

Navigating health information chaos: Perspectives from Persian-speaking immigrants in Finland

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Abstract

The purpose of this study is to explore health information environment and behaviours of Persian-speaking immigrants in Finland during the COVID-19 pandemic, utilising information chaos framework. Between January to March 2022, semi-structured interviews were conducted with a sample of 18 participants, using an adapted framework of information chaos and previous research as a guide for the interview questions.

The study found that participants relied on interpersonal connections, news outlets, and social media to stay informed on current news and health-related information, with messaging apps being particularly popular due to their convenience and ability to connect with friends and family in their home countries. While most participants were satisfied with the amount of information they received, some encountered inaccurate pandemic information. The study also identified significant obstacles related to information scatter and conflict. Participants employed various methods, including verifying with official sources and interpersonal networks, to assess the reliability of their information. Credible health information led to changes in behaviour and lifestyle.

The study's findings offer practical implications for health authorities and policymakers to address the health information needs of Persian-speaking immigrants during public health crises. The use of an information-chaos framework could be beneficial in identifying challenges related to channelling accurate and reliable health information among minorities through different information sources. Such initiatives can bridge the gap between the health information needs of immigrants and the available health information, ultimately reducing health disparities and improving health outcomes.

This study represents one of the pioneering works exploring the information environment during a pandemic and the strategies adopted by the Persian-speaking minority to address the dissemination of false information during a health crisis. These findings shed light on the complex interplay of individual and health information environments that influence adhering to safety protocols and adopting healthy behaviours in this population.

Keywords: chaos, COVID-19, health communication, health literacy, immigrants, social media

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Introduction

The COVID-19 pandemic has sparked a widespread "infodemic" or the excessive spread of both accurate and erroneous information, thus complicating information searches and leading to negative outcomes such as the spread of fake news, misinformation, and disinformation [1,2]. The differences between these terms are critical in combating the spread of false or misleading information, with misinformation being inadvertently wrong, disinformation being intentionally false, and fake news being exaggerated or fabricated stories [3–5]. Effective communication with vulnerable populations requires evidence-based communication strategies [6,7]. Finland has countered misinformation by actively disseminating accurate information, a tactic also noticed in other Nordic countries, albeit with certain challenges [8,9]. For example, Sweden and Norway have observed issues around the infodemic's impact on minority groups, such as immigrants, refugees, and asylum seekers, leading to vaccine hesitancy in Norway and difficulties in accessing accurate information in Sweden due to limited access and language barriers [10–12]. Similarly, Denmark has faced resistance against vaccination among minority groups due to a lack of information caused by language barriers and limited digital competencies [13]. The challenge lies in disseminating reliable and accurate healthcare information to these groups, with linguistic barriers and limited access to information due to socioeconomic factors adding to the complexity [14–16]. The spread of false information significantly affects minority health, which is more vulnerable due to a lack of information access, as seen in the Persian-speaking residents of Finland [17–19]. This study focuses on investigating the health information-seeking behaviours and environment of Persian-speaking immigrants in Finland during the COVID-19 pandemic using an information chaos

framework. The research aims to understand their trusted information sources, the types of health information circulated during the pandemic, and the methods they employ to evaluate information quality and credibility.

Background and literature review

The rising immigration in Nordic countries, including Finland, has resulted in diverse populations facing unique challenges in accessing and understanding health information [20,21]. This is especially prevalent in the healthcare system in Finland, where immigrants' utilisation of healthcare services is hindered by language barriers and system unfamiliarity [22,23]. These issues are exacerbated during the COVID-19 pandemic, with an increase in misinformation, particularly through social media platforms [24,25].

