Health Information Seeking Behavior and Perceived Source Trustworthiness in Public Health Students: A Pilot Study for Improving the Curriculum

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ABSTRACT

Purpose: The Internet is a key resource for college students seeking health information, but it is unclear how well students are trained to evaluate the quality of information accessed. This pilot study sought to determine the sources and critical appraisal of health information accessed by public health students enrolled in a midwestern university to assess and potentially revise the health information seeking skills training of students in the program. Methods: Researchers used five questions from an online 21-item

questionnaire that included demographics, novel questions regarding personal sources of health information, and evaluations of the perceived trustworthiness of information from those sources. Students in the public health education program at a mid-sized, private, midwestern university were asked to complete the online questionnaire assessing their health information seeking behavior and appraisal of the information sources. **Results**: *A total of 46 public health students provided a final response to the questionnaire. Results highlighted that perceived beliefs regarding trustworthiness of health information sources were highest for medical providers (76%) and evidence-based websites (71%), but least for social media (65%). However, those who used social media for health information also found it to be trustworthy.* **Conclusions**: *Overall, it seemed students were capable of identifying valid health information sources, but some program revisions are recommended to better develop health literacy skills in students.* **Recommendations**: *It is recommended that programs of public health/health education consider a self-assessment of this type within their own programs. Identifying where students access health information and how they determine its validity allows programs to tailor educational experiences to best fit the needs of students.*

Key Words: *Health information seeking behaviors, college students, online health information*

INTRODUCTION

Many sources are available to access information about personal health, but not all sources are equal (Lloyd et al., 2013). When examining sources and use of health information accessed by young adults, several factors must be considered including age, social demographics, educational background, or digital literacy (Feinberg et al., 2016). Though multiple studies have assessed health literacy in young adults globally (Abel, Hofmann, Ackermann, Bucher, & Sakarya, 2014; Ickes & Cottrell, 2010; Lloyd et al., 2013; Vader, Walters, Roudsari, & Nguyen, 2011), the information may be out-of-date even by the time it is published, due to the rapidly changing nature of health information availability. Therefore, it may be difficult for academic preparation programs to ensure they are meeting the needs of current students related to the development of health information seeking behaviors (ISB).

Feinberg et al. (2016) examined health ISB among adults who had high school diplomas and those who did not. Authors reported that health ISB can be practiced through a multitude of mediums (print, visual, oral media), in both active and passive manners. The authors also examined factors that could impact how ISB and other health behaviors were developed by reviewing the types of resources most participants used and the relationship with their health. Participants who sought health information from health professionals or the Internet were more likely to report being in excellent or

very good health. Additionally, the Internet was a "significant and important moderating factor" (Feinberg et al., 2016, p.14). Feinberg and colleagues (2016) also reported that the use of the Internet was linked to greater levels of reported health, though there seemed to be an even greater benefit for those with less education.

Exploring college student health ISB in a somewhat different manner, other authors sought to determine the medium of information most preferred by both faculty and students (Chow & Croxton, 2012; Basch, MacLean, Romero, & Ethan, 2018; Weber, Becker, & Hillmert, 2018). One study acknowledged that time and technology have changed the way information is found, noting that "information seeking behavior is increasingly multifaceted, on demand, real-time, and diverse" (Chow & Croxton, 2012, p. 246). Varying groups of individuals preferred the use of different information mediums, while the type of medium used was often the one able to provide the fastest results. Though this research was not specific to health ISB, the results are helpful in determining the types of information sources and mediums that may be preferred by current university students.

In further support of Internet resources as the preferred tool for accessing health information, Dobransky & Hargittai (2012) reported while individuals seek health content from a wide range of sources, the Internet is the most-used source. The Dobransky & Hargittai work

involved a paper and pencil survey designed to control for biases due to greater responses from students who spend more time online, asking questions about socioeconomic background, internet experiences, health ISB, health status and interests. Results suggested a majority of participants were looking for health treatments and healthy lifestyle information, and most used the Internet (particularly websites) to look for the information (Dobransky & Hargittai, 2012). Additionally, the Dobransky & Hargittai work revealed that women were more likely to turn to the Internet than men, as were students of Hispanic descent when seeking health information.

The strength of Internet use for health information seeking by Dobransky & Hargittai was further supported in the more recent work of Basch, MacLean, Romero, & Ethan (2018), who found that college students were more likely to visit the Internet for health information than they were to visit a healthcare professional. These authors also stated that further research was needed to determine the motivating factors associated with health ISB in college students on the Internet and to assess their e-health literacy.

