

Teens and Technology Transforming Acne Treatment

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ABSTRACT

Introduction: Although the Internet contains many health Web sites with valid information, it also contains sites with false information.

Objective: To learn whether high school students searching health care information believe they are using evidence-based sites and to understand their topics of interest, frequently navigated sites, and trust/confidence in the credibility of information found.

Design: Cross-sectional.

Main Outcome Measures: Students at a private high school answered an anonymous survey inquiring about their belief that they were using evidence-based sites, topics of interest, search engines of choice, and their trust in information obtained. Descriptive statistics and multivariate analysis of variance were used to compare trends across grade levels.

Results: Of 705 students enrolled, 24.7% were absent or declined to participate. For the remaining students, 497 completed the surveys, representing a response rate of 70.5% (497/705) and a participation rate of 93.6% (497/531). Overall, 82% of students communicated that they believed they were using evidence-based sources when searching for health information ($p < 0.0006$). Findings showed that 42% searched general health information, and 43% investigated specific medical conditions; topics related to skin and acne were researched significantly more often ($p < 0.05$). Overall, most students (80%) reported using Google as their number 1 search engine ($p < 0.004$), 38% reported using WebMD Search ($p < 0.0002$), and 50% of students used Wikipedia (not significant).

Conclusion: Most students trust health information they learn from the Internet. We found it chilling that less than half of students obtained their information from a Web site with health care professionals' oversight.

INTRODUCTION

Although adolescents engage in online entertainment, it is their social and health information searches that shape their identity formation and autonomy.¹ The Internet's plethora of information has exponentially increased since its inception, and adolescents are relying on Internet sources to obtain information. However, such rapid growth has not been regulated, and concerns have been voiced about the quality of the available information. Many health

care-related sites are not moderated by medical professionals and create the risk of incorrect information being disseminated.^{1,2}

In this study, researchers focus on Internet searches related to the common skin condition acne. Evidence reveals that Internet searches related to acne serve as a major, if not primary, source of skin care information.³ Previous research confirms that one of the most popular Internet searches among adolescents is related to acne. This may be because of the substantial psychological effects acne has on this age group.⁴ High school students are a group of individuals who wish to maintain their social image while their bodies experience demands from varying levels of hormones.⁵

The interest displayed by adolescents related to acne inspired this research group to learn more about how teenagers use the knowledge gained from Internet searches. This study will investigate the types of asynchronous sites that students use to obtain health care information for treating acne and the degree of trust they have regarding the information found.^{2,3}

Prior research assists us in understanding that adolescents seeking health information have multiple sources available to them, including physicians, families, schools, organized activities outside school, the Internet, and "the street."³ In addition, many adolescents have access to mobile media, with almost 70% owning a smart phone in 2013.⁶

The availability of multiple sources of online information poses adolescents with the challenge of determining if a source is credible or faulty. If the information is influential, adolescents may be inclined to treat skin conditions via online sources, even though the effectiveness of advertised remedies may lead to poor outcomes. The choice to use advertised remedies rather than seeking the advice and direction of their primary care physician or even a dermatologist deprives the adolescent of a complete examination. Physicians and dermatologic specialists provide patients education about the facts; for example, why the skin overproduces oils and the consequences of fluctuating hormones, perspiration, stress, improper nutrition, and dehydration. Moreover, a consultation with their primary care physician fosters a physician-patient relationship in which a customized treatment plan can promote healthy skin, control acne, and prevent further skin irritation and risk of scarring.

When challenged with health-related issues, adolescents intentionally seek information. Although this inquisitive nature is

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considered a normal aspect of the maturation process, approximately 80% to 90% of teenagers in the Western world experience behavioral/emotional and physical/psychological effects caused by acne.^{4,7} Despite recent efforts to encourage physician-patient communication, it is thought that there were and are barriers deterring adolescents from communication with their physicians, and many adolescents have limited knowledge of how to identify the best sites to search for health information.⁸

Another reason may be the result of an inadequate Internet connection causing challenges in health-seeking activities. Adolescents in many rural areas have a dial-up Internet connection, which can downgrade connectivity and Internet access.⁹ Communication with their physicians and other health care professionals may also lessen considering it was reported in the literature that only 39% of 500 Web sites found by the Google search engine (Google Inc, Mountain View, CA) provided reliable medical advice.¹⁰ The remaining searches either offered incorrect information (11%) or failed to answer the health-related inquiry (49%).¹⁰ These are important data considering that a recent systematic review article found that only 60% of adolescents and young adults had adequate health literacy skills.¹¹ Ideally, trust in a connected system of reliable and accurate electronic health care information would be valuable when addressing issues of health care quality, safety, education, and efficiency for adolescents.¹²

METHODS

Subjects

In a follow-up to the original study³ of how adolescents obtain health information using electronic tools and again using a cross-sectional design, high school students in Grades 9 through 12 at a single private Catholic high school answered an anonymous survey. The survey of yes/no questions inquired about the following: 1) their belief that they were using evidence-based sites, 2) major topics of interest, 3) their use of WebMD Search (WebMD LLC, New York, NY), 4) their use of Wikipedia, the free-content encyclopedia (Wikimedia Foundation Inc, San Francisco, CA), 5) their use of Google, and 6) their confidence in the information obtained.