Specifically, immigrants in Norway and Sweden are highly susceptible to COVID-19 disinformation on social media [10,26]. The source of health information varies among minority populations, such as undocumented immigrant women in Denmark, who primarily rely on friends, family, the internet, and social networks [27], and Polish migrants in Norway, who trust healthcare providers [28]. During the pandemic, Iranians residing in Iran obtain health information from a variety of sources, including family and friends, authorities, news outlets, social media, and messaging apps [29–32]. However, the spread of fake news, misinformation, and disinformation during the pandemic, particularly via social media, is a global concern affecting nations including the Nordic countries, Iran, Afghanistan, and Tajikistan [33–35]. Factors contributing to misinformation include language barriers, mistrust in mainstream media, government censorship, a lack of transparency, and low health literacy

among immigrants, asylum seekers, and refugees [10,36,37].

Community leaders and healthcare professionals in the Nordic countries have made efforts to foster trust with minority communities and promote reliable sources of information to prevent the spread of false information [10,38,39]. Efforts have been made to combat false information through means such as social media campaigns, fact-checking initiatives, and the establishment of trusted sources of information such as the World Health Organisation [40–42]. Access to reliable health information has been demonstrated to promote vaccination uptake and adherence to public health regulations, resulting in better health outcomes for the public, especially among minority communities [43–45]. Understanding the origins and effects of information chaos on the health information environment for Persian-speaking immigrants in Finland during the COVID-19 epidemic is essential for preventing the spread of false information and enhancing health outcomes.

Theoretical framework

The Information Chaos Framework, originally developed in clinical settings, provides an understanding of the substantial influence that diverse information sources, contextual factors, and behavioural outcomes can have on primary care providers [46]. The framework highlights the potential dangers of information overload, scatter, underload, conflict, and erroneous information. The detrimental effects of these aspects of information chaos are observed in the quality of care delivered by primary care physicians (PCPs) [46–48]. The Information Chaos Framework, while crucial to understanding the influence of information management on healthcare delivery, lacks a comprehensive relationship with other theories of information

seeking. It has been recommended that future studies bridge this gap by linking this framework to broader health information behaviours. Additionally, the origins of the Information Chaos Framework in clinical settings as opposed to health information environment settings need further elucidation for better application in healthcare contexts. The framework also takes into account the impact of mental workload and interruptions on PCPs' situational awareness, decision-making, and overall performance [46,48]. The framework suggests practise redesigns and team communication to reduce information chaos and enhance situational awareness during all phases of the patient visit [46]. During public health crises, it proposes the use of collaborative writing applications to produce open-access and continually updated guidelines to ensure fast-paced expert review [47].

Methodology

This study employed a qualitative approach, using semi-structured interviews with 18 Persian-speaking immigrants in Finland. The goal was to understand their perceptions of health information chaos during a public health crisis. The interview guide was designed based on the Information Chaos Framework [46] and recent studies [47,48] (see Figure 1). The participants' sources of health information, their evaluation methods, and the perceived reliability and accuracy of the information were the key aspects explored. Convenience sampling was used to recruit participants, with multiple recruitment strategies including personal social media networks, community centres, and a snowball sampling approach. Interviews were conducted both in person and online from January to March 2022. For clarity in communication across different linguistic backgrounds, English was used to explain some interview questions, with a multilingual

Kurdish speaker present for participants who spoke Persian as a second language.

The data was analysed using a thematic approach with both deductive and inductive methodologies. Transcriptions were translated from Persian or Kurdish into English for qualitative analysis using NVivo 1.7, structured by the theoretical framework. A coding scheme was developed, guided by the

study objectives and the theoretical framework, with emergent themes identified during the process. For instance, codes like "Health information source evaluation" and "Challenges in Information Assessment" were derived. Each coded text segment was linked to corresponding participant statements, facilitating comprehensive data analysis and theme identification.