PURPOSE

The Internet is a key resource for college students seeking health information for themselves, and potentially others. However, it is less clear how well students are trained to evaluate the reliability and validity of the information. While it is easy to locate information about how students evaluate the validity of online resources, it is more difficult to find scholarly journals regarding students' abilities to critically appraise the health information they are accessing through multiple forms of online media or ways academic programs are preparing students to evaluate sources of health information. The purpose of the current pilot study was to determine the health information sources and critical appraisal of health information accessed by public health students enrolled in a midwestern university in order to revise the academic curriculum to better support the development of skills related to health ISB. This research was approved by the university's human subjects board and informed consent collected from students prior to their clicking for access to the research items.

METHODS

This cross-sectional, Institutional Review Board (IRB) approved pilot study was designed and implemented to evaluate the health ISB of public health students. Researchers developed an online 21-question questionnaire that included demographics, novel questions regarding personal sources of health information, and evaluations of the perceived trustworthiness of information from those sources.

The questionnaire was created and administered using Qualtrics, an online data collection website. Graduate and undergraduate students at a mid-sized private institution in the midwestern United States identified as public health majors through the Registrar's Office received an email from the Public Health Program Director asking them to voluntarily complete a short survey accessible through a provided internet link. A reminder email was sent one week following the initial request. No incentives were utilized to increase response rates and the survey was available for a two-week period. At the conclusion of the data collection window, responses were downloaded from Qualtrics into Excel and loaded into STATA/MP Version 15 for analysis.

Only five questions from the original 21-item questionnaire were used to assess the objectives outlined for this study (Table 1). The reliability and readability of these five questions were tested. Validity was not run due to the pilot nature of the work. Using Cronbach's alpha, the reliability for the health ISB questions was reported as good (α = 83.2%). Readability using Flesch Reading Ease and Flesch-Kincaid Grade Level was reported as 61.3 and 6.4, respectively. Descriptive statistics including percentages and frequencies were conducted. Spearman Rank-difference correlation tests were run to describe associations between health information sources used by students and perceived trustworthiness of those sources. Variables assessing resources for health information included social media (Facebook, Instagram, Pinterest, Tumblr, Twitter, and YouTube), traditional media (brochures, magazines, radio, and television), evidence-based online websites (government websites), non-evidence-based online websites (blogs, non-profit websites, browser searches, and other websites), in-person communication

(social network), and medical providers (doctors and nurses). In the original questionnaire, students were asked to identify the media resources they sought for health information using a 4-point Likert scale (1=never, 2=rarely, 3=sometimes, and 4=always). This 4-point Likert scale was later collapsed for analysis purposes into a 3-point Likert scale (1=never, 2=rarely/ sometimes, 3=always). The original question- naire also asked students to rate the accuracy of media resources for health information based on level of media resource trustworthiness using a 4-point Likert scale (1=not at all trustworthy, 2=somewhat untrustworthy, 3=somewhat trustworthy, and 4=completely trustworthy). For analysis purposes, this scale was collapsed into a 3-point Likert scale (1=not at all trustworthy, 2=somewhat untrustworthy/somewhat trust- worthy, and 3=completely trustworthy). Few demographic questions were asked, though questions about class rank, perceived health status, and whether or not the student was a first-generation college student were included. Researchers inquired about first-generation college student status due to the fact that over one-third of students at the current institution fall within this category and previous research has found that these students may report lower sense of belonging, greater levels of stress, and lower usage of health-related services (Stebleton, Soria, & Huesman, 2014). It is essential to understand whether their identifi- cation of health information sources is reliable and effective since an effort is being made to ensure skill development within the public health program is meeting the needs of these students.

RESULTS

A total of 106 public health students received the questionnaire link. Fifty-two responses were received, six of which were dropped due to incomplete data, giving a final response rate of 43.4% (46/106). Previous authors have suggested that a survey data collection response of 40-50% falls within an acceptable range (Kittleson & Brown, 2005).

Majority of respondents (76.09%) were not first-generation students (indicating their parent(s)/caregiver(s) were college graduates), were undergraduate (84.8%) and reported good or excellent health (73.9%). Table 2 displays additional descriptive statistics for

demographics, student health ISB, and perceived trustworthiness of information.

