Experiences of migrants from India living in Norway with COVID-19 Infodemic: A qualitative study

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Preface:

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ABSTRACT

This qualitative study discusses the unique experiences of migrants from India in Norway, offering an in-depth exploration of their encounters with what has been called an "infodemic" during the COVID-19 pandemic. By conducting interviews with ten migrants and one general practitioner, this research aimed to comprehend the influence of exposure to transnational and sometimes contradictory information sources on health-preserving behaviours and risk perceptions amidst the COVID-19 pandemic. Data was transcribed and analyzed using the Systematic Text Condensation method. The identified themes are i) Sources of Information, ii) Trust, Verification, and Local Authority in Health Information, iii) Informational Influences on Vaccination Decision-Making, iv) Healthcare Guidance: Balancing Local and Transnational Expertise, v) Emotional Impact and Coping Mechanisms. These findings highlight the complexities of information consumption and its effects on the cognitive-emotional processes of migrants, discussing the role of factors such as familiarity, emotional comfort, and trust. Further, the study identified the need for culturally sensitive health communication, the establishment of trust with migrant communities through accurate information dissemination, and the requirement of strategies to support the emotional well-being of migrants in situations when health information varies quickly and differ geographically. The implications of this research extend to the development of effective public health strategies for migrant communities during global health crises.

BACKGROUND

COVID-19 pandemic– Dynamics and dissemination of information

Since its emergence in late 2019, the COVID-19 pandemic has undergone significant evolution, transitioning from a global health crisis to a more manageable public health concern no longer considered a pandemic, but still causing hospitalizations and deaths worldwide. While the immediate and severe impacts of the virus have lessened due to widespread vaccination efforts, improved treatments, and greater public awareness, its far-reaching consequences are still palpable in various aspects of daily life. Even as we enter 2024, WHO is asking countries, especially in South Asia, to be more cautious and increase protective measures and surveillance against this virus as new COVID-19 variants emerge causing new infections even in the year 2024 (1).

Amidst the crisis caused by the infection spread, governments throughout the world imposed various measures for controlling the infection rates. Some countries also had to work on preventing the collapse of health services due to an uncontrolled increase in the incidence of new cases at different point times. In a quickly changing scenario of measures that were started and stopped, using social network platforms to inform people in real-time about the status of the pandemic and control measures by governmental bodies gained popularity. From government institutions to public health organizations, and from world leaders to the general public, usage of social media became prominent as a primary communication medium during the pandemic (2). There were disease outbreaks like severe acute respiratory syndrome (SARS), Middle East Respiratory Syndrome (MERS), influenza, and Ebola in earlier times. However, one aspect in which COVID-19 differs from the rest is the globalized availability and access to disease-related information on social media. In early 2020, when COVID-19 cases began to surge worldwide, media (electronic, print, and social) played a crucial role in setting off an alarm among the public about the virus and its spread. Since then, a continuous stream of memes, multimedia messages, text messages, or even treatment charts from health bodies and home remedies has circulated on social media (3) especially WhatsApp and Facebook for a very long time.

Digital platforms allow for quicker penetration of government announcements into the general public, the generation of simpler infographics that are easily understood, and keeping up with health information (4). Smart phones and the internet are providing the general public easy access to share information across social media.

However, it is not straightforward to discern what information published in the different media is reliable or useful for one´s situation and context. The easy access to online health information presents both advantages and drawbacks. Excessive searches for medical information, termed *cyberchondria*, might also cause health-related anxiety. This phenomenon, characterized by anxious thoughts because of abundance of online health searches, is a major concern in the context of topics like the COVID-19 pandemic (5).

Infodemics

The COVID-19 crisis has been paralleled by an 'infodemic', characterized by an excessive amount of information, some of which is incorrect or deceptive, proliferating across both digital and physical platforms. According to WHO (World Health Organization), "An infodemic is too much information including false or misleading information in digital and physical environments during a disease outbreak. It causes confusion and risk-taking behaviors that can harm health. It also leads to mistrust in health authorities and undermines the public health response" (6). This ocean of information includes various categories of scientifically not validated content, each distinct in its nature and impact. This information flood can be broadly categorised as

Misinformation: This refers to the dissemination of information that is either incorrect or not accurate, shared without any intention to cause harm. During the pandemic, misinformation often spread from rapidly evolving scientific knowledge and public understanding of the virus. Misinformation can include rumors, inaccuracies, and outdated information that remain in circulation (7).

Disinformation: Disinformation differs from misinformation in that it is the intentional sharing of false information aimed at deceiving others. It is frequently employed to sway public opinion or conceal the actual facts. During COVID-19, disinformation campaigns were used to create distrust in public health measures or vaccines (8).

Conspiracy Theories: These are a subset of disinformation characterized by the belief in hidden, malevolent forces driving events. Common COVID-19 conspiracy

theories include the virus being a bioweapon, the pandemic being a hoax, or vaccines being used for mass surveillance. Such theories undermine public health efforts and can lead to harmful behaviors (9).

Social media platforms have been both a source and a vector for the spread of misinformation, disinformation, and conspiracy theories. The algorithms of these platforms often focus more on sensational or controversial content, regardless of its truthfulness, thereby magnifying the infodemic (10). General public was actively involved in sharing COVID-related information from virus transmission to treatment and vaccine efficacy. This large and overwhelming circulating information included a wide range of misinformation, disinformation and also conspiracy theories which has been termed "*infodemic*" and this spread of incorrect information became an epidemic on its own (4).

Information sharing about health on social platforms is very often not scientifically validated and can create confusion and eventually cause more problems than it solves (11). Since the beginning of 2020, when COVID-19 became a global issue, the world started witnessing more scientifically not validated content circulated (12). There is excess information in the public domain including non-validated and misleading concepts about the SARS-COV-2 virus or simply the COVID-19 virus, its transmission, and treatment. Increased digitalization and media penetration caused a greater number of people to aid the "information pollution" (3) which is an excess of information causing confusion, making it difficult to discern authentic and trust worthy sources, particularly during times of crisis. Social communications are also serving as carriers to scientifically invalid content like home remedies for treating the virus, self-medication of antibiotics, etc. creating confusion and resulting in risk-taking behaviours that could potentially harm general public health. WHO reported approximately 6000 hospitalizations and around 800 deaths due to COVID-19 misinformation only in the initial three months after the virus outbreak (13). Director of the WHO, Dr. Tedros Adhanom Ghebreyesus affirmed that fight against the COVID-19 pandemic include a fight against an "infodemic" (14) during the Munich Security Conference in February 2020. Individuals often share false claims about COVID-19 due to a lack of thoughtful consideration about accuracy (15). This along with other instances of sharing false information led to many initiatives at later dates by WHO and other organizations to fight the spread of misinformation. WHO's collaboration with the Tech Task Force (TTF) on

