Health Behavior Research

Volume 7
Number 4 *Special Issue: Mentorship to Advance Health Behavior Research*

Article 7

October 2024

How college students evaluate the quality of online health information: A qualitative study

Xuewei Chen
Oklahoma State University, xuewei.chen@okstate.edu

Jati Ariati
Universitas Diponegoro, jariati@lecturer.undip.ac.id

DJ McMaughan
Oklahoma State University, darcy.mcmaughan@okstate.edu

See next page for additional authors

Follow this and additional works at: https://newprairiepress.org/hbr

 Part of the Health Communication Commons, and the Public Health Education and Promotion Commons

This work is licensed under a Creative Commons Attribution-Noncommercial 4.0 License

Recommended Citation

Chen, Xuewei; Ariati, Jati; McMaughan, DJ; Li, Ming; and Kreps, Gary (2024) "How college students evaluate the quality of online health information: A qualitative study," *Health Behavior Research*: Vol. 7: No. 4. https://doi.org/10.4148/2572-1836.1250

This Research Article is brought to you for free and open access by New Prairie Press. It has been accepted for inclusion in Health Behavior Research by an authorized administrator of New Prairie Press. For more information, please contact cads@k-state.edu.

How college students evaluate the quality of online health information: A qualitative study

Abstract

Objective: Health information is critically important for guiding health-related decision-making. This paper examines the strategies college students used to evaluate the quality of online health information. Methods: Fifteen undergraduate students at a land-grant university located in north central Oklahoma were recruited through a research participation and management tool called SONA. Data were collected with semi-structured individual interviews focused on individual experiences in retrieving health information from the internet, specifically examining how students evaluate the quality of online health information. To analyze the data, we applied a deductive approach guided by established criteria to identify the strategies respondents used to evaluate the quality of online health information. Results: We identified four primary factors influencing participants' judgment of information quality: source-related, content-related, design-related, and individual factors. The most widely mentioned source-related factor was site owners/sponsors (e.g., website domain type and ownership of the information), which influenced their judgement of whether the information had a sufficient level of subject-related knowledge. The most commonly used content-related factor was authorship (e.g., author's credentials and author's previous work), which influenced participants' judgement of whether the information can be trusted. The most used design-related factor was overall appearance as a pivotal indicator of professionalism. Prior knowledge and experience of using a source were identified as the most important individual factors for evaluating online health information. Discussion: This study expands our understanding of online health information seeking behaviors among college students and provides insights for public health organizations and professionals to disseminate high-quality information and prevent the spread of misinformation.

Keywords

evaluation strategies, college students, online health information, information quality criteria, source credibility

Acknowledgements/Disclaimers/Disclosures

This work was supported by the internal research support program managed by the Faculty Development and Research Committee in the School of Community Health Sciences, Counseling and Counseling Psychology at Oklahoma State University.

Authors

Xuewei Chen, Jati Ariati, DJ McMaughan, Ming Li, and Gary Kreps

This research article is available in Health Behavior Research: https://newprairiepress.org/hbr/vol7/iss4/7

How College Students Evaluate the Quality of Online Health Information: A Qualitative Study

Xuewei Chen, PhD., MCHES
Jati Ariati, PhD
Darcy Jones (DJ) McMaughan, PhD
Ming Li, PhD, CHES
Gary L. Kreps, PhD

Abstract

Objective: Health information is critically important for guiding health-related decision-making. This paper examines the strategies college students use to evaluate the quality of online health information. **Methods**: Fifteen undergraduate students at a land-grant university located in north central Oklahoma were recruited through a research participation and management tool called SONA. Data were collected with semi-structured individual interviews focused on individual experiences in retrieving health information from the internet, specifically examining how students evaluate the quality of online health information. To analyze the data, we applied a deductive approach guided by established criteria to identify the strategies respondents used to evaluate the quality of online health information. **Results**: We identified four primary factors influencing participants' judgment of information quality: source-related, content-related, design-related, and individual factors. The most widely mentioned source-related factor was site owners/sponsors (e.g., website domain type and ownership of the information), which influenced their judgement of whether the information had a sufficient level of subject-related knowledge. The most commonly used content-related factor was authorship (e.g., author's credentials and author's previous work), which influenced participants' judgement of whether the information can be trusted. The most used design-related factor was overall appearance as a pivotal indicator of professionalism. Prior knowledge and experience of using a source were identified as the most important individual factors for evaluating online health information. **Discussion**: This study expands our understanding of online health information seeking behaviors among college students and provides insights for public health organizations and professionals to disseminate high-quality information and prevent the spread of misinformation.

Keywords: evaluation strategies, college students, online health information, information quality criteria, source credibility

*Corresponding author may be reached at xuewei.chen@okstate.edu

Introduction

The internet ranks among the top choices for accessing health-related information (Bujnowska-Fedak et al., 2019; Hesse et al., 2005; Wen et al., 2010). In the United States, 62.7% of adults ages 18-29 had used the internet to look for health or medical information between July–December 2022 (Wang & Cohen, 2023). A prior study among a representative U.S. sample of rural and urban populations indicated that both rural and urban participants identified search engines as their most accessible sources for

health information (Chen et al., 2018b). Another recent study also reported that college students preferred using the internet (e.g., Google search) for COVID-19 health information (Chen et al., 2022).

However, health information available on the internet varies widely in quality. Reputable sources, such as official health organization websites and peer-reviewed journals, provide accurate and reliable information. In contrast, other sources, particularly some social media platforms and personal blogs, frequently lack quality, being either inaccurate, incomplete, or biased, thereby potentially influencing individuals to make improper health decisions (Kreps, 2018, 2023; Moorhead et al., 2013). Given the prevalence of internet usage for health-related inquiries, critical health literacy, which involves the ability to distinguish between high-quality and low-quality information (Chinn, 2011; Nutbeam, 2000, 2008), plays a pivotal role in decision-making regarding people's health and well-being (Schulz et al., 2021). Nutbeam's health literacy conceptual model (Nutbeam, 2000, 2008) defines critical health literacy as the skills needed to assess the reliability and usefulness of health information. Critical health literacy is a component of overall health literacy, which is "the degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others" (Santana et al., 2021; U.S. Department of Health & Human Services, 2020).