Table 3 displays bivariate correlations examined between health information sources and perceived trustworthiness of information identified. A significant, moderate, positive correlation between social media ISB and perceived trustworthiness of social media (r_s=0.325, p=0.03) was found among participants. Additionally, correlations were stratified by first-generation student status, self-rated health, and student class rank (underclassmen=freshmen and sophomore; upperclassmen=junior and senior; graduate student=Master of Public Health students). A significant, moderate, positive correlation was found for non-first generation students between social media health ISB and perceived trustworthiness of social media (r_s=0.392, p=0.02). Additionally, among non-first generation students, a marginally significant, moderate, positive association was found between social network health ISB and perceived trustworth- iness of social networks (r_s=0.332, p=0.05). There was a marginally significant, moderate, positive correlation for self-reported good health between social media health ISB and perceived trustworthiness of social media (r_s=0.392, p=0.05). A very strong, significant, positive correlation for self-reported excellent health between social network health ISB and perceived trustworthiness of social networks (r_s= 0.724, p= 0.03) was found. Lastly, there was a significant, strong, positive correlation for upperclassmen between social media health ISB and perceived trustworthiness of social media (r_s= 0.569, p < 0.05).

CONCLUSIONS

This pilot study was designed to further explore the previous works of authors like Basch, MacLean, Romero, & Ethan (2018) in order to assess the health ISB of public health students at one institution and use the information to tailor educational experiences for students in a way that best develops their necessary health ISB skills. Student respondents sought health information from a variety of sources including social media sources, traditional media sources, evidence-based websites, non-evidence-based websites, medical providers, and social networks. Perceived trustworthiness of health information

sources were highest for medical providers (76%) and evidence-based websites (71%). Perceived beliefs regarding the least trustworthy sources for health information was social media (65%). These findings are encouraging since overall, it appears that these students were capable of identifying valid health information sources.

While students perceived social media as the least trustworthy for health information (65%), the corresponding Spearman Rank-difference correlation between social media ISB and perceived trustworthiness of social media was positive and significant (r_s=0.325, p=0.03). Therefore, despite most students perceiving social media as untrustworthy, those that used social media for health ISB were more likely to find it trustworthy. Potentially surprising, this result was also seen among non-first generation students. Non-first generation students reported using their social media to get health information and perceived that source as trustworthy (r_s=0.392, p=0.02). One might believe that students from more educated families would perceive social media as a less trustworthy source for health information, but that did not seem to be the case here. Perhaps having college educated parents simply led students to trust social media because their parents have the ability to discriminate trustworthy versus untrustworthy information sources or there may be no real difference in perceived trustworth-iness of social media as a health information source based on family education level. Further research is needed to explore this finding.

Additionally, a similar positive correlation for social media was found among upperclassmen. Upperclassmen in the study also reported using social media to get health information and perceived that source as trustworthy (r_s=0.569, p < 0.05). This was surprising, because it might be assumed that juniors and seniors would be more aware of the risk of receiving information from social media and therefore would be less likely to use it as a source. However, perhaps being more advanced in their studies provided these students with greater self-efficacy in their ability to identify reliable sources, thus, enhancing their ability to decipher fact from fiction. Ultimately, additional investigation in this area is needed to further understand this relationship.

Similarly, there was a positive significant correlation (r_s=0.724, p=0.03) among students with excellent health found between their social network ISB and perceived trustworthiness of those social networks. Students who self-report excellent health may be more savvy in their knowledge of valid health information sources. This could indicate these students believe they can differentiate fact from fiction among health information, but further research is needed to determine whether this is the case.

The impacts of social media and social networks are important in providing a foundation for information regarding health behavior; however, educators in the classroom need to further train and challenge students to research and question all health advice provided to them from various sources, to differentiate evidence-based health information from fictional health information. With the continued increase in social media availability, more emphasis in the classroom setting should be placed on training students in best practices for identifying, interpreting, and utilizing health messages provided via social media. Further, social media should be used as an interactive pedagogical tool to train public health students in best practices of health ISB in preparation for the workforce.

Limitations

Small sample (n=46) size was the foremost limitation to this study because it may have decreased the statistical power sufficient to identify a true association between personal health ISB and perceived trustworthiness of information from those sources. Additionally, the small size may have been influenced by the perceived invasiveness of college students receiving a link to the questionnaire from their Program Director. Students may not have completed the questionnaire if they felt it was not going to benefit them or influence a grade in their coursework. On the contrary, it is also possible that students completed the question-naire out of a pressure to perform for the faculty members involved and therefore did not answer the questions honestly. In addition, all information was self-reported and could have biased the results.

