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Investigating the Reliability of Substance Toxicity Information Found on the Internet in Pediatric Poisonings

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Objectives: The Internet may be the first source of information used by parents during a suspected poisoning of their children. Our primary aim was to assess the reliability of the Internet as a resource for information for parents to initially manage a suspected poisoning involving their child without outside consultation.

Methods: We distributed a self-administered survey to English-speaking parents to evaluate their Internet access behaviors so we could emulate their search strategies for a poisoning. A panel of clinical toxicologists performed an evaluation of Websites to determine the proportion that provided accurate and adequate information on common substances involved in poisonings.

Results: Of 21 parents surveyed, 15 (71%) used the Internet daily, with Google and Yahoo being the most commonly used search engines. Seven parents (39%) were somewhat to very likely to utilize the Internet during a poisoning scenario with prescription medications involving their child. Overall, only 27 (38%) of the Websites reviewed advised the user to call the poison center with the proper 800 telephone number, whereas no Website provided adequate information to manage the poisoning without outside consultation. Few Websites provided information on the toxic dose (13%), how to determine whether to manage the poisoning at home or in a hospital (22%), or first aid (28%).

Conclusions: The information provided on the Internet for substances involved in poisonings is variable and often incomplete. Reliance on the Internet for poisonings could create needless delays and inappropriate assessments and actions to manage a pediatric poisoning incident.

Key Words: Internet reliability, pediatric poisoning, toxicity information

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The US Census Bureau reports that, in 2007, nearly 62% of families polled had Internet access at home, up from 18% just 10 years prior.¹ Other reports show that the current number of US adults with Internet access to be 66% to 76%, having peaked as high as 79% in recent years.^{2–7}

One consequence has been the shift of patients from passive recipients to active participants in their health care. For many, this means researching health information for themselves or for others on the Internet. Recent polls and estimates show that of all adults with Internet access, 70% to 81% of them have searched for health information online, having peaked as high as 84% in recent years.^{2–7} Studies evaluating parents of pediatric patients showed that 53% to 71% of the parents polled had

used the Internet to seek out health information about their child.^{8–9}

It has been shown that medical information found online can be ambiguous, contradictory, deficient, or incorrect.^{10–15} While the potential for misinformation exists, surveys have shown that between 2005 and 2008, 86% to 90% of people polled believed that the information that they found online about health topics was either very reliable or somewhat reliable.⁷ Furthermore, 3 quarters of online health information seekers say that they do not regularly assess the date and source of the information they find.⁴

We suspect that parents may use the Internet for information when a poisoning occurs involving their child. The Internet might be consulted before, after, or in lieu of a call to the poison control center (PCC). The trend of the annual rate of exposure calls to a PCC was compared with hits on its Website over a recent 5-year period, revealing an inverse correlation: calls to the PCC had declined, whereas the number of hits to the PCC Website had increased.¹⁶ Poison control center services are readily available on a 24-hour, 7-day-a-week basis through a nationally advertised telephone number, 800-222-1222. Poison control centers have long been recognized as a highly effective resource in managing poisoning emergencies involving children. Our goal was to assess the reliability or appropriateness of medical information found online regarding some of the most common ingested substances for pediatric poisonings.

METHODS

We surveyed parents of pediatric patients as to their access and use of the Internet, to include Internet search habits in possible poisoning scenarios. This information was used to emulate search strategies by parents for some of the most common pediatric poisoning scenarios as reported to poison centers nationally.¹⁷ The survey instrument was designed to assess their demographic information, Internet usage, and habits and attitudes toward researching medical and poisoning information using the Internet. The survey also assessed which Internet search engines were most utilized by the parents, as well as how many pages and links that they would be willing to search through to find information. Parents were then posed with 2 situational questions and given options for how they would approach an ingestion of unknown toxicity (eg, call 911, go directly to the hospital, call the PCC, or search the Internet). These situations included finding a child with an open container of bleach and finding a child with an open container of a prescription medication. If the Internet search option was chosen, parents were asked to provide key word search terms that they would have used in the search engine.

Over a 6-week time period, surveys were self-administered to parents of children being seen at either the outpatient pediatric clinic or the inpatient pediatrics services at the University of California, San Francisco (UCSF) Medical Center. Survey participants were included in the study if the following inclusion criteria were met: parents with children 5 years or younger,

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parents with Internet access, and parents who were able to read English.