Research indicates that individuals with lower health literacy struggle to effectively evaluate health information, often giving high-quality ratings to unreliable information (Diviani et al., 2015; Ghaddar et al., 2012). Previous studies examined the relationship between individual health literacy level and people's self-reported use of and trust in various online health information sources such as official government websites. These studies found that compared to people with higher health literacy, those with lower health literacy were more likely to prefer using and trusting health information from social media and blogs or celebrity webpages (Chen et al., 2023; Chen et al., 2018a). Health information from these sources might contain inaccurate information (Moorhead et al., 2013). For example, a systematic review found that health misinformation was most prevalent on topics related to smoking products, drugs, and vaccines across various social media platforms, including YouTube, Twitter, and Facebook (Rodrigo-Ginés et al., 2024). Thus, enhancing critical health literacy is essential in equipping individuals to navigate the complex landscape of health information and make appropriate health decisions.

This study also contributes to the existing literature by examining the online health information seeking behaviors among a unique population: college students, who often encounter the responsibility of making independent health decisions while experiencing newfound autonomy (Basch et al., 2018). Also, college students are active users of the internet, with 98% of U.S. college students reporting the use of social media (Lindner, 2024). However, a prior study revealed that many college students tended to trust myths and misinformation about the COVID-19 pandemic, particularly those circulated on social media platforms (Superio et al., 2021). Some examples of these myths and misinformation included COVID-19 cannot be transmitted in areas with hot and humid climates, COVID-19 can be prevented by eating herbs/plants (e.g., garlic), and COVID-19 can be prevented by taking a hot bath (Superio et al., 2021). Given the prevalence of digital platforms and social media among college students, understanding how they assess the quality of online health information is crucially important for combating the spread of misinformation.

Furthermore, investigating online health information seeking behaviors among college students attending a rural serving university is imperative. These universities often serve as key hubs for knowledge dissemination and community engagement for rural residents (Burkhart-Kriesel et al., 2019). Understanding how college students in these settings navigate online health information can inform the development of educational programs and resources tailored to their needs. This, in turn, can contribute to improved health literacy and outcomes not only among students but also within the broader rural community served by the university. Thus, this current study aims to identify strategies to evaluate the quality of online health information among college students attending a rural serving university in north central Oklahoma. The findings of this study will help guide the development of effective interventions to enhance critical health literacy and improve health outcomes within this population.

More importantly, the findings of this study provide new insights into the current literature about how the COVID-19 pandemic changed people's online health information seeking behaviors. We conducted data collection between April and July 2020, during which the cumulative COVID-19 cases in Oklahoma surged from approximately 500 to 30,000 (CDC, 2020). Public views on infectious diseases, public health, preventive measures, and health information seeking have been reshaped by the pandemic (Mangono et al., 2021). The COVID-19 pandemic gave rise to an *infodemic*, characterized by the rapid spread of a vast array of information, including misinformation and disinformation, which hindered effective crisis management (Kreps, 2021; Siebenhaar et al., 2020; Zarocostas, 2020). Therefore, understanding people's health information seeking behaviors during the pandemic is crucial for devising appropriate responses to future health crises (Montesi, 2021; Tangcharoensathien et al., 2020).

Methods

Data Collection

This research received ethical approval from the Institutional Review Board (IRB-20-179) and was conducted from April to July 2020 at a land-grant university located in north central Oklahoma serving rural communities. Different from other institutions of higher education, land-grant institutions have a tripartite mission of teaching, research, and extension. They receive specific federal funding and aim to make higher education accessible to a broader population, particularly in rural areas (Burkhart-Kriesel et al., 2019). Eligible participants met the following criteria: (1) enrollment as a student at that university, (2) age 18 or older, (3) proficiency in English, and (4) physical presence within the United States. We employed purposive sampling to recruit students from the College of Education and Human Sciences using the online research participation and management platform known as SONA, which connects undergraduate students to faculty and/or graduate students for research studies (https://education.okstate.edu/research/sona-research-participation-system.html). SONA is a research participation and management tool that is similar to Amazon's Mechanical Turk and Qualtrics (Douglas et al., 2023). This online system allows researchers to post studies for recruitment, instructors to encourage student participation in research activities, and students to sign up to participate in open research studies. The system also helps researchers with human subject protection and IRB requirements, tracks participation, and sends out

confidential reminder notices. It provides undergraduate students with an opportunity to gain introductory research experience, as many instructors include a research component as part of their course or offer extra credit for participation in SONA studies. Applying the fundamental principles of purposive sampling, we identified and recruited 15 participants to create a more homogenous sample. Purposive sampling is particularly valuable when the research aims to delve into specific characteristics of a distinct group (Bryman, 2006; Kemper et al., 2003). All participants signed the informed consent form before participating in interviews, and then received 0.5 SONA credits, equivalent to half an hour of participation, which counted towards credit for eligible courses. This incentivization did not influence or bias the responses, as it was uniformly applied to all participants, thereby maintaining the integrity of the data collected. Moreover, the unit number of credits follows the IRB compensation guidelines.

Data were generated through qualitative semi-structured individual interviews to examine students' experiences in assessing health information on the internet, with a particular emphasis on learning about how they assessed the quality of online health information (Ngenye & Kreps, 2020). Examples of primary interview questions included “How do you retrieve health information online?”, “What factors will lead you to reject or mistrust a website quickly?”, “What types of websites will be chosen to explore in more depth?”, and “What criteria do you use to evaluate the quality/credibility of the online health information?” Each interview, conducted either over the phone or via Zoom, lasted approximately 30 minutes. The first author and two undergraduate student researchers conducted the interviews. All of them received formal qualitative method training. All responses were recorded in audio format, transcribed using Rev.com, and subjected to double-checks for accuracy. The second author compared the audio recordings with the transcriptions from Rev.com and made necessary corrections. Subsequently, the first author reviewed the results and approved all corrections.