COVID-19, by collaborating with several global tech and social media companies to combat misinformation is one such initiative. WHO worked with Google to promote evidence-based COVID-19 information to actively counter misinformation and collaborate with digital agencies to maximise trustworthy health messages. This emphasizes the challenge of misinformation and the importance of sustained global cooperation between public and private sectors, guided by WHO, to address a critical issue (16). European Commission has proactively addressed disinformation challenges acknowledging vulnerabilities in online consumer communities. During the initial days of pandemic, the European commission proposed measures to include a 'revised and strengthened' 2021 Disinformation Code as part of the Digital Services Act along with a 'consumer-centric' solution empowering consumers to critically analyze content and report disinformation through mandatory EU-wide digital media literacy programs (17). The United Kingdom and WHO collaborative initiative called "Stop the Spread" and the United Nations program "Verified" are a few such measures that were commenced during the pandemic to fight misleading information about COVID-19 (18). In the context of addressing COVID-19 misinformation, the findings of a study (19) on governmental actions reports that measures such as censorship, similar to misinformation, creates uncertainty and hinders truthful communication making individuals seek information from less transparent sources. It emphasizes the importance of governments adhering to international law promoting the protection of expression, independent journalism, and the active dissemination of evidence-based information in the public interest.

Health literacy, Digital literacy and digital health literacy

The conceptual framework termed by Nutbeam's paper describes health literacy as an advanced cognitive skill that is used in critical analysis of health and health-related information and utilizing this information for better control over life events and situations (20). It becomes pivotal in understanding how individuals, including migrant populations, navigate, interpret, and utilize health information. Health literacy extends beyond the basic understanding of health information; it involves the development of a deeper knowledge, confidence, and skill set to critically analyze information, exert greater control over life events and situations, and make informed decisions regarding health. This level of literacy is

crucial in an era marked by an *infodemic*, where distinguishing between real and fake news is vital for making health-related decisions.

Digital technologies, with their transformative impact globally, offer immense potential for enhancing both societal and individual well-being and health literacy. However, the use of digital technologies adds a layer of complexity to information exchange. Digital literacy, crucial for users of all ages, requires not only technical skills but also the ability to critically and confidently navigate the online environment (21). Digital health literacy (DHL), a more health specific concept, can be defined as the ability of people to obtain, understand, and assess health information from digital technologies including the skills required to navigate online platforms, evaluate the reliability of health information, and apply the acquired knowledge to make health-related decisions (22). Digital Health Literacy is measured by different techniques including Digital Health Literacy Instrument (DHLI), The eHealth Literacy Scale (eHEALS), eHealth Literacy Assesment Toolkit (eHLA), eHealth Literacy Scale (eHLS), Transactional Model of eHealth Literacy (TeHLI) depending on specific areas of Digital Health (23). DHLI in particular assesses a range of competencies, including operational skills, navigation abilities, information retrieval, critical evaluation of reliability, determination of relevance, creation of self-generated content, and safeguarding privacy (24).

Many studies in the past have demonstrated differences in digital health literacy among different groups (25). Research focused on measuring health literacy among migrant groups identified factors such as language and system-specific nuances and their impact on health literacy. Low or unsatisfactory health literacy levels among migrants indicate a contextual shift that affects their understanding of health information (25, 26).

DHL became a critical skill during the COVID-19 pandemic for all members of society. Varied levels of DHL have been reported among such diverse populations as university students or migrants. Various studies, including those conducted in Denmark and South Korea, highlight that while university students generally demonstrate sufficient levels of DHL notable challenge remains in judging the quality and reliability of this information (27, 28). Among migrants, to achieve satisfactory levels of DHL, there are barriers including but not limited to language and cultural differences. These complicate the navigation and evaluation of health information. The need for customised approaches to address these issues and enhance DHL among such special populations have been underscored by findings from

diverse socio-economic groups in Malaysia (29) and university students in Pakistan (30). Collectively, these findings highlight the importance of specific support in enhancing digital literacy during a pandemic, especially for populations facing unique challenges in accessing and interpreting digital health information.

Health information communication and challenges among Migrant Communities

The International Organization for Migration identifies migrant as an individual who crossed an international border or made a move within a state away from their usual residence. This category can include both economic migrants and those who have had forced displacement (31). Migrants are a vulnerable group in the health risk communication process and most migrant communities face distinctive challenges like linguistic and cultural barriers and limited access to tailored health resources especially during health crisis like the pandemic. Their linguistic diversity often leads to insufficient information provision in accessible formats, leaving them at an increased risk of transmission of infections. Challenges in comprehending disease severity, authorities' guidelines, and preventive measures can result in confusion, stress, and sometimes self-isolation (32). Migrants typically consult a range of information sources for health-related issues, often integrating their own cultural values, past experiences, and habitual practices from their home country into their understanding and decision-making in their new host country (33). Migrants also often rely on health-related information from their home country in addition to the host countries' communication during pandemics (34). These factors significantly influence their perceptions and actions regarding health information. However, by being exposed to health information from different countries migrants can often be left behind in a state of confusion (35).

A study conducted in Denmark (36) and research on migrant health in Norway during COVID-19, particularly by Madar et al. (37)and Czapka et al. (35), highlight important challenges faced by migrants in accessing and understanding health information. Individual-level complexities, such as difficulties in following official news and variations in trust and adherence to health recommendations, contribute to dissimilarities among migrants. At the group level, issues arise from contradictory information sources and language barriers, leading to confusion in health information seeking. The studies also identified an institutional gap, indicating a lack of clear, reliable, and accessible health information for

diverse migrant groups. These difficulties compromise the effectiveness of public health strategies designed to meet the specific needs of diverse migrant communities, emphasizing the necessity for a systematic, interdisciplinary approach (38) to address the issues thoroughly within a collaborative approach. The studies did not specifically focus on the role of religious communities on local migrant groups; however, these entities could potentially play a significant role in disseminating accurate health information and bridging the communication gap at the community level. Such involvement could be crucial in addressing the disparities in health information access and orientation among migrants.

Research in Scandinavia during and after COVID-19 has highlighted the challenges migrants faced in accessing health information due to language barriers, with reported levels of inadequate communication from authorities. The issue is amplified by a lack of customization to the cultural and linguistic needs of migrant communities. On the other hand, these challenges also revealed the resilience and resourcefulness of the migrant populations. Despite facing obstacles in accessing official channels of communication, many migrants turned to digital tools and social networks to obtain crucial health information (35, 36, 39, 40).

India and Norway are two countries with unique experiences when it comes to information challenges during the COVID 19 pandemic which is discussed in depth later. The necessity of translating and interpreting services to address communicative challenges faced by different linguistic groups in Norway (41) and the volume of misinformation and the need for effective public awareness measures in reaching out to its vast and diverse population in India (42) are few among many other unique challenges experienced by these countries during the pandemic. The way migrants navigated through these contrasting scenarios in India and Norway can provide valuable insights into how different cultural contexts influence the strategies related to health-related communication in times of a global health crisis.