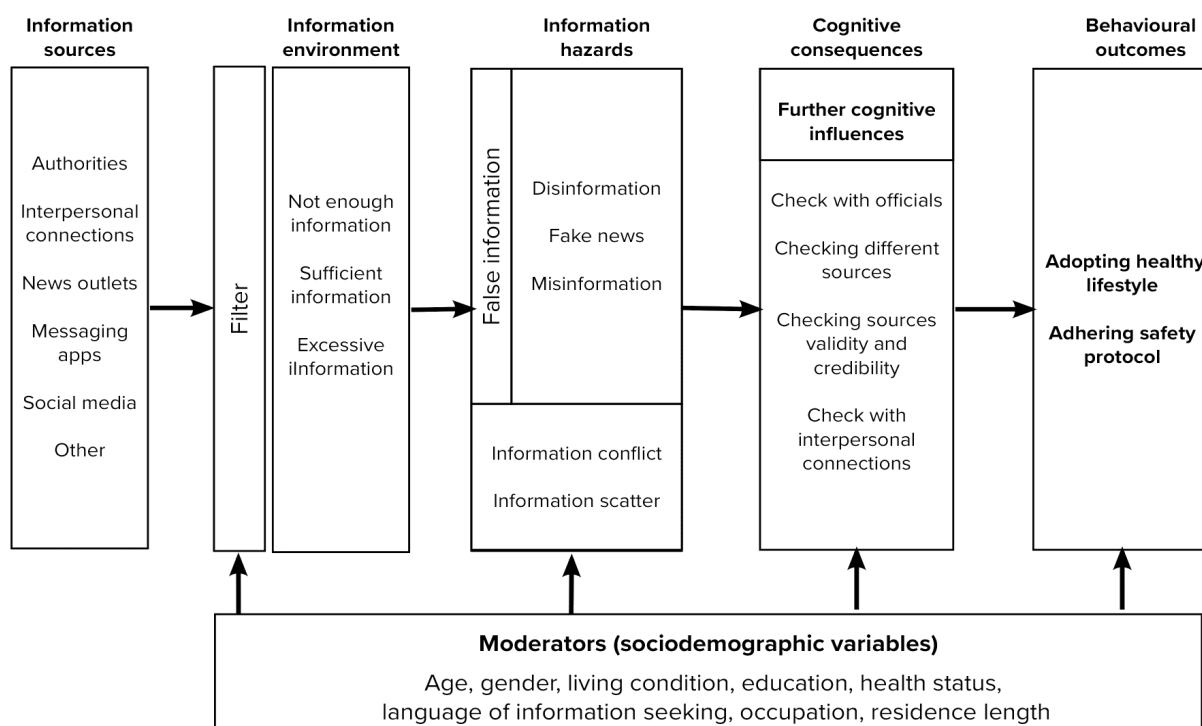


Figure 1. Navigating health information chaos: perspectives from Persian-speaking immigrants in Finland.

It is essential to clarify the process of coding employed in the research. For example, after developing the coding scheme, each interview was carefully transcribed and subjected to this scheme. The process involved tagging sections of the transcripts with relevant codes, allowing for easy retrieval and analysis of the related data. This rigorous methodology ensured a thorough analysis of participants' views and experiences of health information chaos during the COVID-19 pandemic.

Findings

Study participants

The study comprised 18 participants, averaging 38 years old, comprising nine males, eight females, and one non-binary individual. While seven lived with family, eleven lived alone. Most were highly educated and university-enrolled, and eight were full-time employed. A majority, eleven, had resided in Finland for less than five years. Participants predominantly sought health information in English, Persian, and Kurdish, with fewer (six) preferring Finnish and one preferring Swedish.

Health information source

Participants in this study reported using different information sources during the outbreak to obtain information or news, including authorities, interpersonal connections, news outlets, messaging applications on their mobiles, social media platforms, and other sources. Nearly all of the people who took part in this study expressed using interpersonal connections, news outlets, and social media as their main channels to obtain the latest news and health information.

The participants described different reasons for using interpersonal connections, news outlets, and social media as their preferred information sources.