Data Analysis

The data analysis was conducted using a deductive approach, guided by established criteria for assessing the quality of online health information. These criteria encompassed considerations regarding the sources, content, design, and individual factors. Source-related factors pertained to the entities responsible for creating, hosting, or distributing content. Content-related factors focused on the information and its presentation, while design-related factors addressed the appearance and interaction aspects. Individual-related factors considered personal circumstances, knowledge, and beliefs. These criteria were derived from a previous study (Sun et al., 2019).

The first and second authors conducted independent coding by highlighting keywords or phrases explicitly aligned with the above four factors. Additionally, coding involved categorizing health topics based on respondents' most recent experiences in seeking health information, as well as identifying the specific online channels they initially utilized for information gathering. Following the initial coding process, both coders recorded their initial ideas and interpretations of the data and engaged in discussions with each other. After coding approximately half of the total transcripts, the two authors met to compare and reconcile the applied codes, reaching agreement on the final coding scheme. This comparative approach was also employed for the second half of the transcripts to ensure consistency in the coding process.

Table 1

Sample Demographics

		N	%
Gender	Female	7	47
	Male	7	47
	Other	1	7
Race/Ethnicity	Non-Hispanic White	12	80
	Non-Hispanic African American	2	13
	American Indian/Alaskan Native	1	7
Academic Level	Undergraduate	14	93
	Graduate	1	7
Citizenship	U.S. student	14	93
	International student	1	7

Results

Participants

A total of 15 participants completed our interview study. An equal number of male (n = 7) and female (n = 7) students were included, with one person identifying as other. The majority identified as White, Non-Hispanic (n = 12), undergraduate students (n = 14), and U.S. citizens (n = 14). Participants' ages ranged from 18 to 22. Comprehensive participant demographics are provided in Table 1. When asked about their most recent experience in seeking health information, participants reported that their most sought-after health topics were COVID-19 and health insurance. Other health topics included smoking/vaping, diseases symptoms, birth control, exercise, and diet. The majority of participants noted that they initiated their search for health information by entering specific terms into Google. Some went directly to social media (e.g., Facebook and YouTube), the Centers for Disease Control and Prevention (CDC) website, and Web MD.

Many participants expressed their concerns and difficulties with identifying trustworthy health information online. For example, a female, Non-Hispanic White, undergraduate student noted, "There's a lot of information out there and you just have to be careful that you get your information from a reputable source." A female, Non-Hispanic White, 18 years old, undergraduate student admitted "not knowing which ones (websites) were trustworthy or not."

Strategies to Evaluate Online Health Information

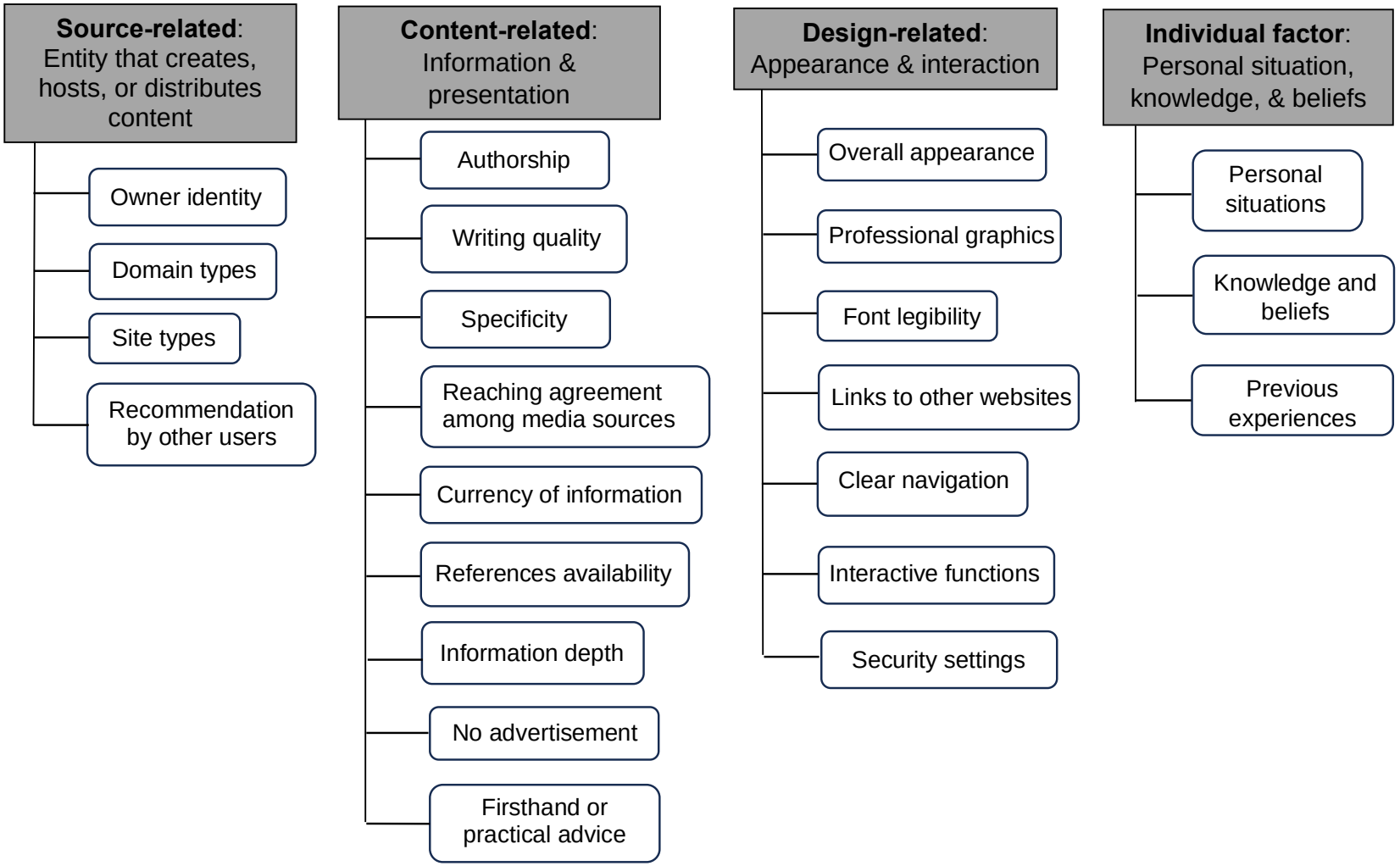
We identified four types of factors influencing our participants' judgment of information quality: source-related, content-related, design-related, and individual factors (Figure 1).

