


Exploring low-income migrant workers' health information-seeking behavior during COVID-19 in Taiwan: A qualitative study

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Abstract

Background: COVID-19 pandemic is reported to exacerbate existing vulnerabilities of marginalized groups, and the lack of self-care can lead to the spread of the virus across society. Therefore, effective responses to the challenges imposed by the health crisis should consider the health information needs of migrant workers.

Objective: We aimed to explore how migrant low-income workers seek health information and how their health-related information needs were met during a health crisis. We also investigated migrant workers' preferred information sources and types of content with the theoretical concept of health literacy to understand the development of health competencies among migrant workers.

Methods: We conducted semi-structured interviews with Thai low-income migrant workers. A total of 13 Thai migrant workers participated in the study, among whom five were undocumented. The interviews were audio-taped, transcribed, and analyzed with the thematic analysis approach.

Results: Our findings indicated that migrant workers' health literacy and health information behavior could be improved through technology when facing a health crisis. We found that participants sought health information proactively to reduce their perceived risks. However, there is still space for design to support the ability to process jargon information and apply local policy, such as providing easy-to-understand, accurate, and timely information. The findings of this study provide some insights for the authority and technological design to respond to migrant workers' health information needs.

Conclusions: This study acknowledges and understands the needs of vulnerable migrant workers in society. The findings of this study provide insights for the authority and technological design to respond to migrant workers' health information needs. We also outline the areas worth further investigation, such as the communication between information seekers and providers, and the navigation of the healthcare system for migrants in the host country.

Keywords

COVID-19, health competence, health crisis, health literacy, health information seeking, migrant worker, low-income worker

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Introduction

Addressing migrant workers' health needs is urgent because the COVID-19 crisis has magnified the preexisting migrant vulnerabilities, including a high risk of virus infection and inaccessibility of healthcare and accurate health information.^{1,2} In its latest report, the International Labour Organization estimated that the number of international migrant workers has increased from 164 to 169 million

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since 2017.³ In addition, international migrant workers are subject to an increased risk of virus transmission due to environmental and occupational exposures. Engagement in the so-called “3-D: dirty, dangerous, and demanding” jobs⁴ and the poor living environments often led to the rapid spread of COVID-19 infection among migrant workers.⁵ Furthermore, migrant workers without legal documents are more marginalized because they are usually not included in the social and health protection system. Many studies have advocated for inclusive policies and operations addressing vulnerable populations’ needs to contain the outbreak of COVID-19.^{6,7} For instance, transparent communication with multi-language is essential for vulnerable communities that often distrust public health institutions.⁷

The risk and vulnerabilities experienced by migrant workers are often attributed to socioeconomic status,⁸ communication and cultural barriers,^{9,10} limited knowledge of healthcare coverage,¹¹ and limited access to health insurance in the host country.¹² In crises like a pandemic, inequalities associated with socioeconomic status become evident as the economically disadvantaged are often unprepared and have limited resources to react.¹³ Linguistic differences and sociocultural differences hinder migrant workers’ well-being in various ways, including difficulties seeking information online, accessing and navigating the healthcare system.^{14,15}

Another “factor” that affects migrant workers’ health information-seeking behavior is health literacy, which is the ability of processing health-related information. Health literacy is critical to better utilization of health information, greater autonomy, and empowerment.¹⁶ Inadequate health literacy hurts immigrants’ access to proper healthcare,¹⁷ and the COVID-19 infodemic has highlighted that poor literacy is a global public health issue.¹⁸ However, limited studies have specifically studied the low-income migrant groups, understand their healthy literacy as well as the influence on their collection and usage of health information. In a study conducted on general European populations, financial difficulty was identified as another strong predictor of limited health literacy.¹⁹

While health literacy is often conceptualized as a set of knowledge and skills, in this study, we adopt an integrated framework that is widely applied.²⁰ In this model, Sørensen et al. categorized health literacy into four dimensions: Access information, which refers to the ability to seek and obtain health information; Understand information, which means the competence to comprehend the health information accessed by an individual; Process/Appraise information, which is the ability to interpret, filter, and evaluate the health information; and Apply information, which is being able to communicate and make informed decisions to maintain and improve health.¹⁹ Through this framework of health literacy, we would examine how migrant populations access,

understand, process, and apply health information during health crisis events.

