A Systematic Review of Source Selection of Health Information

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Abstract

Numerous and disparate sources of information in the modern age (interpersonal, Radio, Television, Film, and various Internet sources, etc.) mean the source(s) people choose for health information are as widespread as ever in human history. Learning the effect ingrained variables such as demographic (sex, age, education, etc.), health literacy, health status, and more is crucial for health communicators who endeavor to reach either a broad or narrow audience. The purpose of this systematic review is to find out the breadth of survey studies that are focused on finding a correlation with the source selection of health information. The EBSCO Databases (Communication Source & Psychology and Behavioral Sciences Collection) were searched, both forward and backward citations of the search results were included, then duplicates were removed resulting in 457 articles. Using PRISMA 2020 as a guide, peer-reviewed survey studies reported in English that captured multiple sources of health information were systematically searched for, filtered, appraised, extracted, and reviewed. After filtering and appraising, the number of studies closely examined was 16, published from 1999 to 2022. Data was extracted into a Microsoft Excel spreadsheet and then uploaded to AirTable for an ease-of-use visual utility. Only 12 studies found significant correlations relating to source selection of health information from their survey data, with only four in the last five years despite the tumultuous nature of health information source trust in the wake a global pandemic. This systematic review shows that while there is a history of research into correlations of source selection of health information, there should be more to better grasp at the understanding of why normal people choose a particular source for knowledge of their health.

Introduction

Rationale

In the current age of mass, personalized media curation networks it is more difficult than ever to understand the reasons behind someone's source for information (Thorson & Wells, 2016). The widespread use of the internet as a means to learn new information, not validate the veracity of its claim, and spread that information to an even wider audience is commonplace (Wilde, 2022). That problem is only amplified when the topic in question becomes as personal as information can be, health information.

Source selection is a topic studied for decades, with findings going back to the 60's sharing significant results that this variable or that is integral to the process of someone choosing a particular source for a specific field (Gerstberger & Allen, 1968). 55 years after that study sources of information are more numerous than ever, and just as Gerstberger and Allen concluded in 1968 there appears to be no support for the idea that sources with the highest quality of information are the ones people are listening to, even in specific genres such as engineering or health information. Instead a person is more likely to choose completely false and more emotionally affecting sources of information than an article detailing the effects of this or that stimulus on a person's healthy wellbeing, with accompanying statistics and figures ignored (Sima, 2022).

In the wake of a global pandemic, health information seekers in 2023 are particularly at risk of receiving false or misleading information. Every individual who lived through the pandemic came away with their own understanding of the tumultuous nature of health communication, including learning who in their lives is receiving health information and from what sources. Many of the top medical institutions in the world offer a wide variety of well-researched, well-documented, and agreed upon health information and advice that is freely available. However, studies show that those online health communities are some of the least frequented when someone is looking for health information (Zhang et al., 2017).

It is imperative to learn more about the why an individual chooses their source of health information to make sure the spread of information is knowledgeable and accurate. On the other side of the coin, health professionals also need to know what ingrained variables in their audiences play a role in them tuning in or out information that could potentially keep them alive and well. To start the search for what about a person might lead them to look for health information from a particular source, a systematic review of the current literature on the topic was necessary.

Objectives

The purpose of this systematic review was to search and find all of the published literature surrounding the topic of source selection of health information that included but was not solely

involving the internet as a resource. The PRISMA 2020 guidelines on conducting a systematic review were used to make sure as much of this review would be available and reproducible for any further research in this area (Page et al., 2021).

Methods

Eligibility Criteria

The starting point for studies to be part of this systematic review was the need for them to be already peer-reviewed and published. The purpose of which is to eliminate possibility that a publication would be part of the review and would then turn out to be of low quality of character in some manner beyond the capabilities of the reviewer. If nothing else, a peer-reviewed and published study would be looked at by several professionals and approved before making its way into the results pool.

Due to the language limitations of the reviewer, publication in the English language was also a requirement to be part of the results pool. Automatic translation software was not deemed trustworthy enough to rely on for publications published in other languages.

No date limits were included as part of the search process because the review aimed to capture the width and breadth of studies on source selection of health information.

