

ORIGINAL ARTICLE

Internet health information use and e-mail access by parents attending a paediatric emergency department

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Objectives: To document internet access and health related usage patterns by families of children in a large paediatric emergency department (ED), and to discover if parents want the internet to become a tool for transferring medical test results.

Methods: This was a pre-tested, 21 item, interview conducted with parents at the paediatric ED in Toronto over 3 months. Descriptive statistics and frequency distributions were calculated and variables associated with parents wishing to access results electronically were examined.

Results: In total, 950 parents completed the interview (93%), of whom 87% reported routine internet access, 75% reported having an e-mail account, and 60% accessed their e-mail once or more a day. Over half (56%) reported searching the internet for health related information, with 8.5% of these searching immediately preceding their visit. Nearly three quarters (73%) indicated they would like to receive an e-mail containing the results of tests conducted in the ED; 66% of all respondents and 89% of those with e-mail indicated that they would like their child's primary care provider to receive information electronically.

Conclusion: The majority of families have internet access and most want to receive medical information electronically and to send it to the primary provider. The vast use of internet for health related information emphasises the need to guide parents regarding reliable resources online, possibly as part of their ED visit.

Since its introduction in 1969, the internet has become an important part of daily life and a popular source of health related information. It has revolutionised access to health information by parents,^{1–5} children,² and paediatricians^{6–8} and has become a significant resource for dissemination of information.¹ While some drawbacks,⁹ such as the readability^{5,10} and reliability¹¹ of the health related material limit the use of this information, there is no doubt that accessibility is increasing. It has been estimated that at the end of 2002, 665 million people in the world had access to the internet.¹² Health care providers might be interested in both the extent of parental use of the internet and the type of information they seek electronically.

Continuity of care¹³ and coordination with the primary care physician provider (general practitioner, family physician, or paediatrician) is of paramount importance. Electronic methods of sharing information have the potential to improve communication and access to test results, and may ultimately contribute to continuity of care.

The objective of this study was to document the prevalence of internet access and health related use in families of children treated in a large, urban, paediatric emergency department (ED). We also wanted to evaluate if parents want to use the internet as a tool for transferring results of tests performed in the ED to parents and to their primary care provider.

MATERIALS AND METHODS

An interview was conducted with parents of children arriving at the ED of The Hospital for Sick Children in Toronto, Ontario, Canada, from 1 January 2003, to 31 March 2003. The Hospital for Sick Children is a tertiary care paediatric health centre and approximately 50 000 children are seen annually in the ED. In our ED, a discharge letter, and at times written information, is given at time of discharge, but no letter or other information is sent to the family or to the community paediatrician or family physician.

Every week a research assistant spent 2 hours a day recruiting parents while they were waiting to be seen by a paediatrician. In order to reduce the possibility of selection bias, recruitment times were stratified over the 7 day period: during the morning (2 days), afternoon (2 days), and evening (3 days). Excluded from the study were parents who were unable to conduct an interview in English when no interpreter was available, parents with no access to a computer, and parents of children undergoing resuscitation.

The 21 item survey took an average 2.5 minutes to complete and was conducted with one parent per family presenting to the ED for medical treatment. Data recorded included parental demographic information such as age and education, child's age, primary language, internet access and its location, e-mail access, and frequency of health related information seeking over the internet. Finally, parents were asked whether they would like to receive results of blood tests taken in the ED by e-mail and whether they would like their primary care provider to receive information about the ED visit by e-mail. This study was approved by the Research Ethics Board of The Hospital for Sick Children.

Statistical analysis

Descriptive statistics and frequency distributions were calculated for all of the questions on the questionnaire. Information from the questionnaire was entered into a Microsoft Excel database 2000 file and analyses were conducted using SAS (version 8; SAS Institute, Inc, Cary, NC). We used χ^2 test and *t* test to compare parents with e-mail and those without. A *p* value <0.05 was considered significant.

RESULTS

Of the 1025 parents approached, 950 (93%) completed the interview. Among those, 21 (2%) were excluded because of lack of interest, 26 (2.5%) did not speak English and no

Abbreviation: ED, emergency department

interpreter was available, 22 (2%) had no access to a computer, 5 (0.4%) did not complete the interview, and one family was recruited in a previous visit. The average age of the children in the study was 5.3 years (range 1 week to 21 years old). The standard deviation for age was 4.9 years. Descriptive statistics for the study population are presented in table 1.