Theme 1: Source-Related Factors

The source-related factors are the most commonly used strategies by our participants to evaluate the online health information quality. Four primary categories emerged within the source-related factors, including owner identity, domain types, site types, and recommendations by other users.

Figure 1

Thematic Map of Themes and Codes



Source-Related Factors – Owner Identity

Owner identity played a crucial role, as seven participants expressed a preference for websites owned by health institutions and health experts. They perceived these websites as more trustworthy, attributing it to the owners' expertise. For example, a 22-year-old Non-Hispanic White graduate student mentioned preferring scientific publishers and reputable health institutions:

> I definitely try to seek out academic articles in so far as I can understand them, depending on the issue…If I was looking at mental health stuff, the National Institute of Mental Health, that's a generally well-known organization…So I try to look for organizations that are reputable, things that are evidence-based.

Another Non-Hispanic White female undergraduate student emphasized the importance of medical websites with actual doctors associated with hospitals or clinics, saying, "I tend to look for websites that are medical websites. But I look to see that they have actual doctors on the website, and if they're associated with different hospitals or clinics or things like actual hospitals." Additionally, one Non-Hispanic White female undergraduate student highlighted a preference for online health information from local government agencies, emphasizing its relevance to their community: "I also use the Oklahoma Health Department...the information is more local."

Interestingly, we found that participants had different opinions about information generated by private companies and news sites. Some believed big companies because they are well-known; some had concerns about private companies' qualifications. For example, a 21-year-old Non-Hispanic African American male undergraduate student preferred websites owned by big companies: "There is another one called a gym chart. Basically, these younger athletes are sponsored by this big company." However, another 22-year-old Non-Hispanic White graduate student expressed distrust in websites owned by private companies: "I did some search myself on BetterHelp and I think I had some concerns just about that company's quality." Additionally, opinions varied on the trustworthiness of news websites. A 19-year-old Non-Hispanic White male undergraduate student expressed trust in well-known news sites such as CNN. Another 19-year-old Non-Hispanic White male undergraduate student had concerns with news sites being biased and too political: "(I trust a website) if it's written by actual health professionals and not by news reporters… Something that might not be as politically charged."

Source-Related Factors – Domain Types

Participants also use domain extensions to evaluate the quality of health websites. Six participants exhibited a preference for websites with domain extensions such as .org, .edu, and .gov, indicating official organizations and government entities, as they perceived these domains as more trustworthy. For example, a 20-year-old Non-Hispanic White male undergraduate student said:

> Before I decide whether something is credible or not, I would probably look at the hyperlink to see if it's a .org or .edu or .gov. I try to stay away from the .gov and the non-educational sites. But if it's an actual like you know health facility, sort of a government website, like the World Health Organization. Something like that, that's credible in my eyes.

Source-Related Factors – Site Types

For site types, three participants expressed a preference for online discussion forums due to the perceived relevance of the information. For example, a 19-year-old Non-Hispanic White female undergraduate student mentioned, "I ask in a Facebook group page of people who live where I live." Another 20-year-old Non-Hispanic White male undergraduate student used forums, saying,

"I may go to forum posts. That's what I can relate to, not articles, like people that have past experiences with a certain product or anything like that." Personal blogs and Wikipedia were generally viewed with skepticism, as these sources were perceived as lacking in expertise. For example, a 22-year-old Non-Hispanic White graduate student said, "I avoid blogs for the most part…A Psychology Today article that's coming from more of a place that puts out summary posts or blog posts isn't going to be as reputable as specific organizations focused around mental health." Another Non-Hispanic White female undergraduate student mentioned, "If it's something like Wikipedia, I mean, you can't trust Wikipedia."

Source-Related Factors – Recommendations by Other Users

Three participants expressed their preference for using websites that were recommended by other users. For example, an 18-year-old Non-Hispanic White female undergraduate student said, "I would go to some of the top sites to make sure that they're credited sources, and then read people's reviews and comments, see how it's being backed up."

Theme 2: Content-Related Factors

Content-Related Factors – Authorship

Participants reported several content-related factors influencing their evaluation of online health information. Authorship emerged as a key consideration, with multiple participants emphasizing the importance of the authors' credentials, professional background, and their previous work. Participants expressed preferences for information authored by healthcare professionals or experts in the field. For instance, a 22-year-old American Indian or Alaskan Native female undergraduate student said, "If it's a doctor, if they have experience in the field, then I'm more likely to trust that rather than somebody who is diagnosed with the disease and they experienced certain issues." A 19-year-old Non-Hispanic White male undergraduate student preferred health professionals rather than news reporters. Another 20-year-old Non-Hispanic White male undergraduate student looked for authors' previous work:

> If I know the author, if I look up in the Google search and I see that he's written, or she, whoever it is, has written several articles and they know what they're talking about and they have credentials. If I read something from one of those websites, I'll bring it up at a visit.

Content-Related Factors – Writing Quality

Writing quality, specifically the absence of spelling and grammar errors, was seen as an indicator of professionalism and trustworthiness among several participants. A 22-year-old Non-Hispanic White graduate student mentioned, "Is it well-worded? Does it look like this has been edited or looked at by more than one person?" Another Non-Hispanic White female undergraduate student said, "If there's mistakes, or typos, or things like that, that concerns me also because it appears unprofessional. And they may not know what they're doing." Participants also pointed out that complex or jargon-laden writing could pose comprehension challenges for some readers. A 20-year-old Non-Hispanic White male undergraduate student mentioned, "I think some of it was a bit harder to understand for an average reader. Someone who doesn't have a medical degree, they might not entirely understand what they're reading."

