

*Review Article*

## Reflections on health information sources in epidemics in synchrony with the COVID-19 pandemic: A scoping review

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### Abstract

This study aims to scrutinize prevalent sources of health information utilized by individuals for informed decision-making regarding protective and preventive health behaviors amidst an infectious epidemic. The acquisition of comprehensible and reliable information relevant to individual needs is deemed imperative in this context. This scoping review encompasses investigations into the sources of information employed during infectious epidemics, conducted in both Persian and English languages, spanning the timeframe from 2003 to 2019. The search for pertinent studies was executed across diverse databases, including PubMed, Embase, ProQuest, the Cochrane Library, Google Scholar, and Scientific Information Database. This review incorporated a total of 13 relevant studies. Findings indicate that traditional media, comprising television, radio, and newspapers, emerged as the predominant information sources during epidemics. Conversely, government resources and official government websites were identified as the least utilized channels. Additionally, the most reliable sources were identified as television, newspapers, and healthcare personnel. Given the historical prevalence of traditional media as a primary information source during past infectious epidemics, health officials and policymakers must consider enhancing public education through these channels during epidemic dissemination. However, due attention should also be directed towards the provision of pertinent and credible content on online social media platforms, particularly catering to the informational needs of young adults and the emerging generation. The identified limitations in the extant studies, namely their contextual dependence on sociocultural factors, the trajectory of lifestyle modifications, technological advancements, and the recent advent of the COVID-19 pandemic underscore the necessity for additional and comprehensive investigations in this domain.

**Keywords:** Epidemic, COVID-19, Health Information, Nursing, Nurses.

### 1 | Introduction

The prevalence and transmission dynamics of infectious diseases constitute a multifaceted, dynamic, and inherently unpredictable phenomenon. The resurgence of both new and previously encountered pathogens underscores the influence of global changes, encompassing factors such as travel, dietary patterns, occupational trends, population expansion, geographic consider-

ations, and various socio-cultural behaviors and customs [1]. Recent outbreaks have prompted a reassessment by public health organizations of the imperative for strategic planning and interventions to mitigate the potential widespread repercussions of infectious diseases [2]. A pivotal element in these plans and actions is the recognition of public access to coherent and reliable information, addressing their need to make informed decisions about protective health behaviors [3]. The acquisition of health information during an outbreak is indispensable to effective outbreak

control strategies [4]. To achieve success in this regard, the requisite information must be disseminated to the general public through communication channels employed by them [5].

In recent years, there has been a notable surge in the utilization of social media platforms such as Facebook and Twitter. The deployment of social media as a source of health information has the potential to influence individuals' awareness and behaviors concerning health issues, encompassing risk perception and preventive measures [6, 7]. Social media is acknowledged as a significant and immediate source of information, particularly when traditional media fail to provide timely and pertinent information to the public [8, 9]. For instance, Ding & Zhang (2010) reported that the initial notification of the outbreak of Influenza A (H<sub>1</sub>N<sub>1</sub>) occurred through virtual social media channels [10]. Consequently, governmental organizations like the Centers for Disease Control and Prevention (CDC) have leveraged social media to disseminate awareness regarding emerging infectious diseases such as Zika and Ebola [11, 12]. Despite the increased accessibility to information facilitated by social media, individuals seeking health information on the internet often express confusion and anxiety in the face of an overwhelming volume of potentially conflicting information [13]. Studies have indicated that online information might contribute to illness-preventing behaviors and heightened stress during outbreaks like severe acute respiratory syndrome (SARS) [14]. It is noteworthy that, contrary to the assumption that modern media channels replace traditional sources of information, individuals tend to use the internet and online social media to reinforce information obtained from conventional media outlets such as television, newspapers, and radio [15].

