Health Information-Seeking Behavior among Mothers of Healthy Infants and Toddlers: A Comparative Study of U.S.-born, Korean-born, and Immigrant Korean Mothers

by

Hanseul Stephanie Lee

A dissertation submitted in partial fulfillment of

the requirements for the degree of

Doctor of Philosophy

(Library and Information Studies)

UNIVERSITY OF WISCONSIN-MADISON

2019

Date of final oral examination: November 25, 2019

The dissertation is approved by the following members of the Final Oral Committee:

Catherine Arnott Smith, Professor, The Information School

Kyung-Sun Kim, Professor, The Information School

Ethelene Whitmire, Professor, Department of Afro-American Studies

Linda J. Roberts, Professor Emerita, Human Development and Family Studies

DEDICATION

This dissertation is dedicated to my beloved family.

ACKNOWLEDGEMENTS

When reading the acknowledgements of other dissertations, I did not deeply realize the meaning of the following sentence – “this work would have never been completed without ....” However, now I truly understand what that sentence means. I would never have been able to finish my dissertation without guidance, suggestions, and support from innumerable people.

First, my deepest appreciation goes to my dissertation committee members who have shared their precious time, perspectives, and insights with me. In particular, I’m eternally indebted to my advisor, Dr. Catherine Arnott Smith. She was readily available for me at every stage of the dissertation process and provided me not only encouragement and support, but also extremely helpful comments. Her profound knowledge of research and the profession proved invaluable to my progress. I would like to thank Dr. Kyung-Sun Kim, who gave me tremendous emotional support and important advice throughout my years of doctoral study. Her constructive feedback in terms of information-seeking behavior research as well as quantitative research methods was the essence of my intellectual growth. Also, I would like to sincerely thank Dr. Ethelene Whitmire and Dr. Linda Roberts who offered comments, critiques, and suggestions that helped me improve my work. Whenever I needed advice about my research, they were there for me and guided me with insights and suggestions which were precious to me.

I also would like to express sincere gratitude to my awesome supervisors of my project assistants’ work at the iSchool library: Michele Besant, Alison Caffrey, Megan Adams, Anjali Bhasin, and Bronwen Masemann. I am thankful to all the library assistants with whom I worked over the past 5.5 years. Indeed, I would not have been able to finish my doctoral studies without cordial support from each of you. In addition, I am incredibly grateful to all the faculty members

at the iSchool who shared their invaluable knowledge and expertise with me inside and outside of the classes. I have been truly privileged to learn and get great support from professors who are outstanding teachers and scholars. Many thanks also go out to the administrative staff members at the iSchool who gave me superb administrative assistance while completing this dissertation. Thank you, Lori, Amy, Katja, Jenny, Dave, Susan, and Tanya! Moreover, I would like to deeply appreciate my instructor at the Writing Center, Jeff Godsey, and my editor, Sarah Kaip, for their keen eyes making this work more decent.

I want to thank my doctoral colleagues at the iSchool of UW-Madison. We supported each other and celebrated each other's progress together. I am blessed to have each of you in my life as my colleagues. Special thanks go to Mei, Yuqi, Ellen, Barbara, Zhiyan, Eric, Xiaofei, Askar, Harvey, Phillip, Bryan, Lauren, Tien-I, Rachel, Tammy, and Kyle.

I am also appreciative to all my dear Madison friends, Youngsun, Sunyoung (Shin), Eunyoung, Jiwon, Eunjin, Sungnam, Dami, Eunjung, Heeseon, Woojung, Yangsun, Jihyun, Hyesun, Mina, Soojung, Yeojin, Sohyun, Gahee, Gayeon, and Dayoung, who have encouraged me throughout my doctoral studies and cheered me with big hugs and warm smiles. Many thanks also go to my Chapel Hill friends, Kelsey, Xiaokun, Soyoung, Youngran, Ayoung, Eunhwa, Boram, Sunyoung (Lee), Eunjee, Eunae, and Sieun, who supported me and encouraged me with their best wishes. Additional special thanks are owed to my friends in Korea, Sunyoung (Kang), Ran, Jiyoon, Soyoung, and Jihye, who kept me sane and grounded with constant text messages.

I should thank all my research participants (851 mothers of infants and toddlers) who graciously participated in the survey by sharing their precious experiences and in-depth thoughts with me during the interviews, despite their busy schedules and time constraints. Without their

contributions, this dissertation would not have been completed. I deeply admire all mothers around the world.

I would like to express the deepest gratitude to my beloved family who have supported me throughout my studies in the U.S. To my parents, Younghak Lee and Seong Geum Kim, for their endless love, support, and trust, which raised me up when I felt discouraged. I am particularly thankful to my mother who has visited Madison several times to help me take care of my little one. I would like to express gratitude to my grandmother, Junghee Jang, for her everlasting love and support. I am also thankful to my wonderful in-laws, Jikhyun Baek and Yangsook Jin, who have provided unfailing love and patience during the long period of my doctoral journey. Special thanks go to my brother and relatives, Hankyul, Youngsook, Inbee, Hanah, and Dayeon, for their love, unlimited support, and prayers. To my aunties, Sophia Larkin and Eunhee Nah, who have motivated me to study abroad since I was young and encouraged me at every stage of my doctoral studies. To my uncle, Russell Eugene Larkin, who is now resting in Heaven; his unconditional love, kindness, and support have been the source of my strength.

Most importantly, I would like to thank my dear husband and lifelong friend, Seunghun Baek, for his ceaseless love, patience, and support. I would not have reached where I am now without him. Also, special thanks go out to my dearest daughter, Eileen Ayoon Baek, who has been the source of my strength and achievements. Thanks much for sharing your giggles, hilarious dances, and fun stories with us. Mommy loves you so much, sweetheart!

Last, but not least, I would like to thank God who guided me with his eyes all the time and offered me the strength, knowledge, ability, and courage to complete this dissertation.

ABSTRACT

Health Information-Seeking Behavior among Mothers of Healthy Infants and Toddlers: A Comparative Study of U.S.-born, Korean-born, and Immigrant Korean Mothers

Hanseul Stephanie Lee

Under the supervision of Professor Catherine Arnott Smith

At the University of Wisconsin – Madison

Historically, mothers have been noted as active health information seekers, reflecting their roles as health mangers and caregivers for their family members. Previous studies have focused on health-related information behavior among mothers in native populations or mothers of children with specific diagnoses. Using Wilson's (1997) information-seeking model and Sonnenwald's (1999, 2005) theoretical concept of information horizons, this study aimed to uncover patterns in information-seeking behavior and source preferences among U.S.-born, Korean-born, and immigrant Korean mothers of children without a specific diagnosis.

Mixed research methods were used to investigate health information seeking behavioral differences, which may have been affected by individual and source characteristics. Three distinctive groups of mothers were studied: (a) American mothers born in and living in the United States, (b) Korean mothers born in and living in Korea, and (c) Korean mothers born in Korea who immigrated to the United States. Online surveys were completed by 851 mothers, and supplementary in-depth interviews with 24 mothers were conducted and analyzed.

Results revealed that there were noticeable differences among the three groups of mothers' source preferences and frequency of using each source. For instance, although the World Wide Web was the most frequently used health information source among all three groups

of mothers, the U.S.-born mothers preferred doctors and nurses the most for their information needs. Furthermore, there were many similarities between immigrant Korean mothers living in the U.S. and Korean mothers who reside in Korea concerning health information-seeking behavior. In addition, the three groups of mothers' health information-seeking pathways differed depending on their child(ren)'s health status (i.e., sick versus healthy).

Findings have several potential contributions. First, to the practice, understanding the unique health information-seeking behavior of specific ethnicities and nationalities is important for information professionals who guide them to trustworthy sources. Second, in the future research, this research may be possibly expanded to examine other ethnicities' health information-seeking behavior in the U.S. and beyond other countries with large immigrant populations.

Health Information-Seeking Behavior among Mothers of Healthy Infants and Toddlers: A Comparative Study of U.S.-born, Korean-born, and Immigrant Korean Mothers

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

1.1 Problem Statement

In the past two decades, diverse online and offline channels have become widely available as health information sources to individuals. Indeed, in a nationwide survey in the United States (hereafter, U.S.), Fox (2014) found that 72% of adult Internet users have searched online for health-related information including specific diagnoses and treatments. Moreover, results of the Health Information National Trends Survey data indicated that 79.5% of the U.S. adults had looked for information about health or medical topics from any source (National Cancer Institute, 2018). This illustrates a durable trend that American adults tend to seek health information very often using diverse sources.

Among the adults, mothers have been noted as active health information seekers reflecting their roles as caregivers or health managers for their family members (Chae & Quick, 2015; Koehly et al., 2009; Lee, 2016; Yoo, 2004). Previous studies have confirmed that parenthood prompts women to more actively seek health-related information (Bernhardt & Felter, 2004; Guendelman, Broderick, Mlo, Gemmill, & Lindeman, 2017; Plantin & Daneback, 2009). Hearn et al. (2013) also supported the idea that the first two trimesters of pregnancy and the first three months after childbirth are times when women might require a variety of new health-related information.

Seeking health information is highly important for immigrant mothers as well. Immigrants tend to actively seek a wide range of information to adjust to new environments (e.g., Lee, 2018; Machet & Govender, 2012; Sirikul & Dorner, 2016; Suh & Hsieh, 2019;

Zimmerman, 2018). Furthermore, countries accepting immigrants, such as the U.S., should assist in their settlement by providing appropriate information resources for maintaining their health. For example, there are credible health-related resources online provided by authoritative government health agencies, such as the Centers for Disease Control and Prevention (CDC) or the National Library of Medicine (resource named MedlinePlus). However, it is less likely that immigrants will know of these valuable resources compared to native populations in the U.S.

In reality, the U.S. currently has more immigrants than any other country around the world (Radford, 2019). According to Radford (2019), among new immigrants' arrivals in the U.S., the number of Asian immigrants has outnumbered that of Hispanic immigrants since 2010. By 2055, Asians are expected to become the largest immigrant group in the U.S. (Pew Research Center, 2015; Radford, 2019), with Korean immigrants comprising a large proportion of the increase (Hoeffel, Rastogi, Kim, & Shahid, 2012; O'Connor & Batalova, 2019). Therefore, understanding Asian immigrants' health information-seeking behavior in the U.S. is important for information professionals and information producers in diverse settings including CDC and the National Library of Medicine, which both provide health information resources for the patients as well as general public.

This research is to compare health information-seeking behavior among three distinct groups of mothers: (a) American mothers born in and currently living in the U.S., (b) Korean mothers born in and currently living in Korea, and (c) Korean mothers born in Korea who have immigrated to the U.S. in the past ten years. This comparison method emphasized the health-related information seeking behavioral differences, allowing information professionals or information providers in various settings (e.g., the CDC and the National Library of Medicine) to better understand the major differences. Furthermore, it is to focus on the immigrant mothers'

cases that information professionals or information providers would not typically look out for because they may not know that they should be looking for these unique characteristics in Korean cases.

1.2 Purpose of the Study

The purpose of this study was twofold. First, it aimed to investigate mothers' health information-seeking behavior differences, which may have been influenced by individual, environmental, and source characteristics[1]. To be specific, based on Wilson's (1997) information-seeking model, the researcher tested several hypotheses to see if there were any relationships between mothers' characteristics when seeking health information related to their infants and toddlers. Second, using Wilson's (1997) information-seeking model and Sonnenwald's (1999, 2005) theoretical concept of Information Horizons, this study aimed to identify mothers' preferred health information sources and to uncover patterns in their information-seeking behavior in the context of their child(ren)'s health. Overall, this research aimed to include both conceptual development and empirical investigation.

1.3 Research Questions (RQs)

In this study, mothers' information-seeking behavior not only refers to the frequency of using sources, but also their health information source preferences and their information-seeking

[1] Source characteristics refers to health-related information sources' characteristics that were identified in previous literature (Cao, Zhang, Xu, & Wang., 2016; Eysenbach & Köhler, 2002; Eysenbach, Powell, Kuss, & Sa, 2002; Fox & Duggan, 2013b; Lee, 2018) in the field of health information-seeking behavior research. Examples could include attributes such as accessible, accurate/credible, comprehensive, interactive/able to respond, objective, and organized.

pathways (defined in the following sub-chapter 1.5 Definitions of Key Terms). Thus, under the three major themes, this dissertation addressed the following research questions:

1. **Frequency of using health information sources**: (1a) What are mothers' frequently used sources when seeking health information related to their child(ren)?; (1b) What are the source characteristics that mothers consider important as selection criteria?; and (1c) How does the frequency of using each health information source relate to individual characteristics of mothers?

2. **Health information source preferences**: (2a) When mothers seek health information with regard to their child(ren), which sources do they prefer?; (2b) How do mothers evaluate and position these sources on their information horizon maps?

3. **Identifying information-seeking pathways**: (3a) Is there a sequence of steps that mothers follow when seeking health information related to their child(ren)? If so, what are those steps?; and (3b) Why do mothers use certain specific information sources in each step?

1.4 Research Methods of the Study

To address the research questions outlined in Section 1.3, the researcher conducted a comparative study using mixed research methods. It was a combination of an online survey (Phase 1) and in-person, telephone, or skype interviews (Phase 2). The online survey was to answer Research Questions 1 and 2, and the collected data from interviews not only answered Research Question 3 but also illuminated the survey findings. The specified research methods will be described in Chapter 3.

1.5 Definitions of Key Terms

Key terms need to be explicitly defined before moving to the next sections. In this dissertation, seven important terms were utilized: health information, information-seeking behavior, health information-seeking behavior, information horizons, information-seeking pathways, healthy infants and toddlers, and recent Korean immigrant mothers. Their usage was governed by the following information.

Health information is defined as consumer health information related to children. Consumer health information is exemplarily defined as "information on health and medical topics provided in response to requests from the general public, including patients and their families" (Consumer & Patient Health Information Section, Medical Library Association, 1996, p. 238). It includes information about preventive medicine, health promotion, wellness, and access to the health care systems, as well as symptoms, diagnoses, and treatments of disease (Consumer & Patient Health Information Section, Medical Library Association, 1996).

Information-seeking behavior is succinctly defined as:

> The purposive seeking for information as a consequence of a need to satisfy some goal. In the course of seeking, the individual may interact with manual information systems (such as a newspaper or a library) or with computer-based systems (such as the World Wide Web). (Wilson, 2000, p. 49)

Health information-seeking behavior is defined as ″the type and amount of health-related information sought, the specific actions implemented to obtain the information, and the sources individuals use" (Lambert & Loiselle, 2007, p. 1013).

A theoretical concept of ***Information horizons*** and methodology were proposed by Sonnenwald (1999, 2005):

> When an individual has decided to seek information, there is an information horizon in which they can seek information. An information horizon may consist of a variety of information resources such as: social networks, including colleagues, subject matter experts, reference librarians etc.; documents, including broadcast media, web pages, books, etc.; information retrieval tools, including computer-based information retrieval systems, bibliographies etc.; and experimentation and observation in the world. Information horizons, and subsequently information resources, are determined socially and individually for situations and contexts. (Sonnenwald, 1999, p. 185)

This positional metaphor was used to understand mothers' source preferences when they seek health information in relation to their child(ren).

According to Johnson, Andrews, Allard, and Johnson (2006), a pathway was defined as "the route someone follows in the pursuit of answers to questions" (p. 572). They further described characteristics of the pathway as dynamic, active, and sequenced. Thus, in this study, ***information-seeking pathway*** was defined as the sequenced information-seeking route that mothers follow in the pursuit of health-related answers to questions for their child(ren).

Healthy infants and toddlers are defined as children aged newborn to 3-years-old without "(a) any form of chronic or recurrent pain; (b) severe learning disability; (c) the presence of a psychiatric or neurological condition; and (d) serious medical illness" (Schoth, Golding, Johnson, & Liossi, 2016, p. 2435).

Recent Korean immigrant mothers are mothers who were born in Korea and emigrated from Korea to the U.S. in the past 10 years.

In addition to the above seven important terms, brief explanations of 19 different information sources are provided in Table 1.1. In the first phase of the research, the research participants were asked about their use of the following 19 information sources which were developed from previous literature (Kim, Sin, & Tsai, 2014; Lee, 2017, 2018).

Table 1.1.