Another limitation was the convenience sampling methodology used to enroll study participants. This may decrease generalizability

and does not allow for extrapolating the data obtained due to the use of nonprobability sampling. Also, while students were asked to identify health ISB sources, no follow-up questions on type of source were asked. For example, while students did mention that they sought information from social media, they were not asked from what type of page they received the information (e.g., government health organization page, primary health care physician page, etc.). Therefore, although there was an association between those who sought information from social media and their likelihood to trust the information, the information they trusted could be coming from a reliable source. Future studies should include additional questions that further probe students for this information. Lastly, many demographic variables (e.g., gender, race) were not included in the survey, nor was any type of personal health assessment a part of the research. Students with pre-existing conditions may be more well versed in finding health information than those who consider themselves healthier. In the future, it is recommended to add demographic and personal health assessment questions to data collection procedures.

RECOMMENDATIONS

Despite the limitations, this data provides vital information that allows an opportunity to further enhance the curriculum and equip students to be prominent health professionals. This data could be used to revise current academic curricula to ensure training in trustworthy sources for health information. In fact, the Public Health Program described here, upon analyzing the data, has decided to layer more specific skill development related to health ISB within its academic coursework. This will begin with discussion of valid and reliable sources in an introductory public health course, followed by further discussion, application, and training at the sophomore level to include specific critiques of various information sources, building to an even more thorough assessment of information sources in the junior year that includes the development of an assessment tool tailored to a priority population for the purpose of evaluating health information sources. Finally, a deeper more enhanced study examining additional demographics and addressing the limitations discussed should be performed to

better understand and enhance instructional content.

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Table 1. Health Information Seeking Behavior Questionnaire Questions & Informed Consent

1) Before you complete this short survey, we need to obtain your consent for participation. Please download the attached Informed Consent Form, read it carefully, then select the appropriate option below to either proceed or exit the survey.
Study 0865 Informed Consent
a) Yes, I voluntarily consent to participation and wish to proceed
b) No, I do not consent to participation and am exiting the survey

2) Are you a first-generation college student? (Definition: Your parent(s)/caregiver(s) did not graduate from college.)
a) Yes b) No c) Unsure

3) How would you rate your personal health?
a) Very Poor b) Poor c) Fair d) Good e) Excellent

4) What is your class rank?
a) Freshman b) Sophomore c) Junior d) Senior
e) Graduate Student

5) Where do you get your health information?
   5a. Blogs
       a) Never b) Rarely c) Sometimes d) Always
   5b. Brochures
       a) Never b) Rarely c) Sometimes d) Always
   5c. Browser Internet Search (Google, Bing, etc.)
       a) Never b) Rarely c) Sometimes d) Always
   5d. Facebook
       a) Never b) Rarely c) Sometimes d) Always
   5e. Government Website (ends in ".gov")
       a) Never b) Rarely c) Sometimes d) Always
   5f. In person social networks (family, friends, etc.)
       a) Never b) Rarely c) Sometimes d) Always
   5g. Instagram
       a) Never b) Rarely c) Sometimes d) Always
   5h. Magazines
       a) Never b) Rarely c) Sometimes d) Always
   5i. Medical providers (doctor, nurse, etc.)
       a) Never b) Rarely c) Sometimes d) Always

6) How would you rate the accuracy of health information available from the following sources?
   6a. Blogs
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6b. Brochures
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6c. Browser Internet Search (Google, Bing, etc.)
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6d. Facebook
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6e. Government Website (ends in ".gov")
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6f. In person social networks (family, friends, etc.)
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6g. Instagram
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy
   6h. Magazines
       a) Not at all Trustworthy
       b) Somewhat Untrustworthy
       c) Somewhat Trustworthy
       d) Completely trustworthy

5j. Pinterest
   a) Never b) Rarely c) Sometimes d) Always
5k. Radio
   a) Never b) Rarely c) Sometimes d) Always
5l. Twitter
   a) Never b) Rarely c) Sometimes d) Always
5m. TV
   a) Never b) Rarely c) Sometimes d) Always
5n. Tumblr
   a) Never b) Rarely c) Sometimes d) Always
*5o. Websites of non-profit organizations
   (ends in ".org")*
   a) Never b) Rarely c) Sometimes d) Always
5p. YouTube
   a) Never b) Rarely c) Sometimes d) Always
5q. Other online sources (explain)
   a) Never b) Rarely c) Sometimes d) Always