Homeroom teachers hand-delivered a letter describing the purpose of the study and a questionnaire tracked by a 6-digit identifying code to students in Grades 9 through 12 at a high school in the Southeastern US.

The school population consisted of 705 students (50.9% male) with a racial makeup that was 89.8% white and 4.1% African-American. Most students (88.1%) were Catholic, and 18.9% were from single-parent families. On the day the survey was distributed, 174 students (24.7%) were either absent or declined to participate. Of the remaining students, 497 of 531 (93.6%) completed the survey in about 30 minutes in the homeroom setting. Incomplete questionnaires were not included in the data analysis.

Statistical Analysis

Separate researchers double entered the survey data to ensure accuracy. Initially a multivariate analysis of variance was conducted to compare the four grade levels of students. For statistically

significant findings, univariate analysis of variance was conducted for each of the survey items. The independent variable was the student's grade level. The dependent variables measured the students' response to the following questions: 1) their belief that they were using evidence-based sites, 2) their major topics of interest, 3) their use of WebMD Search, 4) their use of Wikipedia, 5) their use of Google, and 6) their trust level in the information obtained. All analyses were computed in SAS Version 8.0 software (SAS Institute Inc, Cary, NC), and significance was considered at the $p < 0.05$ level. The Educational Pastoral Team, which reports to the school board of the diocese, approved this study.

RESULTS

The response rate for this survey was 71%, with 497 of 705 returned surveys, and the participation rate was 93.6%. Of the completed surveys, freshmen returned 19.7% of them; sophomores, 45.7%; juniors, 16.1%; and seniors, 18.5%. On a 5-point scale from poor to excellent, 66% of students rated their health status as very good to excellent. The remainder rated their health as good to fair, and no student considered his/her health to be poor.

As shown in Figure 1, most students (82%) communicated that they believed they were using evidence-based sources while researching health care information ($p < 0.0006$). On average, a

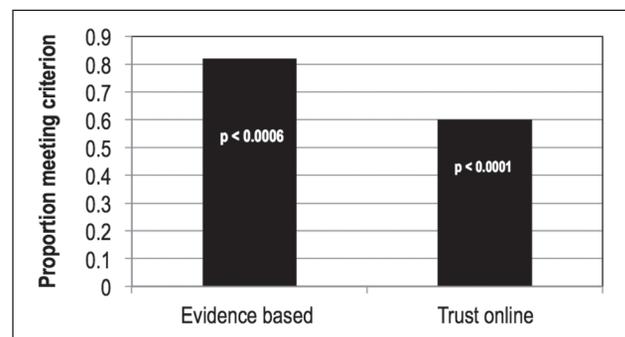


Figure 1. Proportion of students who believe they are using evidence-based sites and report having trust in the online information searched.

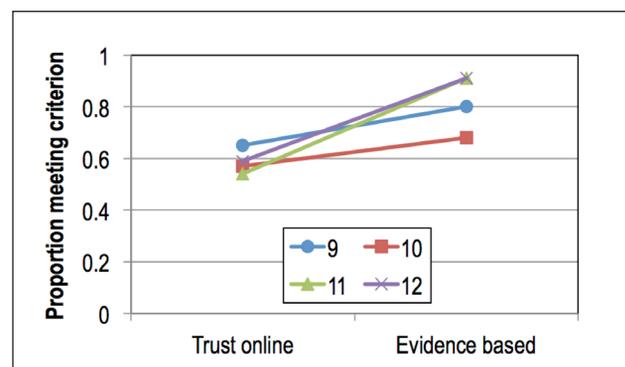


Figure 2. Students' responses, by grade level, regarding their trust in online health information obtained and their belief that they are using evidence-based sites when searching for health care information.

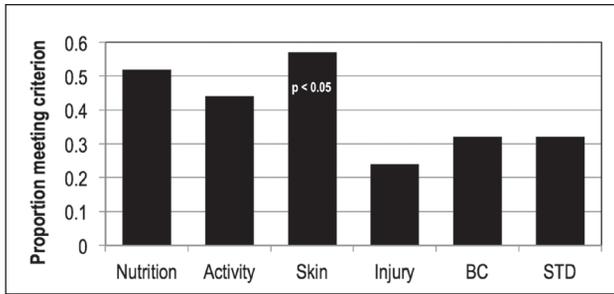


Figure 3. Overall means of common health topics that students search. The topic of skin was the most common topic researched with a statistically significant finding.

BC = birth control; STD = sexually transmitted disease.