This study has two unique implications. First, we investigate one of the countries that demonstrated initial success in controlling the outbreak pandemic²¹ and show how the migrant workers population’s need were accommodated. Taiwan is home to an estimated 710,000 migrant laborers, most of whom are from Indonesia, Vietnam, the Philippines, and Thailand.²² Although entitled to universal healthcare in Taiwan, migrant workers still experienced health disparities due to linguistic and financial barriers.^{23,24} In respond to the pandemic, the Taiwanese government took a top-down approach to communicating with the public by putting out leaflets in different languages with information about COVID-19. Even with the government implementing intensive monitoring and prevention policies, the strategies were not immediately focused on migrant workers,²⁵ and the multilingual content was criticized for its symbolic multilingualism.²⁶

Local news media also revealed other issues such as the limited assistance from employers and labor agencies.²⁷ Second, we paid attention to a special group, the undocumented migrant workers, who are usually “missing workers” absconded from their employers.²⁸ In Taiwan, there are around 50,000 people, an estimated 7% of the total migrant workforce are undocumented migrant workers.²⁹ Undocumented workers often face difficulties accessing healthcare, such as limited medical rights and fear of being reported to the police.³⁰ Undocumented foreign caregivers raised public concern about becoming a loophole in the battle against pandemic.³¹ These barriers might exacerbate workers’ health behavior under the threat of a pandemic, thus we aim to understand and help tackle the health information needs of these vulnerable population.

Methods

Research design

We conducted in-depth interviews to obtain insights on how migrant workers seek health information especially when facing public health crisis.

We recruited migrant Thai low-income workers living in Taiwan with the following criteria: earning the minimum wage, defined by the Taiwan Ministry of Labor (TWD23,800, equivalent to USD855 per month). We used purposive sampling and snowball sampling method because migrant workers, especially undocumented workers, tend to avoid contacting non-migrant workers due to their limited language skills and fear of being deported. Participants were recruited through three methods: (1) post recruiting advertisements on Facebook private groups of Thai low-income workers in Taiwan, (2) recruit participants referred by Thai students who

worked as an interpreter for migrant workers, and (3) referrals from participants. To obtain diverse opinions and experiences, we maximize participants' differences³² and recruited participants from various residential status, residency period in Taiwan, and language ability. We recruited six participants through social media, three participants from Thai interpreters' network, and four participants from referrals. Legal and undocumented workers were, respectively, recruited through each approach. The procedures and interview protocol used in this study were approved by the Research Ethics Review Committee of National Tsing Hua University (REC10907HS074).

Data collection and analysis

We collected demographic information with a pre-interview questionnaire to record background information, including gender, age, occupation, residency status, and length of residency in Taiwan. The main aspects of the interview protocol included health information-seeking behavior and challenges, preferred information source and type of content, and health information-seeking regarding the COVID-19 situation (see Exhibit 1).

We recruited 13 participants and conducted semi-structured interviews between July and August 2020. Our participants were native Thai speakers who worked in various industries, including five male and eight female workers. Eight migrant workers were registered migrant workers and five migrant workers were undocumented workers. The second author, who is a native Thai speaker conducted all interviews in Thai. Among the 13 interviews, 10 interviews were conducted in person, and 3 interviews were conducted via an instant messaging application due to participants' concern on confidentiality. Each interview lasted between 30 and 75 min, and all interviews were audio-recorded with permission from the participants. Detailed demographic characteristics of study participants are in Exhibit 2.