Survey results were evaluated to determine the most frequently used search engines, average number of pages and Websites visited, and search terms that would be used by parents. This information was used to guide Internet searches and data collection by the investigators in an attempt to simulate the information that would be found by a parent seeking information on the Internet regarding a potential poisoning. Internet searches were performed during the months of November 2009 to February 2010. Study investigators searched for toxic poisoning information on the top 11 pediatric poisonings in drug and object categories from the 2008 Annual Report of the American Association of Poison Control Centers' National Poison Data System.¹⁷ In each category, investigators chose a common representative substance in that category as shown in Table 1.

Websites were chosen for evaluation based on the title and description of each Website as it appeared on the initial search engine result pages and whether the information included any of the following terms: "poisoning," "ingestion," or "overdose," or "in a child." Website links were not evaluated if they appeared not to contain any information germane to the research question. This included sites that were clearly for advertising purposes, as well as sites about animal poisonings, non-English sites, and news articles that may have contained 1 or more of our search terms but were otherwise not related to the information we were seeking (eg, the Chicago Tylenol murders). Scientific journals, forums, blogs, and pdf files were also excluded from our evaluations.

We evaluated the Websites for completeness and accuracy of information to properly manage, by a parent at home, a potential ingestion or poisoning situation involving a child. The outcome measure was to determine if the Website met 1 or both of the following standards: (1) the reader was directed to call the PCC utilizing the correct nationally advertised 800 number (1-800-222-1222), and no hazardous first aid was recommended (this was considered to be consistent with the message of the national public outreach efforts on response to poisonings); or (2) the reader could adequately manage the poisoning without further outside consultation by the PCC or another health care provider (this standard was met if the Website included the following 6 pieces of information: potential toxicity, ingredients, toxic dose, symptoms of toxicity, first aid, and recommendation for home care vs hospital care). These are the

fundamental elements of product-specific toxicity used by PCCs to assess and triage pediatric poisonings.

For each substance, the study investigators examined 5 pages of links in search of Websites that contained information regarding potential poisonings. All Internet search results and data were saved using Microsoft Internet Explorer and saved as HTML-only Web pages, with the file extension ".htm" to ensure that all evaluators had the same Website information. The Websites meeting our inclusion criteria were evaluated by an expert panel of board-certified clinical toxicologists. The panelists were each assigned 1 search engine and 2 Websites for each substance. With 4 evaluators, this yielded up to a maximum of 8 evaluations for each substance. Each Website was evaluated using a standardized form that assessed both the presence or lack of information on assessment and home management of a poisoning and the appropriateness of the information. The evaluation criteria included assessing information regarding dose and degree of toxicity for the substance, symptoms of toxicity, antidotes or first aid recommended, and whether home care was appropriate. In addition, if a recommendation regarding hospital referral, PCC referral, or calling a health care provider or manufacturer was noted, evaluators were asked to determine if the contact information was available on the Websites, as well as the appropriateness of this information.

The data were analyzed to determine descriptive statistics such as range, mean, median, and frequency rating for variables in survey response.

This study was approved by the UCSF Committee on Human Research.

RESULTS

Demographic Information for Parents Surveyed

Thirty-two (91%) of the surveys were collected from the UCSF Children's Hospital, whereas the remaining 3 (9%) were obtained at the outpatient pediatric clinic. Of the 35 surveys collected, 21 met the inclusion criteria (parents with children aged ≤ 5 years, Internet access, and able to read English). Table 2 summarizes the demographic information of the survey respondents. The majority were female, and the average age was 35.6 years. Only 1 (5%) of the parents surveyed indicated that they had less than a high school diploma, whereas 10 (48%) indicated that they had a high school diploma or equivalent, and the remaining 9 parents (42%) had a bachelor's or professional degree. Most respondents (18 [85%]) had yearly household incomes that exceeded \$30,000. Nineteen (90%) of survey takers indicated that they had health insurance coverage for themselves, whereas 20 (95%) indicated that they had health insurance for their child. The majority, 12 (57%), had private insurance, whereas 5 (23%) indicated Medi-Cal/Medicare.

Computer and Internet Use for Parents Surveyed

The majority, 19 (90%) of the 21 parents, indicated that they had access to the Internet at home. Those without home Internet had access at alternate sites, such as a family member's home. Fifteen parents (71%) used the Internet daily, whereas 5 (24%) used the Internet weekly, and 1 parent (5%) indicated monthly use of the Internet. Twenty parents (95%) indicated that they have used the Internet to look up medical information in the past, and 19 (95%) of those parents thought the information found on the Internet was valid or reputable. Interestingly, only 11 (55%) of the parents indicated that they would consider using the Internet to look up information if their child ingested something suspicious.