Information Sources and Search Strategy

To begin finding appropriate publications for review, an EBSCO Database search was conducted using a hyperlink through the https://library.ttu.edu webpage which required active affiliation with Texas Tech University to proceed.

For the purpose of this review, the 'Communication Source' and 'Psychology and Behavioral Sciences Collection' databases were selected. Both of these databases were chosen because the subjects of health information, source selection, and information seeking are well covered topics in those fields.

Previous informal searches on this topic were performed using Google Scholar that revealed limited results (5), those results were also included.

In the body of the article, the phrase 'source selection' was necessary, as well as one of 'health information', 'health', or 'medical'. While the scope of this review was not limited to only 'internet' or 'online' sources of health information, because of the importance of the internet as an avenue of health information one of those words was also required in the body of the article. To make sure that at least one of the primary reasons for any study included in the review focused on source selection, it was also a requirement to have either 'source selection' or 'information seeking' in the abstract of the published article.

The full search query is presented here:

> **Search Query**
>
> TX ((“Source Selection”) AND (“Health Information” OR “Health” OR “Medical”) AND (“Internet” OR “Online”)) AND AB ((“Source selection”) OR (“Information seeking”))

The EBSCO Databases search resulted in 28 references, which were exported to a file named ‘ebsco-result.csv’.

Management of the references throughout the systematic review was done in the free, open-source tool Zotero, available at www.zotero.org, which made it easy to compartmentalize each stage of the search, filter, and appraisal process. The EBSCO Database search results in ‘ebsco-result.csv’ were imported into Zotero along with the 5 studies found informally through Google Scholar into a collection labeled ‘corpus_1’ for a total of 33 references.

Those 33 references were imported into the Systematic Review Accelerator’s SpiderCite utility. The Systematic Review Accelerator is a free online utility developed for the purposes of streamlining the process of making a regimented and reproducible systematic review through a collection of automated tools (Clark et al., 2020). The SpiderCite utility uses automation to collect citations that are used as references in publications, as well as collect citations that use the publication uploaded as a reference. This is process is performed to gather a more broad and deep collection of references on a given topic by collecting all of the publications found that are part of the conversation.

The Systematic Review Accelerator’s SpiderCite was able to find 472 references from the uploaded ‘corpus_1’ collection. Those 472 references were then exported in multiple formats (.ris, .csv, .bib) and saved into another Zotero collection labeled ‘corpus_2’.

As part of the search for forward and backward citations, there can be occasions where an article references a piece that is published in one place with a set of details while another article makes reference to that same piece published in the same place but with slightly differing details that lead to duplicate entries. To minimize the time spent by reviewers who might come across several duplicates across the span of hundreds of references, ‘corpus_2’ was uploaded into the System Review Accelerator’s Deduplicator utility.

As part of the Deduplicator utility, the 472 references in ‘corpus_2’ were split across 3 categories for analysis: 2 Highly Likely duplicates, 28 Likely duplicates, with the remaining listed as Non-Duplicates. When eliminating duplicates, the references with intact DOI information were prioritized over those without. The end result of the de-duplication process came to 457 references which were exported as ‘corpus_3’ in multiple formats.

Table 1: Publication Inclusion Criteria

Criteria
Must include more than just the Internet as a source of health information
Must include source selection as a topic of inquiry
Must be based around a survey of participants
Must have a broad population as a target, nothing smaller than 1 million people in mind.
Must be a peer-reviewed journal article
Must not be investigating too narrow a health topic, no specific types of disease, illness, injury, etc.

Selection filtering

The filtering process for this review was completed in two steps.

First, each of the publication references in 'corpus_3' were examined for relevance to the topic using the Title and the Abstract available for each publication. The decision whether to include or exclude from the review at this stage should be simple and obvious from either of those areas, thus there is no written reason for exclusion as part of the first filtering pass.

Second, each of the references left after the first filter pass received a full-text reading of the publication to check for relevance to the goal of the review. If the reviewer decided to remove a publication from further investigation, a detailed reasoning for exclusion based on the criteria for the review was documented and is available in the appendix.