All transcripts were translated to English transcripts by the second author and imported to ATLAS.ti 9 software for in-depth qualitative analysis. We followed an inductive approach to establish coding categories with two steps^{32,33}: initially, the first author (TL) and the second author (WJ) read the transcripts and performed an iterative process of open coding independently. Several codes related to health literacy competency were drawn from existing literature.²⁰ The two coders met weekly to discuss the initial codes generated by line-by-line coding inductively. In the second step, we used the frequently reappearing initial codes to categorize data. All authors joined to discuss the emerging themes and refined the codes iteratively. Discussion between the coders helped to settle disagreements. We adopt constant comparative method³⁴ throughout the data collection and analysis process, which we repeatedly inspect small data set and going back from

data to theory. We strengthened the quality of this qualitative study by following the principles of validity, transparency, and reflexivity³⁵: we built rapport with participants and established a trusting relationship. We ensured transparency by articulating our research process in detail and we also informed participants honestly about the risks and benefits. We provided a rich and nuanced description to reflect the participants' experiences. The collaboration of Thai researcher and the two Taiwanese researchers (TL and YC) also helped maximize the insights we could capture. Finally, since the interviewer (WJ) is a Thai graduate student, we were aware that although WJ speaks Thai, WJ might have different experiences compared to Thai migrant workers because of contextual factors such as language skills and economic resources.

Limitations

One of the limitations derived from the communication with the migrant workers. Some of our participants are less familiar with standard Thai and used their dialect instead, which is more difficult for our Thai researcher to interpret and capture the meaning. The other limitation of this study is that we only focus on exploring the migrant worker, but not those from health information providers. Future studies should include opinions and healthcare information, and service providers for more comprehensive interventions.

Results

Upon analysis of our data, we identified three major themes which are as follows: (1) managing risk by seeking information during COVID-19, (2) preference of information source and content form, and (3) COVID-19's impact on health literacy. Key themes and sub-themes are summarized in Exhibit 3.

Theme 1: managing risk by seeking information during COVID-19

Perceived importance of self-care. Most of our participants perceived themselves at high risk of contracting coronavirus due to their language barrier, unfamiliarity with healthcare system, irregular and long working hours, and less protection of working and living environment.

Their working hours limit their opportunities to watch news frequently and get updated information timely. The lack of familiarity about the right to access healthcare services in the host country increased their perception of risk. The lack of familiarity about their right to access healthcare services in the host country leave these workers feel uncertain and perceive the increased risk of infection. Many workers do not know whether they are

eligible for healthcare service. Undocumented migrant workers expressed greater fear because they are not included in national health care system. Undocumented workers worried that if they are infected and exposed to the virus, they will be sent back to Thailand. One of the undocumented workers interviewed, P11 expressed his anxiety during pandemic:

During the pandemic time, I am very worried about getting facemasks ... Because of my status [as an undocumented worker], I really do not know how or where to get it. I really do not want to be infected because I do not have NHI (National Health Insurance), which means I will not be able to go to work, and worse, I may be sent back to Thailand.

Most of our participants are stressed about losing their income and paying for healthcare if they got infected. Deep concern about finance and residency status has increased the motivation of seeking information to protect themselves from the virus. Migrant workers feel they are in urgent need of protection because they have no choice but to remain exposed to dangerous working conditions. Perceiving themselves at high risk, most participants are very concerned about the importance of self-care and practicing personal hygiene. Particularly, undocumented migrant workers consider themselves vulnerable because they fear exposing themselves and have fewer opportunities to become familiar with the healthcare system.

Find accurate information to reduce uncertainty. Participants seek accurate information to reduce uncertain feelings about their daily life as well as future. To prepare for and mitigate the risk of infection, they collect information about obtaining adequate sanitary equipment, masks, and hand sanitizers. To minimize the impact on their work, they actively search for information about transportation use and regulation during COVID-19. The pursue for health information motivated by perceived risk was evident in P5's comment.

I feel compelled (pause) to find information about COVID-19, such as how and where to buy masks in Taiwan and how to protect myself from the disease because I was afraid of getting sick, going to the hospital, and paying for expensive medical care.