List of 19 Information Sources

<table>
<tr><th colspan="5">19 Information Sources</th></tr>
<tr><th colspan="2">Ten Personal Sources</th><th colspan="3">Nine Non-human Sources</th></tr>
<tr><td>1</td><td>Doctors</td><td>1</td><td rowspan="3">Three traditional media sources</td><td>Books</td></tr>
<tr><td>2</td><td>Nurses</td><td>2</td><td>Newspapers or magazines</td></tr>
<tr><td>3</td><td>Husband / Spouse</td><td>3</td><td>TV programs</td></tr>
<tr><td>4</td><td>Mother / Mother-in-law</td><td>4</td><td colspan="2">One organizational source</td><td>Government health agencies</td></tr>
<tr><td>5</td><td>Father / Father-in-law</td><td>5</td><td rowspan="5">Five digital media sources</td><td>The Internet</td><td>The World Wide Web (www)</td></tr>
<tr><td>6</td><td>Other relatives</td><td>6</td><td rowspan="4">Four social media platforms</td><td>Social networking sites (e.g., Facebook, Instagram etc.)</td></tr>
<tr><td>7</td><td>Friends who have kids</td><td>7</td><td>Social media sharing sites (e.g., YouTube, Flickr etc.)</td></tr>
<tr><td>8</td><td>Friends without kids</td><td>8</td><td>Microblogging sites (e.g., Twitter etc.)</td></tr>
<tr><td>9</td><td>Coworkers</td><td>9</td><td>Blogs or online forums (e.g., online communities etc.)</td></tr>
<tr><td>10</td><td>Librarians</td><td colspan="3"></td></tr>
</table>

As shown in Table 1.1, the 19 information sources consist of 10 personal sources and nine non-human sources. With regard to the 10 personal sources, interaction between the research participants and the sources would be the most important part when those

sources were utilized as health-related information sources. In relation to nine non-human sources, three traditional media (books, newspapers/magazines, TV), five digital media (the World Wide Web, social networking sites, social media sharing sites, microblogging sites, blogs/online forums), and one organization source (government health agencies) were included.

Concerning the specified digital media sources, it should be highlighted that the researcher differentiated the World Wide Web and four different social media platforms based on Kim et al.'s (2014) study. First, the World Wide Web as an information source refers to information from webpages as well as search engines.

Second, a variety of social media platforms were used to see if certain social media platforms were utilized more than the others. In this study, social networking sites (e.g., Facebook, Instagram) were different from blogs/online forums (e.g., online communities). According to Boyd and Ellison (2007), ***social networking sites*** are defined as:

> Web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system. (p. 211)

On the other hand, by conducting a thorough literature review, Hammond (2017) defined online communities as follows:

> ***An online community*** is constituted by people who meet together in order to address instrumental, affective goals and at times to create joint artifacts. Interaction between members is mediated by internet technology. In order to

> constitute community members need to: show commitment to others; experience a sense of connection (e.g., members need to identify themselves as members); exhibit reciprocity (e.g., the rights of other members are recognized); develop observable, sustained patterns of interaction with others; and show the necessary agency to maintain and develop interaction. Community creates consequences which are of value for members. (p. 127)

Based on the above definitions, in this study general Facebook pages are considered social networking sites, whereas Facebook groups specifically for mothers are considered online forums (i.e., online communities). For instance, online communities among mothers seem to be more specific and detailed. Barnett (2011) described mothers' communities as "an easy method for mothers to communicate with each other by asking questions, providing advice, discussing personal experiences, offering emotional support, and several other topics of conversation" (p. 550). Barnett also claimed that mothers' online communities have become considerably universal and "could connect local, regional, and national audiences" (p. 550).

Lastly, government health agencies, including the CDC and the National Library of Medicine, should be clearly defined. If government health agencies' resources were published on the Web, those were considered World Wide Web sources. On the other hand, government health agencies were considered to all the other types of resources (e.g., printed documents, pamphlets, booklets) provided by government health agencies.

1.6 Significance of the Study

Findings of this dissertation have several potential contributions in practical and theoretical perspectives. First, the current study informs information professionals in diverse settings, including the National Library of Medicine, when they provide online health-related resources (e.g., MedlinePlus) to their users. Furthermore, the findings may be informative for information producers at many different organizations, such as government health agencies (e.g., CDC) or other non-profit organizations (e.g., Mayo Clinic, kidshealth.org).

This research also fills the gap in the body of literature concerning information-seeking behaviors among mothers of *healthy* children which previous studies have not focused on. Results of a pilot study of the current research, however, indicated that mothers of healthy infants and toddlers have considerably high information needs on a variety of health topics, including diseases, growth and development, nutrition and diets, and various symptoms (Lee, 2018). It should be highlighted that mothers of healthy infants and toddlers also tended to seek health information related to their child(ren) actively. In fact, in the pilot study, there were information seeking behavioral differences between U.S. mothers and immigrant Korean mothers. By adding another sample – Korean mothers who currently reside in Korea – the research contributes to the body of literature in health information-seeking behavior concerning mothers of healthy children, as well as the cause of the information-seeking behavior differences. Hence, the current study is expected to fill this research gap.

LITERATURE REVIEW

This chapter broadly reviews related studies from diverse fields, as well as subfields in the areas of library and information science (LIS), public health, medicine, nursing, and health education. Several searches were conducted in the following databases: Medline (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Library, Information Science & Technology Abstracts (LISTA), Library and Information Science Abstracts (LISA), Library Literature and Information Science Full Text, and ProQuest Dissertation and Theses Global. The timeframe of the literature was from 1994 to 2019. The researcher decided to review articles published from 1994 onwards because the public started using Internet browsers in that year (Ryan, 2013). The search strategies for each database are described in Appendix A.

The researcher classified the literature found into four subthemes: (a) mothers' health information-seeking behavior, (b) health information-seeking behavior among U.S. mothers, (c) health information-seeking behavior among Korean mothers and Korean immigrants living in the U.S., and (d) factors influencing health information seeking behavior. Moreover, two theoretical frameworks used in the current research and summary of the reviewed literature will be introduced in this chapter.

2.1 Mothers' Health Information-Seeking Behavior

Several researchers have conducted studies to understand mothers' health information seeking behavior, and health information seeking behavior during pregnancy has been widely investigated (Lagan, Sinclair, & Kernohan, 2006; Sayakhot & Carolan-Olah, 2016). Researchers

have also focused on first-time mothers' information seeking behavior (Carolan, 2007; Gazmararian et al., 2014; Loudon, Buchanan, & Ruthven, 2016; Weiner, Fisher, Nowak, Basket, & Gellin, 2015). Loudon et al. (2016) found that mothers searched for information on sleep, nutrition, infant care, and activities. However, Carolan (2007) also noted the information dilemmas of first-time mothers, finding that several mothers felt overwhelmed by "knowing too much" (p. 1162).

Children's health is a key characteristic that may influence mothers' information-seeking behavior. Some previous studies examined information-seeking behavior among mothers of children with specific diagnoses such as pediatric cancer (Kilicarslan-Toruner & Akgun-Citak, 2013), mental illness (Lwoga & Mosha, 2013), asthma (Archibald, Caine, Ali, Hartling, & Scott, 2015), autism spectrum disorders (Fain, 2009), or Down syndrome (Eaves, Ho, Laird, & Dickson, 1996; Murphree, Whitehead, & Painter, 2011).

However, another group of scholars did not specifically focus on the health conditions of a child when conducting research on mothers' health information-seeking behavior. For instance, although Greyson's (2017) research participants were not screened based on children's specific health conditions, the results indicated that young Canadian parents sought information about pregnancy and their child's health-related concerns. Results of another online survey among 349 Belgian mothers of young children indicated that the most frequently searched topic related to child health was breastfeeding, followed by teeth, growth and development, and baby acne (Slomian, Bruyère, Reginster, & Emonts, 2017). Other health information sought included vaccination-related information (Guillaume & Bath, 2004; Kowal, Jardine, & Bubela, 2015) and parenting information (Emmanuel, Creedy, & Fraser, 2001).

Similarly, Skranes, Løhaugen, Botngård and Skranes, (2014) surveyed 99 Norwegian mothers to understand how mothers' pediatric information needs differed in accordance with a child's health conditions. Results indicated that when their child was sick, the most frequently searched health topic was rashes (70%); followed by symptoms of diseases (57%); when to contact the doctor (55%); and other symptoms, such as coughing, diarrhea, vomiting, and fever. In contrast, when their child was healthy, the most frequently sought topic was nutrition and/or diet (57%), followed by child development (52%), allergies (42%), rashes (35%) and parenting (35%).

When it comes to used sources, researchers noted that there were two major health-related information sources among mothers: healthcare professionals (Khoo, Bolt, Babl, Jury, & Goldman, 2008) and the Internet (Jaks, Baumann, Juvalta, & Dratva, 2019; Skranes et al., 2014; Slomian et al., 2017). For example, 98% of the mothers stated that they had used the Internet regularly to search for child health information (Skranes et al., 2014), and 52.15% of the mothers expressed that they had used the Internet to make a decision concerning their child's health (Slomian et al., 2017). Slomian's (2017) research team also noted that, before seeking online, the research participants had consulted other sources such as family members (69.5%), their friends (62.9%), midwives (62.6%), general practitioners (51.2%), and journals or magazines (20.8%). Greyson (2017) also emphasized that young Canadian parents sought health information from people and institutions, as well as online and from print materials. Moreover, some of her research participants used only one source, whereas others used multiple sources iteratively.

In sum, most studies examined two groups of mothers' health information-seeking behavior: (a) mothers of children with specific diagnoses, or (b) mothers of children with

unspecified health conditions. Therefore, this study was conducted to bridge the gap by focusing on mothers of healthy children.

2.2 Health Information-Seeking Behavior among U.S. Mothers

Regarding health information sources, a nationwide survey (Bailey, 2008) of 550 U.S. mothers showed that the top seven most-trusted information sources were pediatricians (58%), friends and family (55%), evening news (39%), Internet searches (38%), a physician's office (37%), websites (33%), and parenting books (32%). Other recent studies focused on the health information-seeking behavior of first-time mothers living in the U.S. (Gazmararian et al., 2014; Weiner et al., 2015). Gazmararian et al. (2014) noted that most first-time mothers preferred in-person, electronic, or video media, including DVDs, websites, and mobile applications, to written materials or pamphlets. Regarding frequency of information seeking behavior, study results among first-time mothers indicated that 62% looked for information about childhood vaccines in a one-month period (Weiner et al., 2015).

There are conflicting results regarding information sources used. Studies on U.S. mothers' information seeking behavior found that the primary sources of pediatric information were physicians and nurses (Baker et al., 2007; Bernhardt & Felter, 2004; Kennedy et al., 2011). Yoo (2004) also found that middle-aged U.S. mothers most frequently used healthcare professionals as their information sources, which was consistent with similar study results (e.g., Baker et al., 2007; Bernhardt & Felter, 2004; Kennedy et al., 2011). However, relatively recent studies suggested different findings. For example, Lee (2018) and Alwhaibi, Goyat, and Kelly (2017) reported that the Internet was the most frequently used source among U.S. mothers when

seeking health information. Weiner et al. (2015) also supported the evidence that Internet search engines (e.g., Google, Yahoo) were the most important sources of information among their participants (36%), followed by family (27%), healthcare professionals (22.5%), online parenting sites (19%), and friends (17%). Moreover, Moon, Mathews, Oden, and Carlin (2019) claimed that the Internet, as well as social media, have been influential sources related to parenting and health information these days.

Other studies investigated information-seeking behavior of mothers in disadvantaged populations or ethnic minority groups living in the U.S. (Criss et al., 2015; Davis, Cole, McKenney-Shubert, Jones, & Peterson, 2017; Guendelman, Broderick, Mlo, Gemmill, & Lindeman, 2017; Guerra-Reyes, Christie, Prabhakar, Harris, & Siek, 2016). In a large-scale focus group study among low-income U.S. mothers, Guendelman et al. (2017) emphasized that only three percent of their study sample did not search for health information at all. The researchers reported that mothers in their sample preferred face-to-face contact with healthcare providers or with other mothers when seeking health-related information, advice, and support. Regarding the source preferences, the finding is worth noting because another comparative study in the U.S. (Lee, 2018) highlighted that U.S.-born mothers preferred human sources (e.g. doctors, nurses, husband, and other relatives), whereas immigrant Korean mothers preferred non-human sources (e.g., online communities, books).

2.3 Health Information-Seeking Behavior among Korean Mothers and Korean Immigrants in the U.S.

Characteristics of recent Korean immigrants have changed dramatically compared to several decades ago (O'Connor & Batalova, 2019). While earlier immigration waves from Korea

consisted of many unskilled laborers and their families, the contemporary Korean immigrant population has high socio-economic standing with relatively high educational attainment compared to other immigrants and native-born Americans. As of 2017, 34% of Korean immigrants had at least a bachelor's degree, compared to 18% of the total U.S. foreign-born population and 20% of the U.S.-born population (O'Connor & Batalova, 2019). More Korean immigrants had graduate or professional degrees (20%) than other immigrant populations (13%) or U.S.-born individuals (12%).

Despite the unique characteristics of Korean immigrants, there is a dearth of research related to the questions of health information seeking behavior among immigrant Korean mothers (e.g., Lee, 2017, 2018). However, several previous studies addressed health information needs, information seeking, and information usage behavior among Korean Americans (Huh, DeLorme, Reid, & Kim, 2013; Kim, 2013; Kim, Kreps, & Shin, 2015; Oh, Kreps, Jun, & Ramsey, 2011; Oh, Kreps, Jun, Chong, & Ramsey, 2012; Park & Park, 2014; Yi, Stvilia, & Mon, 2012) or Korean American women in the U.S. (Kim & Yoon, 2012; Oh, Jun, Zhao, Kreps, & Lee, 2015). It should also be noted that Lee (2017, 2018) conducted an exploratory study to understand health information needs and information seeking behavior among Korean immigrant mothers living in the U.S. Moreover, in a comparative study, Lee (2018) found that immigrant Korean mothers had sought health information a lot more frequently than U.S.-born mothers. Regarding frequency of seeking behavior, for example, 16.8% of immigrant Korean mothers answered that they had looked for health information related to their children more than once a day, whereas only 1.5% of the U.S. mothers answered that they did. It is notable that the immigrant Korean mothers were more likely to be active in seeking health information related to their children compared to mothers in the native population.

When it comes to the type of information sources used, Lee (2017) found that Korean immigrant mothers used the Internet most frequently (97.4%), followed by healthcare providers (87.2%), books (79.5%), newspapers/magazines (69.2%), and TV programs (53.8%). In another study, results also supported evidence that the Internet was the most frequently utilized source when mothers searched for health information related to their children (Lee, 2018). However, other frequently used sources were as follows: blogs/online forums, friends with kids, family members, and healthcare providers. Other studies underlined that friends, church members, and family members were also key sources for Korean Americans searching for health information (Kim, 2013; Kim et al., 2015). In addition, Yi et al. (2012) noted that Korean Americans in their sample used search engines (e.g., Google or Naver—a popular search engine in South Korea) most frequently when seeking health-related information. Yi et al. (2012) found that 15% of their participants relied heavily on print materials (e.g., magazines, newspapers), whereas 20% of participants preferred consumer health information obtained from family members or friends. The above results are not surprising because previous studies conducted among Korean mothers in Korea found that Korean parents tend to heavily rely on the Internet (Suh, 2004) or online forums (Chae & Quick, 2015; Kim & Kim, 2007).

Results of other studies on Korean immigrants revealed that because of language barriers, several Korean immigrants tended to search for health information from their ethnic media and the Internet, which are both available in the Korean language (Oh et al., 2012; Oh et al., 2015). In addition, Oh et al. (2015) reported that although the Internet, family or friends, and Korean ethnic media were used more frequently than healthcare providers or U.S. mainstream media (e.g., TV, radio, newspapers or magazines), the most trusted information source was healthcare

providers (47.2%), followed by Korean TV channels (22.6%), family or friends (20.3%), and Korean magazines (17.3%).

2.4 Socio-demographic Factors Influencing Health Information-Seeking Behavior

Factors affecting health information seeking have been studied by a number of researchers. For instance, Ramanadhan and Viswanath (2006) claimed that key socio-demographic characteristics, such as age, gender, race or ethnicity, and socioeconomic status (SES), could influence people's health information seeking. In the context of health, active health information seekers have been highlighted as white, middle-aged women who are well-educated and have high socioeconomic status (SES) (Galarce et al., 2011; Ramanadhan & Viswanath, 2006).

Other studies have also confirmed that age can be one of the important characteristics that would influence differences in people's health information seeking/use behavior. For instance, younger patients more actively seek cancer-related information from various sources than older patients (Jenkins, Fallowfield, & Saul, 2001; Pinquart & Duberstein, 2004; Silliman, Dukes, Sullivan, & Kaplan, 1998), whereas older patients differ from younger patients in the amount of medical information preferred, in the content of this information, and in the sources of information they use (Pinquart & Duberstein, 2004).