For example, one male respondent who was working full time stated, *"I don't speak English or the local languages well enough, so the people around me are the best way for me to find out the latest news and information about what's going on..."*. Another male participant who had good command of English stated that *"The BBC and the Daily Mail are two of my go-to sources for news and updates on the pandemic..."*. Finally, a bilingual female participant who has lived in Finland for less than 5 years mentioned that *"I frequently visit Iran-related pages on social media to read the most up-to-date Persian translations of Finnish newspaper articles... After [name of a Finnish national news agency] began posting updates about the outbreak in Kurdish, my native language, I began following the agency on social media..."*.

Participants also mentioned using mobile messaging applications, such as Signal, WhatsApp, Facebook Messenger, Telegram, Viber, and Line, to obtain health-related news or information during the outbreak. Participants cited various reasons for using messaging apps, including convenience, ease of use, low cost, and the ability to connect and share information with family and friends in their home countries. Moreover, a few participants mentioned other sources, such as postal letters from municipalities or emails from their employers or universities. For example, a participant who is currently studying towards a master's degree stated that *"Each week, I receive an official email from my university [name a Finnish university] that contains the most recent health information regarding the COVID-19 outbreak, including roles, regulations, and the latest recommendations..."*.

Amount of information

During the course of the interviews, the participants were queried regarding the adequacy of the amount of information or news they had received

with regard to the outbreak, using a rating scale ranging from "not enough" to "sufficient" and "excessive." The majority of respondents indicated that the quantity of information and news available from their preferred health information sources was satisfactory. However, a minority of participants (eight individuals) expressed differing opinions. Specifically, five of these individuals reported that the amount of information available was excessive, while three others indicated that there was not enough information available specifically regarding the current situation. For example, we can highlight the following comments: One respondent stated, *"I've received a good amount of information about what's going on with the pandemic here...how it's spreading...how to prevent it...how to get treated if you get sick..."*. In contrast, we can highlight the following comments: *"I sometimes worry that I'm not getting all the information I need about Corona... Lots of news and updates aren't translated into English, which makes it tough for me and other immigrants to stay up to date..."*, and a highly educated female participant argued that *"I feel like there's way too much Corona news and information in Finland... Every website and news source is talking about it...It's just too much to handle..."*

False information

During the interviews, the participants were asked whether they had encountered any inaccurate or misleading information about the pandemic and were subsequently requested to provide specific instances. Thirteen participants confirmed that they had been exposed to a significant amount of false information, which they had encountered through active information-seeking or passive exposure to news sources, social media, messaging applications, interpersonal conversations, and other channels of communication. These examples were

grouped into three categories: misinformation, disinformation, and fake news. Notably, the majority of the examples provided fell into the categories of misinformation (n = 10) and disinformation (n = 6), while only four participants mentioned instances of fake news. The following comments from the interviews provide interesting information about the participants experiences:

Regarding misinformation, a male participant stated that *"I read on [name of a social media platform] that getting COVID-19 can make your lungs weaker and prevent you from doing sports... It stressed me out...I found out later that the information was wrong and misleading..."*. Similarly, a highly educated female participant mentioned, *"I've been reading a lot of news on [names of some international news broadcasting agencies] about COVID-19 lately... Healthcare professionals used to say that if you don't have respiratory symptoms, your chances of getting infected are low. But now they're saying that some people who are infected don't have any respiratory symptoms at all"*.

Participants also provided some examples related to the concept of disinformation. For example, a male participant stated that *"I once saw this video on [name of a mobile massaging application] by a [name of an international actress] who claimed that you could use a hair dryer to kill the coronavirus by heating up your nasal cavity...then the celebrity admitted it was fake"*. Another example from a female participant stated that *"There was much misleading information circulating among my friends, like drinking lemon juice and spices such as saffron, turmeric, and cinnamon to boost your lungs and immune system against the virus"*.

During the outbreak, participants who received various amounts of information or news, classified as sufficient, inadequate, or excessive, reported encountering different types of false information,

including misinformation, disinformation, and fabricated news. Participants provided many examples of fake news that they encountered while seeking information, such as *"The rumour about drinking methanol to cure coronavirus... Sadly, many people believed it and ended up in serious trouble..."*, and *"There were many fake news stories about domestically produced herbal medicines in [name of a middle eastern country] that are effective in the treatment of COVID-19...However, these remedies have already cost lives"*.