P8 explained that he paid attention to policy regarding foreigner residency status and the healthcare process if they get contracted, including quarantine procedure and reimbursements.

Everything has changed since Covid ... I must pay more attention to my health. it is quite urgent for me to search

for new rules or new policies regarding COVID-19 and what I need to do if I get infected.

Seek social support in real world and via social platform.

Moreover, we observed that migrant workers reached out to their familiar ones and communities for support as a response to the health crisis. Participants describe that they browse the Facebook group for migrant Thai workers in Taiwan, follow the news shared by Radio Taiwan International (RTI), and read news shared by people who are familiar with similar situations. RTI is a government-owned radio station that broadcasts daily in 13 languages. Participants' engagement in online communities will be described in more detail in the second theme about preferred information source and type of content.

Theme 2: preference of information source and content

Credible news agencies and authorities. Information from verified sources such as government agencies, hospitals, and reputational news media is the most trusted. Among the various credible information sources, the government-owned broadcast service, "the Radio Taiwan International" is the most trusted and most accessible with the translated content. The broadcast services and their presence on social media both served as crucial information sources to the participants for keeping updated with the policy and information about medical supplies. P3 shared the role of RTI when she seeks health information.

I found the information and update about COVID-19 by listening to the RTI (Radio Taiwan International) and following their fan page on Facebook because it is convenient, and the news is quite fast, and information is all in Thai.

Another crucial information source is the Q&A sessions with health experts that provide opportunities for consultation and personalized healthcare advices. Our participants appreciated the interactive formats for clarifying health issues relevant to personal conditions with trusted experts. As a result, migrant workers can make health-related decisions, improve health conditions, and apply the information accessed.

Updates from social media and online communities. Social media is preferred for the great availability and easiness of getting relevant information. The information shared by the contacts or trusted sources were often communicated in short and simplified ways that increase understandability. The participants were also able to obtain informative news instantly, which is particularly useful during pandemic. For instance, participants mentioned they learned about hygiene

practices, and became able to take care of their hygiene during COVID-19. In addition to the accessibility and understandability, the contents generated by peers are considered more authentic. On social media, workers could easily exchange experiences and engage in discussion with people sharing similar backgrounds.

Similarly, the online communities formed on Facebook were considered important information sources for learning self-care practices and purchase channels of medical masks. Our participants prefer information from the Facebook group for migrant Thai workers in Taiwan because the contents are most relevant to their own situation. P6 explained his reliance on obtaining latest information from Facebook.

I liked how easy Facebook updates the situation. I liked how people share their information and post the latest news. Even if I do not turn on Facebook that often, I could still keep up with the situation (COVID-19). Especially on the FB groups of migrant Thai workers in Taiwan, workers like me share news or relevant information that the workers should know, such as how to get face masks and the new rules. In this case, I think FB (Facebook) is beneficial.

P10 specifically pointed out the importance of peer interactions on Facebook:

I like information on Facebook more because there is discussion and that I can read and make a decision afterward after reading information and comments ... I like content with comment. I like the feeling of talking with people.

Local social network in the host country. To obtain relevant information on local policies and regulations, workers rely on interpersonal relationships, such as family members, employers, and language instructors. The workers were able to overcome language barriers and better comprehend information since their familiar ones would share and explain news with them, for example, family members help translate the local news. Migrant workers living in the host country for longer rely on their established social connections to filter the most relevant and helpful information. In this regard, P13 said:

I learnt information about COVID-19 from my (Taiwanese) husband and read some information related to work or new policy from LINE (messaging application) that my friends or colleagues had sent to me.

Multimedia content. The multimedia presentation is commonly preferred for learning health information because of their perceived comprehensibility. Participants could easily understand information conveyed through graphics and video compared with text-based content. Consequently,

they could better practice the healthcare guidelines. Infographics and videos featuring healthcare experts help workers understand complex information and improve their application skills, including following the guidance and practice self-care step-by-step.