The most commonly used search engines were Google and Yahoo, with 20 and 11 respondents (95% and 52%) indicating

TABLE 1. Top 11 Substances Most Frequently Involved in Pediatric Exposures¹⁷

Substance Category	Representative Substance Chosen
Cosmetics	Deodorant
Analgesics	Ibuprofen
Cleaning substances (household)	Bleach
Foreign bodies/toys/miscellaneous	Silica gel
Topical preparations	A&D Ointment
Cold and cough preparations	Robitussin DM
Vitamins	Pediatric multiple vitamins
Antihistamines	Benadryl
Pesticides	Ant bait: Grant's Kills Ants
Plants	Ficus
Gastrointestinal preparations	Ex-Lax

TABLE 2. Demographic Information of Survey Participants

	n	Average	Median
Parents			
Age		35.6	36
Male	4		
Female	17		
Total	21		
	n	%	
Parent's education level			
Less than high school diploma	1	5	
High school diploma or equivalent	10	48	
Bachelor's or professional degree	9	42	
Declined to state	1	5	
Total	21	100	
Household income			
<\$10,000	1	5	
\$10,001–\$30,000	2	10	
\$30,001–\$80,000	12	57	
>\$80,001	6	28	
Total	21	100	
What kind of health insurance do you have?			
Blue Shield/Blue Cross	8	38	
Kaiser	4	19	
Medi-Cal/Medicare	5	23	
Other or declined	4	20	
Total	21	100	
Do you have health insurance for yourself?			
Yes	19	90	
No or declined	2	10	
Total	21	100	

their use of each search engine, respectively. All parents who used Yahoo also indicated that they used Google routinely. When asked to recall their most recent online search for medical

information, 7 (36%) of responding parents recalled searching through 2 to 4 pages of Website links, 4 (21%) searched through 5 to 7 pages, and 5 (26%) looked at more than 10 pages. In regard to the total number of Websites that they had actually visited in search of information, 9 parents (45%) responded that they estimate clicking on 2 to 4 links, whereas 7 (35%) had clicked on 5 to 7 Websites, and 3 (15%) estimate clicking on more than 10 Websites. Although the majority of our survey respondents indicated that they would look through 2 to 4 pages of results in search of information, we chose to expand our searches to 5 pages to account for many of the substances with sparse information online.

In the situational questions posed, parents were asked for the likelihood that they would call their doctor, call the PCC, call 911, drive to the emergency department (ED), or search the Internet. As shown in Table 3, the majority of parents surveyed indicated that they would call their doctor, call the PCC, call 911, or drive to the ED. In both situational questions, the majority of parents, 13 and 11 (72% and 61%) in situations 1 and 2, respectively, indicated that they would not likely search the Internet for information.

Parents who indicated that they would use the Internet to search for information in the situational questions were then asked to list terms that they would utilize in their search. Terms listed by the parents included antidote, child, child poisoning, children, first aid, ingestions, injection [sic], overdose, pill, poison, poisoning, PCC, prescription pills, side effects, toddler. Many parents indicated that they would also look up the name of the substance in question. Surveys also indicated that some parents would use longer search strings such as “child ingesting prescription pills,” “toddler prescription overdose,” and “[pill names] child side effect overdose.”

WebSite Evaluation

Assessment of First Standard: Referral to PCC

Assessment of our first standard was based on the recommendation to call the PCC, and results are shown in Table 4. Of the Websites evaluated, 48 (67%) found a recommendation for