To manage the filtering of such a large number of references, 'corpus_3' was uploaded to the free online utility Rayyan, which was designed to simplify the management of systematic review filtering and coding while keeping screeners blinded to remove any biasing effects (Ouzzani et al., 2016). Through the use of keyword filtering on the word 'survey', the 457 references in 'corpus_3' were filtered to 125 references.

Criteria for inclusion in the filtering and selection process were published peer-reviewed articles, containing survey data, concerning the topic of source selection of health information.

As part of the first filtering stage, 125 references were examined for Title and Abstract relevance. Results found that 41 references would move on, while 84 were excluded. The 41 references marked for inclusion were exported from Rayyan into a collection that was again imported into Zotero as 'filter_1'. Once the 'filter_1' collection was in Zotero, three more duplicates were discovered and removed, bringing the final total in 'filter_1' to 38 references.

A feature included in Zotero (version 6.0.26) is the ability to search the internet for full PDF copies for closer inspection. This feature was utilized and able to find 28 full versions, the remaining 10 were then found and attached individually by the reviewer.

For the second stage of the filtering process, a new review was created in Rayyan to eliminate possible confusion. Each referenced publication was then read and filtered based on the criteria listed in Table 1.

At the end of the second stage of filtering 22 publications were excluded, reason for their exclusions available in the appendix. 16 publications were chosen for inclusion for further review. The remaining 16 were exported from Rayyan and saved as 'working_corpus' (.ris, .csv, .bib) for import into Zotero. The full search and filtering process can be seen as part of a PRISMA flow diagram in Figure 1 (Haddaway et al., 2021).

Data Collection / Extraction

For the purpose of data extraction, a Microsoft Excel spreadsheet was chosen for its ubiquitous nature and familiarity. Each of the 16 publications remaining as part of 'working_corpus' were then examined and the data in the following table extracted. A single reviewer was used for this process, future replications of this or similar reviews should be performed with more than a single reviewer to reduce human error and risk of bias (Krause, n.d.).

Data extracted included study characteristics such as the authors, year, title, and type, as well as whether the survey included gathering several types of participant demographics. Inclusion measures were indicated in the spreadsheet by either 'YES' or 'NO' to eliminate confusion. Further data extracted included whether each study used a measure for determining the source of participant's health information, a measure of the trust of source of health information, whether the study found any significant correlations in their results, and a short stratified summary of the author's conclusions. For a full list of data types extracted with explanations see Table 2.

Risk of Bias Assessment

Each of the 16 studies were also subject to a risk of bias or quality assessment. This process is performed to make sure that one or more of them did not need to be excluded from further analysis due to an obvious bias or internal validity problem that might throw off the results of the review. Assessments for quality are also a good measure to understand the strength of the body literature under review and further highlight any potential needs for studies in the future (Viswanathan et al., 2017).

For the purposes of this risk of bias assessment, the Checklist for Analytical Cross Sectional Studies was used from the JBI collection of critical appraisal tools (Barker et al., 2023; Munn et al., 2023). For better visualization and understanding of the risk of bias across the breadth of the studies included for review, the free and open-source online version of 'robvis' was used (McGuinness & Higgins, 2021).

As can be seen from the 'traffic light' Figure 2, all studies were evaluated and passed based on the bias measurements which included clarity of inclusion criteria, objective standard for measurements, outcomes measured validly and more. There was a bias present across all but one of the studies in the review, the identification and follow-through of confounding factors.