Information conflict and information scatter

Information scatter and conflict are critical challenges in collecting and organising information; information scatter refers to the spread of information across multiple sources, while information conflict results from difficulties in determining accurate information [46]. Participants recounted many examples of seeking information on specific topics from multiple sources and encountering contradictory information, such as discrepancies in the efficacy of wearing facemasks, vaccination, the consumption of certain vitamins or foods, social distancing, and risk group categorization, among other health-related issues. The following interview responses provide more information about the participants' experiences. A female participant who recently moved to Finland stated that *"One of the biggest challenges for me and my family was figuring out what to believe about how serious the outbreak was..."*. Similarly, a participant belonging to an older group stated that *"There were many messages circulating among my friends about using herbs and traditional stuff to battle COVID-19...They aren't proven or endorsed by Finnish health officials...It was causing confusion among my friends who are living in Finland...making it hard to decide what to trust and splitting up the community"*.

Regarding the dissemination of information, participants provided numerous examples, including but not limited to the receipt of information from multiple sources regarding uncertainties surrounding the efficacy of face masks, modes of transmission of COVID-19, speculations regarding the spread of the virus through 5G technology, discrepancies in COVID-19 statistical reporting, unsubstantiated rumours regarding the intentional dissemination of the virus, and conspiracies. For example, a highly educated female participant stated, *"Some news channels [name of some international and local news outlets] were saying that the virus wasn't that serious to avoid freaking people out or making the government look bad..."*. Similarly, a male participant added that *"There were many stories on social media that healthcare professionals and officials didn't want to admit that COVID-19 was in [name of a middle Eastern country], which caused confusion among my family and friends"*.

Cognitive consequences

When participants reported encountering erroneous information and disclosed details about the sources, subsequent questions focused on their methods for evaluating the credibility of the information they had obtained. The participants expressed applying a mixture of different strategies as their preferred method for evaluating the credibility of their obtained information, including checking with official sources, checking with their interpersonal networks, checking different information sources, and checking the validity and creditability of information sources. However, the majority of participants mentioned checking official sources and their interpersonal networks as their preferred methods. The following comments from interviews will provide a better perspective on the motivations of participants when applying different strategies to check the validity of information. A highly

educated male participant stated, *"I want to make sure the information and news I'm getting is legit... I'm sticking to the official sources..."*. Regarding interpersonal networks, a female participant mentioned, *"I always turn to my friends and family, who really know their stuff when it comes to health issues..."*. Regarding checking different information sources, one of the participants stated, *"What I do is that I check the reliability of the sources that I get my information from..."*. Finally, a participant stated that *"I'm all about making sure I'm getting my information from reliable sources... I always do my due diligence and double check the information with sources I know I can trust"*.

Behavioural outcomes

The final question asked how participants used the health information for their own benefit. The majority of participants who received credible health information reported modifying their behaviour and lifestyle. This included adhering to safety protocols during the COVID-19 outbreak, adopting healthy behaviours, and following guidelines and recommendations from credible sources in either their native language or English. Participants mentioned social distancing, avoiding close contact with others, getting vaccinated when recommended, seeking medical care if experiencing COVID-19 symptoms, practising good hand hygiene, and maintaining a balanced and nutritious diet as examples of adopting healthy behaviours as a result of using reliable health information.

Furthermore, participants specified safety protocols they followed, such as wearing masks in public spaces, maintaining a distance of at least 2 metres from others, washing hands frequently with soap and water for at least 20 seconds, using hand sanitizer when hand washing is not possible, avoiding large gatherings and crowded places, staying home if feeling unwell or experiencing any COVID-19

symptoms, covering the mouth and nose with a tissue or elbow when coughing or sneezing, disinfecting frequently touched surfaces, and following quarantine and isolation guidelines if exposed to or infected with COVID-19.