Consequently, public health organizations and practitioners must remain cognizant of evolving trends in individuals' preferences and behaviors concerning communication resources and their favored information sources. Understanding the information sources utilized by individuals in past disease outbreaks, and monitoring the gradual shifts in these resources, is instrumental in informed planning for current and future conditions [3]. Given the absence of a review study on this subject in the current literature, coupled with the ongoing prevalence of Coronavirus Disease 2019 (COVID-19) and the imperative for public education and health information dissemination, the researchers have undertaken a scoping review to examine existing studies on the sources of information employed by individuals in previous infectious epidemics. This initiative aims to enhance the understanding of this phenomenon globally, facilitating informed planning to address the information needs of the public during current and prospective outbreaks.

## 2 | Methods

This scoping review aimed to investigate the extent, scope, and nature of existing studies on the information resources utilized by individuals during infectious epidemics, employing the six-stage framework proposed by Arksey & O'Malley (2005) [16-18]. The framework encompasses the following stages: 1) Identifying research questions, 2) Searching for relevant studies, 3) Selecting main studies, 4) Recording and charting key results, including study objectives, population, location, time, findings, etc., 5) Collating, summarizing, and reporting the findings, and 6) Consulting with stakeholders (optional). Scoping reviews, by their nature, provide an accurate overview of the literature in a specific field without engaging in qualitative evaluations of the studies [16]. Consequently, according to the purpose of the present study, critical evaluation of studies has not been carried out.

### 2.1 | Search strategy

The research questions for this scoping review were formulated in the first stage, focusing on the examination of the most common, least utilized, and most trusted sources of information during infectious epidemics [19]. To ensure a comprehensive review, multiple data sources, including international databases such as PubMed, Google Scholar, Embase, ProQuest, Cochrane Library, and Scientific Information Database, were simultaneously searched. English keywords, such as information sources, information media, health information, infectious disease, outbreak, infectious epidemics, and general population, along with their Persian equivalents, were employed. The search strategy is detailed in Table 1.

**Table 1.** Search Strategy.

Search Strategy
1. "Information sources" OR "Information media" OR "Health information"
2. "Infectious disease outbreak" OR "Infectious epidemic"
3. "General population"
4. #1 AND #2 AND #3

### 2.2 | Study selection

The scoping review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) diagram [20]. to track the number of studies at each stage. PRISMA-ScR, developed by Levac et al. [21] provides essential guidance for reporting scoping reviews by adapting and modifying certain PRISMA items. The stage of selecting studies was based on predefined inclusion criteria, specifically studies conducted between 2003 (the time of the SARS epidemic in the recent century) and 2019, focusing on information

sources used by individuals throughout infectious epidemic outbreaks and published in either Persian or English. No restrictions were imposed on the type of study design. Studies conducted in specific groups, such as healthcare staff, or those inconsistent with the study's purpose were excluded. The process of reviewing and selecting studies was carried out independently by two researchers in two screening stages. Discrepancies were resolved through simultaneous review and consensus. The search strategy and results were documented and stored, utilizing the EndNote-X9 information resource management tool.

### 3 | Results

A total of 1154 original articles and grey literature were initially identified. After the scrutiny of article titles, 1018 items were excluded based on the absence of inclusion criteria or duplication. The remaining 136 items underwent abstract review, resulting in the elimination of 106 items due to non-compliance with exclusion criteria. The full text of the remaining 30 articles was then assessed for eligibility, with 19 exclusions based on the established criteria. Additionally, a reference review methodology led to the inclusion of two articles, ultimately yielding 13 eligible studies for inclusion in this investigation (Figure 1).

Data extraction from the selected 13 studies was carried out independently by two researchers using a standardized data extraction form. The form encompassed the following sections: (1) study title, (2) year of publication, (3) country, (4) author, (5) study type, (6) sample size, (7) sample characteristics, (8) data collection method, and (9) results pertinent to the study's objectives. Nota-

bly, all 13 studies reviewed were diverse in study design and uniformly published in English. The studies originated from various countries, including the United States, China, the Netherlands, Canada, Japan, Malaysia, Australia, and the United Kingdom. Diverse sampling methods were employed, with questionnaires (written or online) and interviews (oral or phone) being commonly utilized for data collection. The scope of the studies encompassed influenza pandemics (seasonal, avian, and H<sub>1</sub>N<sub>1</sub>), SARS, Ebola, Zika, and Salmonella infections. The study populations in all articles consisted of adults aged 18 and above, who had experienced various infectious epidemics and represented different groups such as the general public, students, pregnant women, or the poultry community. The detailed results of the studies are presented in Table 2.