Most parents (87%) reported routine access to the internet; 80% at home or work, and 15% in a library, internet cafe, or other public places. There were 709 (75%) who reported that they had an e-mail account, 60% accessed their e-mail once a day or more, and 257 parents used the internet at least every month. The majority (535 parents, 56%) reported searching the internet for health related information. While some parents were able to report the website or search engine they used, most did not remember which website was used for information. Moreover, 81 parents (8.5%) sought medical information on the internet immediately preceding their visit to the ED.

Demographic information related to having an e-mail account is presented in table 2. Parents who had an e-mail account were significantly more likely to speak English as a primary language and to have lived in Canada longer than those without e-mail accounts. They were also more likely to seek health related information on the internet.

When asked if parents would like to receive an e-mail message containing the results of tests conducted during the ED visit, should the results not be available before the family left the department, 692 (73%) indicated they would. Of those parents with an e-mail account, 564 (80%) indicated that they would like the results sent electronically. The majority (86%) of all respondents and 89% of those with e-mail indicated that they would like the child's primary care provider to receive information electronically about their child's complaints, diagnosis, and treatment given in the ED. Parents with an e-mail account use the internet for health information much more, and are more interested in communicating electronically with their doctor and to receive results electronically than parents with no e-mail.

DISCUSSION

The internet has become an important tool for distribution and handling of data because of the speed of communication; accessibility; availability; and user competence in importing, processing, storing, and exporting data using one's own

computer.¹⁴ The internet has revolutionised the dissemination of information, especially in health related topics,¹⁴ due mostly to the exponential increase in accessibility. Our study shows that 87% of families arriving at our tertiary care facility had access to the internet. We found that many of these parents would like to receive e-mail with their child's medical information, such as blood test results, and would also like the child's physician to receive detailed e-mails. Even some parents without internet access wanted the hospital to have the ability to receive and send information to their doctor over the "information highway." As currently no other means of written post discharge communication takes place, either with the parents or with their primary community provider, we did not ask the family if they preferred other means of communication over e-mail (by post or fax). It is possible that the high rate of interest in e-mail resulted from offering a service that is otherwise unavailable to them. Future research should compare means of post discharge follow up and include e-mail as a possibility.

Access

The vast majority (87%) of parents have access to the internet. In the period May–June 2004, more than 70% of Americans were reported to use a computer, 63% go online, and 93% of these read or send e-mail.¹⁵ While in the UK, only 51% (248/485) of parents of outpatients in a paediatric clinic had internet access,¹⁶ superior e-mail access was recently documented in reports from Virginia (66% of families)¹⁷ and Texas (160/275 or 58% of parents of children with congenital heart diseases).¹ Internet access by primary caretakers of children presenting to an urban ED has also increased dramatically from 36% in 1998 to about 70% in 1999.¹ Among parents of children seen as outpatients in a paediatric surgery clinic in Buffalo, 85% (128/150) had internet access.¹⁸

Parents build their own internet sites¹¹ and feel that the information they obtain on the internet is helpful.^{1,2} The 2001 Canadian census reported that 53% of Canadians over 15 years of age accessed the internet in the year preceding the survey. The access rate of adolescents and young adults (15–24 years old), soon to be parents themselves, was recently reported as 90%.¹⁹ Three quarters have access at home, a third from their bedroom, and half access the internet as frequently as once a day.

Internet access in our population was found to be higher than previously reported. This could be attributed to the fact that our survey was carried out recently compared with other reports and access to the internet increases over time. In addition, internet access is widely available free of charge in Canada through workplaces, schools, and public libraries.