The case of India: Health information exchange and influence on drug use during the pandemic

India faced a significant burden of the COVID-19 pandemic as it suffered with high number of confirmed cases and COVID-19 related deaths. The country's response included a nationwide lockdown due to escalating cases, and subsequent measures to manage infected

patients. However, the deadly second wave in March 2021 overwhelmed the healthcare system, leading to shortages of beds, vaccines, and medical resources across the country. Emergence of highly infectious variants contributed to the severity of the crisis (43). In India, the pandemic also led to a surge in digital solutions. Citizen-led initiatives and community efforts, along with web-based platforms and social media had a prominent role in disseminating real-time information and urgent requests for medical supplies. Mobile apps and volunteer-led initiatives using the digital technologies addressed critical healthcare needs during the crisis (44). People increasingly sought information, using the internet and other digital tools as a primary source for virus-related updates amid the crisis and lockdowns.

Self-medication is a major public health problem globally prevalent. India is one of the countries with highest self-medication prevalence rates in Asia with 87% of the population engaging in self-prescription (45). In India, the financial burden of healthcare largely falls on individuals, with more than 50% out-of-pocket expenses accounting for a significant portion of total healthcare costs (46-48). Along with high healthcare costs factors like news on social media, social circle, past medication history, or advertisements in newspapers influence self-medication in low and middle-income countries (49). Self-medication also became a problem during the COVID-19 pandemic. People followed all sorts of remedies out of desperation to keep themselves safe from virus investing hope in unlikely offerings of prophylactic agents, treatments, and cures. In India, there is documented use of chloroquine and hydroxychloroquine without prescription as a COVID-19 prophylactic treatment (50). Improper use of steroids is another such practice observed with the COVID outbreak where patients pressurized doctors to prescribe steroids and self-medication with steroids without doctors' knowledge was also widely practiced (51).The infodemic played a crucial role in the emergence of secondary health issues like mucormycosis, commonly known as black fungus in India.

India is a country with high diabetes prevalence and over the years it emerged as the diabetes capital in the Southeast Asian region with a 74 million known diabetic population, followed by Pakistan with approximately 35 million adult diabetics (52). Clinical inertia, poor drug adherence, and low disease awareness are contributing factors to inadequately controlled blood glucose levels in this region (53). Diabetes on the other side is also an important risk factor associated with mucormycosis globally. Mucormycosis is a serious but

rare fungal infection caused by a group of molds called mucormycetes with an overall mortality of 46% (54). India has a 70 times higher prevalence of mucormycosis disease burden compared to the global average (55). Steroid use is a major risk factor linked to the development of mucormycosis, especially in diabetic patients (56). COVID patients who were both diabetic and exposed to immune suppressants as part of treatment were most vulnerable to this infection. High glucose levels combined with an acidic medium, increased iron levels, and immune suppression resulting in decreased white blood cell (WBC) activity in COVID-affected diabetic patients creates an ideal growth system for Mucorales spores resulting in mucormycosis (54). During the pandemic in India often due to lack of diagnosis or lack of compliance, this combination led to the rise of mucormycosis afterCOVID-19 disease also termed as "black fungus". The surge in mucormycosis cases, particularly during India's catastrophic second wave, was largely influenced by the spread of misinformation and the improper use of medical treatments, such as steroids, which are known to suppress the immune system(57). Misinformation about COVID-19 treatment protocols, exacerbated by the infodemic, led to increased vulnerability among patients, particularly those with underlying conditions like diabetes, to this severe fungal infection (58). The situation was further complicated by the lack of early diagnosis and the challenges in managing the disease, which requires prompt treatment with antifungal agents and, in severe cases, surgical intervention.

A combination of widespread misinformation, a high prevalence of diabetes, tendency towards self-medication, high disease burden of COVID-19 complications like mucormycosis all of which significantly exacerbated the challenges faced during the COVID-19 pandemic in India.

Indian migrants in Norway

The Norwegian population is multicultural and migrants in Norway are heterogeneous in many respects. According to Statistics Norway (SSB), in 2023, about 16% of the total population in Norway had a migrant background and 3.9% of total population were Norwegian born to migrant parents (59). There are around 240,000 Asian immigrants in Norway of which one-third are from South Asia. Approximately twenty-five thousand of these South Asian immigrants are from India. Indian migration to Norway began in the late 1960s, primarily as a response to Norway's economic growth. This period marked the start

of labour migration from countries like Pakistan, Morocco, India, and Turkey to Norway (60). A report published in 2015 affirmed that Indians in Norway are regarded as a successful non-Western minority by achieving substantial socio-economic and socio-cultural integration. This integration is not just within Norway but also includes maintaining strong ties with India, their country of origin. Their success is seen as a case study in effective economic and cultural assimilation in a Western host country (61). The Indian diaspora's role extends beyond national borders, contributing to economic development and cultural exchange between Norway and India.

The impact of COVID-19 on Indian immigrants as a part of broader immigrant group in Norway emerged from a study by Kjøllesdal et al (62). In the study the Indian immigrant population above 16 years was reported to be 12,700 providing context to the pandemic's reach within this community. Notably, the rate of COVID-19 infections in this group was 449 cases per 100,000 individuals, with a hospitalization rate of 31 per 100,000. In contrast, the rate of infections reported among all immigrants in Norway was 1319 per 100,000 and the hospitalization rate was 104 for 100,000. In Norway, until October 2021, 93% of the local population has received at least one dose of the COVID-19 vaccine. Among all immigrants, this percentage slightly decreases to 90%. However, when specifically considering Indian migrants in Norway, the vaccination rate further drops to 88% (63). In addition, the type 2 diabetes prevalence among immigrants from South Asia, including the Indian community is higher than in the general Norwegian population (64). The prevalence of diabetes among Norwegian adults aged 30-59 is 3-6%, whereas among immigrants from India, Pakistan and Sri Lanka in the same age group, the rates are higher, ranging from 20-24%, nearly four times the national average (65).

Health care systems and access to self-prescribed medications are different in India and Norway, and strict regulations in Norway prevent people from having easy access to prescription drugs. A legitimate prescription from a general practitioner (GP) is essential for getting prescription medications in Norway and that includes antibiotics, steroids, and other specialized medications. Limited travelling because of the pandemic made few patients who want to use these types of medication in Norway consult their GPs unlike the usual practice of importing medication for personal use when travelling back from home countries (66, 67). Immigrant GPs who have personal experience in their own countries and as immigrants in Norway are more often chosen by immigrant patients than Norwegian GPs (68).