The findings from the reviewed studies indicated that the most prevalent and widely utilized sources of information in previous epidemics were traditional mass media (TV, radio), print media, and Internet social media platforms (Facebook, Twitter, etc.), respectively. Health care providers and family and friends were each identified in two articles as the most frequently consulted sources of information. In contrast, official government websites and resources were cited with lesser frequency and were each reported in separate studies. Regarding the trustworthiness of information sources, while most studies did not extensively address this aspect, healthcare providers were mentioned more favorably in two articles compared to traditional mass media in one article. Additionally, in a study conducted in China, government officials were recognized as a reliable source of information.

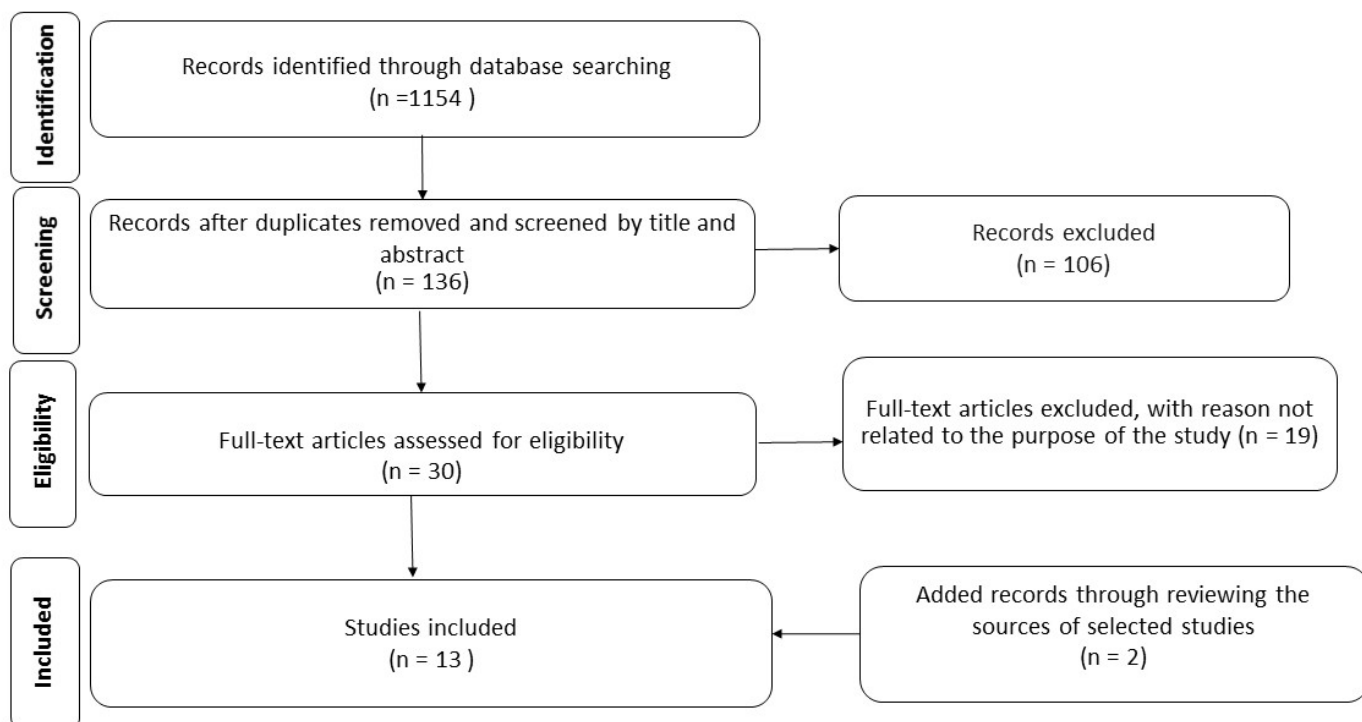


Figure 1. Selection of study.