Health related use

Accessing internet for health related issues was reported previously among 40–43% of adults in 1998 and 2000.^{20,21} In December 2002, two thirds of all Canadians who use the internet (76% of females and 56% of males) visited a health related website, up from 55% in 2000. Seeking health related information online was more common than any other online activity.²² 66% of Americans looked for health or medical information on the internet in May–June 2004.¹⁵ Of parents in an outpatient paediatric clinic in the UK, 32% (154/485) were searching for health related topics on the internet,¹⁶ and this is similar to the rate in an urban, paediatric ED in Boston.²³ Among paediatric outpatients from Buffalo, 73% searched for health related topics on the internet and 16% were seeking information once a week or more. The majority (68%) completely trusted the information they found.¹⁸ Among adolescents and young adults (18 to 34 years old), searching for health related topics is very common (67%)¹⁹ and is the commonest online activity.²² Almost 40% of the

Table 1 Parents and the internet: descriptive statistics

Variable	Results*
Internet access and use	
Has a computer at home	797 (83)
Has a computer at work	544 (57)
Has access to the internet	830 (87)
Has e-mail	709 (75)
Searched the internet for information immediately preceding their visit to the ED	81 (8.5)
Frequency of internet use for health related information	
Uses the internet for health related information (% of those with access)	535 (56)
Once a day or more	18 (2)
Once every 2–6 days	53 (5)
Once every week to a month	186 (20)
Less frequently	278 (29)
Sociodemographic information	
Child's age in years, mean (SD)	5.3 (4.9)
Father's age, mean (SD)	39 (7.9)
Mother's age, mean (SD)	36 (7.8)
Number of years in Canada (father), mean (SD)	25.3 (15.0)
Number of years in Canada (mother), mean (SD)	24.2 (14.7)
English as a primary language	615 (65.0)

Results are n (%) unless otherwise stated.

Table 2 Variables associated with parents' access to e-mail

	Parents with e-mail	Parents with no e-mail	p
Language			
English primary language	495 (70.0)	120 (50.0)	<0.001
English is not primary language	211 (30.0)	115 (49)	<0.001
Father's age, mean (SD)	39.2 (7.85)	37.9 (8.2)	0.03
Years in Canada (father), mean (SD)	27.1 (15.2)	20.1 (13.2)	<0.001
Mother's age, mean (SD)	36.8 (7.8)	33.7 (7.7)	<0.001
Years in Canada (mother), mean (SD)	26.3 (14.9)	18.1 (12.3)	<0.001
Test results			
Would like doctor to receive test results electronically	625 (88.1)	189 (78.4)	<0.001
Would like to receive test results electronically	564 (79.5)	128 (53.1)	<0.001
Use of internet for health information			
Searches internet for health information	487 (68.7)	48 (19.9)	<0.001
Total	709	241	

Results are n (%) unless otherwise stated.

adolescents interviewed by phone reported they have changed their own behaviour based on the information they found.¹⁹ The majority of parents bringing their children to our ED seek health information online, and almost 9% searched just before coming to the ED. This emphasises the need to guide parents regarding reliable resources online, possibly as part of their ED visit.

Usefulness of health related search

Most (66%, 61/93) parents of children with congenital heart disease reported that the information they found on the internet was very helpful to their understanding of their child's illness and 29% found it helpful.¹ In our study, most parents (93.5%) looking for information regarding their child's illness before arriving to the ED did not find an answer to their health related question on the internet. It is possible that if they had found an answer they would not have come to the ED. The urgency of the visit to the ED and the uncertainty of the diagnosis parents face before coming can account for this difference.

Other demographic factors

Speaking a primary language other than English was not a barrier to accessing e-mail. Although a greater proportion of parents who speak English at home have an e-mail address (80%), most of the parents who spoke a language other than English also reported having an e-mail address (65%). This suggests that information regarding a child's health can be sent to parents for whom the primary language is not English, as well as to English speaking families.

Higher internet access rates in Canada are associated with a younger age, higher income, and higher level of education.²⁴ Our findings show no significant difference between parents' age and e-mail use. This could be because our responders are a selected population, reflecting people of childbearing age.

Future research should further explore issues related to confidentiality of the information sent over the internet, and parental perception of that confidentiality. The need for verbal communication such as over the phone or face to face, in case the digital information is not clear, should also be investigated.

Among our population, 22 parents (2%) reported no availability of a computer, and they were excluded from our study. Future studies should explore this small population of parents, and clinicians should advise them of potential public access to computer and internet.

As the internet is widely available in Canada, all parents could, in theory, have internet access as long as they could learn to use web browsing software. Some parents may not

be aware of this. The vast majority of our parent population does have internet access and is interested in receiving information through e-mail that is not available during their visit to the ED. If relevant medical information could be sent accurately and safely through the internet to parents, the internet could become a new and unique way for information transmission, giving parents an opportunity to receive follow-up results on tests performed in the ED.

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