.
- The most preferred web sources were those web pages written by specialists.
- Adult patients mostly used web sources (36.5%), while the parents of pediatric patients stated that their first-line source for allergies is a pediatrician (40.8%).
- This study reported the only statistically significant factor associated with internet use for allergies is "age" for adult patients and "onset age of the disease" for pediatric allergies.
- According to this study, there is a clear need for evidence-based online information on food allergy and atopic dermatitis, which are the most common allergic diseases in the first year of life.

ETHICS

Ethics Committee Approval: The study protocol was approved by Institutional Ethics Committee with reference number 2021/01-003 and

date 31.03.2021.

Informed Consent: The participants gave written informed consent by filling out the questionnaire themselves.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: N.G., Design: N.G., Data Collection and/or Processing: N.G., M.Ü., Analysis and/or Interpretation: N.G., M.Ü., Literature Search: N.G., M.Ü., Writing: N.G., M.Ü.

DISCLOSURES

Conflict of Interest: No conflict of interest was declared by the authors.

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