The impact of transcultural information on health-related decision making

While there is a growing body of literature addressing the challenges faced by migrant populations in Scandinavia during the COVID-19 pandemic, there remains a notable gap in research specifically focusing on the impact of differences between virus diagnosis, management, treatment and disease related information between home country and host country on decision making, including specific countries like India. Research is limited especially about migrants´ understanding of how to deal with the overload of conflicting information and discerning which information sources to trust. Differences in COVID-19 prevalence rates, cultural practices around health and medication, such as the prevalence of self-prescription, prevalence of high diabetes incidence and unique health issues like black fungus (mucormycosis) among COVID-19 patients in India, highlight the need for targeted research on the Indian diaspora in this region. Such a focused study could provide valuable insights into how specific migrant communities navigate health crises and manage the influx of information and misinformation during pandemics.

In this study, we interviewed migrants from India in Norway to better understand how migrants from India responded to the wide variety of information available around COVID and how it impacted their health-seeking behaviour in their host country. In addition, we interviewed a general practitioner with the same migrant background who has experience treating those populations in Norway during COVID to add the perspective of the health care services for this particular group. Our purpose in conducting this study is to generate insights of how migrants find, manage, and relate to sometimes contradictory and overwhelming information during a global health crisis. Results can be useful for health authorities both in Norway and the migrant home countries to design strategies for better health information exchange with the public.

AIMS OF THE STUDY

This study aims to get a deeper understanding of how being exposed to transnational information sources affected decision-making regarding protective behaviors and risk perceptions about COVID-19 among migrant communities from India living in Norway.

The specific research objectives underlying the study are:

1) Understanding how migrants discern information from a wide range of sources.

2) Uncovering the challenging situations migrants might have experienced because of being exposed to information overflow and how they solved them.

3) Describing facilitators for better communication of health information with migrants exposed to transnational sources of information during pandemics.

METHODS

a. **Study participants:**

Our study is aimed at two target populations, to gain different perspectives on our research question.

   i. Adult Indian migrants living in Norway.
   ii. GPs from India working in Norway who have experience in treating Indian migrants.

b. **Research Design**

The study employed a qualitative research approach to explore how Indian migrants in Norway perceived and managed the exposure to information sources on information regarding protective behaviors and risk perceptions amid the COVID-19 pandemic. Utilizing semi-structured interviews, the study aims to delve into the views of the participants, particularly with respect to their experiences with information from both India and Norway. A detailed interview guideline has been developed to navigate the conversations and ensure that all relevant topics are covered (See Appendix for Interview Guideline). The study includes two key participant groups: Indian migrants residing in Norway and General Practitioners (GP) who have experience in treating these migrants. Through this approach, the research design intends to produce a rich understanding of the complexities involved in health-related information consumption and decision-making for both health-seeking behaviors and preventive measures among Indian migrants in Norway during the COVID-19 pandemic.

c. Participant Recruitment

The recruitment process for this qualitative study involving Indian migrants in Norway was carefully designed to ensure a diverse group of participants in terms of age, educational backgrounds, and length of stay in Norway. Various strategies were employed to identify individuals who could contribute valuable insights to the research. These strategies included both targeted selection and snowball sampling methods. One of the primary methods of participant identification was through community engagement. Prospective participants were approached during community events and gatherings attended by the Indian migrant community in Bergen. These events provided an opportunity to engage with individuals actively involved in community activities. Informal interactions during weekend recreational activities allowed for the identification of individuals who may not have participated in formal community gatherings. Recognizing the importance of including participants with extensive experience living in Norway, additional steps were taken to identify some individuals who had resided in the country for longer duration. Established business owners and retired individuals were identified and engaged in this study and their long-standing presence in Norway provided valuable insights into the evolution of their COVID-19 experiences and information-seeking behaviours. Efforts were made to ensure diversity across various demographic dimensions, including gender, age, and educational background. This approach aimed to capture a wide range of perspectives and experiences within the Indian migrant population in Norway.

In order to gain valuable insights from the perspective of medical professionals, we sought the participation of three general practitioners (GPs) in our study. To identify and recruit these medical experts, we leveraged the expertise and connections of our study supervisors, who played a crucial role in facilitating their involvement. Out of the five identified GPs for potential participation in the study, one responded positively to the initial email. Subsequent attempts, including additional emails and cold calls, did not yield responses from the remaining GPs. Additionally, two GPs were sent SMS messages inquiring about

their availability for the study, but there was no response from them either. Finally, only one GP was available for interview and included for analyses.

A total of eleven participants were interviewed for this study, consisting of ten individuals and one general practitioner (GP).

d. Inclusion Criteria:

For the migrant participants:

- Migrants who were born in India to Indian parents, disregarding reason for migration, such as work, study, family reunification, or other purposes.

- Currently residing in Norway and were in Norway during the pandemic.

- Aged 18 or above.

- Willingness to participate in an in-depth interview.

For the general practitioners:

- Individuals who were born in India or in Pakistan.

- Currently residing and working as GPs in Norway.

- Willingness to participate in an in-depth interview.

e. Data Collection

The research purpose was thoroughly explained and all queries regarding confidentiality were answered before starting the interview, and consent was obtained from the study participants. Each interview with migrants was conducted one-on-one, lasting approximately 30 minutes, and was carried out in English to ensure clarity and mutual understanding. Interviews are performed using the interview guide that was developed using existing literature and making use of the supervisors´ subject expertise. The interviews took place in a

quiet setting, chosen based on the participant's preference to facilitate open and honest communication. During the sessions, participants were asked a series of questions designed to explore their experiences with various transnational information sources and how these shaped their protective behaviors and risk perceptions amid the COVID-19 pandemic. Topics ranged from the types of information sources consulted to their strategies for assessing credibility and the influence of their transnational background on these processes. With the permission of the participants, each interview was captured via audio recording. The anonymized data is stored on a secure server. The list of names and other details of the participants are kept separately from the transcripts. Audio files were deleted immediately after the transcription.

Interview with GP took place at his office by prior appointment or over the telephone and was designed to accommodate the doctors' availability using an interview guide developed using data from interviews with migrants and the supervisor's subject expertise. This interview lasted approximately 20 minutes. Just like the interviews with migrants, this session was audio-recorded with consent and later transcribed for analysis.

f. **Time Period**

Review and Proposal Development: This phase of the research took place from January 2022 to May 2022. During this time, I conducted an extensive review of relevant literature to build a strong theoretical foundation for the study. Additionally, I developed the research proposal, outlining the research objectives, methodology, and anticipated timeline.

Declaration of the Project to NSD: In August 2022, we formally declared the research project to Sikt – Kunnskapssektorenstenesteleverandør (previously Norwegian Centre for Research Data (NSD)). The declaration process was completed by September/October 2022, ensuring that the study adhered to ethical and regulatory standards for data collection and management.

Personal Leave: I was on personal leave from January 2023 to June 2023 for a semester.

Study Enrolment and Data Collection: The enrollment of participants and data collection occurred from August 2023 to October 2023. During this phase, I recruited eligible participants and conducted in-depth interviews to gather qualitative data, aligning with the research objectives.

Data Analysis: Data analysis commenced in September 2023 and continued until November 2023. This phase involved the systematic examination of collected data, thematic analysis, and the generation of findings to address the research questions and objectives.