Previous studies also have found correlations between gender and health information seeking behavior. As briefly mentioned in the introduction, women are inclined to be more active health information seekers online than men (Allen & Rainie, 2002; Fox & Duggan, 2013a; Rutten, Squiers, & Hesse, 2006; Song, Cramer, McRoy, & May, 2013; Yoo, 2004). Allen and

Rainie (2002) noted differences between mothers and fathers in terms of information seeking topics. They highlighted that mothers tend to look for health or medical information more frequently than fathers. Song et al. (2013) also supported that health information seeking is a maternal behavior related to improved health outcomes.

Differences in racial and ethnic groups lead to different patterns of information seeking behavior related to health. For example, prior studies reported that young African American and Hispanic women tend to trust information from friends or family members more than information from health care professionals (Guendelman et al., 2017; Yee & Simon, 2010). On the other hand, Oh et al. (2012) pointed out that only 6.7% of Korean Americans mentioned they trust health information from their friends or family members. Due to language barriers with English speaking physicians and nurses, a large number of Korean Americans tend to seek health information from their ethnic media and the Internet, both of which are in the Korean language (Han, Song, & Kim, 1996; Oh et al., 2012).

Several studies demonstrated that income is another important factor that influences mothers' health information seeking behavior (Braveman, Cubbin, Marchi, Egerter, & Chavez, 2001; Shieh, Broome, & Stump, 2010; Song et al., 2013). For instance, Braveman et al. (2001) underlined that low socio-economic status has been associated with less engagement in health information-seeking, and poor pregnancy and infant outcomes among pregnant mothers. In terms of education, among first-time mothers in general, well-educated mothers above the age of 35 tend to seek pregnancy-related resources more actively (Viau, Padula, & Eddy, 2002).

Several studies have described that household size, specifically, the number of children, could be one important factor. Baker et al. (2007) implemented structured interviews with 30 mothers (15 mothers with one child and 15 mothers with two or more children). Baker et al.

(2007) found that mothers with one child treated their information needs as slightly more immediate, whereas mothers with two or more children often placed their information needs at a lower priority. Lee's (2018) study also supported the argument because the number of children was one of the most influential characteristics that affect mothers' health information-seeking behavior.

Other researchers noted that first-time pregnancy was significantly associated with mothers' health information seeking (Bernhardt & Felter, 2004; Carolan, 2007; Gazmararian et al., 2014; Loudon et al., 2016; Renkert & Nutbeam, 2001; Shieh et al., 2010; Weiner et al., 2015). First-time mothers are provided with a great deal of information, regardless of their age (Renkert & Nutbeam, 2001); however, Carolan (2007) also highlighted that a lot of first-time mothers described feeling overwhelmed by considerable health information offered by their nurses and midwives. These findings illustrate that the number of children and first-time pregnancy may be factors influencing mothers' health information-seeking behavior.

Overall, extant literature has revealed that several socio-demographic factors, such as age, gender, race or ethnicity, household income, education levels, the number of children, and first-time pregnancy, tended to influence people's health information seeking behavior to a certain degree. Including these characteristics, it would be necessary to test other individual characteristics would mothers' health information-seeking behavior such as their employment status, housing status, marital status, the size of household, the number of years living in the U.S. (or in Korea), and fluency in speaking the English language.

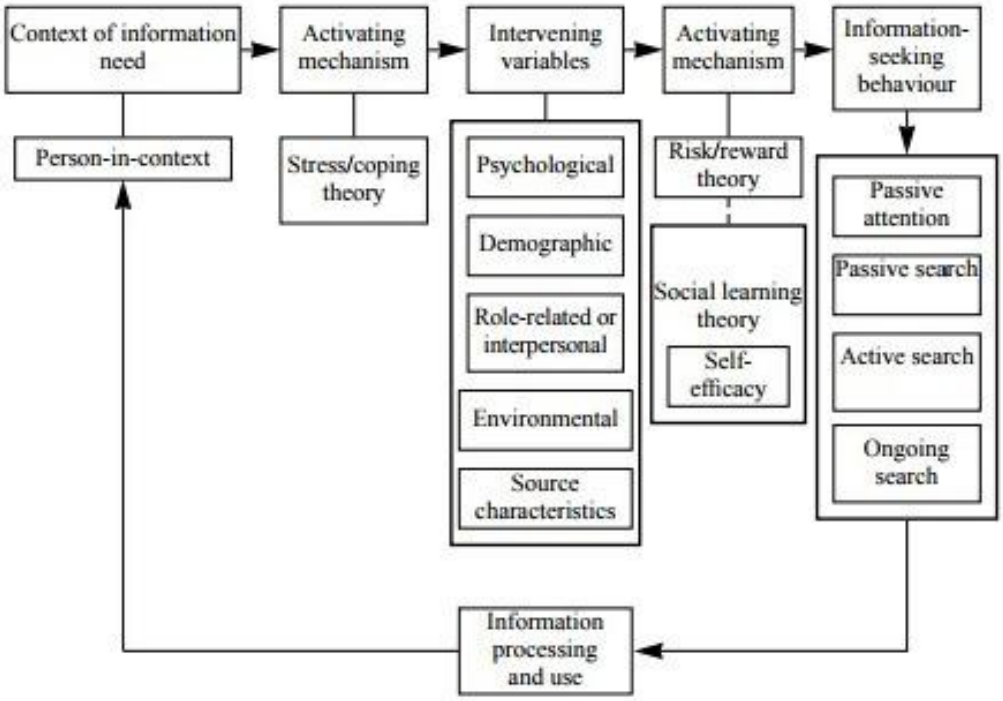
2.5 Theoretical Frameworks

2.5.1 Wilson's Information-Seeking Model

In Wilson's (1997) model of information behavior (Figure 2.1), information-seeking is considered as a purposive, goal-determined behavior and the concept of information processing provides a framework that might help to explain mothers' information seeking behavior. The model maintains more a person-centered approach, focusing on the information use by people, information needs, and the context. For instance, the situation in which information needs arise and the obstacles to information seeking may have an impact on a person's information seeking behavior (Wilson, 2000).

Figure 2.1.

Wilson's Model of Information Behavior. (Wilson, 1997, p. 569)



The model is based on two important propositions (Beverley, Bath, & Barber, 2007; Potnis, 2015). First, information needs are secondary type of needs that arise out of a set of primary needs in everyday life. Second, diverse personal and external barriers are encountered by users during the information-seeking process. The researcher of this study assumes all the above propositions and relates the research questions to these propositions. Specifically, RQ3a and RQ3b were developed based on the first proposition, whereas RQ1c was developed based on the second proposition to test the following hypothesis:

Hypothesis 2: *There is a relationship between the frequency of using each health information source and mothers' individual characteristics*.

Other hypotheses will be explained in the next chapter.

Since information needs are somewhat subjective, their consequence of seeking behaviors also varies greatly by individuals. For example, mothers might play a range of intertwined roles (e.g., parents, mentors, health managers, caregivers, etc.) and utilize diverse information resources (e.g., the Internet, healthcare providers, books, family/friends, etc.), which can be digital, conventional, or interpersonal, to meet their health information needs. Their multiple roles in the health-related context within family can be manifested differently, such as passive information consumers, or active/ongoing information seekers. The current study puts mothers in a context of health-related information seekers who play their connected roles as health managers and caregivers for their children. The specific context of information needs plays a significant role in shaping overall information seeking behavior of the mothers.

When explaining the overall process of information seeking, it is also noteworthy that mothers' information seeking behaviors may be affected by five diverse types of intervening

variables (Case, 2016). Those are summarized as follows: (a) psychological predispositions (e.g., curiosity or fear), (b) demographic characteristics (e.g., age, gender, education, or household income), (c) factors related to one's role (e.g., whether one is acting as an instructor or a mother), (d) environmental variables (e.g., the resources available to disadvantaged communities), and (e) characteristics of the sources (e.g., accessibility or credibility). Among those five different types of intervening variables, the researcher of the current study focused specifically on four factors – demographic characteristics, role as a mother, environment, and characteristics of the sources.

2.5.2 Sonnenwald's Information Horizon

Sonnenwald (1999, 2005) presented the theoretical concept of information horizons to investigate individuals' information-seeking behavior in context. Information horizons indicate that a person is looking forward to the information landscape, so it is a positional metaphor for information seeking, and mapping horizons graphically illustrate this positional metaphor. This concept and method are grounded on empirical studies of people's information behavior in diverse research disciplines including information science and sociology.

In this method, three fundamental concepts have been suggested: context, situations, and social networks, and the information horizon is made up of those three elements (Sonnenwald, 1999). Sonnenwald (1999) defined contexts as "multi-dimensional in that they can be described by a variety of attributes (Dervin, 1997)" (p. 179). The contexts might include "place, time, goals, tasks, systems, situations, processes, organizations, and types of participants" (Sonnenwald, 1999, p. 179). For instance, contexts may include family life, academia, and citizenship. For example, when mothers seek health information for their children, it is

considered to be within the family-related context but is outside the boundaries of the academic context.

The second fundamental concept is situations. Within each context, several situations may come up; for instance, within the context of family life, seeking health information for children, attending a family-related event, and preparing meals for family members are three different kinds of situations. That is, a context is somehow larger than a situation and may be composed of various situations.

The third underlying concept is social networks. Social networks may help to establish situations and contexts and are constructed of situations and contexts. Although Sonnenwald (1999) pointed out that social networks refer to communication among individuals. Her five propositions of the model included not only social networks as information sources but also other documents or information resources when examining individuals' information behavior. As an example, a mother's information horizon may consist of diverse information sources including social networks (e.g., family members, health care providers, friends), documents (e.g., books, websites), or information retrieval tools (e.g., databases).

Sonnenwald's (1999) information horizon is still an evolving theory, and there are a variety of ways to investigate individuals' information horizons. It is noteworthy that information horizon could be a useful theoretical framework to understand people's information seeking behavior and source preferences as well. Sonnenwald (1999) suggested that conducting in-depth interviews and facilitating information horizon map drawings could help to discern users' information horizons more effectively (Sonnenwald, 2005; Sonnenwald, Wildemuth, & Harmon, 2001). Moreover, Sonnenwald et al. (2001) highlighted the importance of triangulation and employed a survey asking individuals' frequencies and preferences for information use.

Savolainen and Kari (2004) further expanded and specified the concept of information horizon by using three concentric circles to illustrate how users prioritize information sources according to their preferences.

2.6 Summary of the Reviewed Research

This chapter reviewed the previous literature related to the dissertation topic. In particular, the researcher reviewed literature about mothers' information seeking behavior in the context of children's health. Although a substantial amount of research has been conducted to investigate health-information behavior among mothers in native populations or Korean Americans living in the U.S., most previous studies have focused on mothers of children living with specific diagnoses. This study is to bridge the gap in the literature by examining mothers of young healthy children. That is because in the pilot study of this dissertation research (Lee, 2018), findings indicated that the mothers of healthy children also have high information needs and search for children's health information actively.

Furthermore, in terms of mothers' frequently used health information sources, there are conflicting results. In the previous literature, researchers found that U.S. mothers most frequently utilized healthcare professionals such as physicians and nurses as their information sources (e.g., Baker et al., 2007; Bernhardt & Felter, 2004; Kennedy et al., 2011; Yoo, 2004). Relatively recent studies, however, emphasized that the Internet was the most frequently used source among U.S. mothers when seeking health information (e.g., Alwhaibi, Goyat, & Kelly, 2017; Jaks et al., 2019; Lee, 2018; Moon et al., 2019). This study will contribute to confirm, compare, and contrast the existing body of work.

RESEARCH METHODS

The intent of this study is to examine mothers' health information-seeking behavior and their health information source preferences. The information-seeking behavior of three groups of mothers were examined and compared: (a) American mothers born in and currently living in the U.S., (b) Korean mothers born in and currently living in Korea, and (c) Korean mothers born in Korea who have immigrated to the U.S. in the past ten years. In this chapter, the design and procedure of the research will be presented in the following order: (1) research questions (RQs), hypotheses, and conceptual framework, (2) research design including explanations on mixed-methods approach, (3) data collection procedures, and (4) data analysis processes.

3.1 Research Questions (RQs), Hypotheses, and Conceptual Framework

3.1.1 Research Questions (RQs)

In order to comprehend any possible relationships between the mothers' behavior and individual characteristics, the broader research question was "In the context of children's health, what are the information-seeking behavioral differences among mothers in the U.S. and Korean native populations and immigrant mothers?" In order to answer this comprehensive research question, the following sub-questions were addressed:

1. Frequency of using health information sources: (1a) What are mothers' frequently used sources when seeking health information related to their child(ren)?; (1b) What are the source characteristics that mothers consider important as selection criteria?; and (1c) How does the frequency of using each health information source relate to individual characteristics of mothers?

2. **Health information source preferences**: (2a) When mothers seek health information with regard to their child(ren), which sources do they prefer?; (2b) How do mothers evaluate and position these sources on their information horizon maps?

3. **Identifying information-seeking pathways**: (3a) Is there a sequence of steps that mothers follow when seeking health information related to their child(ren)? If so, what are those steps?; and (3b) Why do mothers use certain specific information sources in each step?

3.1.2 Hypotheses

The following hypotheses are formulated to provide a starting point for researching the proposed questions for testing the relationship between frequency of using each health information source and mothers' demographic characteristics.

RQ1: Frequency of using information sources

Hypothesis 1: *There are group differences in the frequency of using each health information source.*

Hypothesis 2: *There is a relationship between the frequency of using each health information source and mothers' individual characteristics.*

RQ2: Health information source preferences

Hypothesis 3: *There are group differences in source preferences when mothers seek health information related to their children.*

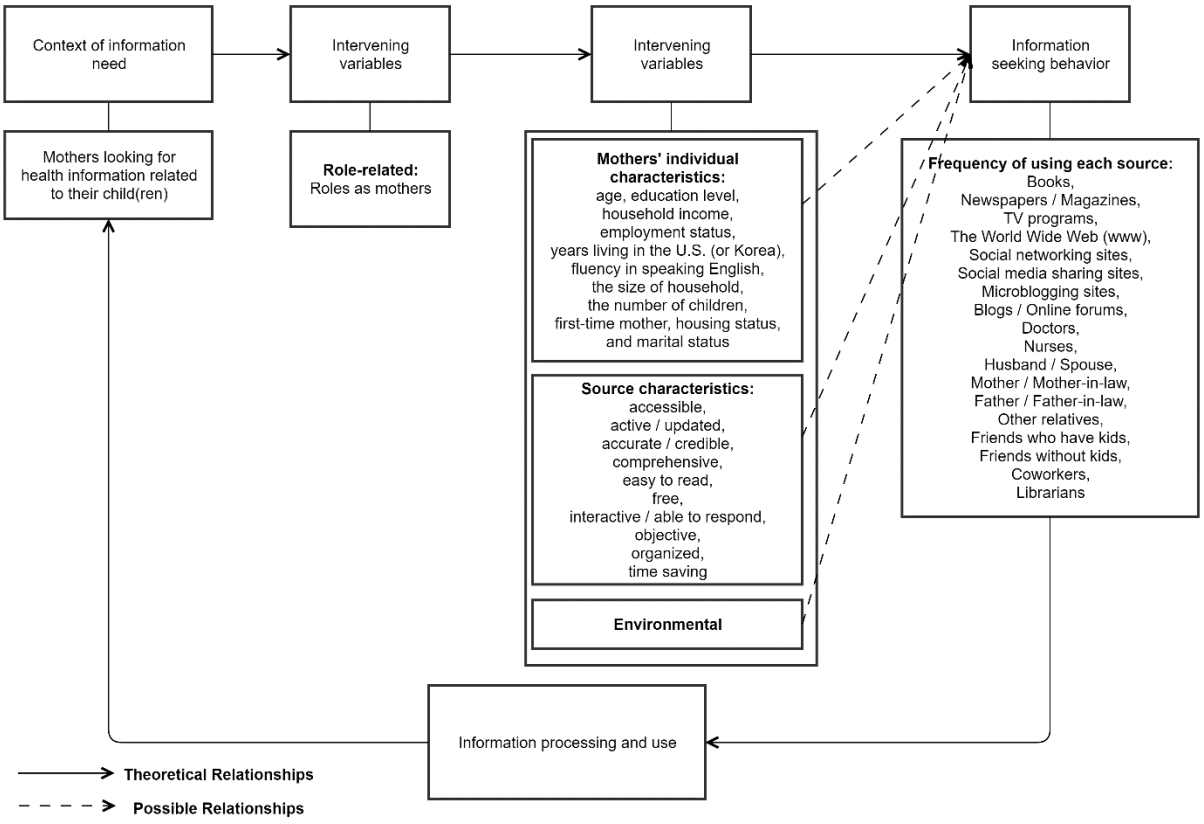
3.1.3 Conceptual Framework

Based on the review of the literature on mothers' health information-seeking behavior, their source preferences, and two theoretical frameworks (discussed in Chapter 2), the researcher

developed a conceptual framework of the current study (Figure 3.1.). An important contribution of the conceptual framework is to find the relationship between individual and source characteristics under the context of mothers' information-seeking behavior related to their children's health. Possible relationships which are currently presented with broken arrows in Figure 3.1. will be tested using ordinal regression. Specific data analysis method will be illustrated in the following subchapter 3.4 Data analysis.