Content-Related Factors – Specificity

Other content-related criteria were considered in the evaluation process. Participants mentioned that they would evaluate whether the content is specific or

detailed (specificity). For example, when asking about the barriers from getting health information on the internet, a 20-year-old Non-Hispanic White male undergraduate student stated, "Maybe a lack of detail. Like some websites might state something but very specific to that situation and it might not fit their own description, and it's probably not as detailed as what a doctor is knowledgeable."

Content-Related Factors – Reaching Agreement among Media Sources

Participants also mentioned agreements with other media sources. For example, a 21-year-old Non-Hispanic African American male undergraduate student, in response to being asked about if they use any criteria to evaluate the credibility of the online health information, said, "Yes, I use the criteria based on what I've been hearing. And what I've seen the most, whether it's on TV or what I've heard...I know there's information that's very false. And they'll try to just say to get people riled up or anything."

Content-Related Factors – Currency of Information

They also considered the currency of information, with one 19-year-old Non-Hispanic White female undergraduate student, in response to being asked about what criteria they use to determine whether the online health information is reliable, stating, "When it was published."

Content-Related Factors – References Availability

Additionally, the availability of references was a factor, as expressed by an 18-year-old Non-Hispanic White female undergraduate student: "Definitely citing where they've gotten things, like information about what they're putting on their website."

Content-Related Factors – Information Depth

Information depth and length was another aspect. When asked what websites draw them to explore more, a 20-year-old Non-Hispanic White male undergraduate student noted, "Websites that contain lots of dropdowns. The paragraphs that continue information are not very short, like they're good in depth and length."

Content-Related Factors – No Advertisements

Furthermore, participants considered whether the source displayed advertisements, as indicated by a 20-year-old Non-Hispanic African American male undergraduate student: "If it's just so many ads and stuff popping up, I might get out of it."

Content-Related Factors – Firsthand or Practical Advice

Notably, a 21-year-old Non-Hispanic African American male undergraduate student indicated trusting firsthand or practical advice from YouTubers:

> I'll watch certain people that I've been watching for years. And over time, they've been giving out new information that I can use. And I've just been keeping up with them to see how can I improve myself with a certain thing.

Theme 3: Design-Related Factors

Design-related factors consisted of several categories, including overall appearance, professional graphics, font legibility, links to other websites, clear navigation, interactive functions, and security settings.

Design-Related Factors – Overall Appearance

Two participants evaluated the overall website appearance to see whether it looked professional. For example, an 18-year-old Non-Hispanic White female undergraduate

student mentioned, “I go to the website and if it doesn't look professional...like it's approved by professional health organizations, then obviously I'll go somewhere else.”

Design-Related Factors – Professional Graphics

Participants also favored professional graphics on the website. For example, a 20-year-old Non-Hispanic White male undergraduate student remarked, “There's also pictures throughout the text or on the side or somewhere. And they're not Shutterstock, average pictures that you would find on a Google search. They're like professional or like faces of people.”

Design-Related Factors – Font Legibility

Font legibility was another consideration, with a 20-year-old Non-Hispanic White male undergraduate student noting:

> This is really kind of petty, but the size of the text, the font. Like is it legible? Do I have to squint? Do I have to look closer to the screen? Do I have to put more effort just to read the words than to actually process the sentence?

Design-Related Factors – Links to Other Websites

Participants also preferred online health information websites that have links to other websites to provide further information as resources. For example, a 22-year-old Non-Hispanic White graduate student would not trust a website if “it looks like there's not as many resources going into the page.”

Design-Related Factors – Clear Navigation

Participants evaluated website navigation design as well. For example, a 20-year-old Non-Hispanic African American male undergraduate student complained about a website with no clear navigation:

> Really, it's almost just clicking the next thing, and you're reading, and it's another link and you're clicking that. And then somehow your stuck [with something] way different than what you even looked up...I wish I did have something that was just clear cut.

Design-Related Factors – Interactive Functions

Additionally, the opportunity for site visitors to share feedback and interact with the site contributed to participants' decisions to engage further with the online health information. For example, a 20-year-old Non-Hispanic White male undergraduate student described trustworthy websites by saying, “They give out their information and people give their feedback to them. I kind of like the forum posts.”

Design-Related Factors – Security Settings

Participants also considered website security settings. A Non-Hispanic White female undergraduate student red flagged the sites requiring downloads: “Or if they want you to download something, that's going to be a big turnoff to me because it looks like a virus to me.”

Theme 4: Individual Factors

The individual factor encompassed personal situations, knowledge and beliefs, and positive previous experiences as criteria for evaluating online health information.

Individual-Related Factors – Personal Situations

Participants indicated a preference for information that directly related to their personal situations. A 20-year-old Non-Hispanic White male undergraduate student articulated his approach, saying, “I kind [of] would see if that's a description of the symptoms and see like if my symptoms relate to those symptoms in a way.”

Individual-Related Factors – Knowledge and Beliefs

Participants also obtained information that aligned with their existing knowledge and beliefs. For example, a 22-year-old Non-Hispanic White graduate student expressed, "I think I will generally start with a Google search that just has key terms…I also try to go from there once I have a general knowledge."

Individual-Related Factors – Previous Experiences

On one hand, positive past experiences with certain sources or individuals also influenced people's trust in online health information providers. A 21-year-old Non-Hispanic African American male undergraduate student emphasized this by stating, "Bodybuilding.com is one (that I chose to explore more). That's my majority. Basically, you go on there. There's like these top athletes, top professional[s] that know nutrition very well." On the other hand, negative previous experiences led to distrust in a certain online source. For example, when asked about if they noticed any health misinformation or rumors, a 22-year-old Non-Hispanic White graduate student mentioned, "I have people I see on Facebook who think that masks are their way of controlling the populace and they shouldn't be mandated or that they don't really help. I see people just spreading conspiracy theories all the time." When asked how they retrieve health information online, that participant mentioned, "I wouldn't go to Facebook for health stuff."

Discussion

We explored college students' strategies to evaluate the quality and trustworthiness of online health information. This study expands our understanding of online health information seeking behaviors among college students and provides insights for public health organizations and professionals to disseminate high-quality information and prevent the spread of misinformation. Moreover, our study findings assist in guiding the development of effective and efficient evidence-based interventions to improve health literacy, especially critical health literacy, among college students.