TABLE 3. Results From Situational Questions Of Surveyed Pediatric Parents

	Situational Question 1: You come into the kitchen to find your 2-y-old child under the sink with a bottle of bleach. The top is off, and the child smells like bleach. How likely are you to				
	Call Your Doctor (n = 18), n (%)	Call PCC (n = 19), n (%)	Call 911 (n = 19), n (%)	Drive to ED (n = 18), n (%)	Search the Internet (n = 18), n (%)
Not likely	2 (11)	1 (5)	0 (0)	2 (11)	13 (72)
Somewhat likely	5 (28)	2 (11)	1 (5)	1 (6)	2 (11)
Likely	3 (17)	5 (26)	2 (11)	6 (33)	2 (11)
Very likely	8 (44)	11 (58)	16 (84)	9 (50)	1 (6)
Total	18 (100)	19 (100)	19 (100)	18 (100)	18 (100)
	Situational Question 2: You find your 2-y-old child playing with several bottles of prescriptions medications. Some of the tops are off, and the child has white material from the pills around their mouth but otherwise looks fine. How likely are you to				
	Call Your Doctor (n = 18), n (%)	Call PCC (n = 19), n (%)	Call 911 (n = 18), n (%)	Drive to ED (n = 19), n (%)	Search the Internet (n = 19), n (%)
Not likely	2 (11)	2 (11)	2 (11)	2 (11)	11 (61)
Somewhat likely	3 (17)	2 (11)	1 (6)	3 (15)	3 (17)
Likely	4 (22)	4 (21)	2 (11)	2 (11)	1 (5)
Very likely	9 (50)	11 (57)	13 (72)	12 (63)	3 (17)
Total	18 (100)	19 (100)	18 (100)	19 (100)	18 (100)

Numbers in bold represent most frequent response.

TABLE 4. Evaluation Results: Did WebSites Recommend a Call to a PCC? And If So, Was the Telephone Number Provided? (n = 72 WebSites)

WebSite Recommended to Call PCC	Search Engine		
	Google, n (%)	Yahoo, n (%)	Total, n (%)
No	14 (39)	10 (28)	24 (33)
Yes	22 (61)	26 (72)	48 (67)
If yes, was the PCC telephone number provided			
Yes telephone number provided	10 (28)	17 (47)	27 (38)
No telephone number provided	12 (33)	9 (25)	21 (29)
Total	36 (100)	36 (100)	72 (100)

parents to call the PCC. Twenty-seven sites (38%) listed the toll-free phone number for the PCC, whereas several sites suggested calling the PCC but did not provide a number. Twenty-five of the 72 Websites (35%) advised viewers to call their health care provider or the manufacturer of the substance.

Assessment of Second Standard: WebSites Meeting Criteria for Self-management of Poisoning

Assessment of our second standard was based on whether a Website listed enough information for a parent to successfully manage or appropriately triage a potential poisoning case without the need of a PCC or health care professional.

Table 5 lists the breakdown of the 72 Website evaluations received by the number of evaluations meeting each of the criteria. Forty-eight (67%) of the Website evaluations indicated the correct assertion of the potential for toxicity, 51 (71%) listed the ingredients, and 54 (75%) gave symptoms of toxicity. The remaining criteria were met by a minority of the evaluated Websites: only 20 (28%) provided a recommendation regarding first aid, only 16 (22%) advised whether home care or hospital care was appropriate for the substance exposure, and only 9 (13%) of evaluations indicated that a toxic dose of the substance was listed on the Website.

A further stratification by search engine used demonstrated that the majority of evaluations meeting the first 2 criteria, correctly asserting the toxic potential and listing ingredients, were from Websites found via Google, 28 (78%) and 29 (80%), respectively, whereas 20 (55%) and 22 (61%) of evaluations of Websites found by Yahoo met the same criteria. The next 2 criteria were evenly distributed, with 5 (14%) and 27 (75%) of Google evaluations and 4 (11%) and 27 (75%) of Yahoo evaluations indicating that the Websites included a toxic dose and symptoms of toxicity, respectively. The final 2 criteria, first aid recommended and home versus hospital care needed, were met more frequently in the evaluation of Websites found by Yahoo

than those found by Google: 12 (33%) and 10 (28%) with Yahoo versus 8 (22%) and 6 (17%) with Google.

Among the 72 Website evaluations, no single Website assessed listed information sufficient to meet all 6 criteria. Only 3 (4%) of the Websites listed information sufficient to meet 5 criteria. The majority, 45 (60%) of Websites, listed information that met 3 to 4 of the criteria; 20 (28%) met 4 criteria, whereas 23 (32%) met 3 criteria. Twelve (17%) Websites listed information to meet 2 criteria, whereas 20% (14) of the Websites listed information to meet either 1 or none of the criteria.

DISCUSSION

The data gathered from the surveys allowed us to formulate searches to approximate information that was likely to be found by parents looking for information online. This in turn allowed us to evaluate Websites from our searches based on their completeness of data, as well as their overall utility to parents who may have to rely on them in a potentially life-threatening situation.