Writing and Final Thesis Submission: The culmination of the research project was the submission of the final thesis in January 2024. This comprehensive document presents the study's methodology, results, conclusions, and implications, representing the culmination of several months of research and analysis.

g. Ethical considerations

The study is registered with Sikt - (Norwegian Agency for Shared Services in Education and Research) with reference number 217472 in Norway. Other ethical approval was not necessary as we refrained from collecting any information regarding health from the participants. We followed strict consent measures and made sure all participants were completely aware of the research purpose and could be withdrawn from the study at any point in time.

h. Data management and analysis

To maintain participant confidentiality, audio recordings were meticulously transcribed and then anonymized. We applied the method of Systematic Text Condensation for our data analysis, as described by Kirsti Malterud. This method helps us understand the main ideas and themes from the interviews across different cases, based on the real-world experiences of the participants. It aims to condense the essence of participants' views and experiences into meaningful themes. The following four-phase strategy is adapted from Malterud's methodology (69).

1. Initial review of data, setting aside preconceptions.

2. Coding segments related to research questions.

3. Condensing coded data to core meanings.

4. Synthesizing condensed data into overarching themes

This method enables a nuanced understanding of the participants' viewpoints and experiences, offering a structured framework for thematic analysis.

FINDINGS

As we analysed the qualitative data, our findings revolved around uncovering the impact of transnational information sources on how migrants from India in Norway perceive and respond to COVID-19 risks. Through the conversations with study participants, we unfolded valuable insights that emerged from these diverse voices. Participant details are described in Table 1.

Table 1. Details of participants included

Participant ID	Age Range	Gender	Type of Education	Years in Norway
P1	30-39	Female	Doctorate	5
P2 (Couple)	40-49	Male	Bachelor's Degree	13
	30-39	Female	Bachelor's Degree	9
P3	30-49	Male	Master's Degree	6
P4	40-49	Male	Bachelor's Degree	4
P5	40-49	Female	Doctorate	3
P6 (Couple)	30-39	Male	Master's Degree	7
	20-29	Female	Bachelor's Degree	3
P7	40-49	Male	Bachelor's Degree	10

P8	40-49	Male	Doctorate	15
P9	69-70	Male	Graduate	46
P10	50-59	Male	High School	38
GP1	60-70	Male	MD	40

The analysis of the interviews enabled for the identification of following five themes that are relevant to the research objectives.

- **Sources of Information**: This theme sets the stage by highlighting the different channels through which migrants first encounter information. It serves as the foundation for how they evaluate and process this information.

- **Trust, Verification and Local Authority in Health information**: Building on the initial sources, this theme explores how migrants decide what information is trustworthy, integrating both local and international cues.

- **Influences Underlying Decision-Making on information related to Vaccination**: This theme provides real-world context by illustrating how the information gathered and processed impacts the choices migrants make about vaccination.

- **Healthcare Guidance: Balancing Local and Transnational Medical Expertise**: This theme offers insights into how information from local and international sources shapes migrants' perspectives and choices, often in interrelated ways.

- **Emotional Impact and Coping Mechanisms**: This final theme explains the impacts of information consumption and how migrants cope, thereby linking back to their choices and trust in various information sources.

Theme 1: Sources of Information

Newspapers, television, social media, and messaging apps like WhatsApp are discussed as information sources for the participants in Norway. These platforms include both Norwegian and Indian outlets. Participants often consume content in multiple languages, including

Norwegian, English, and various Indian languages, to stay informed. Digital platforms are the most popular sources of information among majority of migrants while reliance on traditional outlets like newspapers is also discussed.

"Yes, I primarily relied on news channels for updates. I also followed newspapers". P4

"I just Googled it. I'll follow that because I don't know what is the most trustable one". P1

Social media and messaging apps are popular for their convenience, real-time updates, and the sense of community they offer among younger informants. The participants express that the emotional need for real-time interaction with their social circles back in India influences this choice. The need for a sense of community strongly influences the choice of information sources, particularly during the uncertainties of a pandemic and this could be serving as both a coping mechanism and a potential source of stress due to misinformation.

"Initially I didn't rely on Facebook social media or friends for information. However, after some negative experiences within my family (citing COVID-19 related illness and deaths) I started paying more attention to the news and various sources including YouTube, Facebook and WhatsApp".P6

"I think in terms of getting information regarding COVID I was of course reading newspapers and then also relying on social media channels... I was concerned about India like how the situation is there". P5

Theme 2: Trust, Verification and Local authority in Health information

Most informants demonstrated a preference for official and verified sources from both India and Norway for obtaining information during the COVID-19 pandemic. Their specific actions and choices suggested a deliberate and thoughtful approach to consuming information. The informants consistently referred to their reliance on authoritative sources, including World Health Organization (WHO), indicating a strategy of caution amidst the widespread dissemination of information, some of which was unreliable, during the global health crisis. This reliance on established sources appears to stem from their desire to access trustworthy and accurate information in a time marked by uncertainty and rampant misinformation.

"I think I would go for WHO because that might give the best information since it is World Health Organization and so I trusted that most". P1

"I go with the government sources (referring to Norway), published by the corporations, the municipality, the Kommune (municipality). Because it was based on trust, or they must have done the due diligence to verify that the information is correct, and they then released it to the public. I think whenever I got information and if I didn't feel like it's trustable, I just went online and looked for genuine sources like the BBC or you know the other trusted medias and then read upon it". P3

The older informants trust traditional media due to its established credibility and journalistic integrity. The choice is shaped by prior experiences in India, where traditional media has been a longstanding pillar of information. During the COVID-19 pandemic, this older group considered local Norwegian news outlets to be a more reliable source among all information portals they had access to for health-related information, owing to an assumption of rigorous fact-checking in these platforms.

"I was of course reading newspapers and then also relying on social media channels. I trusted like the (Norwegian) national newspapers or the news channels, which were there also on social media. That was something that I had been mostly seeking information". P5

The study participants in general do not differentiate between local and transnational sources when it comes to trust, suggesting that authority and credibility are universally recognized. However, universally present among participants is an adaptive strategy towards skepticism and cross-verification of information because of information overload in the digital age and complicated further by the transnational nature of their information sources. Norwegian health authorities developed an official digital platform called Helse Norge that has health-related information and acts as service centre for all citizens in Norway, which include immigrants. The platform includes multiple features that aim at improving accessibility of health services and information based on facts. The migrants who had interactions with Helse Norge expressed a high degree of satisfaction as it offered services in English as well.

"Helse Norge provided accurate and reliable information on a day-to-day basis. I found the information from Helse Norge and Bergen municipality very helpful and easy to understand". P2

There was a general feeling that the information provided was comprehensive enough, boosting their confidence in the health system. The satisfaction level with Bergen municipality, where most of the informants lived, was similarly high. Migrants appreciated

localized updates, feeling that these were more actionable and relevant to their daily lives. Also, the GP noted that the Indian Norwegians appeared well-informed and demonstrated a high level of adherence to COVID-19 guidelines, with individuals seemingly following the advice provided by Norwegian authorities.