We found that our college student participants used multiple strategies based on four factors to evaluate online health information: source-related factors, content-related factors, design-related factors, and individual factors. The discussion of source-related factors revealed that participants employ various strategies to evaluate online health information quality, focusing on owner identity, domain type, site type, and recommendation by other users. Content-related factors highlighted considerations such as authorship, writing quality, agreements with other media sources, currency of information, references, information depth, and the presence of advertisements. Design-related factors encompassed overall appearance, professional graphics, font legibility, links to other websites, clear navigation, and interactive functions. Participants also used individual factors as criteria for evaluating online health information. They sought information relevant to their situations, aligned with existing knowledge and beliefs, and were influenced by positive past experiences with certain sources or individuals.

These findings align well with a prior systematic literature review study identifying criteria that consumers used to evaluate the quality of online health information across 37 peer-reviewed journal articles (Sun et al., 2019). Notably, our study uncovered novel insights not previously documented. First, participants expressed distrust in news reporters/websites, perceiving them as overly

politicized. This is an emerging phenomenon exacerbated by the wide spread of politicized misinformation surrounding COVID-19 prevention science (Chen et al., 2022; Weiss & Paasche-Orlow, 2020). Second, our participants exhibited a preference for online health information from local government agencies such as the State Health Department because these agencies provide information that is more relevant to their community. This is another trend amplified amidst the pandemic. This echoes our earlier research, which highlighted the pivotal role of state/county/city health departments as one of the most used and trusted sources for COVID-19 information (Chen et al., 2023). Last, our participants also mentioned using and trusting health information from social media influencers, particularly regarding topics such as nutrition and exercise. Leveraging social media influencers on online platforms, such as Instagram and YouTube, emerges as an effective strategy for disseminating health promotion campaigns among young adults (Burke-Garcia et al., 2017, 2018; Lim et al., 2022).

Implications for Health Behavior Research

Some participants are using highly subjective and situational strategies (e.g., personal beliefs and previous experience) to evaluate online health information quality. Therefore, the findings from this study suggest adopting a more holistic approach to understanding health information seeking behaviors, considering the influence of digital environments, information sources, and individual factors such as beliefs and experiences. This may involve integrating theories of health behavior with theories of health literacy and information processing to better understand how individuals engage with and interpret online health information. Theories of health behavior considering individual characteristics, such as the Health Belief Model (Janz & Becker, 1984) and the Theory of Planned Behavior (Ajzen, 1991), emphasizes the need for tailored interventions and educational initiatives that address the diverse needs and perspectives of users. Theories of health literacy and information processing, such as critical health literacy, media literacy, and digital literacy, guide intervention developments to enhance individuals' critical thinking skills and empower them to navigate the vast landscape of online health information effectively. Critical health literacy enables individuals to evaluate the credibility and reliability of health information (Chinn, 2011; Nutbeam, 2000, 2008). Media literacy equips individuals with the skills to critically analyze the messages conveyed through various media channels, including online platforms (Potter, 2018). Digital literacy ensures proficiency in utilizing digital tools and technologies to access, evaluate, and apply health information (Tinmaz et al., 2022). By incorporating these theories into intervention strategies through the collaboration among health professionals, healthcare providers, librarians, and educators, we can promote a more nuanced understanding of health information seeking behaviors and provide individuals with the necessary skills and competencies to identify misinformation or disinformation online.

The findings of our study also provide actionable insights for public health education web developers to design online health information that will gain high trust among potential audiences. For example, incorporating clear indicators of owner identity, such as prominently displaying affiliations with reputable health institutions and professionals, can enhance perceived credibility. Ensuring that website content is authored by recognized healthcare professionals or experts in the field and providing easy access to their credentials and

previous work can further bolster trust. Additionally, prioritizing writing quality by minimizing spelling and grammar errors and avoiding complex jargon can improve readability and professionalism, thereby increasing trustworthiness. Design considerations such as professional graphics, legible fonts, clear navigation, and interactive functions contribute to a positive user experience and signal professionalism. Providing links to additional resources and enabling user feedback mechanisms can enhance transparency and engagement, fostering trust in the information provided. Moreover, acknowledging individual factors such as personal situations, beliefs, and positive previous experiences can inform content customization strategies, ensuring that online health information resonates with users on a personal level.

Insights gained from this study have implications not only for health behavior researchers and health professionals but also for policymakers. Policymakers can use our findings to advocate for initiatives aimed at bridging the digital divide in rural communities, ensuring equitable access to reliable health information resources (Kreps, 2005; Sanders & Scanlon, 2021). Additionally, policies promoting the regulations of social media influencers, such as incorporating sponsorship disclosure rules, can mitigate the negative impact of information disseminated for commercial purposes, but lack an evidence base (Musiyiwa & Jacobson, 2023; Vassey et al., 2023).

Limitations

First, our participants were recruited primarily from a single university, so the results may not be representative of broader populations or cultural contexts due to the nature of qualitative research. Second, individuals' information seeking behaviors may change in ways that were not fully captured within the scope of our study due to the evolving public health guidance and information dissemination during the COVID-19 pandemic. Despite these limitations, our study underscores the importance of further research to explore these complexities and their implications for online health information seeking strategies, especially in times of crisis such as the COVID-19 pandemic.

Conclusion

In conclusion, this study advances our understanding of health behavior by examining the interplay between the COVID-19 pandemic, online health information seeking behaviors among college students, and the unique context of a rural university setting. By offering actionable recommendations for research, practice, and policy, the study paves the way for future efforts to improve health outcomes and promote health equity in diverse communities.

Discussion Questions

How do the identified strategies for evaluating the quality of online health information among college students align with existing models or theories of health behavior?

How might health behavior researchers and public health professionals collaborate to develop interventions or educational programs that improve critical health literacy among college students, specifically targeting their ability to discern reliable health information from misinformation and biased content online?