Previous studies of adults with Internet access have reported that up to 70% to 84% have used the Internet to look up medical information online,²⁻⁷ whereas 53% to 71% of parents have used the Internet to research health information about their child.^{8,9} Our study revealed that 95% of parents have looked up medical information online, whereas 55% would consider using the Internet to research a potential poisoning of their child. Our survey results are consistent with previous studies that have shown that adults are more likely to research health information via the Internet when it is for themselves compared with when it is for a child.

When we asked parents where they would seek information about a potential poisoning scenario involving their own child, the number who indicated that they would utilize the Internet was relatively small. Parents were presented with the options of calling a physician, calling the PCC, calling 911,

TABLE 5. Expert Panel Evaluation of WebSite Pediatric Poisoning Management Content, Compared by Search Engine (n = 72)

Poisoning Management Content	Search Engine		
	Google, n (%)	Yahoo, n (%)	Total, n (%)
Correctly asserts the potential or lack of toxicity?	28 (78)	20 (55)	48 (67)
Ingredients listed on Website?	29 (80)	22 (61)	51 (71)
Toxic dose listed on Website?	5 (14)	4 (11)	9 (13)
Symptoms of toxicity listed	27 (75)	27 (75)	54 (75)
First aid recommended?	8 (22)	12 (33)	20 (28)
Home care vs hospital care listed?	6 (17)	10 (28)	16 (22)
Total	36 (100)	36 (100)	72 (100)

driving to the ED, or researching information online. Our survey results showed that they were least likely to research information online, with only 6% to 17% indicating that they would be very likely to use the Internet in our potential poisoning scenarios. This number reflects the trend previously seen that parents are less likely to look for information online regarding their children.

The majority of parents in both scenarios indicated that they were likely to very likely to call 911: 95% and 83% in scenarios 1 and 2, respectively. While the pros and cons involved in the decision to call 911 versus calling a PCC are beyond the scope of this article, it may suggest a lack of awareness of PCC services by this study population, which was not assessed in the survey, and is also beyond the scope of this study. It is noteworthy that the national number that will connect a caller to their local PCC is located on the back label of many product containers, but parents may not realize it exists on the label or do not take the time to carefully read the label when confronted with a poisoning situation. In contrast, 911 may be a more universally recognized emergency number and one that many people are likely to be able to recall in a potentially life-threatening situation. However, utilization of the 911 emergency call system may unnecessarily burden emergency medical services if the substance exposure is nonemergent. Pediatric poisoning cases continue to be a large burden to EDs,^{17,18} which can lead to increased health care costs.¹⁹ Many of these substance exposures may be safely managed at home with assessment and information provided by the PCC, thus avoiding unnecessary health expenditures.²⁰

In our first assessment of the recommendation to call the PCC, our results showed that only 67% of Websites directed viewers to call the PCC. Within the Websites that referred viewers to call the PCC, even fewer provided the national contact number. Lack of a PCC referral or contact number creates the potential for suboptimal outcomes. This could potentially result in time lost in an effort to find the necessary contact information. Lack of contact information for the PCC may leave the parent to rely on information found on the Website.

Thirty-five percent of Website evaluations found that the Website referred viewers to call their health care provider or the product manufacturer. Although these sources may provide valuable information, we believe them to be of limited utility for a poisoning emergency. The ability to contact a physician is limited by business hours, and a physician's office is likely to refer an acute poisoning case to 911 or the PCC. Finding contact information for a substance manufacturer may be difficult, and a caller may have to interact with an automated phone system.

In our second assessment, 6 criteria were needed to be met by the Website to be considered a reliable site to manage a poisoning by a parent without outside consultation from a health care provider or PCC. None of the Websites that we evaluated met all 6 criteria. Although the majority of the Websites noted the potential toxicity (67%) and listed the ingredients (71%) and symptoms of toxicity (75%), they were less likely to include first aid (28%), advice about home care versus hospital referral (22%), and toxic dose (13%).