Figure 3.1.

Conceptual Framework of This Study

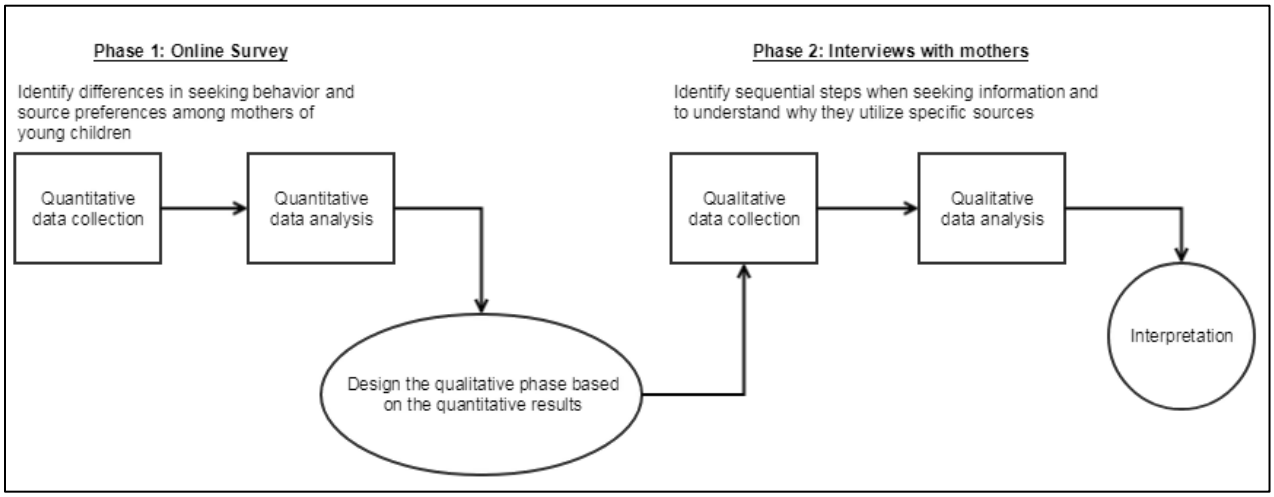


3.2 Research Design

The current study consists of two phases (Figure 3.2). An explanatory sequential mixed methods design was used to collect quantitative survey data (Phase 1) and then to illuminate the quantitative results with in-depth qualitative interview data (Phase 2). The online survey was to answer Research Questions 1 and 2, and the collected data from interviews not only answered Research Question 3 but also supplemented the survey findings.

Figure 3.2.

Research Design of This Study



Note. Diagram based on Creswell & Plano Clark (2011, p. 129).

3.2.1 Mixed Research Methods Approach

According to Johnson, Onwuegbuzie, and Turner's (2007) analysis of the definitions provided by 19 methodology experts, mixed methods research is defined as "the type of research in which a researcher or team of researchers combines elements of qualitative or quantitative

research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration" (p. 123). Wildemuth (2017) also agreed that this definition was important because several key themes within mixed research methods were identified by Johnson et al. (2007), such as what is mixed (quantitative and qualitative approaches), when or where the mixing happens (during data collection, data analysis, or both), and the reasons/purposes for mixing methods.

In fact, mixed methods research has received lots of attention in a past few decades and may be useful for several reasons. Creswell and Plano Clark (2011) emphasized that a single data source may be insufficient to fully address research questions or the problems under consideration. Creswell and Plano Clark (2018) further described advantages of using mixed methods research as:

> (1) a way to harness strengths that offset the weaknesses of both quantitative and qualitative research; (2) a way to provide more evidence for studying a research problem than either quantitative or qualitative research alone; (3) a way to help answer questions that cannot be answered by quantitative or qualitative approaches alone; (4) a way which offers new insights that go beyond separate quantitative and qualitative results. (pp. 12-13)

However, strengths of quantitative and qualitative research methods have been controversial in a number of fields for more than 30 years (Creswell, 2011; Creswell & Plano Clark, 2018). First, quantitative research is characterized by having a population for which the researcher wants to draw conclusions, but it would not be feasible to collect data on the entire population (Iversen, 2004). Therefore, it is necessary to select an appropriate, statistically random sample and utilize methods of statistical inference to draw conclusions about the

population. However, some scholars might point out the quantitative method's weakness in understanding the specific context or setting where people actually live. Also, in quantitative research, researchers may not be able to understand specific reasoning behind behavioral choices of individual respondents.

Qualitative research, on the other hand, is an inductive approach to knowledge generation that is "primarily concerned with studying the nature, quality, and meaning of human experience" (Willig, 2016, para. 1). It is not relevant to hypothesis testing, but instead, it tries to capture the quality of research participants' experiences, and to produce detailed descriptions and particularized interpretations of the people and their experiences (Sandelowski, 2004; Willig, 2016). Qualitative research alone might be seen as imperfect because of the difficulty in generalizing findings to a large group, or the personal interpretations by the researcher. Thus, using a mixed methods approach, the strengths of one approach are likely to compensate the weaknesses of the other.

For the above reasons, the current study utilized the mixed methods approach to minimize the weaknesses of both quantitative and qualitative methods and to answer the three major research questions.

3.2.2 Development of Questionnaire

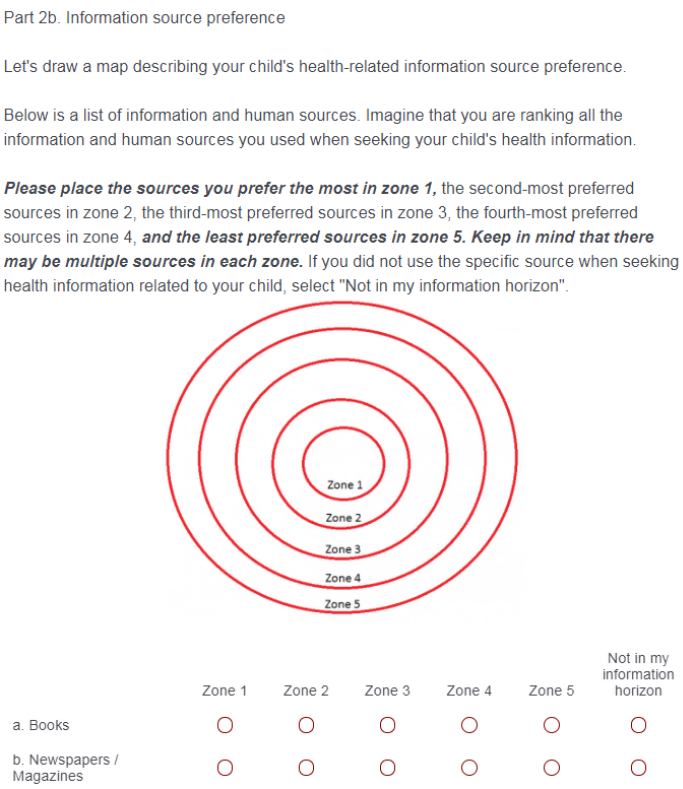
An online questionnaire (see Appendix C) was developed based on previous literature (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002; Fox & Duggan, 2013b; Kim et al., 2014; Lee, 2017, 2018; Tsai, 2013). Other than screening questions, the questionnaire consisted of three major sections: (a) health information source use, (b) source preferences, and

(c) demographic information. First, regarding health-information source use, respondents were asked to illustrate how frequently they used individual information sources in the past six months using a five-point Likert scale (one = never to five = very frequently). The survey included 19 information sources that were developed from previous literature (Kim et al., 2014; Lee, 2017, 2018). After that, ten source characteristics were identified from previous studies in health information-seeking behavior research including accessible, accurate/credible, comprehensive, interactive/able to respond, objective, and organized (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002; Fox & Duggan, 2013b; Lee, 2018).

Next, to understand each respondent's preference for type of information sources (RQ2), the researcher provided (a) a sample of an information horizon map that was adapted and modified from a previous study (Tsai, 2013); and (b) brief instructions on how to answer a question regarding mothers' preferences for each information source (see Figure 3.3). After that, 19 diverse types of information source were listed, which were developed from the Health Information National Trends Survey (National Cancer Institute, 2017) and previous literature (Kim et al., 2014; Lee, 2017, 2018). Participants were asked to select the most appropriate zone for each information source (zone one = the most preferred sources; zone five = the least preferred sources). It should be noted that there could be more than one source for each zone. In addition, if a participant did not use the specific information source, she was able to select one of the options as "not in my information horizon." Therefore, responses from participants who answered, "not in my information horizon" were excluded from the analyses of the specific information sources.

Figure 3.3.

Information Horizon Map Instructions to Participants on the Questionnaire



Part 2b. Information source preference

Let's draw a map describing your child's health-related information source preference.

Below is a list of information and human sources. Imagine that you are ranking all the information and human sources you used when seeking your child's health information.

Please place the sources you prefer the most in zone 1, the second-most preferred sources in zone 2, the third-most preferred sources in zone 3, the fourth-most preferred sources in zone 4, ***and the least preferred sources in zone 5. Keep in mind that there may be multiple sources in each zone.*** If you did not use the specific source when seeking health information related to your child, select "Not in my information horizon".

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Not in my information horizon
a. Books	○	○	○	○	○	○
b. Newspapers / Magazines	○	○	○	○	○	○

Demographic characteristics collected included age, ethnicity, highest level of completed education, marital status, annual household income, employment status, country of birth, state of residence at the time of the study (or City/province for Korean mothers who lived in Korea at the time of the study), housing status, first-time mothers (yes/no), health insurance coverage for the respondent and her child(ren) (yes/no), years living in the U.S. (or Korea for Korean mothers who resided in Korea), primary languages spoken, fluency in speaking English, and the number of children. In addition, to help gain an in-depth understanding of the survey among Korean mothers, the question items were carefully translated to maintain the meanings and nuances of

the original questionnaire. The translated versions were finalized after pre-testing with a few immigrant mothers from Korea and mothers who live in Korea.

3.2.3 Development of Interview Protocol

The interview protocol was developed to examine mothers' health-related information-seeking behavioral patterns related to their child(ren) and the reasons why they utilize each information source in the individual step (RQ3). The completed interview protocol is included in Appendix E. It was developed based on the previous literature (Sonnenwald, 1999, 2005; Sonnenwald et al., 2001; Tsai, 2013), as well as key findings from the first phase of the study.

The interview started with the introduction of the study and some background questions such as age of the participant, age of her child(ren), state of residence (city/province of residence for Korean mothers), and her academic major(s). After that, the interview was divided into two different parts. First, the researcher asked each interviewee to draw her health-related information-seeking pathways when her child was sick. Then, the participant was able to describe her information-seeking behavior based on her self-drawn pathways. Second, each interviewee was asked to draw her health information-seeking paths when her child was healthy. This was not only to answer RQ3 but also to see if there were any behavioral differences in accordance with the child's health status. That is because, even though all the participants of this study were recruited as mothers of healthy infants and toddlers, urgency of the issues may come up differently in accordance with their child(ren)'s health conditions. Moreover, a few previous studies also found that a child's health conditions could be one of the characteristics that might affect mothers' health information needs and information-seeking behavior (e.g., Archibald et

al., 2015; Eaves et al., 1996; Fain, 2009; Kilicarslan-Toruner & Akgun-Citak, 2013; Murphree et al., 2011; Skranes et al., 2014).

3.3 Data Collection

The researcher collected data from an online survey with follow-up semi-structured interviews. Each interview participant was asked to draw their information-seeking pathways to reflect the information sources they used. The methods of the two-phase study, including (1) the research setting and study sample, and (2) the selection of the online communities used for recruiting potential participants, are illustrated in the following subsections.

3.3.1 Phase 1: Web-based Survey

3.3.1.1 Research Setting and Study Sample

From late February to early June 2019, a web-based survey was used to collect data. The sample of this study was drawn from mothers of healthy infants and toddlers currently living in the U.S. or in Korea. Participants were recruited through postings in 21 online communities of mothers. A total number of 102 online communities' administrators were contacted and provided details about the study for permission to post recruitment messages on their specific sites. An example of the recruitment messages is included in Appendix B. Also, detailed strategies for selecting the online communities are illustrated in the following subsection, 3.3.1.2. Selection of online communities.

In the first phase of the research (an online survey), a convenience sampling, a type of non-probability sampling, was utilized. There were three subject groups for the current study: (a) American mothers born in and currently living in the U.S., (b) Korean mothers born in and currently living in Korea, and (c) Korean mothers born in Korea who immigrated to the U.S. in the past 10 years. All of the potential participants were aged 18 years or older and had at least one child aged newborn to 3-years-old. Moreover, in order to focus on mothers of healthy children, potential participants were excluded if their child(ren) had been diagnosed with any of the following:

1) any form of chronic or recurrent pain,

2) severe learning disability,

3) the presence of a psychiatric or neurological condition,

4) serious medical illness. (Schoth et al., 2016, p. 2435)

If a potential participant satisfied the above inclusion criteria, she was able to participate in the research by clicking the survey link. Of the 1,595 recorded responses, 249 respondents did not meet the criteria and were screened out in accordance with the selection criteria; 495 respondents did not complete the survey. Consequently, a total of 851 mothers of healthy infants and toddlers participated in the online survey. Once the data collection was completed, gift cards ($50 each) were awarded to respondents selected by a random draw. The first phase of this study was reviewed and approved by the Education and Social/Behavioral Sciences Institutional Review Board of the researcher's university (date of approval: February 20, 2019).

3.3.1.2 Selection of Online Communities

U.S. Sample

The researcher first determined the median household income of all U.S. states to achieve diverse representation in the household income of the research participants. Moreover, in the previous literature, socioeconomic status had been noted as one of the important factors influencing people's health information-seeking behavior (e.g., Galarce, Ramanadhan, & Vishwanath, 2011; Johnson, 1997; Lee, 2018). In alignment with that, one of the interests in this study was to compare health information-seeking behavioral patterns between high-income and low-income mothers. Second, in the pilot study, one of the limitations was that the sample had been somewhat atypical and biased toward households with extremely high income (Lee, 2018). To make up for this weakness, the researcher first listed the U.S. states with the top 12 highest median household income and the 12 states with the lowest (U.S. Census Bureau, 2017b). These 24 states are where potential survey respondents of the current study were recruited (Table 3.1).

After that, two different types of mothers' online communities were used to achieve diversity in household income of the research participants. The first resource was *City Moms Blog Network*. This online community was established in 2010, and it has been a hyperlocal network for U.S. mothers from 89 different cities (City Moms Blog Network, 2019). The researcher contacted administrators of the City Moms Blog Network in the 24 selected U.S. states.

Table 3.1.

Median Household Income by U.S. State (U.S. Census Bureau, 2017b)

	Top 12 highest		Top 12 lowest	
Rank	State	Income	State	Income
1	Maryland	$ 78,916	Mississippi	$ 42,009
2	District of Columbia	$ 77,649	Arkansas	$ 43,813
3	New Jersey	$ 76,475	West Virginia	$ 44,061
4	Alaska	$ 76,114	Alabama	$ 46,472
5	Hawaii	$ 74,923	Kentucky	$ 46,535
6	Massachusetts	$ 74,167	Louisiana	$ 46,710
7	Connecticut	$ 73,781	New Mexico	$ 46,718
8	New Hampshire	$ 71,305	Tennessee	$ 48,708
9	Virginia	$ 68,766	South Carolina	$ 48,781
10	California	$ 67,169	Oklahoma	$ 49,767
11	Washington	$ 66,174	North Carolina	$ 50,320
12	Minnesota	$ 65,699	Montana	$ 50,801

The second local-based online community used was Facebook groups. According to Facebook (2019), Facebook groups are "a place to communicate about shared interests with certain people" (para. 1). Under Facebook groups, several searches had been carried out to determine appropriate online forums among U.S. mothers. For example, keyword searches combining the name of the state and *mothers* OR *moms* were conducted (e.g., *Maryland mothers* OR *Maryland moms*). Based on the number of group members and the average number of postings, online communities with more than 1,000 members and at least 10 postings per day were contacted for recruitment purposes. Administrators of 90 online communities were contacted to grant permission to recruit U.S. participants of the current study. Of those,

moderators of 17 online communities allowed the researcher to promote this study in specific sites (see Table 3.2). This sample's data were collected between late April and early June 2019.