Discussion

This study presents a novel exploration of the health information-seeking behaviour of Persian-speaking immigrants in Finland during the COVID-19 pandemic, utilising the Information Chaos Framework [46]. Information Chaos Framework offers a comprehensive understanding of the impact of diverse information sources, contextual factors, and behavioural outcomes on healthcare providers, but its application in the health information environment setting is relatively unexplored [47]. By employing this framework in the context of immigrant populations, this research contributes to bridging this gap and enhances our understanding of navigating health information chaos among vulnerable communities.

The research findings reveal that major sources of health information for Persian-speaking immigrants in Finland during the pandemic were interpersonal relationships, news outlets, social media, and mobile messaging apps. However, participants also expressed concerns about potential misinformation and disinformation, particularly through social media, echoing prior studies. This aligns with the Information Chaos Framework's emphasis on the detrimental effects of information overload, scatter, conflict, and erroneous information, thereby underscoring the framework's applicability in this context [46,47].

Furthermore, the study identified significant issues of information overload, where participants felt overwhelmed by the volume and contradictory nature of information. Information Chaos

Framework's focus on information overload and its influence on decision-making and situational awareness of healthcare providers [46,48] sheds light on how this phenomenon can similarly impact immigrants' ability to assess and adopt accurate health information. The research highlights the importance of reliable and accurate health information in promoting behaviour modification among Persian-speaking immigrants in Finland. The Information Chaos Framework's consideration of the influence of diverse information sources on adopting healthy behaviours further reinforces the framework's relevance in this study.

Despite the study's limitations, such as its small sample size, convenience sampling, and cross-sectional design, it provides valuable insights into the information-seeking behaviours of Persian-speaking immigrants during a public health crisis [44,45]. This research underscores the need for further investigations into immigrants' information environment and challenges during health crises. Additionally, future research should explore diverse communication strategies, improve health literacy, and evaluate information among immigrant populations. In-depth analysis of second-generation immigrants, refugees, and asylum seekers can provide a more nuanced understanding of health information management within these communities.

The study's contributions are crucial in addressing the unique challenges faced by immigrant populations in accessing accurate health information during public health crises. By employing the Information Chaos Framework, the research enhances our understanding of how information chaos

influences health information seeking and adoption behaviours among Persian-speaking immigrants in Finland. The findings highlight the need for effective communication strategies and support systems to ensure access to reliable health information in multicultural contexts.

Conclusion

This study investigates the health information-seeking behaviour of Persian-speaking immigrants during a public health crisis in Finland. The results indicate that interpersonal connections, news outlets, social media, and mobile messaging applications were the primary sources of health information. However, participants encountered a substantial amount of false information, leading to confusion and anxiety. Conflicting information from multiple sources also made it challenging to determine accurate information. Effective communication strategies and various communication channels are necessary to disseminate accurate and timely health information to immigrant communities during pandemics. This study contributes to a better understanding of the information environment and behaviours of Persian-speaking immigrants during health emergencies, highlighting the need for public health policies and practises that address information challenges and promote healthy behaviours among immigrant communities.

Conflict of interest statement

No conflicts declared.

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Appendixes

Appendix. Characteristics of the sample (n = 18).

Category	Group	n	%
Age	20 - 30	1	5.56
	31 - 40	8	44.44
	41 - 50	7	38.89
	51 & more	2	11.11
Gender	Female	8	44.44
	Male	9	50.00
	Non-binary	1	5.56
Living condition	Alone	11	61.11
	With family	7	38.89
Language of information seeking	English	14	77.78
	Persian	7	38.89
	Kurdish	3	16.67
	Finnish	6	33.33
	Swedish	1	5.56
Education	Basic education	4	22.22
	Higher education	14	77.78
Occupation	Studying	10	55.56
	Working	8	44.44
Residency length	Less than 5 years	11	61.11
	Over 5 years	7	38.89