**Table 2.** Characteristics of selected studies.

Author (Year)/ Country	Type of study	Sample size	Sample characteristics	Data collection method	Key findings
Brug <i>et al.</i> , (2004) [33]/ Netherlands	Survey	500	Person's age 19–78 years	Electronic questionnaire	Main and trustworthy sources of information: Television and newspapers
Wong & Sam (2010)/ Malaysia	Cross-sectional	1,050	Adults from the general Malaysian population	Telephone interview	Main sources of information: Newspapers, television, and family preferred sources among three different populations: Television: Malaysians, Newspapers: Chinese, Family: Indians
Voeten <i>et al.</i> , (2009)/ United Kingdom and The Netherlands	Survey	330	Chinese people in the UK and The Netherlands	Questionnaire	The most common sources of information are television and newspapers Low level of trust: Physicians, government agencies
Liao <i>et al.</i> , (2010)/ China	Cross-sectional	1,001	Hong Kong adults	Telephone interview	Trust in government/media information was more strongly associated with greater self-efficacy and hand-washing, whereas trust in informal information was strongly associated with perceived health threats and avoidance behavior.
Maurer <i>et al.</i> , (2010)/ USA	Survey	3,917	adults age 18 and older	Questionnaire	The most influential source of information: employers or health care providers, public health organizations; CDC, and News
Goodwin & Sun (2013)/ China	Survey	637	Chinese adults	Online questionnaire	Main sources of information: a combination of traditional and social media. Reliable sources: Chinese officials
Sasaki <i>et al.</i> , (2013)/ Japan	Survey	109	pregnant women	Questionnaire	Main information sources: Television, radio, and newspaper
van Velsen <i>et al.</i> , (2014)/ Netherlands	Survey	1,057	Healthy individuals	Questionnaire	The most information sources: Traditional media, news, newspaper
Jardine <i>et al.</i> , (2015)/ Canada	Survey	2,412	Adults age 18 and older with SARS, H <sub>1</sub> N <sub>1</sub>	Telephone interview	The most used sources of information: Traditional mass media
Koralek <i>et al.</i> , (2016)/ USA	Survey	797	undergraduate student over 18 years of age	Online Questionnaire	The most used sources of information: News media (34%) and social media (19%) The least used sources of information: official government websites (11%)
Piltch-Loeb <i>et al.</i> , (2018)/ USA	Cross-sectional	3,698	USA Adults	Questionnaire	The primary sources: TV and radio, followed by print news, less than all government resources.
King <i>et al.</i> , (2018)/ Australia	Mixed methods study	432	Parents of children aged 6 months to 5 years	Semi-structured interviews and questionnaire	Trust to information sources: Doctors (90%), nurses (59%), government (56%), children centers (53%), antivaccination groups (6%), and celebrities (1%).
Cui <i>et al.</i> , (2019)/ China	Survey	426	Poultry farmers	Questionnaire	The most important source of information: is television. Simultaneous use of multiple sources of information

## 4 | Discussion

This scoping review, aimed at investigating sources of public health information during infectious epidemics, encompassed studies originating from American, European, and Asian countries. Notably, however, there was an absence of studies conducted in African countries, even though epidemics such as Ebola and Zika have emanated from these regions [22, 23]. Furthermore, the review did not identify studies from Saudi Arabia or other Middle Eastern countries, which serve as the origin of the Middle East Respiratory Syndrome Coronavirus (MERS-CoV) [24]. Given the cultural context, the diversity of available information sources, and the variability in information networks and electronic-telecommunications infrastructure across different countries, it is plausible that these factors contribute to variations

in the utilization of information sources. Consequently, the need for analogous studies in other countries affected by similar epidemics becomes evident.