Theme 3: COVID-19's impact on health literacy

Improved access to more comprehensive information. Given the high public awareness of the pandemic, our participants obtain comprehensive information from various sources ranging from news media, local authorities, and their social networks. Most participants perceived that information about COVID-19 is more accessible and easier to find than common illnesses because people are eager to share COVID-19 information. For instance, migrant workers learn keywords for searching information from people's discussions in real world and online. Expanded access allows the workers to quickly get informed about diseases even they have long working hours. Some workers mention that they are still able to get updated news regardless of their limited time and energy for consuming news. Undocumented workers with limited networks can obtain trustworthy health advice from reliable people and authorities on social platforms. P4 distinguished that during pandemic information is much easier to access.

COVID-19 information was everywhere, on TV every day. News updates on social media allow you to get information about the COVID-19 situation at any time every day.

Improved understanding of self-care and preventive practices. Translation of important contents, a wide variety of content presentation styles, and increased discussions have enhanced the knowledge about self-care practices. Multilingual information is highly preferable and easy to find on social media. Participants can understand the current development of the virus, methods of prevention and reduction. The diverse content types satisfy different needs and help improve apprehension of the pandemic. Contents with illustrations and graphics are preferred for the easiness of comprehending the information.

Our participants benefit from both extensive offline and online discussions about the topic of COVID-19. Many workers appreciate being able to discuss and ask about COVID-19 with family members or close ones that help them interpret the meaning of the information they obtain. In addition, ordinary people's comments on the social media posts help our participants understand the jargon terms used in the post.

Proactive evaluation on the quality of information. Encountering an overload of information about COVID-19, many of our participants have developed

strategies to filter, judge, and triangulate obtained information. They validate information through multiple sources, find credible news sources, and cross-check the information in Thai and Chinese. The news is considered reliable if the cross-check results are consistent and the information is provided by medical professionals or authorities. For getting informed about the updates on local regulations and supplies about medical gear, the migrant workers favor local news media as the most relevant and efficient source.

Through browsing and comparing information from various sources, the migrant workers feel more confident in judging information related to protective practices. They seek confirmation from sources that are easy to access and discuss with peers online, cross-check with various sources. When the workers' perceived information is consistent, they would trust and act on it. The expanded access, various sources, and multi-language contents empowered the migrant workers by equipping them with valuable and understandable information. As a result, the migrant workers perceived that they became more capable of applying information, practicing personal hygiene, and taking care of themselves.

Limited ability to follow local policy. Language barriers strongly influence migrant workers' ability to understand and comply with local regulations in the host country. During the early development of COVID-19, policies on quarantine and purchasing masks are updated frequently. Therefore, our Thai participants struggle to obtain the most updated information about the medical supplies, quarantine, and mask-wearing policies. Many participants mentioned that they had difficulty following guidelines announced during the early outbreak of coronavirus in February 2020. When the government announced a suite of measures controlling the sale of face masks, masks are sold only by pharmacies chartered by the National Health Insurance Administration (NHIA).

Newcomers and undocumented workers are particularly vulnerable because they are less familiar with the healthcare system and cannot obtain needed resources. For instance, since the medical masks could only be purchased with a National Health Insurance card or residence certificate, undocumented workers struggled to secure a supply of medical masks.

Limited ability to process jargon information. Lower education levels and limited language skills significantly prevent migrant workers from interpreting the jargon information available. For example, the information about the transmission of the virus and the development of the virus or self-care practices is difficult for migrant workers to understand. Overwhelmed by the tremendous amount of jargon information, our participants felt more difficult grasping the information and applying to their own

situation. Limited comprehension of the jargon health information increases their sense of risk. In the following comment, P7 described the difficulty she faced when searching for health information via search engine.

I don't like Google sometimes, when the information from the results are too difficult to read, or too difficult to understand. I then umm ... need to ask my friend to explain it (information) to me.

P12 discussed their expectation of communicating information because of their difficulty understanding jargon words.

If the experts in the video use too many jargon words, or the video is too professional, it is still hard for me to understand even with the explanation from the expert.