Table 3.2.

Online Communities Used for Recruiting Potential Participants (U.S. Mothers)

	Name of the Online Community	URL
1	Orange County Moms Blog (CA)	https://orangecounty.citymomsblog.com/
2	DC moms blog (DC)	https://washingtondc.citymomsblog.com/
3	Columbia SC Moms Blog (SC)	https://columbiasc.citymomsblog.com/
4	NoVa Moms (VA)	https://www.facebook.com/groups/novamom/
5	Working Mom Notes (NJ)	https://www.facebook.com/groups/WorkingMomNotes/
6	Montana Mama (MT)	https://www.facebook.com/groups/1602111436706487/
7	Raleigh Moms Group for The Practical Mamas of The Triangle (NC)	https://www.facebook.com/groups/theraleighmomsgroup/about/
8	Collierville Tennessee Moms (TN)	https://www.facebook.com/groups/ColliervilleTennesseeMoms/
9	Bellevue, TN Moms Group (TN)	https://www.facebook.com/groups/2925149242733356/
10	Kona Moms (HI)	https://www.facebook.com/groups/konamoms/
11	Moms of Morgantown, WV (WV)	https://www.facebook.com/groups/MomsOfMorgantownWV/
12	Mamas Helping Mamas Oklahoma (OK)	https://www.facebook.com/groups/1803722463047554/
13	Mama2Mama: Central KY Moms BST (KY)	https://www.facebook.com/groups/lexkymomsbst/about/
14	Oklahoma Breastfeeding Mamas (OK)	https://www.facebook.com/groups/521134554729960/
15	Mothers Helping Mothers: West Virginia, USA (WV)	https://www.facebook.com/groups/1927814810785642/
16	Greenfield, MA moms (MA)	https://www.facebook.com/groups/1046535162555443/
17	Mom to Mom Breastfeeding Support Group- Glasgow, Kentucky (KY)	https://www.facebook.com/groups/592314544127423/about/

Immigrant Korean Sample

To recruit Korean immigrant mothers, online communities that had been utilized by previous scholars who had studied Korean immigrant mothers in the U.S. were approached (Kim & Yoon, 2012; Lee, 2018; Park & Park, 2014). Administrators of two major Korean immigrant

mothers' communities named MissyUSA and Momsholic approved posting recruitment messages on their specific sites (see Table 3.3). MissyUSA is the largest online community among female Korean immigrants in the U.S., where Korean immigrant women living in the U.S. share information about living in their adopted country (Kim & Yoon, 2012; MissyUSA, 2019). In addition, Momsholic is the largest online community for parenting topics among women in Korea and immigrant women who have Korean ethnicity but live in another country. As of September 2019, Momsholic had approximately 2.8 million members. Both online communities were considerably useful to recruit potential survey respondents among Korean immigrant mothers who live in the U.S. This sample's data were collected from late February to May 2019.

Table 3.3.

Online Communities Used for Recruiting Potential Participants (Immigrant Korean Mothers)

	Name of the Online Community	URL
1	MissyUSA	https://www.missyusa.com/mainpage/content/index.asp
2	Momsholic	https://cafe.naver.com/imsanbu

Korean Sample

To reach out to Korean mothers of infants and toddlers, identifying the largest online communities was needed. One of the most popular web search engines in Korea named *Naver* has numerous online forums (Naver Corp., 2019). The researcher contacted the administrators of the 10 largest *Naver* online forums (Figure 3.4) under the topic of "Family/Parenting" to get permission for posting recruitment messages including a survey link. Administrators of three online communities eventually authorized the researcher to promote the current study in their forums (Table 3.4). This sample's data were collected from late February to May 2019.

Figure 3.4.

Largest Online Forums Under the Topic of "Family / Parenting"

Table 3.4.

Online Communities Used for Recruiting Potential Participants (Korean Mothers)

	Name of the Online Community	URL
1	Momsholic	https://cafe.naver.com/imsanbu
2	Jihumom	https://cafe.naver.com/1msanbu
3	Children's book café	https://cafe.naver.com/nowbook

3.3.2 Phase 2: Interviews and Information-Seeking Pathways Drawings

3.3.2.1 Research Setting

At the end of the online survey (Phase 1), respondents completing the survey were directed to another website, which was used only for compensation and recruitment for the follow-up interviews. Their preferred contact information (e.g., email address) was stored separately from their survey responses, so the responses remained confidential. In the link leading to compensation, one additional question asked the mother whether she was interested in participating in a supplementary interview. Accordingly, the researcher contacted some of the survey participants who had expressed their interest in participating in follow-up interviews (Phase 2).

When the researcher contacted potential interviewees, three questions about the number of family members, annual household income, and completed educational attainment were asked for screening purposes in order to interview survey respondents with diverse demographic characteristics. When a potential interviewee satisfied the study criteria, the researcher contacted the potential interviewees via email to set a date and time for the interviews.

Each interview was conducted either in face-to-face, telephone, or Skype format based on the interviewee's preference. For the telephone or Skype interviews, an informed consent form (Appendix D) was provided to the research participants via email in advance, and signed forms were returned to the researcher before the interview was conducted. For the face-to-face interviews, the research participants received the informed consent form before the interview, and the signed form was collected during the interview. During the individual interview, each interviewee was also asked to draw their information-seeking pathways in relation to their

child(ren)'s health. Those drawings were collected in person or via email after each interview session was completed. For example, some interviewees had taken pictures of their drawings, attached those drawings as attachments, and sent them to the researcher via email.

The second phase of this study was also reviewed and approved by the Education and Social/Behavioral Science Institutional Review Board of the researcher's university (date of approval: May 15, 2019), and the entire interview protocol is attached in Appendix E. Finally, each interview participant received a $15 gift certificate as an incentive for their participation.

3.3.2.2 Selection of Interview Participants

According to Creswell and Plano Clark (2018), in an explanatory sequential research design, a qualitative follow-up sample tends to be a much smaller sample than the initial quantitative sample of the study. It is worth noting that individuals who participate in the qualitative phase should be individuals who participated in the quantitative phase. The important consideration lies in collecting enough qualitative data so that "meaningful themes can be developed that provide explanation for selected quantitative results" (Creswell & Plano Clark, 2018, p. 191).

In the second phase of the current research, each participant's annual household income, the number of family members, and final educational attainment were used to purposively sample interview participants from the first phase of the study. This is because household income and education levels have been found to be significant factors influencing mothers' health information-seeking behaviors (e.g., Bravemen et al., 2001; Lee, 2018; Shieh et al., 2010; Song et al., 2013; Viau et al., 2002). Moreover, since this study focuses on mothers' country of birth and country of residence at the time of the study, eight U.S. mothers, eight Korean mothers, and

eight Korean immigrant mothers who resided in the U.S. at the time of the study were purposefully recruited.

3.4 Data Analysis

Several methods were adopted to analyze the collected data. This section explains how quantitative and qualitative analyses were conducted.

3.4.1 Phase 1: Online Survey

Data collected from the web-based questionnaire were coded and processed in SPSS 26 (IBM, Armonk, NY). To address RQ1 and RQ2, descriptive and inferential statistics were conducted. First, a descriptive statistical analysis was carried out to comprehend the sample's demographic characteristics, frequency of using each information source, and source preference. Second, inferential statistics, such as analysis of variance (ANOVA), were used to compare health-related information-seeking behavioral differences among three groups. Third, ordinal regression analyses were used to identify any possible relationships between frequency of each information source used and the participants' individual characteristics. In general, ordinal regression analysis was used to determine the relationships between an ordinal-level dependent variable (e.g., a five-point Likert scale) and more than one independent variable (Garson, 2014; Sin & Kwon, 2017; Yi, 2016). Ordinal regression also requires an adequate sample size and the absence of high multicollinearity. According to Teddlie and Tashakkori (2009), when a given population is over 10,000, a sample size should be at least 384 to maintain a 95% confidence

interval (5% precision). That is, the sample in this study was large enough to be representative and reach a 95% confidence interval in all statistical analyses.

Multicollinearity diagnostics were also conducted to ensure that no predictor variables were too highly intercorrelated. A tolerance statistic lower than 0.2 or a variance inflation factor (VIF) higher than ten proposes multicollinearity problems (Field, 2009). In this study, the tolerance values were all higher than 0.2. The VIF values were all lower than ten. Therefore, these results suggest the data have no multicollinearity issues.

3.4.2 Phase 2: Interviews and Information-Seeking Pathways Drawings

A total of 24 interviews were recorded and transcribed in Microsoft Word. Each interview participant was given an identifier, which were a letter for the specific group and a number (e.g., US1 to US8; IM1 to IM8; K1 to K8). All the transcripts were then uploaded into NVivo 12 (QSR International, Melbourne, Australia) for coding and analysis. The researcher and coding team worked together to develop the coding scheme. The coding team consisted of two other coders with graduate degrees in relevant fields.

For the interviews, inductive open coding approach was used in the study. The team initially reviewed a sample of the interview transcripts independently to see if there were any noticeable health information-seeking patterns among interviewees and to see if there were any themes to explain why each source was used in the respective step. Next, the coding team reviewed the proposed code lists together, discussing similarities and differences in the codes which were applied in an inductive and repetitive process (Ahuvia, 2001; Neuendorf, 2002, 2017). Disagreements were resolved through discussion. The coding team worked through a

series of review sessions to arrive at the code lists focusing on two questions: (a) the sequential health information-seeking steps by interviewees, and (b) reasons for using the specific information sources in each step. While subtle differences in coding existed, the coding team did not find significant discrepancies, and a few minor discrepancies were resolved through further discussion to ensure intercoder reliability and the credibility of the analysis (Gaskell & Bauer, 2000; Golafshani, 2003; Lincoln & Guba, 1985; Worrall & Oh, 2013). After negotiating the discrepancies, we reached 96% intercoder agreement for the final codes, and the final codebook is attached in Appendix F.

RESULTS

This chapter first describes demographic characteristics of the research participants. It also reports the results regarding the three sets of research questions (RQs) in three sections. The research questions are as follows:

1. Frequency of using health information sources: (1a) What are mothers' frequently used sources when seeking health information related to their child(ren)?; (1b) What are the source characteristics that mothers consider important as selection criteria?; and (1c) How does the frequency of using each health information source relate to individual characteristics of mothers?

2. **Health information source preferences**: (2a) When mothers seek health information with regard to their child(ren), which sources do they prefer?; (2b) How do mothers evaluate and position these sources on their information horizon maps?

3. **Identifying information-seeking pathways**: (3a) Is there a sequence of steps that mothers follow when seeking health information related to their child(ren)? If so, what are those steps?; and (3b) Why do mothers use certain specific information sources in each step?

As reported in chapters one and three, an online survey was conducted to gather information answering Research Questions 1 and 2; interviews were conducted to answer Research Question 3. Section one presents results regarding RQ1 on the frequency of using health information sources. Section two shows results regarding RQ2 on the health-related information source preferences; section three describes results regarding RQ3 on the pathways of the research participants' information-seeking behavior.

4.1 Demographic Profile of Research Participants

4.1.1 Demographics of Survey Participants

Among the 851 mothers of health infants and toddlers who completed the online survey, 255 were U.S. mothers, 300 were immigrant Korean mothers, and 296 were Korean mothers. The demographic profile of the survey participants is shown in Table 4.1.

The age distribution was somewhat similar in the two Korean samples, whereas the U.S. sample had a greater number of slightly younger mothers. In terms of educational attainment, 21.2% of the U.S. mothers answered that they had attended college but did not graduate, compared to 3.7% of immigrant mothers and 2.4% of Korean mothers. Also, more than half of the two Korean samples obtained a four-year degree (Immigrant Korean mothers: 56.3%; Korean mothers: 54.7%), while 34.9% of the U.S. sample obtained a four-year degree. Regarding marital status, almost all mothers in the two Korean samples were married, whereas 7.8% of U.S.

mothers stated they were single, never been married, 5.9% were living as married, 2.4% were divorced, and 0.8% were separated. Annual household income was nicely distributed in all three samples. When it comes to employment status, a significant difference was noted between mothers in native populations and immigrant mothers. Indeed, 54.5% of the U.S. mothers stated that they work either full-time (38.4%) or part-time (16.1%), whereas only 13.4% of the immigrant Korean mothers work full-time (7.7%) or part-time (5.7%). On the other hand, 76.3% of the immigrant Korean mothers were stay-at-home mothers, while 36.4% of the U.S. mothers and 47.6% of the Korean mothers were stay-at-home mothers. Furthermore, when the participants were asked if they were first-time mothers, more than 80% of the Korean mothers stated they were (Korean immigrant mothers at 80.3% and Korean mothers at 84.5%), whereas only 41.6% of the U.S. mothers said they were first-time mothers.

Table 4.1.

Demographic Characteristics of Survey Participants (N = 851)

Demographic variables		**U.S. Mothers (*n* = 255)** Frequency (%)	**Immigrant Korean Mothers (*n* = 300)** Frequency (%)	**Korean Mothers (*n* = 296)** Frequency (%)	**U.S. Population**	**Korea Population**
Age	18-20	3 (1.2)	-	-	N/A	
	21-25	20 (7.8)	3 (1.0)	2 (0.7)		
	26-30	78 (30.6)	46 (15.3)	43 (14.5)		
	31-35	87 (34.1)	160 (53.3)	156 (52.7)		
	36-40	61 (23.9)	85 (28.3)	82 (27.7)		
	41-45	6 (2.4)	6 (2.0)	13 (4.4)		
	46 or older	-	-	-		

Education	Some high school or less	-	-	3 (1.0)	7.6%[2]	12%[3]
	High school diploma or equivalent	19 (7.5)	6 (2.0)	15 (5.1)	29.7%	40%
	Some college (attended but did not graduate)	54 (21.2)	11 (3.7)	7 (2.4)	29.1%	48%
	2-year college degree	25 (9.8)	21 (7.0)	44 (14.9)		
	4-year college degree	89 (34.9)	169 (56.3)	162 (54.7)	21.2%	
	Master's degree	46 (18.0)	64 (21.3)	53 (17.9)	12.4%	
	Doctoral degree	18 (7.1)	24 (8.0)	9 (3.0)		
	Other	4 (1.6)	5 (1.7)	3 (1.0)	N/A	
Marital status	Married	212 (83.1)	300 (100.0)	290 (98.0)	N/A[4]	N/A[5]
	Living as married	15 (5.9)	-	2 (0.7)		
	Single, never been married	20 (7.8)	-	2 (0.7)		
	Divorced	6 (2.4)	-	2 (0.7)		
	Separated	2 (0.8)	-	-		
Annual household income	$0 - $9,999	4 (1.6)	12 (4.0)	7 (2.4)	4.2%	N/A
	$10,000 - $14,999	3 (1.2)	12 (4.0)	4 (1.4)	2.8%	
	$15,000 - $19,999	6 (2.4)	9 (3.0)	7 (2.4)	7.1%	

[2] This dataset was the highest educational attainment for the population aged 25 years and older (U.S. Census Bureau, 2017d).
[3] This dataset was the educational attainment among Korean population aged 25 to 64 years old. (Ministry of Education in Korea, 2018).
[4] In 2016, the median age for a first marriage was 27.4 for U.S. women (Parker & Stepler, 2017).
[5] According to Statistics Korea (2019), the average age for a first marriage was 30.4 for Korean women, while the mean age for divorce was 44.8.

	$20,000 - $34,999	22 (8.6)	26 (8.7)	31 (10.5)	8.2%	
	$35,000 - $49,999	29 (11.4)	43 (14.3)	64 (21.6)	12.2%	
	$50,000 - $74,999	62 (24.3)	64 (21.3)	74 (25.0)	18.3%	
	$75,000 - $99,999	65 (25.5)	41 (13.7)	50 (16.9)	14.2%	
	$100,000 - $149,999	32 (12.5)	40 (13.3)	36 (12.2)	17.3%	
	$150,000 or more	24 (9.4)	34 (11.3)	10 (3.4)	15.7%	
	Don't know	8 (3.1)	19 (6.3)	13 (4.4)	N/A	
Employment status	Work outside the home (full-time)	98 (38.4)	23 (7.7)	76 (25.7)	Females (aged 15 to 64) – Employed 65.5%[6]	Females (aged 15 to 64) – Employed 57.2%
	Work outside the home (part-time)	41 (16.1)	17 (5.7)	32 (10.8)		
	Stay-at-home (full-time)	93 (36.4)	229 (76.3)	141 (47.6)	N/A	N/A
	Student	4 (1.6)	19 (6.3)	2 (0.7)		
	Retired	1 (0.4)	1 (0.3)	8 (2.7)		
	Disabled	1 (0.4)	-	-		
	Other	17 (6.7)	11 (3.7)	37 (12.5)		
Housing status	Own	167 (65.5)	70 (23.3)	156 (52.7)	63.8%[7]	57.7%[8]
	Rent	73 (28.6)	221 (73.7)	127 (42.9)	36.2%	38.5%
	Occupied without paying monetary rent	15 (5.9)	6 (2.0)	8 (2.7)	N/A	
	Other	-	3 (1.0)	5 (1.7)		

[6] Data of OECD Statistics (2018) indicated that 65.5% of the U.S. women (aged 15 to 64) are employed, whereas 57.2% of the Korean women (aged 15 to 64) are employed.