6i. Medical providers (doctor, nurse, etc.)
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6j. Pinterest
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6k. Radio
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6l. Twitter
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6m. TV
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6n. Tumblr
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
*6o. Websites of non-profit organizations (ends
   in ".org")*
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6p. YouTube
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy
6q. Other online sources (explain)
   a) Not at all Trustworthy
   b) Somewhat Untrustworthy
   c) Somewhat Trustworthy
   d) Completely trustworthy

Table 2. Descriptive statistics, counts (n) and percentages (%), for sample demographic characteristics and health information seeking behavior survey questions. (n = 46)

Sample Demographics	*First Generation*		*Class Rank*		*Self-reported Health*	
	Yes	11 (23.91%)	**Lower**	14 (30.43%)	**Fair**	12 (26.09%)
	No	35 (76.09%)	**Upper**	25 (54.35%)	**Good**	25 (54.35%)
			Graduate	7 (15.22%)	**Excellent**	9 (19.56%)

Health Information Seeking Behavior Source	*Social Media*	*Traditional*	*Evidence Based Websites*	*Non-evidence Based Websites*	*Medical Providers*	*Social Network*
Never/Rarely	16 (34.78%)	13 (28.26%)	10 (21.74%)	1 (2.17%)	6 (13.04%)	6 (13.04%)
Sometimes	20 (43.48%)	28 (60.87%)	23 (50.00%)	24 (52.17%)	19 (41.30%)	25 (54.35%)
Always	10 (21.74%)	5 (10.87%)	13 (28.26%)	21 (45.65%)	21 (45.65%)	15 (32.61%)

Health Information Source Trustworthiness	*Social Media*	*Traditional*	*Evidence Based Websites*	*Non-evidence based websites*	*Medical Providers*	*Social Network*
Not Trustworthy	30 (65.22%)	5 (10.87%)	1 (2.17%)	3 (6.52%)	0 (0%)	14 (30.43%)
Somewhat Untrustworthy/ Somewhat Trustworthy	15 (32.61%)	31 (67.39%)	12 (26.09%)	28 (60.87%)	11 (23.91%)	30 (65.22%)
Completely Trustworthy	1 (2.17%)	10 (21.74%)	33 (71.74%)	15 (32.61%)	35 (76.09%)	2 (4.35%)

Table 3. Bivariate correlational analysis reporting the Spearman correlation coefficients (r_s) examining Health Information Seeking Source vs. Health Information Source Trustworthiness.

	Overall	Stratified								
		First Generation		Self-Rated Health			Class Rank			
		Yes	No	Fair	Good	Excellent	Under	Upper	Graduate	
Social Media	*0.325*** *(0.03)*	0.189 (0.58)	*0.392*** *(0.02)*	0.471 (0.12)	*0.392** *(0.05)*	-0.164 (0.67)	-0.110 (0.71)	*0.569*** *(0.00)*	0.171 (0.71)	
Traditional	0.226 (0.44)	-0.151 (0.66)	0.196 (0.26)	0.200 (0.53)	-0.085 (0.69)	0.439 (0.24)	0.0 (1.0)	0.125 (0.5502)	-0.258 (0.58)	
Evidence Based	0.211 (0.16)	0.412 (0.21)	0.045 (0.80)	0.087 (0.79)	0.232 (0.27)	0.327 (0.39)	0.0 (1.0)	0.297 (0.1490)	0.382 (0.40)	
Non-evidence	-0.056 (0.71)	-0.339 (0.31)	0.036 (0.84)	-0.136 (0.67)	-0.158 (0.45)	0.500 (0.17)	0.061 (0.84)	-0.103 (0.6230)	-0.354 (0.44)	
Medical Providers	0.147 (0.33)	0.0 (1.0)	0.177 (0.31)	-0.081 (0.80)	0.382 (0.06)	0.146 (0.71)	0.340 (0.23)	0.141 (0.5018)	-0.171 (0.71)	
Social Network	0.245 (0.10)	-0.082 (0.81)	*0.332** *(0.05)*	0.401 (0.20)	0.061 (0.77)	*0.724*** *(0.03)*	0.105 (0.72)	0.343 (0.10)	0.441 (0.32)	

** - Statistically Significant with a p-value < 0.05;

* - Marginally statistically significant compared to a p-value < 0.05.