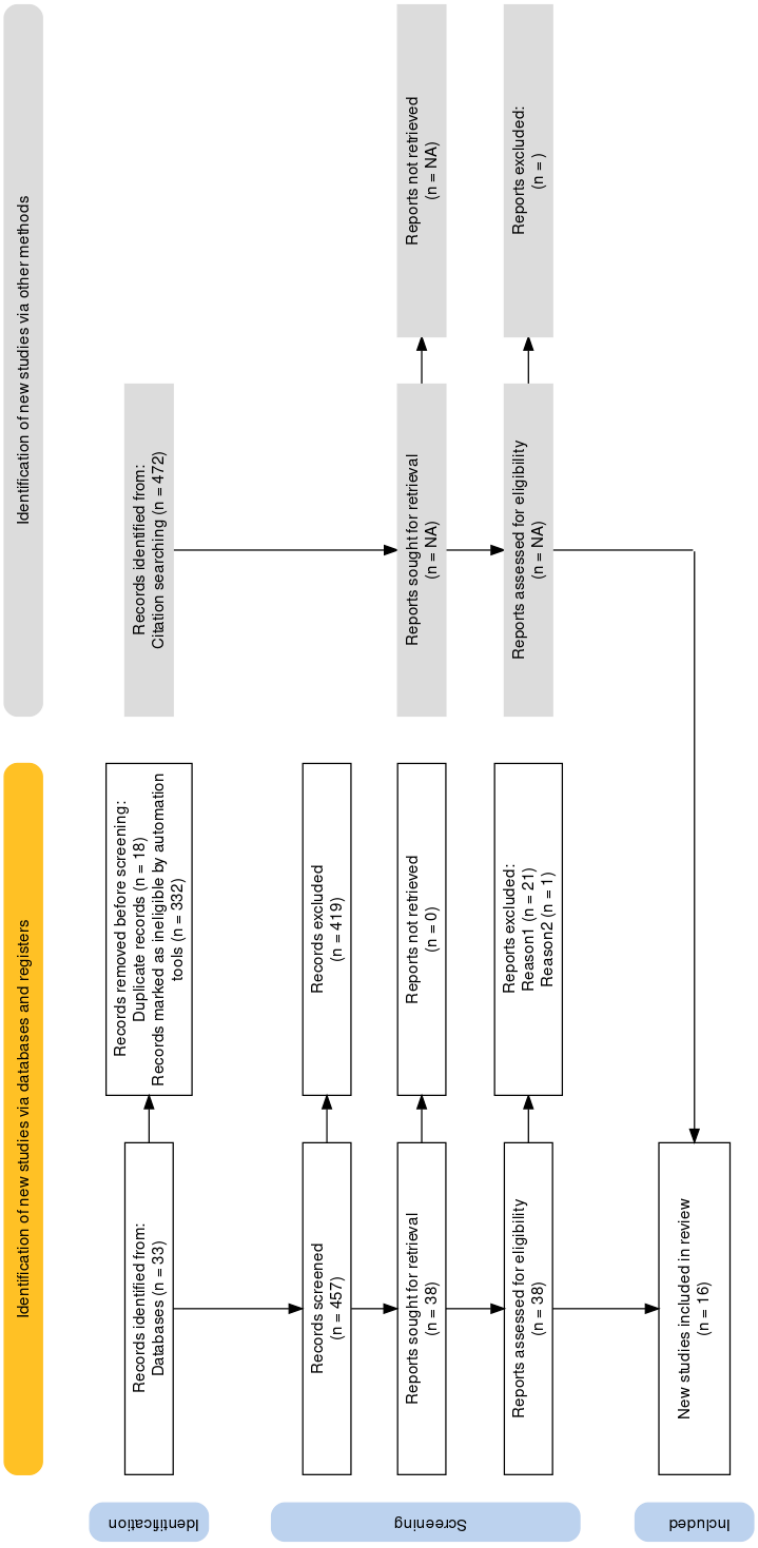


Figure 1: PRISMA Flow Diagram

Table 2: Extracted Data

DATA TYPE	**Explanation**
Study Information	
Author	Who are the authors
Year	What year was the study published
Title	What is the title of the study
Study Type	What type of measurement ws used in the study
Population Goal	What population is the study trying to capture
Sample Type	Was the sample targeted
Sample Size	How many participants were analyzed
Data Collection Method	What was the method of survey collection
HINTS	Was the Health Information National Trends Survey used
Demographics	
DATA-Age	Were age demographics gathered
DATA-Ethnicity	Were ethnicity demographics gathered
DATA-Employment	Were employment demographics gathered
DATA-Language	Were language demographics gathered
DATA-Sex	Were sex/gender demographics gathered
DATA-MaritalStatus	Were marital status demographics gathered
DATA-Education	Were education demographics gathered
DATA-Income	Were income demographics gathered
Health Information Focused	
DATA-HealthLiteracy	Was some measure of health literacy gathered
DATA-HealthInfoSource	Was a measure of the source of health information gathered
DATA-HealthInfoTrust	Was a measure of the trust in a source of health information gathered
DATA-HealthcareSource	Was a measure of access to healthcare gathered
DATA-Insured	Was a measure of participant health insurance status gathered
DATA-HealthStatus	Was a measure of general healthiness gathered
DATA-IllnessType	Was a measure of a specific type of illness gathered
Outcome	
OUTCOME-Significance	What were the significant correlations found in the study
OUTCOME-Conclusion	Short summary of the study