[7] According to the U.S. Census Bureau (2017c), 63.8% of U.S. households owned houses, whereas 36.2% of the U.S. households rented.

[8] According to Statistics Korea (2019), 57.7% of the Korean households owned houses while 38.5% of the Korean households rented.

Years lived in the US (Years lived in Korea for KM)		*M = 31.12 (SD = 6.16)*	*M = 4.55 (SD = 2.76)*	*M = 33.51 (SD = 5.84)*	N/A	
Health insurance for herself	Yes	241 (94.5)	272 (90.7)	296 (100)	88%[9]	100%[10]
	No	14 (5.5)	28 (9.3)	-	12%	-
Health insurance for her child(ren)	Yes	247 (96.9)	292 (97.3)	293 (99.0)	95.0%	100%
	No	8 (3.1)	8 (2.7)	3 (1.0)	5.0%	-
Current states (Current cities/provinces for KM)		26 US states	32 US states, and Washington DC	8 metropolitan cities, and 8 provinces	N/A	
English fluency	Very well	251 (98.4)	15 (5.0)	1 (0.3)	N/A	
	Well	4 (1.6)	119 (39.7)	58 (19.6)		
	Not well	-	157 (52.3)	224 (75.7)		
	Not at all	-	9 (3.0)	13 (4.4)		
First-time mother	Yes	106 (41.6)	241 (80.3)	250 (84.5)	N/A	
	No	149 (58.4)	59 (19.7)	46 (15.5)		

[9] This dataset was from Kaiser Family Foundation (2017).
[10] Since 1989, Korea has provided national health insurance services to all Korean citizens who reside in Korea (National Health Insurance Service, 2019).

Number of children	1	98 (38.4)	204 (68.0)	198 (66.9)	N/A[11]
	2	95 (37.3)	74 (24.7)	85 (28.7)	
	3 or more	62 (24.3)	22 (7.3)	13 (4.4)	

4.1.2 Demographics of Interview Participants

Twenty-four interviews were conducted between late May and July 2019. Each interview was conducted either in person, telephone, or Skype format based on the participant's preference. The length of each interview session ranged from 30 to 60 minutes. The demographic profile of the interview participants is shown in Table 4.2.

There were eight participants in each category of mothers: U.S. mothers, Korean immigrant mothers, and Korean mothers. Most participants were 30 to 40 years old, and their child's age varied from 2 months to 3 years old. The participants' educational attainment ranged from some college (attended but did not graduate) to doctoral degree. Interestingly, the interviewees' academic majors were considerably manifold including nursing, theology, education, vocal music, philosophy, fashion design, and statistics. The participants' annual household incomes also varied from $0-$9,999 to more than $150,000, but the median household income range of each group was different: $50,000 - $74,999 for the U.S. sample, $35,000 - $49,999 for the immigrant sample, and $75,000 - $99,999 for the Korean sample. Concerning the interviewees' current states and cities/provinces, they were from 10 different U.S. states and four different cities/provinces in Korea.

[11] According to OECD statistics (2017), the fertility rate of the U.S. was 1.770, whereas that of Korea was 1.050.

Table 4.2.

Demographic Characteristics of Interview Participants (N = 24)

	ID	Age	Highest Level of Education Completed	Major	Household Income	State (City or Province)
1	US1	30s	4-year college degree	Nursing	$20,000 - $34,999	WV
2	US2	20s	4-year college degree	Biology & Nursing	$100,000 - $149,999	VA
3	US3	30s	4-year college degree	Information Technology	$20,000 - $34,999	HI
4	US4	20s	Doctoral degree	Physical Therapy	$50,000 - $74,999	OK
5	US5	30s	Some college (attended but did not graduate)	Computer Science	$35,000 - $49,999	OK
6	US6	30s	Master's degree	Plant Biology & Ecology	$100,000 - $149,999	MA
7	US7	30s	4-year college degree	Elementary Education	$50,000 - $74,999	HI
8	US8	30s	4-year college degree	Philosophy	$75,000 - $99,999	NC
					Median household income of the U.S. sample: **$50,000 - $74,999**	
9	IM1	30s	4-year college degree	Textiles & Fashion Design	$ 0 - $ 9,999	NY
10	IM2	20s	Some college (attended but did not graduate)	Wildlife Management	$35,000 - $49,999	MA
11	IM3	30s	Master's degree	Chinese Literature	$20,000 - $34,999	WI
12	IM4	30s	2-year college degree	Culinary Arts	$50,000 - $74,999	CA
13	IM5	30s	Doctoral degree	Special Education	$100,000 - $ 149,999	CA
14	IM6	20s	4-year college degree	Speech Therapy	$35,000 - $49,999	NY
15	IM7	30s	Master's degree	Early Childhood Education	$75,000 - $99,999	NJ
16	IM8	20s	4-year college degree	Voice & Opera	$20,000 - $34,999	WI
					Median household income of the immigrant sample: **$35,000 - $49,999**	
17	K1	30s	2-year college degree	Vocal Music	$20,000 - $34,999	Incheon
18	K2	30s	4-year college degree	Child Welfare	$15,000 - $19,999	Incheon
19	K3	30s	Doctoral degree	Statistics	$150,000 or more	Daejeon
20	K4	30s	4-year college degree	Theology	$75,000 - $99,999	Gyeonggi Province
21	K5	30s	Master's degree	Commerce and Trade	$20,000 - $34,999	Incheon
22	K6	40s	Master's degree	Statistics	$75,000 - $99,999	Incheon

23	K7	30s	Master's degree	Educational Technology	$75,000 - $99,999	Seoul
24	K8	30s	4-year college degree	Economics	$150,000 or more	Seoul
					Median household income of the Korean sample: **$75,000 - $99,999**	

4.2 Frequency of using Health Information Sources

4.2.1 Frequently Used Sources

When mothers were asked if they had sought health information related to their child(ren) in the past six months, nearly all mothers in each sample (U.S. mothers 98%, Immigrant Korean mothers 97.7%, Korean mothers 98.6%) answered that they did (see Table 4.3). However, when the frequency of their seeking behavior was compared, the immigrant Korean mothers and Korean mothers who live in Korea tended to seek a lot more frequently than the U.S. mothers (Table 4.3 and Figure 4.1). For instance, 15.3% of the immigrant mothers and 18.2% of the Korean mothers mentioned that they search for health information related to their children more than once a day, whereas only 3.1% of the U.S. mothers said the same. There were also a few mothers who did not seek health information in relation to their child(ren) in the last six months (U.S. mothers 2.0%, Immigrant Korean mothers 2.3%, Korean mothers 1.4%). When the characteristics of these inactive health information seekers were examined, they were likely to be middle-income ($50,000-$99,999, 62.5%), mothers with two or more children (56.3%), renting a house (68.8%), and with a four-year degree (62.5%).

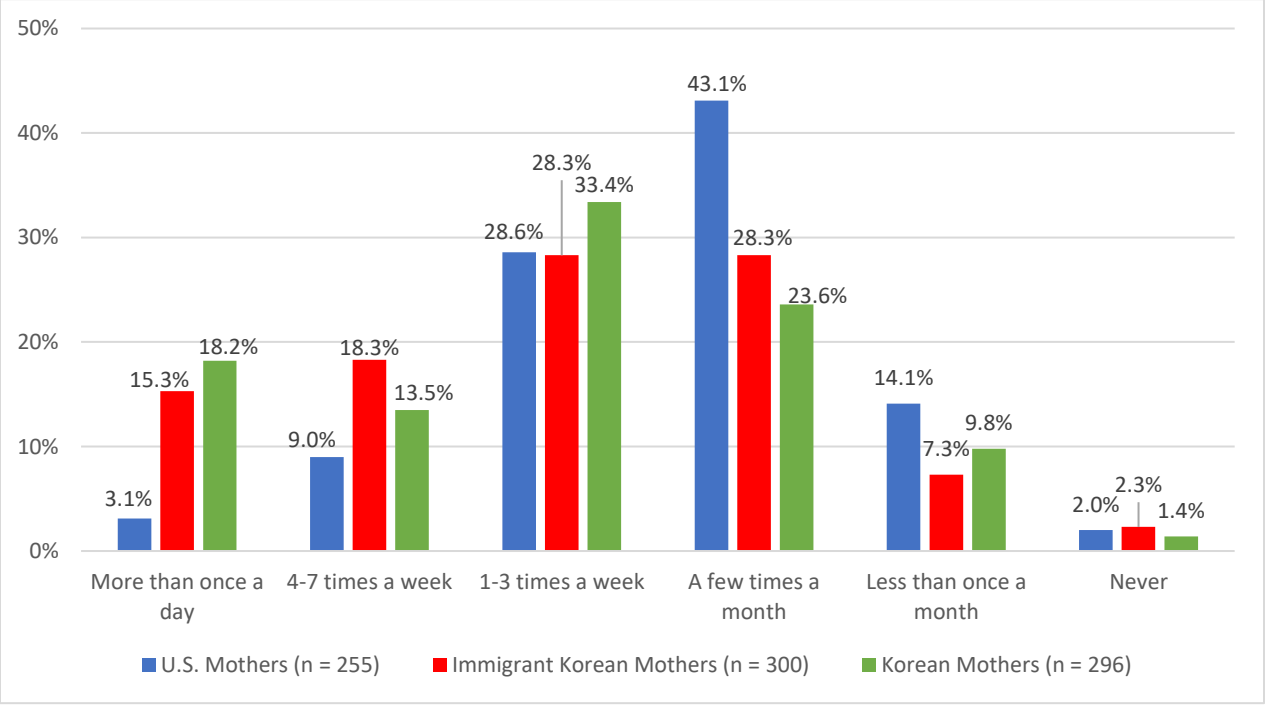
Table 4.3.

Health Information Seeking Frequency among Mothers (N = 851)

		U.S. Mothers (*n* = 255)	Immigrant Korean Mothers (*n* = 300)	Korean Mothers (*n* = 296)
Looked for health information related to child(ren) in the past 6 months	Yes	250 (98.0%)	293 (97.7%)	292 (98.6%)
	No	5 (2.0%)	7 (2.3%)	4 (1.4%)
Frequency of their seeking behavior	More than once a day	8 (3.1%)	46 (15.3%)	54 (18.2%)
	4 – 7 times a week	23 (9.0%)	55 (18.3%)	40 (13.5%)
	1 – 3 times a week	73 (28.6%)	85 (28.3%)	99 (33.4%)
	A few times a month	110 (43.1%)	85 (28.3%)	70 (23.6%)
	Less than once a month	36 (14.1%)	22 (7.3%)	29 (9.8%)
	Never	5 (2.0%)	7 (2.3%)	4 (1.4%)

Figure 4.1.

Frequency of Seeking Health Information related to Child(ren) (N = 851)



Frequency of using each health information source is shown in Table 4.4. Among 19 sources, the World Wide Web was the information source used most often by all three groups (U.S. mothers *M* = 4.09, *SD* = .91; Immigrant Korean mothers *M* = 4.50, *SD* = .75; Korean mothers *M* = 4.32, *SD* = .74). The different groups utilized sources with varying degrees of frequency. For instance, the U.S. mothers used, in order of frequency: doctors (*M* = 3.59, *SD* = .91), nurses (*M* = 3.20, *SD* = 1.12), and friends with kids (*M* = 3.03, *SD* = 1.05). The other two Korean groups, however, used blogs or online forums (Immigrant Korean mothers *M* = 4.11, *SD* = 1.04; Korean mothers *M* = 3.97, *SD* = .89), friends who have kids (Immigrant Korean mothers *M* = 3.38, *SD* = .97; Korean mothers *M* = 3.47, *SD* = .95), and doctors (Immigrant Korean mothers *M* = 4.11, *SD* = 1.04; Korean mothers *M* = 3.97, *SD* = .89) frequently. It is also worth noting that microblogging sites such as Twitter was one of the least used source among the U.S. sample (*M* = 1.30, *SD* = .63) but often utilized in the other two Korean samples (Immigrant Korean mothers *M* = 2.42, *SD* = 1.26; Korean mothers *M* = 2.80, *SD* = 1.28). Moreover, it is also noteworthy that there were a few sources that were not used frequently in all three groups, such as father / father-in-law (U.S. mothers *M* = 1.46, *SD* = .85; Immigrant Korean mothers *M* = 1.62, *SD* = .87; Korean mothers *M* = 1.83, *SD* = .92), friends without kids (U.S. mothers *M* = 1.28, *SD* = .62; Immigrant Korean mothers *M* = 1.19, *SD* = .50; Korean mothers *M* = 1.41, *SD* = .69), and librarians (U.S. mothers *M* = 1.12, *SD* = .56; Immigrant Korean mothers *M* = 1.11, *SD* = .37; Korean mothers *M* = 1.22, *SD* = .59).

Table 4.4.

Frequency of Using Each Health Information Source (N = 851)

Rank	U.S. Mothers (*n* = 255)		Immigrant Korean Mothers (*n* = 300)		Korean Mothers (*n* = 296)	
	Source	***M (SD)***	**Source**	***M (SD)***	**Source**	***M (SD)***
1	The World Wide Web (www)	4.09 (.91)	The World Wide Web (www)	4.50 (.75)	The World Wide Web (www)	4.32 (.74)
2	Doctors	3.59 (.91)	Blogs or online forums	4.11 (1.04)	Blogs or online forums	3.97 (.89)
3	Nurses	3.20 (1.12)	Friends who have kids	3.38 (.97)	Friends who have kids	3.47 (.95)
4	Friends who have kids	3.03 (1.05)	Doctors	3.33 (.95)	Doctors	3.30 (.99)
5	Husband / Spouse	2.88 (1.14)	Husband / Spouse	2.95 (1.18)	Social Networking Sites (e.g. Facebook, Instagram etc.)	3.20 (1.32)
	Social Networking Sites (e.g. Facebook, Instagram etc.)	2.88 (1.23)				
6			Social Networking Sites (e.g. Facebook, Instagram etc.)	2.94 (1.32)	Microblogging Sites (e.g. Twitter etc.)	2.80 (1.28)
7	Resources provided by government health agencies	2.59 (1.07)	Social Media Sharing Sites (e.g. YouTube, Flickr etc.)	2.87 (1.25)	Mother / Mother-in-law	2.72 (1.06)
8	Mother / Mother-in-law	2.57 (1.29)	Nurses	2.66 (1.16)	Husband / Spouse	2.67 (1.03)
9	Blogs or online forums	2.47 (1.07)	Mother / Mother-in-law	2.54 (1.18)	Social Media Sharing Sites (e.g. YouTube, Flickr etc.)	2.58 (1.19)
10	Other relatives	1.87 (1.02)	Microblogging Sites (e.g. Twitter etc.)	2.42 (1.26)	Resources provided by government health agencies	2.57 (1.00)
11	Books	1.86 (.96)	Resources provided by	2.38 (1.08)	Books	2.48 (1.00)

			government health agencies			
12	Coworkers	1.82 (1.09)	Books	2.36 (1.05)	Nurses	2.44 (1.10)
13	Social Media Sharing Sites (e.g. YouTube, Flickr etc.)	1.78 (1.01)	Health-related programs on TV	1.96 (.94)	Health-related programs on TV	2.35 (.99)
14	Newspapers / Magazines on health information	1.56 (.86)	Newspapers / Magazines on health information	1.68 (.89)	Coworkers	1.88 (1.08)
15	Father / Father-in-law	1.46 (.85)	Father / Father-in-law	1.62 (.87)	Newspapers / Magazines on health information	1.84 (.86)
16	Health-related programs on TV	1.38 (.67)	Other relatives	1.54 (.93)	Father / Father-in-law	1.83 (.92)
17	Microblogging Sites (e.g. Twitter etc.)	1.30 (.63)	Coworkers	1.42 (.86)	Other relatives	1.67 (.88)
18	Friend without kids	1.28 (.62)	Friend without kids	1.19 (.50)	Friend without kids	1.41 (.69)
19	Librarians	1.12 (.56)	Librarians	1.11 (.37)	Librarians	1.22 (.59)

Note. Mean scores based on 5-point Likert scale: 1 = Never used; 5 = Very frequently

A series of one-way analysis of variance (ANOVA) tests was conducted to examine whether there were any statistical differences in using each information source among the three groups (Table 4.5). Results indicated that 18 out of 19 information sources showed significant differences among the three groups in the frequency with which they utilized health information sources. Only one information source did not show significant difference in the usage across the three groups and that was Mother / Mother-in-law, $F(2, 832) = 1.978$, $p = .139$.