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Basch, C. H., MacLean, S. A., Romero, R.-A., & Ethan, D. (2018). Health Information Seeking Behavior Among College Students. *Journal of Community Health*, *43*(6), 1094–1099. https://doi.org/10.1007/s10900-018-0526-9

Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, *6*(1), 97–113.

Bujnowska-Fedak, M. M., Waligóra, J., & Mastalerz-Migas, A. (2019). The Internet as a Source of Health Information and Services. In M. Pokorski (Ed.), *Advancements and Innovations in Health Sciences* (pp. 1–16). Springer International Publishing. https://doi.org/10.1007/5584_2019_396

Burke-Garcia, A., Berry, C. N., Kreps, G. L., & Wright, K. B. (2017). *The Power & Perspective of Mommy Bloggers: Formative Research with Social Media Opinion Leaders about HPV Vaccination*. http://hdl.handle.net/10125/41388

Burke-Garcia, A., Kreps, G. L., & Wright, K. B. (2018). Perceptions About Disseminating Health Information Among Mommy Bloggers: Quantitative Study. *JMIR Research Protocols*, *7*(4), e116. https://doi.org/10.2196/resprot.7764

Burkhart-Kriesel, C., Weigle, J. L., & Hawkins, J. (2019). Engagement to Enhance Community: An Example of Extension's Land-Grant Mission in Action. *Social Sciences*, *8*(1), Article 1. https://doi.org/10.3390/socsci8010027

CDC. (2020). *CDC COVID Data Tracker*. https://covid.cdc.gov/covid-data-tracker/#cases_totalcases

Chen, X., Ariati, J., McMaughan, D. J., Han, H., Hubach, R. D., & Miller, B. M. (2022). COVID-19 information-seeking behaviors and preventive behaviors among college students in Oklahoma. *Journal of American College Health*, 1–9.

Chen, X., Hay, J. L., Waters, E. A., Kiviniemi, M. T., Biddle, C., Schofield, E., Li, Y., Kaphingst, K., & Orom, H. (2018a). Health Literacy and Use and Trust in Health Information. *Journal of Health Communication*, *23*(8), 724–734. https://doi.org/10.1080/10810730.2018.1511658

Chen, X., McMaughan, D. J., Li, M., Kreps, G. L., Ariati, J., Han, H., Rhoads, K. E., Mahaffey, C. C., & Miller, B. M. (2023). Trust in and Use of COVID-19 Information Sources Differs by Health Literacy among College Students. *Healthcare*, *11*(6), Article 6. https://doi.org/10.3390/healthcare11060831

Chen, X., Orom, H., Hay, J. L., Waters, E. A., Schofield, E., Li, Y., & Kiviniemi, M. T. (2018b). Differences in Rural and Urban Health Information Access and Use. *The Journal of Rural Health*.

Chinn, D. (2011). Critical health literacy: A review and critical analysis. *Social Science & Medicine (1982)*, *73*(1), 60–67. https://doi.org/10.1016/j.socscimed.2011.04.004

Diviani, N., Putte, B. van den, Giani, S., & Weert, J. C. van. (2015). Low Health Literacy and Evaluation of Online Health Information: A Systematic Review of the Literature. *Journal of Medical Internet Research*, *17*(5), e4018. https://doi.org/10.2196/jmir.4018

Douglas, B. D., Ewell, P. J., & Brauer, M. (2023). Data quality in online human-subjects research: Comparisons between MTurk, Prolific, CloudResearch, Qualtrics, and SONA. *PLOS ONE*, *18*(3), e0279720.

https://doi.org/10.1371/journal.pone.0279720

Ghaddar, S. F., Valerio, M. A., Garcia, C. M., & Hansen, L. (2012). Adolescent health literacy: The importance of credible sources for online health information. *J Sch Health*, *82*(1), 28–36. https://doi.org/10.1111/j.1746-1561.2011.00664.x

Hesse, B. W., Nelson, D. E., Kreps, G. L., Croyle, R. T., Arora, N. K., Rimer, B. K., & Viswanath, K. (2005). Trust and sources of health information: The impact of the Internet and its implications for health care providers: findings from the first Health Information National Trends Survey. *Archives of Internal Medicine*, *165*(22), 2618–2624. https://doi.org/10.1001/archinte.165.22.2618

Janz, N. K., & Becker, M. H. (1984). The Health Belief Model: A decade later. *Health Educ Q*, *11*(1), 1–47. https://doi.org/10.1177/109019818401100101

Kemper, E. A., Stringfield, S., & Teddlie, C. (2003). Mixed methods sampling strategies in social science research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 273–296). Sage.

Kreps, G. L. (2005). Narrowing the Digital Divide to Overcome Disparities in Care. In *Health Communication in Practice*. Routledge.

Kreps, G. L. (2018). Promoting patient comprehension of relevant health information. *Israel Journal of Health Policy Research*, *7*(1), 56. https://doi.org/10.1186/s13584-018-0250-z

Kreps, G. L. (2021). The role of strategic communication to respond effectively to pandemics. *Journal of Multicultural Discourses*, *16*(1), 12–19.

Kreps, G. L. (2023). The central role of relevant health information for promoting cancer prevention and control. *Medical Research Archives*, *11*(2). https://doi.org/10.18103/mra.v11i2.3615

Lim, M. S. C., Molenaar, A., Brennan, L., Reid, M., & McCaffrey, T. (2022). Young Adults' Use of Different Social Media Platforms for Health Information: Insights From Web-Based Conversations. *Journal of Medical Internet Research*, *24*(1), e23656. https://doi.org/10.2196/23656

Lindner, J. (2024, December 20). *College Student Social Media Statistics: Market Report & Data • Gitnux*. https://gitnux.org/college-student-social-media-statistics/

Mangono, T., Smittenaar, P., Caplan, Y., Huang, V. S., Sutermaster, S., Kemp, H., & Sgaier, S. K. (2021). Information-Seeking Patterns During the COVID-19 Pandemic Across the United States: Longitudinal Analysis of Google Trends Data. *Journal of Medical Internet Research*, *23*(5), e22933. https://doi.org/10.2196/22933

Montesi, M. (2021). Human information behavior during the Covid-19 health crisis. A literature review. *Library & Information Science Research*, *43*(4), 101122. https://doi.org/10.1016/j.lisr.2021.101122

Moorhead, S. A., Hazlett, D. E., Harrison, L., Carroll, J. K., Irwin, A., & Hoving, C. (2013). A new dimension of health care: Systematic review of the uses, benefits, and limitations of social media for health communication. *Journal of Medical Internet Research*, *15*(4), e85.