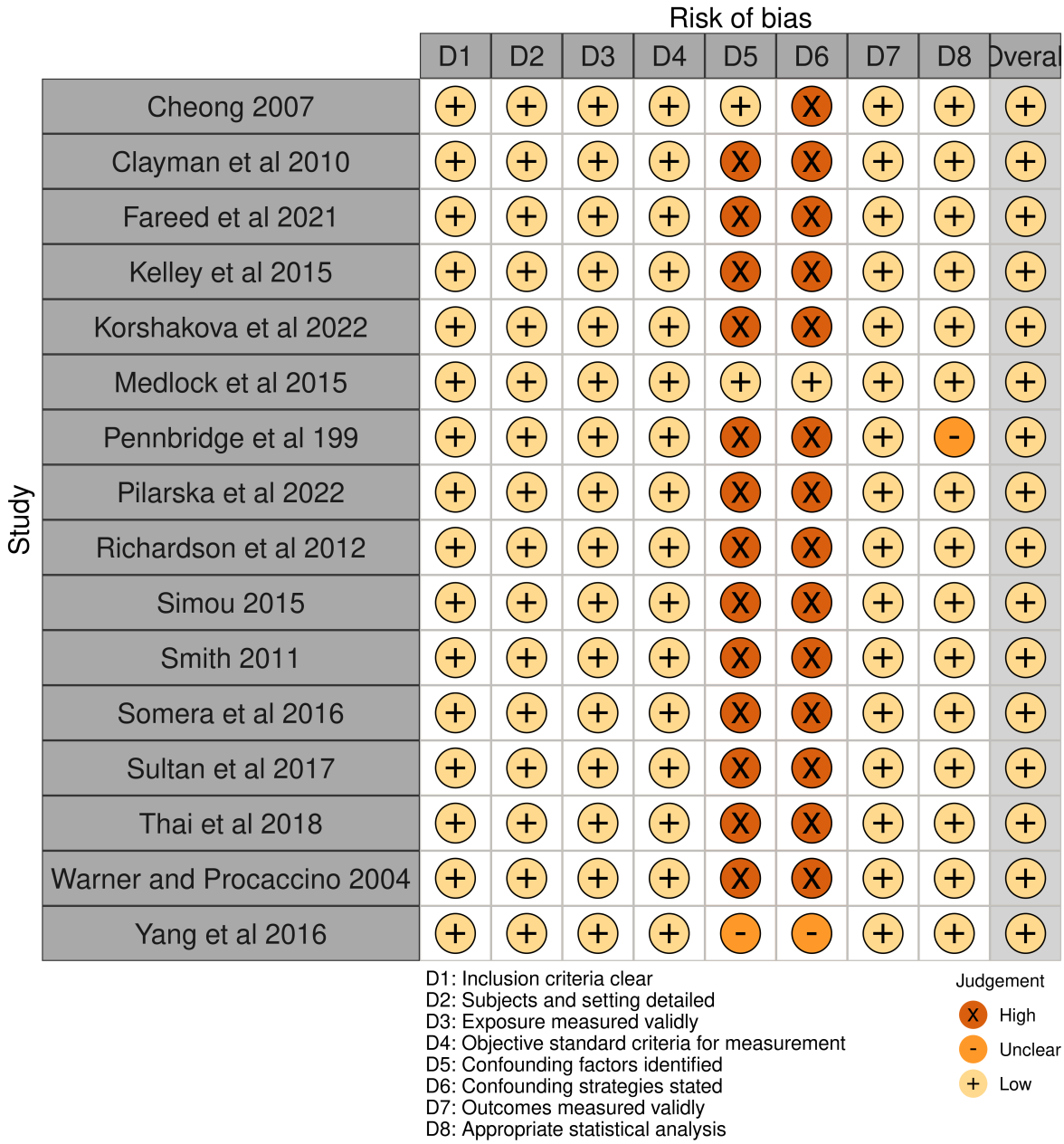


Figure 2: Risk of Bias Assessment

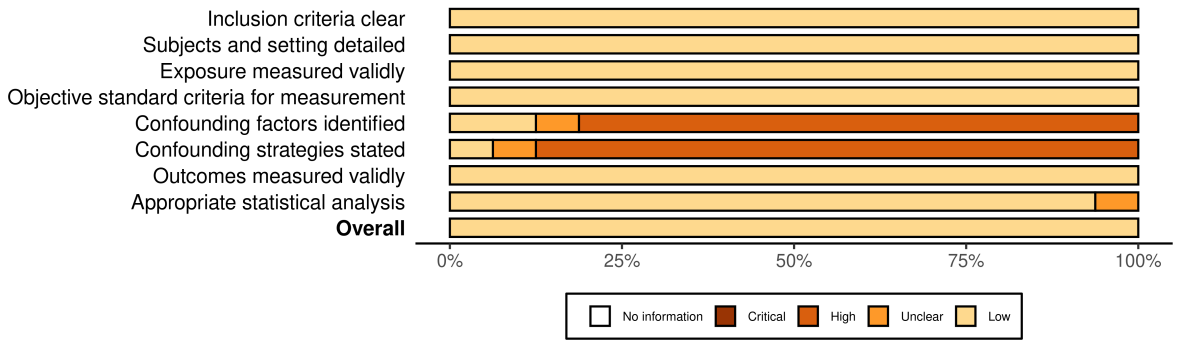


Figure 3: Risk of Bias Summary

Because the bias was present in nearly the entire review sample, it was deemed to be a non-exclusion worthy risk, otherwise the entire review would need to be abandonded. However it is worth highlighting that nearly every single survey study on the topic of source selection of