Conversely, all studies scrutinized in this review adopted a quantitative research design [3-5, 9, 25-33], with only one instance employing a mixed-method approach combining quantitative and qualitative methodologies [32]. Given that societal preferences for distinct types of media and information sources pertinent to health may be influenced by social, cultural, and economic factors, and prevailing societal policies [34, 35], there emerges a compelling rationale for the inclusion of qualitative studies in this domain. Qualitative investigations, characterized by an in-depth exploration of the information sources accessed

and favored by the general public, would facilitate a comprehensive examination of the underlying reasons informing these choices and preferences within the specific societal context.

The findings of this study regarding the predominant sources of information reveal that traditional mass media, encompassing television, radio, and print media (newspapers), are consistently identified as the most frequently utilized information sources by the general populace [3-5, 9, 29-32]. The prevalence of traditional information sources in countries such as the United States, Canada, the Netherlands, and Japan may be associated with the demographic age distribution in these nations, wherein a high median age is observed (38.3 years in the United States, 41.4 years in Canada, 43.4 years in the Netherlands, and 48.4 years in Japan) [36]. This proclivity could also be attributed to the longstanding and pervasive nature of mass media, coupled with their accessibility to a broad spectrum of the general public. Despite the advent of internet social media in recent years, offering new avenues for the public to access information during infectious epidemics [5], traditional media persist as the primary information sources, with Internet sources not supplanting them despite an upward trajectory in usage [3]. The multifaceted nature of this issue invites further exploration, potentially involving an examination of the electronic infrastructure of nations.

Several studies suggest that during crises, individuals may not turn to social media platforms due to perceptions of unreliability [31] or concerns about misinformation and confusion [32, 35]. However, considering evolving social habits and technological dissemination, it is plausible to anticipate a transformation in this pattern. The current review underscores that online social media platforms, such as Facebook or Twitter [25-27], emerge as prominent sources of health information, even surpassing the reliance on healthcare providers [28, 32], who traditionally represent authoritative figures in this domain. This underscores the paramount importance of acknowledging the role of Internet-based media in disseminating information and underscores the necessity for countries to formulate long-term strategies for leveraging the potential of cyberspace to foster preventive and protective behaviors during epidemics. Notably, the use of the internet and virtual social media emerges as a popular avenue for health information consumption, particularly among young adults [35]. As indicated, the widespread prevalence of smartphones among adults (90%) and young adults (79% in the 18-24 age group), with 73% engaging in social network usage, underscores the pervasive influence of these platforms [37].

The findings of the present study underscore the acknowledgment of healthcare providers as a source of health information among the general populace. While not consistently ranked

highly in this regard, the significance of this observation necessitates further in-depth analysis. It is imperative to recognize the indisputable role played by healthcare staff in the dissemination and transmission of health-related information to the public. Strategic planning can harness the potential of this reliable information source to optimally enhance public awareness and influence health behaviors. Additionally, the study highlights the noteworthy prevalence of friends and family as widely used and favored sources of information in specific societies, such as India [4] and China [31]. This inclination may be influenced by the cultural context and social lifestyle prevalent in these communities. To validate and contextualize this finding, further investigations are warranted, particularly within other Asian countries, such as Iran, to discern potential cultural nuances and variations in health information-seeking behavior.

A salient observation in this review is the consistent indication, in multiple studies conducted in the United States, that government official websites were among the least utilized sources of health information [26, 29]. This finding prompts a nuanced discussion regarding the trustworthiness individuals ascribe to government entities within society. Nevertheless, the pivotal consideration lies in recognizing the critical role governments play in epidemic control, with the majority of decisions, policies, and actions being enacted at the governmental level. Consequently, there is a need for thoughtful examination of individuals' utilization of government information sources across different countries. Governments, given their central role and influence, should strategically address potential factors contributing to low referrals to their information sources. By implementing measures to enhance accessibility, transparency, and reliability, governments can devise and implement strategies to position government information sources as the most widely used and trusted health information outlets. Such an approach holds the potential to bolster public adherence to government policies and actions, thereby contributing to effective epidemic management.