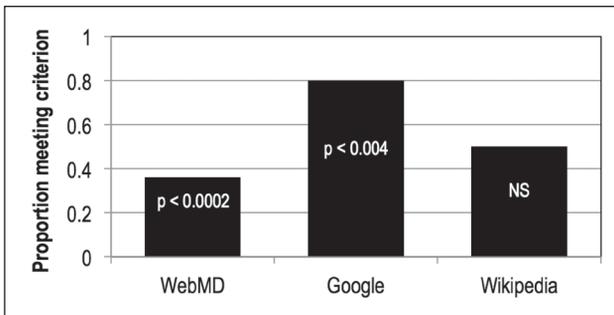


Figure 4. Overall means of high school students who use three search engines: WebMD Search, Google, and Wikipedia.

NS = not significant.

significant proportion of students (66%) acknowledged that they trust the online information ($p < 0.0001$) they accessed on the Internet. Figure 2 represents by grade level the students' response to both variables. Regarding "trust," it appears that freshmen (65%) and juniors (54%) were more likely to trust online information than were sophomores (57%) and seniors (59%). This contrasts with the second variable in which both seniors and juniors (92%) believed that the sites they used were more evidence based than the sites visited by underclassmen.

Although 42% of students reported using the Internet to search for general information related to health care, 43% reported searching for specific topics. Figure 3 summarizes the proportion of students who searched the Internet for specific health-related information and/or information about specific disease states. It was interesting to note that students searched topics related to skin (acne) significantly more frequently than other topics ($p < 0.05$).

As shown in Figure 4, most students (80%) identified Google as their primary search engine ($p < 0.004$), 36% of students reported using WebMD Search ($p < 0.0002$), and although not significant, 50% of the students reported using Wikipedia to search for health care information. Figure 5 summarizes by grade level the search engines of choice. By grade level, seniors' and juniors' use of Google was even higher than overall: 86% and 89%, respectively. Furthermore, seniors were more likely to use WebMD Search and Wikipedia than were other high school students.

DISCUSSION

The staggering growth of the Internet has provided its diverse audience with potentially the world's most powerful information source. However, this growth has been largely unregulated, and we are concerned about the quality of the information that the Internet provides and what sites teens access. Our results showed that most high school students in our study in Grades 9 through 12 believed that they were using evidence-based resources when conducting research on health care information. In addition, they reported being confident in and having trust in the information they obtained online.

Nearly 57% of the students reported they used the Internet to search for specific health care-related information and sought information related to skin care more frequently than the other health care-related topics. On average, a significant proportion of students (66%) reported that they trust online information ($p < 0.0001$), and 22% (not significant) acknowledged that they changed their behavior on the basis of information they found on the Internet.³ Evidence-based research has found that acne treatment is vital for teenagers who are developing their identity and building self-confidence. Acne can have detrimental psychological effects on individuals, especially young adolescents, regardless of their personal or cultural background. Most behavioral modifications related to severe acne symptoms are psychological and may result in low self-esteem. These data may suggest that students are willing to correspond with professionals asynchronously if given the opportunity.

For those in hopes of having a "better" social life, without the physical hindrance of acne, adolescents choose to use remedies found online to modify behavior. These behavioral modifications may consist of changes in diet, home facial remedies, recommended medications, and changes in lifestyle. Consequently, even if the adolescent obtains accurate and valid information, further research is needed to determine whether a behavioral change has occurred and the length of time the change is maintained. More important, adolescents need to improve communication with their physicians.

There are several limitations to this study. Although many of our results are similar to those of other reports, the students in our study came from a single private Catholic high school and

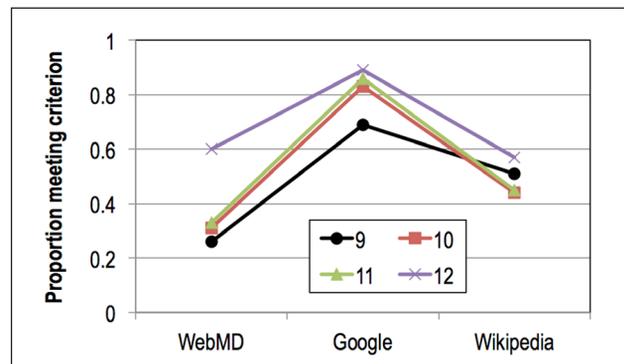


Figure 5. Most common search engines used by students, by grade level.

do not necessarily reflect the population at large. Thus, we feel these findings are not generalizable.

CONCLUSION

The large majority of students in our study have trust and confidence in the health information they receive from the Internet. Most students use Google as their primary source to find the answers to their health-related inquiries. These two findings combined reveal a potentially dangerous trend as well as a major need in our health care community for reliable sources. Although the Internet contains many Web sites with valid and accurate health information, it also contains Web sites with incomplete, contradictory, false, and sometimes harmful information. This finding raises questions about how to safeguard access to health care information for adolescents that is accurate, understandable, and culturally sensitive. Even though many of the students reported they trusted the information they found, it was chilling to note that less than half obtained their information from a Web site with oversight by health care professionals. ❖

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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