Table 4.5.

Group Differences in Using Each Information Source (N = 851)

Information source	U.S. Mothers (*n* = 255)	Immigrant Korean Mothers (*n* = 300)	Korean Mothers (*n* = 296)		
	M (SD)	*M (SD)*	*M (SD)*	*F*	*p*
a. Books on health information ***	1.86 (.96)	2.36 (1.05)	2.48 (1.00)	28.069	**.000 *****
b. Newspapers / Magazines on health information **	1.56 (.86)	1.68 (.89)	1.84 (.86)	7.198	**.001 ****
c. Health programs on TV ***	1.38 (.67)	1.96 (.94)	2.35 (.99)	80.163	**.000 *****
d. Resources provided by government health agencies *	2.59 (1.07)	2.38 (1.08)	2.57 (1.00)	3.388	**.034 ***
e. The World Wide Web (www) ***	4.09 (.91)	4.50 (.75)	4.32 (.74)	17.642	**.000 *****
f. Social Networking Sites (e.g., Facebook, Instagram etc.) *	2.88 (1.23)	2.94 (1.32)	3.20 (1.32)	4.671	**.010 ***
g. Social Media Sharing Sites (e.g., YouTube, Flickr etc.) ***	1.78 (1.01)	2.87 (1.25)	2.58 (1.19)	61.944	**.000 *****
h. Microblogging sites (e.g., Twitter etc.) ***	1.30 (.63)	2.42 (1.26)	2.80 (1.28)	129.974	**.000 *****
i. Blogs or online forums ***	2.47 (1.07)	4.11 (1.04)	3.97 (.89)	218.189	**.000 *****
j. Doctors **	3.59 (.91)	3.33 (.95)	3.30 (.99)	7.275	**.001 ****
k. Nurses ***	3.20 (1.12)	2.66 (1.16)	2.44 (1.10)	32.296	**.000 *****
l. Husband / Spouse **	2.88 (1.14)	2.95 (1.18)	2.67 (1.03)	4.825	**.008 ****
m. Mother / Mother-in-law	2.57 (1.29)	2.54 (1.18)	2.72 (1.06)	1.978	.139
n. Father / Father-in-law ***	1.46 (.85)	1.62 (.87)	1.83 (.92)	11.611	**.000 *****
o. Other relatives ***	1.87 (1.02)	1.54 (.93)	1.67 (.88)	8.296	**.000 *****
p. Friends who have kids ***	3.03 (1.05)	3.38 (.97)	3.47 (.95)	14.504	**.000 *****
q. Friends without kids ***	1.28 (.62)	1.19 (.50)	1.41 (.69)	9.744	**.000 *****
r. Coworkers ***	1.82 (1.09)	1.42 (.86)	1.88 (1.08)	17.572	**.000 *****
s. Librarians *	1.12 (.56)	1.11 (.37)	1.22 (.59)	4.317	**.014 ***

* $p < .05$, ** $p < .01$, *** $p < .001$.

Note. Mean scores based on 5-point Likert scale: 1 = Never used; 5 = Very frequently.

Post hoc analyses revealed that the two Korean samples (i.e., immigrant Korean mothers and Korean mothers) tended to use books *(F(2, 832) = 28.069, p* < .001; $Mean_{U.S.}$ = 1.86, $Mean_{immi}$ = 2.36, $Mean_{Kor}$ = 2.48), blogs/online forums (*F*(2, 832) = 218.189, *p* < .001; $Mean_{U.S.}$ = 2.47, $Mean_{immi}$ = 4.11, $Mean_{Kor}$ = 3.97), and friends who have kids (*F*(2, 832) = 14.504, *p* < .001; $Mean_{U.S.}$ = 3.03, $Mean_{immi}$ = 3.38, $Mean_{Kor}$ = 3.47) significantly more frequently than the U.S. sample. Post hoc analyses further indicated that the U.S. mothers were more likely to use doctors (*F*(2, 832) = 7.275, *p* < .01; $Mean_{U.S.}$ = 3.59, $Mean_{immi}$ = 3.33, $Mean_{Kor}$ = 3.30), nurses (*F*(2, 832) = 32.296, *p* < .001; $Mean_{U.S.}$ = 3.20, $Mean_{immi}$ = 2.66, $Mean_{Kor}$ = 2.44), and other relatives (*F*(2, 832) = 8.296, *p* < .001; $Mean_{U.S.}$ = 1.87, $Mean_{immi}$ = 1.54, $Mean_{Kor}$ = 1.67) as their child(ren)'s health information sources than the two Korean samples. It is also noticeable that the immigrant Korean mothers tended to use coworkers (*F*(2, 832) = 17.572, *p* < .001; $Mean_{U.S.}$ = 1.82, $Mean_{immi}$ = 1.42, $Mean_{Kor}$ = 1.88) significantly less frequently than the other two groups (i.e., U.S. and Korean mothers). Post hoc analyses also revealed that Korean mothers who live in Korea tended to use newspapers/magazines (*F*(2, 832) = 7.198, *p* < .01; $Mean_{U.S.}$ = 1.56, $Mean_{immi}$ = 1.68, $Mean_{Kor}$ = 1.84), father/father-in-law (*F*(2, 832) = 11.611, *p* < .001; $Mean_{U.S.}$ = 1.46, $Mean_{immi}$ = 1.62, $Mean_{Kor}$ = 1.83), friends without kids (*F*(2, 832) = 9.744, *p* < .001; $Mean_{U.S.}$ = 1.28, $Mean_{immi}$ = 1.19, $Mean_{Kor}$ = 1.41), and librarians (*F*(2, 832) = 4.317, *p* < .05; $Mean_{U.S.}$ = 1.12, $Mean_{immi}$ = 1.11, $Mean_{Kor}$ = 1.22) significantly more frequently than the other two samples (i.e., U.S. and immigrant Korean mothers).

Eta squared (η^2) was used to measure the effect size for the ANOVA results. Based on Cohen (1988), η^2 = .02 indicates a small effect size, η^2 = .13 indicates a medium effect size, η^2 = .26 indicates a large effect size. Among 18 statistically significant information sources, effect size of the three different groups was large for blogs/online forums (η^2 = .34) and microblogging

sites (η^2 = .24); medium for *TV* programs (η^2 = .16), and social media sharing sites (η^2 = .13); and small for the rest of the fourteen sources (η^2 around .02).

4.2.2 Important Source Characteristics as Selection Criteria

In an online survey, participants were asked to evaluate importance of ten source characteristics using a 7-point Likert scale (1 = Not important at all to 7 = Extremely important). The ten characteristics were identified from previous literature in health information seeking behavior research such as accessible, accurate/credible, comprehensive, interactive/able to respond, objective, and organized (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002; Fox & Duggan, 2013b; Lee, 2018). As shown in Table 4.6, the survey results indicated that accurate / credible was the most important source characteristic in all three samples when mothers sought health information related to their child(ren) (U.S. mothers *M* = 6.65, *SD* = .83; Immigrant Korean mothers *M* = 6.30, *SD* = .97; Korean mothers *M* = 6.31, *SD* = .94). Results of Korean mothers indicated that the second important characteristic when seeking health information was organized information (*M* = 5.93, *SD* = 1.09), whereas U.S. and immigrant mothers expressed that accessible was the second important source characteristic (U.S. mothers *M* = 6.26, *SD* = 1.10; Immigrant Korean mothers *M* = 6.12, *SD* = 1.09).

U.S. mothers tended to value comprehensiveness of the information as an important characteristic when choosing health information sources, whereas the other two groups of mothers did not (U.S. mothers ranked it #4 out of 10 characteristics; Immigrant Korean mothers ranked it #9; Korean mothers ranked it #9). Moreover, when overall ratings for the ten source characteristics were compared, the average ratings of all three groups of mothers were usually

high (all higher than 4 = Neutral). In particular, the mean ratings of the Korean mothers were higher, resulting in all of the averages being higher than 5 (somewhat important).

Table 4.6.

Important Source Characteristics as Selection Criteria (N = 851)

Rank	U.S. Mothers (*n* = 255)		Immigrant Korean Mothers (*n* = 300)		Korean Mothers (*n* = 296)	
	Characteristic	***M (SD)***	**Characteristic**	***M (SD)***	**Characteristic**	***M (SD)***
1	Accurate / Credible	6.65 (.83)	Accurate / Credible	6.30 (.97)	Accurate / Credible	6.31 (.94)
2	Accessible	6.26 (1.10)	Accessible	6.12 (1.09)	Organized	5.93 (1.09)
3	Active / Updated	6.25 (1.06)	Active / Updated	5.95 (1.11)	Accessible	5.90 (1.17)
4	Comprehensive	5.85 (1.19)	Easy to read	5.80 (1.24)	Time saving	5.85 (1.27)
5	Organized	5.69 (1.15)	Free	5.78 (1.45)	Active / Updated	5.84 (1.20)
6	Free	5.62 (1.58)	Organized	5.70 (1.22)	Objective	5.82 (1.19)
			Objective	5.70 (1.24)		
7	Easy to read	5.61 (1.40)			Easy to read	5.75 (1.15)
8	Time saving	5.43 (1.51)	Time saving	5.69 (1.36)	Comprehensive	5.62 (1.20)
	Objective	5.43 (1.37)				
9			Comprehensive	5.62 (1.21)	Free	5.39 (1.65)
10	Interactive / Able to respond	4.12 (2.05)	Interactive / Able to respond	4.87 (1.77)	Interactive / Able to respond	5.01 (1.59)

Note. Mean scores based on 7-point Likert scale: 1 = Not important at all, 7 = Extremely important

4.2.3 Relationships between Frequency of Using Each Information Source and Individual Characteristics

Ordinal regression analyses were performed to identify any possible relationships between the frequency of using a specific information source and respondents' demographic characteristics. For instance, among the U.S. mothers, the researcher tested whether individual demographic characteristics would influence participants' use of government health agencies as

a health information source in relation to their child(ren). In the following sections, brief explanations of the dependent / independent variables and how to interpret the results are illustrated.

Dependent Variables (DVs)

In this study, an ordinal regression analysis was performed on each information source, yielding 19 regression models in each sample. Frequency of using each information source can be considered dependent variables. There were 19 different health-related information sources developed based on the previous literature in information behavior research (Kim et al., 2014; Lee, 2017, 2018). Those consisted of nine non-human information sources such as the World Wide Web, TV, government health agencies, and blogs/online forums; 10 personal information sources including doctors, nurses, husband/spouse, friends who have kids, coworkers, and librarians. Respondents were asked to note their frequency of using each source in the past six months using a 5-point Likert scale: 1 = never, 2 = rarely, 3 = occasionally, 4 = frequently, and 5 = very frequently.

Independent Variables (IVs)

For each sample, 10 demographic characteristics were tested to identify the predictors of using each source among mothers of healthy infants and toddlers. Nine individual characteristics including age (of the mother), educational attainment, annual household income, employment status, first-time mother (Yes/No), housing status, years lived in the U.S. (Korea for the Korean mothers), the number of children, and the size of household were tested in all three groups. However, an independent variable—English fluency—was not tested with the U.S. sample,

whereas another independent variable—marital status—was not tested with the other two Korean samples. This was because their zero frequency in a few categories made the regression model unstable.

How to Interpret the Results

In an ordinal regression analysis, the odds ratio (OR) is used to measure how various levels within each independent variable would affect the direction and magnitude of changes in the dependent variable (Garson, 2014). The odds ratio is a numerical value of exponentiated regression coefficient. When it comes to interpreting the results, the odds ratio for a subgroup needs to be interpreted related to the reference group, which will have an odds ratio of one. The odds ratio may be particularly useful to determine which independent variables have a significant effect on dependent variables. For categorical independent variables (e.g., employment status, which had four separate groups in this study: working full-time, working part-time, stay-at-home, and other), the results could be interpreted with the odds that one group (e.g., working full-time) had a higher or lower value on the dependent variable (e.g., using doctors as their health information source) compared to the reference group (e.g., stay-at-home mothers). For a continuous independent variable (i.e., years lived in the U.S., measured in years), the results can be interpreted by how a single unit increase or decrease in that variable (e.g., one year increase or decrease in length of stay in the U.S.) was associated with the odds of the dependent variable having a higher or lower value (e.g., one year increase in participants' length of stay in the U.S. increases or decreases the odds that they would use *doctors* as their health information source for their child(ren). The overall results of the ordinal regression tests are shown in Appendix G, and only significant models are reported in Table 4.7 (U.S. sample), Table 4.8 (Immigrant Korean

sample), and Table 4.9 (Korean sample). The statistically significant variables are shown in each table with asterisks (*). Detailed interpretations of the odds ratio for each sample are described in the following sections.

4.2.3.1 U.S. Sample

The frequency of use of the 19 information sources was tested against individual demographic characteristics. Results indicated that the U.S. mothers' individual characteristics were significantly associated with the frequency of using four different sources (Table 4.7): the World Wide Web, other relatives, friends with kids, and coworkers. For the significant individual characteristics, the odds ratio can be interpreted as follows: all other things being equal, a U.S. mother with a specific characteristic is more likely to use a specific information source if that characteristic has an odds ratio higher than one (OR > 1). The higher the odds ratio, the higher the likelihood a U.S. mother with a specific characteristic is likely to use the particular source when seeking health information. For example, in a regression model named “friends with kids,” the number of children “1” had an odds ratio of 7.47, indicating that a U.S. mother with one child was 7.47 times more likely to use friends with kids as her health information source than a U.S. mother with two or more children (reference group). Overall, when the U.S. mothers’ other regression models were carefully examined, independent variables named age, educational attainment, employment status, and the number of children were significant characteristics affecting U.S. mothers’ health information source use. Other independent variables named annual household income and the size of household were also somewhat significant factors influencing U.S. mothers’ health information seeking behavior. The odds ratios of the independent variables are fully reported in Appendices G1 and G2.

Table 4.7.

Statistically Significant Regression Models in the U.S. Sample

		www*	**Other relatives****	**Friends with kids****	**Coworkers *****
Age	18-30	2.13	1.69	1.13	0.95
	31-35	1.71	1.10	2.19*	2.91**
	36 or older †	1.0	1.0	1.0	1.0
Education	2-year college or less	0.35**	1.21	0.30**	1.73
	4-year college	0.58	1.07	0.89	2.29*
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0
Annual household income	$0-$34,999	0.58	3.56*	1.52	1.35
	$35,000-$49,999	0.63	0.69	0.59	0.88
	$50,000-$74,999	1.15	1.06	0.82	0.66
	$75,000-$99,999	0.83	0.93	0.75	0.77
	$100,000 or more †	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	0.65	0.93	0.79	36.68***
	Working (Part-time)	0.96	1.63	2.51*	18.49***
	Other	1.55	2.79	2.44	6.15**
	Stay-at-home †	1.0	1.0	1.0	1.0
Marital status	Single, divorced, living as married, separated	1.11	1.20	1.37	1.20
	Married †	1.0	1.0	1.0	1.0
First-time mother	Yes	0.44	2.61	0.36	0.47
	No †	1.0	1.0	1.0	1.0
Housing status	Own	1.00	1.64	1.03	0.97
	Rent or others †	1.0	1.0	1.0	1.0
Years lived in the U.S.		1.04	1.02	1.01	1.03
Number of children	1	4.31	1.81	7.47*	5.30
	2 or more †	1.0	1.0	1.0	1.0
Size of household	3 or less	0.70	0.27	0.34	0.69
	4	1.46	1.04	0.85	1.13
	5 or more †	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		544.21*	535.09**	625.43**	436.14***

Note 1. * p < 0.05. ** p < 0.01. *** p < 0.001.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to annual household income and years lived in the U.S. questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named English fluency was not tested with the U.S. sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables – age, education, annual household income, employment status, marital status, housing status, number of children, and size of household – were recoded due to considerably limited number of participants in each category. For instance, age was recorded in three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.