health information did not attempt to identify any confounding factors as part of their analysis.

Data Preparation

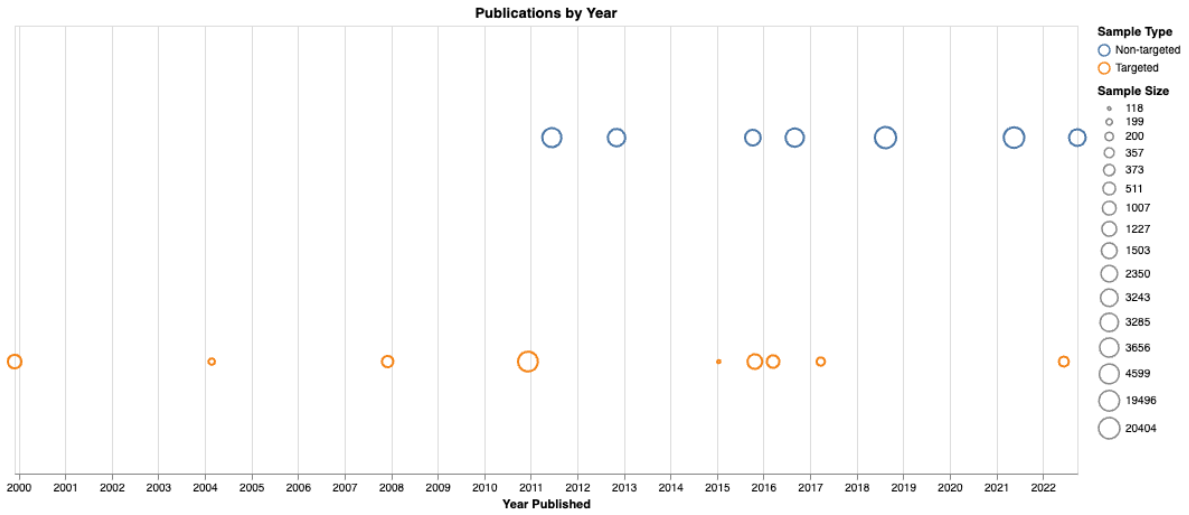
The extracted data saved in the Microsoft Excel spreadsheet Extraction1.xlsx was uploaded to the online database collaboration utility, AirTable (Airtable, n.d.). This allowed for simple, painless, and easily readable exploration and visualization of the data collected.