Musiyiwa, R., & Jacobson, J. (2023). Sponsorship Disclosure in Social Media Influencer Marketing: The Algorithmic and Non-Algorithmic Barriers. *Social Media + Society*, *9*(3), 20563051231196870. https://doi.org/10.1177/20563051231196870

Ngenye, L., & Kreps, G. (2020). A Review of Qualitative Methods in Health Communication Research. *The Qualitative Report*. https://doi.org/10.46743/2160-3715/2020.4488

Nutbeam, D. (2000). Health literacy as a public health goal: A challenge for contemporary health education and communication strategies into the 21st century. *Health Promotion International*, *15*(3), 259–267. https://doi.org/10.1093/heapro/15.3.259

Nutbeam, D. (2008). The evolving concept of health literacy. *Social Science & Medicine (1982)*, *67*(12), 2072–2078. https://doi.org/10.1016/j.socscimed.2008.09.050

Potter, W. J. (2018). *Media Literacy*. SAGE Publications.

Rodrigo-Ginés, F.-J., Carrillo-de-Albornoz, J., & Plaza, L. (2024). A systematic review on media bias detection: What is media bias, how it is expressed, and how to detect it. *Expert Systems with Applications*, *237*, 121641. https://doi.org/10.1016/j.eswa.2023.121641

Sanders, C. K., & Scanlon, E. (2021). The Digital Divide Is a Human Rights Issue: Advancing Social Inclusion Through Social Work Advocacy. *Journal of Human Rights and Social Work*, *6*(2), 130–143. https://doi.org/10.1007/s41134-020-00147-9

Santana, S., Brach, C., Harris, L., Ochiai, E., Blakey, C., Bevington, F., Kleinman, D., & Pronk, N. (2021). Updating Health Literacy for Healthy People 2030: Defining Its Importance for a New Decade in Public Health. *Journal of Public Health Management and Practice*, *27*(Suppl. 6), S258–S264. https://doi.org/10.1097/phh.0000000000001324

Schulz, P. J., Pessina, A., Hartung, U., & Petrocchi, S. (2021). Effects of Objective and Subjective Health Literacy on Patients' Accurate Judgment of Health Information and Decision-Making Ability: Survey Study. *Journal of Medical Internet Research*, *23*(1), e20457. https://doi.org/10.2196/20457

Siebenhaar, K. U., Kother, A. K., & Alpers, G. W. (2020). Dealing With the COVID-19 Infodemic: Distress by Information, Information Avoidance, and Compliance With Preventive Measures. *Front Psychol*, *11*, 567905. https://doi.org/10.3389/fpsyg.2020.567905

Sun, Y., Zhang, Y., Gwizdka, J., & Trace, C. B. (2019). Consumer Evaluation of the Quality of Online Health Information: Systematic Literature Review of Relevant Criteria and Indicators. *Journal of Medical Internet Research*, *21*(5), e12522. https://doi.org/10.2196/12522

Superio, D. L., Anderson, K. L., Oducado, R. M. F., Luceno, M. T., Palcullo, V. E. V., & Bendalian, M. V. T. (2021). The information-seeking behavior and levels of knowledge, precaution, and fear of college students in Iloilo, Philippines amidst the COVID-19 pandemic. *Int J Disaster Risk Reduct*, *62*, 102414. https://doi.org/10.1016/j.ijdrr.2021.102414

Tangcharoensathien, V., Calleja, N., Nguyen, T., Purnat, T., D'Agostino, M., Garcia-Saiso, S., Landry, M., Rashidian, A., Hamilton, C., AbdAllah, A., Ghiga, I., Hill, A., Hougendobler, D., Andel, J. van, Nunn, M., Brooks, I., Sacco, P. L., Domenico, M. D., Mai, P.,...Briand, S. (2020). Framework for Managing the COVID-19 Infodemic: Methods and Results of an Online, Crowdsourced WHO Technical Consultation. *Journal of Medical Internet Research*, *22*(6), e19659. https://doi.org/10.2196/19659

Tinmaz, H., Lee, Y.-T., Fanea-Ivanovici, M., & Baber, H. (2022). A systematic review on digital literacy. *Smart Learning Environments*, *9*(1), 21. https://doi.org/10.1186/s40561-022-00204-y

U.S. Department of Health & Human Services. (2020). *Health Literacy in Healthy People 2030*. https://health.gov/healthypeople/priority-areas/health-literacy-healthy-people-2030

Vassey, J., Valente, T., Barker, J., Stanton, C., Li, D., Laestadius, L., Cruz, T. B., & Unger, J. B. (2023). E-cigarette brands and social media influencers on Instagram: A social network analysis. *Tobacco Control*, *32*(e2), e184–e191. https://doi.org/10.1136/tobaccocontrol-2021-057053

Wang, X., & Cohen, R. A. (2023, November 6). *Health Information Technology Use Among Adults: United States, July–December 2022*. https://doi.org/10.15620/cdc:133700

Weiss, B. D., & Paasche-Orlow, M. K. (2020). Disparities in Adherence to COVID-19 Public Health Recommendations. *Health Lit Res Pract*, *4*(e3), e171–e173. https://doi.org/10.3928/24748307-20200723-01

Wen, K.-Y., Kreps, G., Zhu, F., & Miller, S. (2010). Consumers' perceptions about and use of the internet for personal health records and health information exchange: Analysis of the 2007 Health Information National Trends Survey. *Journal of Medical Internet Research*, *12*(4), e73. https://doi.org/10.2196/jmir.1668

Zarocostas, J. (2020). How to fight an infodemic. *The Lancet*, *395*(10225), 676. https://doi.org/10.1016/S0140-6736(20)30461-X