"It seemed to me that everybody was well informed. I don't remember that anybody has put any question on how to behave or how to act. Actually they were quite adherent to the advice given by the authorities in Norway".GP

Theme 3: Influences Underlying Decision-Making on Information related to Vaccination.

Participants expressed varying attitudes towards vaccination. Some migrants were driven to get vaccinated more by regulatory requirements than by a personal belief in the efficacy of vaccines. The strict implementations in place by local authorities, workplaces, or travel requirements were influential factors in their decision-making process. Concerns were raised about conflicting information and uncertainties; particularly regarding the perceptions of vaccination efficacy and potential side effects as social media has contrasting information.

"We were unsure about the reliability of the vaccines, which made us hesitant. We took our time before deciding to get vaccinated. There were various rumors on social media about the vaccines causing blood clots and other side effects". P10

Transnational information sources also played a role, especially for those who consulted with family or medical professionals in India before deciding on vaccination. A migrant has also discussed about his conversations within his professional networks in Norway to mitigate fears and skepticism around vaccine uptake.

"We received constant reminders about our vaccination appointments, and since we plan to stay here for several more years, it made sense to get vaccinated". P6

"If none of the restrictions were in place, I will not take any vaccine. Because I know my DNA, and my immunity is good enough". P2

The decision-making process regarding vaccination among migrants in Norway was multifaceted, influenced by a complex interplay of regulatory pressures, personal health beliefs, transnational consultations, and discussions at workplace.

Theme 4: Healthcare Guidance: Balancing Local and Transnational Medical Expertise

Some migrants highlighted the role of healthcare professionals in India as a trusted source of guidance. This indicates an active engagement with transnational healthcare networks, where information from medical professionals in their country of origin impacted their health-related decisions. The trust in these healthcare professionals appeared to be grounded in existing relationships and ongoing treatments for conditions unrelated to COVID-19. Some migrants performed transnational comparative risk assessment that allowed them to calibrate their own understanding of the COVID-19 situation in Norway.

"I felt mentally and physically drained, and I needed someone I could rely on. That's why I turned to my Indian doctor because I kept explaining to the doctors here that all these issues started after I had COVID and received the vaccination. I trust my Indian doctor more. They are more familiar with my medical history and conditions compared to my GP here". P6

Comparative evaluation between healthcare systems of Norway and their home country (India) shaped the migrants' perceptions of the efficacy and responsiveness of Norwegian health authorities. As a result, many expressed increased satisfaction and adherence to the guidelines provided by these authorities. However, the narrative wasn't uniformly positive. One participant highlighted specific challenges faced as a migrant, particularly in terms of accessing healthcare services and communicating effectively with local providers in Norway. These challenges weren't directly attributed to the COVID-19 pandemic, but the participant felt that such issues are a common aspect in their experience as migrant, indicating barriers in healthcare accessibility and communication for non-native residents.

"I'm a bit shy to talk with the local GP about very personal thing. But I'm not shy to speak with my Indian doctor because he knows me better". P2

Theme 5: Emotional Impact and Coping Mechanisms

All interviewees mentioned the emotional impact of COVID-19, often amplified by conflicting information. Several interviewees described considerable mental health challenges due to the pandemic. Uncertainties around vaccination along with ongoing

pandemic concerns, anxiety about long term effects of COVID-19 and aftereffects of COVID-19 vaccine are few other concerns that were addressed by the study participants that had an effect on their mental health. The emotional toll was also evident in worries about family members in their home country especially when considering the well-being of elderly family members back in India.

"After vaccination my health hasn't been stable. I developed thyroid issues which I didn't have before. My hormone levels became imbalanced, and my health has been a concern". P4

"Many got infected in India and my parents were among them, and I was very much concerned about that". P2

Participants expressed confusion and anxiety arising from approaches to medication following a COVID-19 diagnosis. One interviewee, with an overview insight from both India and Norway, discussed contrast in medical practices. In India, a defined list of medications made him feel that it provided a structured approach which is also endorsed by healthcare professionals. However, in Norway, a notable absence of prescribed medicines left him with uncertainty. These contrasting approaches created a challenging emotional state.

"Another big source of confusion was the medicines that one should take once you get covid. In India and Norway, there were completely different approaches to this question. In India, there was a list of medicines that was being used by the people, even prescribed by the medical practitioners. However, in Norway, no medicines were prescribed. As someone who was having information from both the locations, it was not clear what to trust". P8

Also, study participants expressed anxiety about the seemingly endless nature of the pandemic and its potential long-term presence in society. Transnational networks were not limiting as coping mechanism but also a source of emotional stress due to conflicting information.

"I think I was more concerned about what they said during the first wave and probably during 2nd wave but at some point, after second wave or during I stopped following news on this because it was not helping me with anything. It was just creating more chaos". P5

"I used to ignore Facebook and social media because sometimes I feel that those are not relevant information as they might exaggerate the number and can cause confusion". P7

DISCUSSION

This qualitative study aimed to give a deeper understanding about the experiences of Indian migrants in Norway during the COVID-19 pandemic, focusing on their health information-seeking behavior, decision-making processes and experienced challenges when being exposed to transnational information sources related to COVID-19.

In general, the findings of our study align with Nutbeam's Health Literacy Framework(20), highlighting that migrants' information evaluation is influenced by cultural backgrounds and the credibility of sources. Credibility especially holds a pivotal role in influencing health information-seeking behaviors. A source is considered credible when individuals believe it provides reliable and accurate health information. This perception is shaped by the source's reputation, authority, and recognition within the community. Nutbeam's concept delves into the perceived reliability and trustworthiness of information sources, an aspect essential for individuals navigating health-related decisions. As observed in the study, study participants had a clear inclination towards official and validated channels, notably relying on sources like the World Health Organization (WHO) and government outlets for information amid the COVID-19 pandemic. While it is not specifically described as "credibility" in this study, the informants' information-seeking behaviours and risk perceptions indicate a reliance on sources perceived as credible. Breaking down the idea of credibility in Nutbeam's model, the study participants demonstrated a clear belief in that the official information sources were trustworthy and accurate, and accordingly deliberately chose these trusted sources to get authentic information, especially when everything around them was so uncertain with full of random content.

In addition to the official sources, findings from our study reveal that the major sources of information during the COVID 19 pandemic for Indian migrants in Norway were social media channels like Facebook and WhatsApp, Newspapers and Television. Our study results are consistent with a recent research report on Persian-speaking immigrants in Finland. Participants in the Finnish study utilized interpersonal connections, news outlets, and social media platforms, with a notable preference for messaging apps, recognizing their convenience and effectiveness in staying connected with friends and family in their home countries while staying informed on current news and health-related information (70). This combination of sources was also observed in a Norwegian study, where immigrants from

different countries considered press conferences from the government, Norwegian news media, and health authorities' websites as major sources of information during the COVID-19 crisis, but also used social media and conversations with friends and acquaintances, although these were regarded as less important (37). These coherent results across multiple studies underscore the role of various channels in shaping public awareness and the impact of social connections on information dissemination. This commonality highlights that people everywhere tend to seek complementary information in similar ways during a crisis.