Discussion

COVID-19 outbreak poses specific challenges to migrants' health across the world. With no exception to such challenges, more attention was drawn to the preventive measures on migrant workers when an undocumented Indonesian caregiver was confirmed as one of Taiwan's earliest COVID-19 patients in February 2020.^{36,37} This study reveals migrant workers' needs for health information during the pandemic and reflects on the implications of our findings with theories related to health literacy and health behaviors. Our analysis enhanced our understanding of the digital health literacy of vulnerable populations, which is critical for developing digital services but received less attention in the past literature.³⁶

Self-protective actions to cope with the perceived threat

Echoing with the protection motivation theory that predict individual behaviors base on the level of perceived vulnerability and perceived severity of the diseases,^{38,39} we found our participants are motivated to adopt protective behaviors toward a perceived threat. This protection motivation theory framework is particularly relevant to explaining individuals' actions in health-threatening situations, such as infectious diseases. Our findings suggest that facing COVID-19, low-income workers perceived their vulnerability to contracting the virus and perceived the severity from the negative impact on health and unstable income. Thus, they are motivated to adopt self-protective behavior and adhere to policy guidelines and preventive practices.^{40,41} Our participants actively seek updates about the pandemic and adopt self-care practices as their coping appraisals. Proactively obtaining health information appeared to be an important strategy for mitigating the

perceived risk and gaining a sense of security and control. The undocumented workers in our study demonstrated stronger motivation to search information due to their strong concern about health care rights and the financial crisis. This observation is also found in other studies, for example, Ahadzadeh et al.⁴² found that the perceived health risk significantly influences health-related internet use.

Reliance on using ICT for health information seeking

Our results showed that the preference and Internet usage for health information-seeking were prominent among the migrant workers, as found in other population.⁴³ Taking advantage of the ubiquitous Internet, our participants can obtain and use health information more easily and get connected with trusted persons and authoritative sources. This finding echoed with findings about the Middle East Respiratory Syndrome outbreak in South Korea, where information technology became a surviving weapon for foreign residents during the health crisis.⁴⁴ Particularly, social media has also been increasingly important in responding to information needs in crisis events. Similar to analysis on Chinese social media users during the early outbreak of COVID-19,⁴⁵ social media is an effective tool for engaging our participants' preventive behaviors during a pandemic.

We observed the various benefits of social media including connecting with others with similar healthcare experiences, widening access to health information, and raising questions to gather opinions from others.⁴⁶ We highlight that the interaction between information seekers and sharers empowered our participants to engage with others and gain social support.⁴⁷ Moreover, when seeking information online, the importance of "brand recognition" of the health information sources is prominent,⁴⁸ as the migrant workers prefer the information provided by the government and the reputational news media.

However, we also observed that online information overload could influence individuals' responses similar to findings from Farooq et al.⁴⁹ Our findings also show that limited health literacy may lead to information overload⁵⁰ or negatively impact individuals' evaluation and trust toward online health information.⁵¹ Revealing the challenges of the migrant workers is only the first step to promote preventive behaviors and reduce the risk of these vulnerable people. Effective interventions for health literacy could improve health issues of migrant populations,⁵² and tailored communicative technologies are expected to empower migrant workers to stay informed, sustain preventive behaviors, and improve communication for both information seekers and healthcare providers.^{53,54} More specifically, the multi-media content could help grow individual's knowledge and self-care skills and empower them to be active in their care.⁵⁴ For instance, health institutions

could adopt conversational agents which has shown potential for improving the effectiveness of health information delivery.⁵³ Conversational agents such as voice assistants and health bot could stimulate conversations between caregivers and patients and could fulfill the knowledge gap with personalized information.⁵⁵

Improved health competencies through proactive information seeking

One of our crucial observations is the strengthened health competencies by the health information-seeking practices among migrant workers. The migrant workers in this study have shown various improved health competencies, that is, access, understanding, appraising, and applying information, which have influence their health outcomes.⁵⁶ For instance, we observed that one of the key health competencies, appraisal skill, has increased during the COVID-19 Pandemic because social media users' diverse viewpoints and interpretation of health information on social media reduce workers' educational and language barrier. Before the pandemic, our participants are less engaged in health information-seeking behaviors due to limited time and lower health literacy. Thus, their online information-seeking activities are limited to preparation for communication with physicians, consistent with the findings from previous studies.⁵⁷ However, during pandemic, they took health actions proactively, using health information for self-caring and caring for others, which contributed their improvement in health literacy.