Results

Data extracted from the 16 studies in the review showed a number of notable figures and patterns.

The studies reviewed vary in publication date by a wide margin. Between the first publication and the last, 24 years go by, while only 16 studies are run and published that fit the review criteria. That means that a single survey study was published to determine if there are any meaningful correlations related to the source selection of health information every one and a half years.

Nine of the studies reviewed were found to be targeted to specific populations or groups of people. The targeted populations included Hispanics, Californians, Greeks, Polish medical patients, Guamanians, Omanis, Seniors, and Women. The other seven studies were non-targeted surveys where participants were simply over the age of 18, adults.



The sample sizes varied greatly for the 16 studies reviewed, and can be thought of as lumped into three groups. The first group contained six of the studies which sampled approximately 500 participants or less, with the lowest sample size of 118. This first grouping of studies are notably all targeted at specific populations of people. Eight of the studies make up a middle grouping of sample sizes between 1,000 and 5,000 participants. Finally the third grouping is just a pair of studies with approximately 20,000 participants each surveyed. The two largest studies are both analyses run on multiple iterations of the HINTS survey.

The three most commonly measured demographic variables were Age, Ethnicity, and Sex. All of the 16 studies under review measured participant age and the only study that did not measure sex was targeted to women, so it was an implicit demographic as it was required to be part of the study. The demographics least measured across the reviewed studies were participant health insurance status and the language spoken by participant. All of the demographic variables collected across all studies can be found in Table 3.

The collection of data on the source of health information was ubiquitous across all of the studies in the review. All 16 publications asked their participants about their source of health information, another variable implicit based on criteria. After that, some measurement of trust in sources of health information was found on 13 of 16 studies. The health literacy, or competency in managing one's own health, as well as a measurement of the participant's current health status both were found on 9 of the 16 studies. A few studies collected information from participants on whether they had a current source of healthcare if needed, and whether they were interested in a particular healthcare illness. The full breakdown of health related variables collected as part of this review can be found in Table 4.

All of the articles included in this review reported finding a significant correlation of some kind in their collected survey data. However in consideration of the objective of this review, source selection of health information, only 75% (12) of the studies involved reported finding

Table 3: Demographics Captured by Reviewed Studies

Age	**Ethnicity**	**Employment**	**Language**	**Sex**	**Marital**	**Education**	**Income**	**Insured**
1	1	1	1	1	0	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	0	1	1	1	1	0
1	1	1	0	1	1	1	1	1
1	1	0	0	1	0	1	0	0
1	0	0	0	1	0	1	0	0
1	1	0	0	1	0	0	1	0
1	0	1	0	1	1	1	1	0
1	1	1	0	1	1	1	1	0
1	0	1	0	1	1	0	0	1
1	1	0	0	1	1	1	1	0
1	1	1	0	1	1	1	1	0
1	0	1	0	1	0	0	1	0
1	1	0	1	1	1	1	1	0
1	1	1	0	0	0	1	0	0
1	1	0	0	1	1	1	1	0
16	12	10	3	15	10	13	12	4

Table 4: Health Data Captured by Reviewed Studies

	Literacy	**Info Source**	**Info Trust**	**Healthcare Source**	**Status**	**Illness**
	0	1	0	1	0	0
	0	1	1	0	0	0
	1	1	1	0	0	0
	0	1	0	1	1	0
	1	1	1	0	0	1
	1	1	1	1	1	1
	0	1	1	0	0	0
	0	1	1	0	1	1
	1	1	1	0	0	0
	1	1	1	0	1	0
	0	1	1	0	1	0
	1	1	1	0	0	0
	1	1	0	1	1	0
	1	1	1	0	1	0
	1	1	1	1	1	0
	0	1	1	0	1	0
Totals	9	16	13	5	9	3

a relevant significant correlation.