In our study, historical reasons linked to India seemed to be key to explain the trustworthiness of the official sources of information. Study participants´, in particular the older informant's, preference to follow traditional media in our study is due to its established credibility coupled by earlier experiences in India where traditional media has been a longstanding pillar of information. A broader European study (71) revealed similar preference for traditional mass media over social media among older adults above sixty. However, the degree to which the different migrant groups trust one or channel of information more than another might be different depending on previous history both in the country of origin and the host country. When it comes to the participants trust in the information consumption, it is worth noting that the practice of cross-verification and the tendency to trust credible sources may be enduring behaviors beyond the pandemic context. A Norwegian study conducted where researchers investigated trust evolution among immigrants during the COVID-19 pandemic based on interviews with the migrants highlighted the importance of interpersonal relationships in shaping trust in authorities (72). The study brought new perspectives to an established idea that trust is solely influenced by culture, discussing the effects of relationships established within Norway on migrants' trust during crisis management. This reference study provides valuable insights into trust dynamics, offering a basis for correlation with the current study's findings. The communication efforts of the Indian Council of Medical Research (ICMR) during the COVID-19 pandemic had an impact in shaping public perception in India. ICMR's active engagement was an important tool for disseminating accurate information and disregarding rumours. Such proactive approaches helped during the pandemic in building public trust (73). This underscores the importance of effective communication in building public trust which aligns

with our study's findings, where participants exhibit trust in authorities, emphasizing the pivotal role of official sources.

High trust is expressed by migrants in the Norwegian authorities, compared to their home countries which were facing greater challenges during the pandemic creating a notable impact on their emotional well-being (72). This trust is particularly evident in their appreciation for and reliance on recommendations made by the Norwegian authorities as affirmed by our study participants as well. Participants appreciate the Norwegian system's efficiency and quality while maintaining trust in Indian doctors. This paradox prompts a deeper exploration of the factors influencing trust at both systemic and individual levels. Such trust in Norwegian health systems can also be viewed as a coping strategy that can reduce negative emotions and impart positive reinterpretations of their situation in the middle of the pandemic. This highlights the important link between emotional well-being and the nature and credibility of information consumed. Norwegian government incorporated interplay of hope and fear making way for an optimistic anxiety during the pandemic. This was observed in the government's messaging paying attention to the virus's danger while instilling hope through narratives of collective action and trustworthy leadership. This emotional interplay served as a powerful coping mechanism in navigating the challenges posed by the pandemic (74) which resonates with our findings on the emotional toll experienced by participants, particularly concerning uncertainties around vaccination, anxiety about long-term effects, and worries about family members in their home country.

While the trustworthiness of information sources played a pivotal role in shaping individuals' perceptions and actions, the complexity of travel and quarantine regulations, changes in rules, and conflicting medical advice from different countries contributed to confusion and uncertainty among the participants.

Understanding the impact of information overload on vaccine perceptions is crucial in the context of public health as it was one of the themes observed from the interviews. It can help design and implement tailored communication strategies to address the negative consequences of information overload, including cyberchondria – a term describing repeated internet search activity regarding medical information and perceived vaccine risks. This phenomenon is explained and affirmed in a dual model study (5) where survey and

experimental designs are employed to investigate the information overload influence vaccine scepticism and vaccination intention. Results indicate that as individuals navigate through an overwhelming volume of information about COVID-19 vaccines from various sources, ranging from traditional media to social platforms, this overload negatively impacted their overall willingness to get vaccinated. The resemblance of findings between our study and the dual model research highlights the multilayered nature of vaccine decision-making, influenced by regulatory pressures, information overload, transnational consultations, and varied endorsements. These similarities can contribute to a more detailed understanding of the factors shaping attitudes towards COVID-19 vaccines among diverse populations.

A recent Vietnamese study (75) aimed at finding the relationship between transmission misinformation and COVID-19 stress affirmed that the nature and credibility of information play a pivotal role in individuals' emotional states. Our study also aligns with the notion that information overload, especially from transnational social media channels, significantly contributes to emotional distress. As a coping strategy, some migrants limit their exposure to volatile information sources, indicating a proactive management of emotional health in the face of inconsistent information. Additionally, conflicting information from unofficial sources, especially on social media platforms like WhatsApp, created anxiety and skepticism.

Interestingly, Mucormycosis which was a bigger issue in a particular patient pool during the COVID-19 pandemic in India does not seem to be a matter of concern for Indian migrants in Norway in our study. Almost all the migrants were adhering to the recommendations and limited themselves from self-medication except for usage of common OTC medications like paracetamol and following basic home remedies like hot water consumption in the mornings. Although this could reflect the wish to please the interviewer, a qualitative study with migrants in Norway (37) reported similar findings about migrants generally receiving sufficient disease related information from official channels and overall adherence to recommendations is high although differences in trust levels towards services and authorities exist among different groups. This supports the notion of overall high adherence to guidelines also emphasizing the importance of acknowledging group-specific variations.

This high level of adherence to recommendations and COVID-19 awareness is affirmed by the general practitioner as well in current study.

Furthermore, participants in our study did not discuss about conspiracy theories, or express feelings of being disinformed. The absence of such narratives within our participant discussions suggests a potential denial to disinformation or conspiracy beliefs within this specific migrant population. This absence may also reflect assurance on credible sources of information and a lack of exposure to misinformation, highlighting a noteworthy aspect of the information landscape among our study participants. Also, the GP we interviewed commented about not having interactions with the Indian migrants on how to act during the pandemic and he felt that they were adherent to the advice given by the authorities in Norway. However, this cannot be generalised as we could not recruit more GPs in our study and individual behaviours observed by one GP and his perspectives cannot give an overall sense of how Indians used healthcare in Norway during the pandemic. Furthermore, the participants might not have felt confident enough to take us through these issues during the conversation. In any case, the lack of spontaneous addressing of possible conflicting themes in our material underscores the need for a nuanced understanding of information-seeking behaviours during the pandemic and prompts further exploration of controversial themes and ideas in a perceived safe environment, perhaps with group interviews.

The need to focus on the power shifts produced by social media and crowd sourcing technologies, particularly in disaster risk management contexts, has been emphasized recently (76). This perspective is highly relevant to understanding the dynamics of health information dissemination and consumption among migrants during the COVID-19 pandemic. It suggests a shift from merely using these technologies for information distribution to understanding how they reshape power dynamics, influence cultural contexts, and co-produce outcomes in health crisis management.