Conclusions

When people are exposed to a large amount of health information, it is important to understand how vulnerable people seek, interpret, and respond to information and protection knowledge to improve epidemic control. This study concluded that the use of ICT is beneficial for promoting health information and improving the health literacy of international migrant worker. The authors suggest that more understanding of ICT literacy, so-called digital health literacy among this group, is crucial. Furthermore, more attention needs to be paid to improving digital means and empowering the relationship between health information consumers and providers.

This study outlines significant areas of intervention, such as navigating the healthcare system and strengthening communication between information seekers and providers. In the future, designing effective technical interventions to support migrant workers should include key stakeholders who provide health-related knowledge and services. These stakeholders include healthcare professionals, interpreters, employers, and nonprofit organizations that support migrant workers to access healthcare and health

information. The comprehensive perspectives from the key information providers will help policymakers and health service providers develop strategies and interventions to improve migrant workers' well-being and health.

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Appendix

EXHIBIT 1. Items from qualitative interview guide by topic.

Main item	Interview topic
Background understanding	Gender, occupation, education level, residency status, and duration of residence in Taiwan.
Health information-seeking behavior	<ul style="list-style-type: none"> • How do they normally search for health information? • Any differences or difficulties encountered when searching for health information in the host country compared to Thailand?
Health information-seeking source and type of content	<ul style="list-style-type: none"> • What source of content do you prefer? Why? • What type of content do you prefer? Why?
Health information-seeking behavior during COVID-19 situation	<ul style="list-style-type: none"> • What do you do when you want to search for health information about COVID-19? • What source do you prefer for finding COVID-19 information?

Source/Notes: Current study.

EXHIBIT 2. Demographic characteristics of the study participants.

	Age	Gender	Industry	Education	Status	Length of residency (year)
P1	38	M	Manufacturing	Middle High	Legal	12
P2	47	F	Elderly care	High School	Legal	11
P3	28	M	Foodservice	High School	Legal	1.5
P4	42	F	Food processing	Middle High	Legal	7
P5	37	F	Food processing	Bachelor	Undocumented	2.5
P6	25	F	Unemployed	Bachelor	Legal	4
P7	35	F	Foodservice	High School Diploma	Undocumented	1
P8	31	M	Manufacturing	High School	Undocumented	3
P9	48	M	Manufacturing	Primary school	Legal	3
P10	54	F	Elderly care	Primary school incomplete	Undocumented	15.5
P11	39	M	Construction	Middle High	Undocumented	2.8
P12	38	F	Manufacturing	High School	Legal	5
P13	54	F	Food processing	Primary school incomplete	Legal	27

Source/Notes: Qualitative interview of current study.

EXHIBIT 3. Key themes and subthemes identified in our analysis.

Theme	Subtheme
Theme 1: Managing risk by seeking information during COVID-19	<ul style="list-style-type: none"> • Recognized importance of self-care • Find accurate information to reduce uncertainty • Seek social support in real world and via social platform
Theme 2: Preference of information source and content form	<ul style="list-style-type: none"> • Credible news agencies and authorities • Updates from social media and online communities • Local social network in the host country • Multimedia content
Theme 3: COVID-19's impact on health literacy	<ul style="list-style-type: none"> • Improved access to more comprehensive information • Improved understanding of self-care and preventive practices • Proactive evaluation on the quality of information • Limited ability to follow local policy • Limited ability to process jargon information

Source/Notes: Qualitative interview of current study.