There were a total of 16 unique combinations of variables reported to have a significant correlation with the source selection of health information. Many of the combinations were reported in multiple studies, such as income, sex, ethnicity, age, health literacy, and health status. A full representation of the significant correlations found for the source selection of health information is included as part of the review.

The most reported significant correlation was between a survey participant's education level and their source selection of health information, reported in 31% (5) of the studies included in the review. A surprising finding is the high instance of significant correlations reported for the demographic of income. Income as a variable was only included in 12 of the studies, but was reported the same number of times as Age which was included in all 16 studies. All of the demographic variables measured across the studies in this review were reported as significantly correlated with the source selection of health information at least once.

Another surprising finding discovered in the data is the seemingly poor connection between a participant's trust in a source of health information and their selection of a source of health information. While some measure of trust was collected in 81% (13) of the reviewed studies, a significant correlation was found between it and source selection just 6% (1) of the time.

Discussion

Conclusion

The purpose of this systematic review was to explore and map out the breadth and depth of studies focusing on source selection of health information. The review successfully searched for, filtered, appraised, and found 16 publications matching the inclusion criteria, and while that number is not nothing, it is still rather small. Especially with no cut limit for the date range that was acceptable for inclusion, and being able to include studies from as far back as 24 years in the past, only finding 16 publications was surprising and frustrating.

The importance of source selection for health information seems to be clearer than ever with ever increasing number of sources, as well as the much maligned and rampant spread of 'fake news' that joined the zeitgeist of the modern media consumer a handful of years ago (Cooke, 2018).

From what can be seen in the data extracted as part of this review, it appears that there are a number of factors corresponding with the very fiber of who a person is, such as age, sex, income, ethnicity, etc. that are related to who or what or where that person chooses to go to for health information. 37.5% of the studies in this review end by saying that whenever health communication is being targeted at populations in need of intervention, the communicators must make sure to pay attention and take into account to at least one demographic or complementary variable of that population. Education, sex, insurance status, etc., were all factors that the reviewed researchers wanted to let future health communication scholars know were important when coming up with any messages that needed to be heard.

Of the studies reviewed, 56% summarized their results by saying that even in the age of the internet, differences in demographic variables were still meaningful for people's health information seeking process and their trust in sources of health information.

This review shows that any further research done in the hopes of illuminating a connection to why an average person chooses to listen to Source A instead of Sources B-F for information that is vital to their livelihood, those researchers must take into account exactly who that person is. Limiting studies to an average person might not be enough to capture the relationship an individual has with their sources of health information. If too broad of a lens is used, health communicators might not take into account all the ways the more than 62-thousand participants who were part of this review differ from one another, and the authors of these studies all believe that those differences matter.

Limitations

This review had many limitations along the process. To start, it was performed by only a single reviewer which establishes not only reviewer bias but also invites a lot of human error. The review was handled meticulously with the help of PRISMA guidelines to counteract those vulnerabilities, but they are present nonetheless.

Another limitation is that while this is a systematic review, a meta-analysis might prove to be more useful to fully understand the scope of effect of the data captured over the past 24 years. Unfortunately that is beyond the scope of the review and the reviewer so the statistical analysis included in each study was taken at nearly face value.

Yet another limitation is the problem of the review being run by a novice database delver. The search terms and their structures are simple and hopefully effective, but search strategies likely exist that the review did not entail.

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Appendix

Reasons for Exclusion

1. Atkinson, N. L. (2009). Using the Internet for Health-Related Activities: Findings From a National Probability Sample. _Journal of Medical Internet Research_, _11_, e4-undefined. (https://doi.org/10.2196/jmir.1035) – This article was excluded because the sample was focused entirely on internet users and was not actually about source selection.

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Health Communication_, _22_, 53–65. (https://doi.org/10.1080/10810730.2016.1250846) – This article was excluded because the sample and object of the study was entirely on internet users and usage.

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