Stratification of the data by substance demonstrated that information contained in the Websites varied by product, as well between Websites for the same product. Study investigators found that, for common pharmaceuticals, such as Robitussin DM, Benadryl, and ibuprofen, there were more Websites available with overdose information compared with other common household products, such as bleach and Grant's Kills Ants bait, where Websites did not meet any criteria. No Website was

reliable enough to manage an acute ingestion or poisoning, even for nontoxic substances such as silica gel or deodorant. Furthermore, it is not ensured that, even if the Website met all criteria, the poisoning could have been appropriately managed by a parent or lay caregiver. The assumption would be that there was an accurate history of exposure, for example, known substance and amount ingested, as well as a predictable dose-response toxic reaction by the exposed victim. The potential for an idiosyncratic or allergic reaction or foreign body obstruction can exist for products considered nontoxic.²¹

It was noted that search results not only varied between the 2 search engines, but that they also varied within each individual search engine over time. This was noted while performing identical searches in the weeks and months after the primary search results. When comparing the new search results to previously saved search results, investigators noted that results pages had changed. The differences were not only in the order that sites were listed, but also many of the pages were actually different. Identical searches are likely to return different results at different times, making evaluation of results returned by individual search engines less useful.

The Internet serves as a global resource, and our Internet searches returned results from the United States, as well as from other countries. Determining that a Website was from outside the United States or determining the country of origin for a given Website was not always obvious. This became apparent during our study after finding multiple Websites directing viewers to call an international number. Each country's culture and common drugs, plants, and household products may differ greatly. This must be taken into account when assessing Websites for completeness of information provided and its accuracy. Many countries may not use certain substances or chemicals in their products; thus, their information may be deficient in certain areas and may misguide viewers to inappropriate treatment.

Another variable that can dramatically affect the result returned is the choice of the search terms used. In our surveys, parents listed a wide variety of search terms and search strings that they would potentially use. In initial searches, investigators noted that similar terms often returned results that were quite different. This could be seen when using terms that were very similar, such as using "poison" versus "poisoning" in a search string, which produced differing results.

The algorithms and criteria that determine which Websites appear in search results are beyond the scope of this article. However, it is of note that the Websites appearing most frequently in the search results were ehow.com, webmd.com, revolutionhealth.com, livestrong.com, and emedicine.com. These Websites are large consumer health information sites, with the exceptions of ehow.com, which is an instructional Website that provides tutorials on "just about anything," and emedicine.com, which is directed toward medical professionals. These are very large sites with hundreds of informational pages. We speculate that these large sites have sufficient resources that give them a strong position in search results.

Health information sites can be an important consumer reference, providing articles, forums, tutorials, and more on health topics. This information can be used to further research health topics before or after speaking with a physician and can be powerful tools in helping patients understand health issues. Although content overall may be more reliable on these sites, all sites recognize the inherent weakness in using a Website for health information. Each of these health information Websites contains disclaimers that they are not providing medical advice and that they are not meant to substitute for the care of appropriate health providers. Emedicine.com, although designed for

use by medical professionals, is easily accessible by anyone. It also carries a similar disclaimer. The tutorials and information on ehow.com are contributed by writers and members of the site. This site carries a disclaimer that the information is to be used for “informational and entertainment purposes only.”

LIMITATIONS

There were several potential limitations in our study. One potential weakness is that there were a relatively small number of surveys collected. Distribution of surveys was limited by the busy hospital setting as well as time constraints faced by UCSF nursing staff and pharmacy students.

There may have also been a bias in the survey participant selection purely by the nature of the institution. Because UCSF Medical Center is a tertiary referral center, parents of seriously ill pediatric patients may be more medically savvy because oftentimes their children have rare disease states or conditions that require special care. Thus, these parents may be more inclined to bring their children with special needs to a hospital ED rather than looking up information on the Internet. In contrast, there may have been a bias in the way the situational questions on the survey were written in that some parents might not have known that the PCC existed until it was presented as an option in the survey. Furthermore, our survey participants were all English speaking, tended to be of high socioeconomic status, and had health insurance. Although this limits the generalizability of this part of the study, the intent was to provide a method for us to emulate potential search strategies by parents to evaluate Websites.

Another potential weakness is the use of different search terms in the 2 search engines by each investigator. However, this study's objective was to determine the reliability and validity of Websites found and not the difference between search engines. We also recognize that the Internet is a dynamic resource, and the information provided is in a state of constant flux and change. Therefore, our results reflect only a snapshot in time.

CONCLUSIONS

Information found on the Internet regarding a potential poisoning is not complete and does not provide an acceptable substitute for a call to the PCC. Parents rely on the Internet in their search for information risk relying on incomplete information that carries the potential for unnecessary ED visits for nontoxic exposures or adverse outcomes due to delayed hospital referral for serious poisoning. Outreach programs on poisonings should target the Internet with a provision of the appropriate content and priority Website links for major search engines.

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