In conclusion, our analysis reveals a multi-layered experience for Indian migrants in Norway, demonstrating that their information consumption patterns and coping strategies during the COVID-19 pandemic are influenced by a complex set of factors. These findings have substantial implications for understanding risk perception and protective behaviors within transnational communities during a global crisis. The choice to engage with specific kinds of information is not just a matter of what is accessible or readily available. Instead, it appears

to be a complex interplay of factors including familiarity in home country versus country of origin, emotional comfort in a scenario of transnational belonging, and trust based on previous experiences, showing that the migration experience extends its impact into the cognitive-emotional processes of information consumption. By focusing on the people and power dynamics involved, and by formalizing and diversifying communication strategies, health authorities and organizations can better manage health information during pandemics. This approach can lead to more resilient health systems and communities, better prepared to respond to and recover from health crises.

Methodological Strengths and Weaknesses

The qualitative approach of this study provided rich, in-depth insights into the subjective experiences of the participants. However, this approach has limitations, including the number of study participants, potential biases in participant selection and the interpretation of data. Another potential limitation is that the majority of participants hold at least a bachelor's degree. This could be considered a weakness, as it might have not adequately captured the perspectives of individuals with basic or no formal education. Additionally, interviews are conducted in English, a non-native language for some participants, causing a language bias, potentially limiting the depth of their responses. In terms of numbers, however, data collection reached a saturation point where no new answers or insights emerged from participants during the participant interviews indicating that a sufficient depth of understanding has been achieved, and further data collection might not yield additional perspectives.

The recruitment of General Practitioners (GPs) posed a significant challenge in this study, with a limited response rate from the targeted professionals. Despite concerted efforts to engage multiple GPs for comprehensive insights, the study had to adapt due to the minimal response received. The initial intent to conduct three interviews with GPs had to be revised to accommodate the constraints encountered during recruitment. This limitation, primarily because of a lack of responsiveness, further compounded by the specificity of the target GPs, as we were seeking those with a focus on treating the Indian migrants in Norway who also had Indian roots, potentially impacts the depth and diversity of perspectives incorporated into the study. A higher participant number would have provided a more robust foundation for generalizability and in-depth exploration of the multifaceted themes

identified. However, we chose to keep the GP in the study to provide an additional layer of understanding, offering insights into how healthcare professionals perceive the informational behaviors and health-related decision-making processes of these migrants.

While the findings offer valuable perspectives, they may not be universally generalizable. The study's reliability and trustworthiness are supported by rigorous thematic analysis, yet they are inherently influenced by the subjective experiences of the individuals involved.

Acknowledging the researcher's positionality is integral in maintaining transparency throughout the study. As a researcher and a migrant from India, the potential influence of personal experiences on data collection and interpretation cannot be disregarded. While conscious efforts were made to approach the research objectively and impartially, the researcher's background may have influenced participant interactions and data interpretation.

Despite the constraints, the study remains a valuable exploration into the experiences of migrants from India in Norway during the COVID-19 pandemic.

Future Implications

The findings from our study can guide policymakers and health communicators in crafting inclusive, sensitive, and effective public health interventions, contributing to better health outcomes and integration for migrant populations.

Implementing culturally sensitive public health communication and acknowledging the diversity in social and cultural norms is crucial during health crises like pandemics to ensure effective communication (77).

The study's findings can support strategies in that direction like:

1. Formalizing and diversifying communication strategies are key to health crises preparedness. Recognizing the importance of end user involvement in decision-making, understanding the unique information needs and coping mechanisms of migrant communities is vital for developing effective public health strategies.

2. Enhancing Culturally Sensitive Health Communication to Migrant Groups: Develop communication strategies that are linguistically accessible and culturally relevant to migrant communities, acknowledging their diverse backgrounds.

3. Trust Building: Establish and maintain trust with migrant communities through consistent, accurate, and transparent health information.

4. Strategies Providing Emotional Well-being and Support: Public health responses should incorporate strategies to support the emotional well-being of migrants, recognizing the impact of misinformation and information overload for persons living transnational lives.

5. Targeted Research on Migrant Health Information Consumption: Further research is needed to explore the information consumption patterns of different migrant communities, understanding how cultural, emotional, and cognitive factors influence these patterns.

Conclusion

The study's findings provide a better understanding of the health information-seeking behavior and coping mechanisms of Indian migrants in Norway during the COVID-19 pandemic in a wider frame of trust and meaningfulness. The research answers the research question by discussing how various factors including the migrants' cultural backgrounds and the credibility of information sources significantly influence their decision-making processes and emotional well-being. This study emphasizes the importance of culturally sensitive health communication and the need for public health strategies to build trust and support the emotional well-being of migrant communities. The implications of these findings are crucial for enhancing the effectiveness of public health interventions in multicultural societies, ensuring that migrant populations receive accurate, relevant, and supportive health information during global health crises.

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Appendices

- **Discussion guide for migrants**

Statement about study participant anonymity, data protection and confidentiality.

1. **How would you describe the amount and type of information you got on how to handle the pandemics in Norway and in your home country?**
2. **What were your experiences withCovid-19 information sources during COVID-19 pandemic:**
- What sources of information did you trust?
- How did you share disease information with your colleagues/relatives using social media?

Probe :

- Following Covid information from home country
- Health information in Norway
- Social media (Whatsapp, Facebook)
- Information from friends and relatives
3. **If there were any, what were the situations that made you confused/panic in this pandemic?**

Probe:

- Contradicting information about measures to prevent Covid
- Information around Covid vaccine
- Medication use
- Covid risk perception to oneself and family
4. **If you had any such problem, tell me what bothered you most in this pandemic in terms of disease knowledge?**

Probe:

- Covid cases in home country
- Life after covid
- Anxietybecause of lack of guidance or information
- Trust issues
5. **How did you handle with any uncertainty regarding information during the pandemic?**

Probe:

- Use of GP in Norway
- Contact doctor in home country by telefone
- Use of pharmacy in Norway
- Other

6. **What are your thoughts around Norwegian Health authority COVID-19 pandemic updates?**

Probe:

- Disease awareness programs
- Vaccination follow-up
- Regular alerts
- Any other

7. **Did you have contact with your GP regarding anything related to COVID-19 and if so, can you describe your experience?**

Probe:

Was it an Indian GP?
Was it used for information, treatment, other (like sick leave)

Challenges??

- **Interview guide for GPs**

Statement about study participant anonymity, data protection and confidentiality.

1. **How did you communicate and educate your patients about information on managing the pandemic?**

2. **Did you have contact with Indian migrants during COVID?**
3. **What has been your experience in addressing COVID-19 concerns within the Indian migrant community?**
4. **Have you noticed any specific challenges or patterns in how Indian migrants seek information or adhere to COVID-19 guidelines?**
5. **Have you identified any difference between consultations with these migrants and with other migrants from EU or other high income countries?**
6. **Is there anything else you would like to add or highlight based on your experience with Indian migrant patients?**