This scoping review yielded limited findings on the determinants of public trust, with only a subset of studies investigating the level of trust in information sources. Notably, the results varied across studies, revealing a spectrum of trusted sources, including television and newspapers [32], healthcare staff [28, 32], and government officials (in China) [25]. Conversely, other studies reported lower levels of trust in media and celebrities [26], physicians, and government agencies, particularly among Chinese immigrants in Britain and the Netherlands [31]. Given the paucity of information and the contradictory nature of findings, further research in this domain is imperative. The importance of trustworthiness cannot be understated, as it significantly influences

the selection and reliance on a particular information source. Distrust can detrimentally impact the choice of media, audience receptivity, and responses to public health information. Consequently, the type of information source chosen also has implications for individuals' knowledge, health beliefs, and preventive behaviors [31]. Recognizing and understanding reliable information sources is essential from the individuals' perspective, presenting an opportunity for government officials and healthcare stakeholders to strategically invest in these resources. Such investments can be pivotal in leveraging trusted sources to enhance awareness levels, overall health outcomes, and the adoption of preventive behaviors during infectious disease outbreaks.

The present study demonstrates a high level of reliability through its comprehensive approach to literature search, result extraction, and analysis. Its significance is underscored by being the inaugural scoping review in this particular field.

#### **4.1 | Limitations**

It is important to acknowledge a limitation in the review process, as only articles published in Persian or English languages were included. This limitation introduces the potential for overlooking studies published in other languages, such as Chinese or others, particularly in regions that have experienced previous epidemics. This linguistic restriction may impact the comprehensiveness of the review, necessitating caution in generalizing the findings across diverse linguistic and cultural contexts.

#### **5 | Conclusions**

This scoping review underscores the paucity of research on information sources employed by individuals during infectious epidemics, which has been limited both in quantity and geographical scope. The prevailing methodology in these studies predominantly involves quantitative approaches, primarily relying on questionnaires. Furthermore, the focus has largely been on the general population, with a primary emphasis on determining the most utilized sources of information, while fewer studies have delved into the assessment of perceived reliability from the public's standpoint. Summarizing the outcomes of the reviewed studies reveals that traditional mass media, comprising television, radio, and newspapers, have consistently emerged as the most widely accessed sources of information during previous epidemics. Following closely are virtual social media platforms and healthcare staff. Conversely, the perceived reliability of government information sources appears to be relatively low among the populace. Given the limited scope of these findings, coupled with

the recognition that the choice of information source and perceived reliability may be contingent upon diverse cultural, social, economic, welfare, and political factors, there is an imperative for further investigations. It is recommended that future research in this domain employs a diverse range of methodologies, including both quantitative and qualitative approaches, to comprehensively address the existing information gap. Such endeavors should extend across various countries and diverse demographic groups, facilitating a nuanced understanding of potential shifts influenced by evolving communication media and technological advancements. The exigency for such research is particularly pronounced in the aftermath of the recent COVID-19 pandemic. This need is particularly acute in Iran, a country characterized by a unique socio-cultural structure, which, despite not having experienced a pandemic of this magnitude in recent years, requires empirical insights to inform planning and intervention strategies. The current research landscape lacks evidence about this specific domain, emphasizing the critical importance of undertaking comprehensive studies to enhance public health awareness and preventive behaviors during epidemics.

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#### **Authors' contributions**

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: MI, MS, SAM, AG, PS; Drafting the work or revising it critically for important intellectual content: MI, MS, SAM, AG, PS; Final approval of the version to be published: MI, MS, SAM, AG, PS; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: MI, MS, SAM, AG, PS.

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### Availability of data and materials

The datasets used during the current study are available from the corresponding author on request.

### Using artificial intelligent chatbots

None.

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