4.2.3.2 Immigrant Korean Sample

Among the 19 information sources, results indicated that immigrant Korean mothers' individual characteristics were significantly associated with the frequency of using five information sources (Table 4.8): TV, government health agencies, the World Wide Web, blogs/online forums, and coworkers. It is also noteworthy that demographic attributes such as age, educational attainment, annual household income, employment status, and English fluency, were statistically significant factors that would affect immigrant mothers' health information source use. Although effect sizes of three characteristics, such as years lived in the U.S., the size of household, and housing status, were not that large, these characteristics also influenced immigrant mothers' source use in blogs/online forums and books regression models.

For the significant individual characteristics, interpretations should be made with regard to the reference group (an odd ratio of 1). For instance, an immigrant Korean mother who speaks English fluently is 1.90 times more likely to utilize government health agencies as her health information source than an immigrant Korean mother who is not fluent in English language (reference group) (OR = 1.90, $p < .05$). A continuous independent variable named "years in the U.S." was statistically significant in the blogs/online forums regression model. That is, in the

immigrant Korean sample, a one-year increase in length of stay in the U.S. tended to decrease the odds that they would use blogs/online forums as their health-related information source regarding their children (OR = 0.87, $p < .01$). When other regression models in the immigrant sample were thoroughly investigated, it was interesting to note that individual characteristics, such as first-time mothers (Yes/No) or the number of children, were not statistically significant which might influence immigrant mothers' health information source use (Appendices G3 and G4).

Table 4.8.

Statistically Significant Regression Models in the Immigrant Korean Sample

		TV*	**Gov. health agencies***	**www***	**Blogs/ Online forums *****	**Coworkers*****
Age	18-30	0.46*	1.89	1.40	1.50	0.37
	31-35	1.06	1.79*	1.06	1.26	0.78
	36 or older †	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	2.74**	2.10	1.11	1.98	1.55
	4-year college	1.06	0.86	0.75	1.37	1.34
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0
Annual household income	$0-$34,999	1.31	0.94	0.98	1.23	1.26
	$35,000-$49,999	1.43	0.77	1.80	1.42	1.35
	$50,000-$74,999	1.71	1.38	1.66	1.37	2.67*
	$75,000-$99,999	2.17*	0.84	1.18	1.83	2.08
	$100,000 or more †	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	1.18	1.79	0.24**	0.55	9.33***
	Working (Part-time)	1.05	0.75	1.52	0.78	3.73*
	Other	1.39	1.87	1.33	0.57	5.03***
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0

First-time mother	Yes	1.83	0.63	1.21	0.68	0.60
	No †	1.0	1.0	1.0	1.0	1.0
Housing status	Own	1.31	1.13	0.87	0.87	0.86
	Rent or others †	1.0	1.0	1.0	1.0	1.0
Years lived in the U.S.		0.96	0.96	0.98	0.87**	0.94
Number of children	1	0.46	0.69	1.30	0.81	0.58
	2 or more †	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	0.64	0.79	1.64	4.15*	3.74
	4	0.54	0.46	2.29	2.61*	1.59
	5 or more †	1.0	1.0	1.0	1.0	1.0
English fluency	Very well / Well	0.86	1.90*	0.65	0.73	2.76**
	Not well / Not at all †	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		638.65*	721.92*	470.53*	620.16***	409.93***

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to annual household income and years lived in the U.S. questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named "marital status" was not tested with the immigrant sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables – age, education, annual household income, employment status, housing status, number of children, size of household and English fluency – were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35, and (c) 36 or above.

4.2.3.3 Korean Sample

Of the 19 information sources, the results showed that associations between frequency of using six information sources and Korean mothers' demographic characteristics existed (Table 4.9). The six information sources were as follows: books, TV, the World Wide Web, blogs/online forums, mother/mother-in-law, and coworkers. The results indicated that demographic attributes such as age, educational attainment, employment status, and fluency in English were highly significant predictors of Korean mothers' health information source use. Other influential characteristics included annual household income, years lived in Korea, and the size of household. Like the immigrant Korean sample, two attributes such as first-time mothers

(Yes/No), and the number of children were not statistically significant in all the regression models in the Korean sample.

Like the other two samples, detailed interpretations should be made in regard to the reference group (OR = 1). For example, a Korean mother with low educational attainment (i.e., two-years of college or less) was significantly less likely to use books as her health information source related to her child(ren) than a Korean mother with master or doctoral degrees (OR = 0.39, $p < .05$). In other regression models, Korean mothers' individual characteristics were not large enough to be significant but are still worth noting (Appendices G5 and G6). Although the participants' individual characteristics did not significantly influence their frequency of source use to make the overall regression model statistically significant, there were some characteristics that affected mothers' frequency of using each source. For instance, a Korean mother aged 18 to 30 years was significantly more likely to seek her child(ren)'s health information using social networking sites (OR = 3.14, $p < .01$), and microblogging sites (OR = 3.90, $p < .01$) than a Korean mother aged 36 or older (OR = 1). Although age somewhat affected Korean mothers' use of social networking sites and microblogging sites as their health information source, the effect was not large enough to make regression models statistically significant.

Table 4.9.

Statistically Significant Regression Models in the Korean Sample

		Books**	**TV*****	**www****	**Blogs/ Online forums *****	**Mother/ Mother-in-law***	**Coworkers****
Age	18-30	0.55	1.18	1.28	0.82	1.62	0.60
	31-35	0.82	0.47**	1.33	1.46	0.88	0.93
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	0.39*	1.28	1.00	1.09	0.36**	0.49

	4-year college	0.74	1.31	1.07	0.88	0.91	0.79
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	₩0-₩34,999,999	2.23	1.05	0.93	1.06	0.97	0.71
	₩35,000,000-₩49,999,999	1.28	1.31	1.47	1.71	0.78	0.82
	₩50,000,000-₩74,999,999	1.27	1.14	1.03	1.66	0.73	1.36
	₩75,000,000-₩99,999,999	2.14*	0.71	1.93	1.59	0.99	0.93
	₩100,000,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	1.67	1.14	0.62	0.50*	0.81	3.08***
	Working (Part-time)	1.24	1.55	0.24***	0.36**	0.57	2.06
	Other	1.47	1.15	0.94	1.09	0.66	1.45
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0
First-time mother	Yes	1.20	1.46	0.45	0.48	0.93	0.51
	No †	1.0	1.0	1.0	1.0	1.0	1.0
Housing status	Own	1.18	1.23	1.02	1.03	0.77	0.97
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in Korea		1.01	1.01	0.94*	0.92**	0.99	1.02
Number of children	1	1.01	1.10	1.86	2.48	1.03	0.92
	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	1.56	0.27*	0.84	1.16	0.60	1.58
	4	1.12	0.39*	0.86	1.43	0.38	1.20
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0
English fluency	Very well / Well	1.57	0.43**	1.43	1.50	1.19	0.82
	Not well / Not at all †	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		722.28***	692.35***	538.87***	630.14***	763.39*	646.58**

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to annual household income and years lived in the U.S. questions were excluded when analyzing the data for this research question.

Note 4. An independent variable named “marital status” was not tested with the immigrant sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables – age, education, annual household income, employment status, housing status, number of children, size of household and fluency in English – were recoded due to a considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35, and (c) 36 or above.

4.2.3.4 Summary of the Key Findings

Of the 11 tested demographic characteristics, nine attributes were found to influence frequency of using specific health information sources, such as age, educational attainment, annual household income, employment status, the number of children, the size of household, English fluency, housing status, and years lived in the U.S. (Korea for Korean mothers).

It is worth mentioning that three characteristics – age, educational attainment, and employment status – were highly significant predictors of all three groups of mothers' health information source use. Although an individual characteristic named "fluency in English*"* was not tested with the U.S. sample due to zero frequency in a few categories, that was one of the significant influencing factors in the other two Korean samples' source use.

4.3 Mothers' Health Information Source Preferences

4.3.1 Preferred Information Sources

To comprehend each mother's health information source preference, the researcher granted two things on the questionnaire: (a) a sample of an information horizon map that was adapted and modified from a previous study (Tsai, 2013); and (b) brief instructions on how to answer a question regarding mothers' preferences for each information source.

Mean values of 19 source preference scores were compared among three different samples (Table 4.10). When each mother's information source preferences were analyzed, the researcher provided reversed scores to each zone (five = zone one (the most preferred sources); one = zone five (the least preferred sources)). This method was adapted from previous empirical studies (Savolainen & Kari, 2004; Tsai, 2013). That is, the higher the mean value, the higher likelihood the specific source will be included in zone one. Also, participants who answered

"Not in my information horizon" were excluded from the analyses. When the top three preferred information sources were compared, healthcare providers such as doctors (*M* = 4.63, *SD* = .82), nurses (*M* = 4.32, *SD* = .97), and the World Wide Web (*M* = 4.21, *SD* = 1.08) tended to be the most favored sources among the U.S. mothers. The other two Korean samples, on the other hand, preferred the World Wide Web the most (Immigrant Korean mothers: *M* = 4.48, *SD* = .86; Korean mothers: *M* = 4.30, *SD* = 1.10), followed by doctors (Immigrant Korean mothers: *M* = 4.27, *SD* = 1.06; Korean mothers: *M* = 4.12, *SD* = 1.15), and blogs/online forums (Immigrant Korean mothers: *M* = 4.05, *SD* = 1.17; Korean mothers: *M* = 3.97, *SD* = 1.15).

Table 4.10.

Information Source Preference of the Three Samples (N = 851)

Rank	U.S. Mothers (*n* = 255)		Immigrant Korean Mothers (*n* = 300)		Korean Mothers (*n* = 296)	
	Source	***M (SD)***	**Source**	***M (SD)***	**Source**	***M (SD)***
1	Doctors	4.63 (.82)	The World Wide Web (www)	4.48 (.86)	The World Wide Web (www)	4.30 (1.10)
2	Nurses	4.32 (.97)	Doctors	4.27 (1.06)	Doctors	4.12 (1.15)
3	The World Wide Web (www)	4.21 (1.08)	Blogs or online forums	4.05 (1.17)	Blogs or online forums	3.97 (1.15)
4	Husband or Spouse	3.49 (1.26)	Nurses	3.76 (1.31)	Friends with kids	3.62 (1.06)
5	Friends with kids	3.31 (1.09)	Friends with kids	3.64 (1.07)	Nurses	3.33 (1.32)
6	Government health agencies	3.20 (1.27)	Husband or Spouse	3.24 (1.24)	Social networking sites (e.g. Facebook, Instagram etc.)	3.26 (1.35)

7	Social networking sites (e.g. Facebook, Instagram etc.)	3.14 (1.21)	Social networking sites (e.g. Facebook, Instagram etc.)	3.18 (1.29)	Books	3.07 (1.33)
	Mother or mother-in-law	3.14 (1.32)				
8			Mother or mother-in-law	3.05 (1.21)	Husband or Spouse	2.97 (1.21)
9	Blogs or online forums	2.88 (1.14)	Social media sharing sites (e.g. YouTube, Flickr etc.)	3.04 (1.26)	Government health agencies	2.94 (1.26)
10	Other relatives	2.50 (1.24)	Government health agencies	3.01 (1.34)	Mother or mother-in-law	2.93 (1.20)
					Microblogging sites (e.g., Twitter etc.)	2.93 (1.31)
11	Books	2.41 (1.38)	Books	2.83 (1.44)		
12	Social media sharing sites (e.g. YouTube, Flickr etc.)	2.22 (1.17)	Microblogging sites (e.g., Twitter etc.)	2.78 (1.29)	Social media sharing sites (e.g. YouTube, Flickr etc.)	2.81 (1.27)
13	Coworkers	2.21 (1.19)	TV programs	2.30 (1.15)	TV programs	2.61 (1.10)
	Father or father-in-law	2.21 (1.22)				
14			Newspapers/ magazines	2.14 (1.25)	Newspapers/ magazines	2.49 (1.21)
15	Newspapers/ magazines	1.90 (1.02)	Father or father-in-law	2.02 (1.17)	Coworkers	2.41 (1.18)
16	TV programs	1.85 (1.01)	Other relatives	2.01 (1.20)	Father or father-in-law	2.23 (1.23)
17	Microblogging sites (e.g., Twitter etc.)	1.84 (1.04)	Coworkers	1.99 (1.11)	Other relatives	2.06 (1.25)
18	Friends without kids	1.47 (.79)	Librarians	1.51 (.98)	Librarians	1.75 (1.22)
19	Librarians	1.44 (.77)	Friends without kids	1.37 (.75)	Friends without kids	1.69 (1.08)

Note 1. Mean scores based on 5-point Likert scale: 5 = Zone 1 (the most preferred sources); 1 = Zone 5 (the least preferred sources).

Note 2. Participants who did not use the specific source and answered, “Not in my information horizon” were excluded from the analysis.

A series of one-way ANOVA tests were conducted to examine whether there were any statistical differences in preferences of the 19 information sources (Table 4.11). Results revealed that 14 out of 19 source preferences showed statistically significant differences across the three groups.

Table 4.11.

Group Differences in Mothers' Source Preferences (N = 851)

Information source	**U.S. Mothers (*n* = 255)**	**Immigrant Korean Mothers (*n* = 300)**	**Korean Mothers (*n* = 296)**		
	M (SD)	***M (SD)***	***M (SD)***	*F*	*p*
a. Books on health information ***	2.41 (1.38)	2.83 (1.44)	3.07 (1.33)	12.733	**.000**
b. Newspapers / Magazines on health information ***	1.90 (1.02)	2.14 (1.25)	2.49 (1.21)	13.058	**.000**
c. Health programs on TV ***	1.85 (1.01)	2.30 (1.15)	2.61 (1.10)	23.703	**.000**
d. Resources provided by government health agencies	3.20 (1.27)	3.01 (1.34)	2.94 (1.26)	2.828	.060
e. The World Wide Web (www) **	4.21 (1.08)	4.48 (.86)	4.30 (1.10)	5.107	**.006**
f. Social Networking Sites (e.g., Facebook, Instagram etc.)	3.14 (1.21)	3.18 (1.29)	3.26 (1.35)	.556	.573
g. Social Media Sharing Sites (e.g., YouTube, Flickr etc.) ***	2.22 (1.17)	3.04 (1.26)	2.81 (1.27)	22.241	**.000**
h. Microblogging sites (e.g., Twitter etc.) ***	1.84 (1.04)	2.78 (1.29)	2.93 (1.31)	31.912	**.000**
i. Blogs or online forums ***	2.88 (1.14)	4.05 (1.17)	3.97 (1.15)	74.693	**.000**
j. Doctors ***	4.63 (.82)	4.27 (1.06)	4.12 (1.15)	17.080	**.000**
k. Nurses ***	4.32 (.97)	3.76 (1.31)	3.33 (1.32)	41.453	**.000**
l. Husband / Spouse ***	3.49 (1.26)	3.24 (1.24)	2.97 (1.21)	10.812	**.000**
m. Mother / Mother-in-law	3.14 (1.32)	3.05 (1.21)	2.93 (1.20)	1.726	.179
n. Father / Father-in-law	2.21 (1.22)	2.02 (1.17)	2.23 (1.23)	1.609	.201
o. Other relatives ***	2.50 (1.24)	2.01 (1.20)	2.06 (1.25)	7.749	**.000**
p. Friends who have kids **	3.31 (1.09)	3.64 (1.07)	3.62 (1.06)	7.412	**.001**
q. Friends without kids **	1.47 (.79)	1.37 (.75)	1.69 (1.08)	5.097	**.006**
r. Coworkers *	2.21 (1.19)	1.99 (1.11)	2.41 (1.18)	4.273	**.015**
s. Librarians	1.44 (.77)	1.51 (.98)	1.75 (1.22)	2.769	.064

Note 1. * p < .05, ** p < .01, *** p < .001.
Note 2. Mean scores based on 5-point Likert scale: 5 = Zone 1 (the most preferred sources); 1 = Zone 5 (the least preferred sources).
Note 3. Participants who did not use the specific source and answered, "Not in my information horizon" were excluded from the analysis.

Post hoc analyses using the Tukey HSD test revealed that the U.S. mothers were less likely to prefer books ($F(2, 701) = 12.733$, $p < .001$; $Mean_{U.S.} = 2.41$, $Mean_{immi} = 2.83$, $Mean_{Kor} = 3.07$), social media sharing sites (e.g. YouTube, Flickr etc.) ($F(2, 657) = 22.241$, $p < .001$; $Mean_{U.S.} = 2.22$, $Mean_{immi} = 3.04$, $Mean_{Kor} = 2.81$), microblogging sites (e.g., Twitter etc.) ($F(2, 576) = 31.912$, $p < .001$; $Mean_{U.S.} = 1.84$, $Mean_{immi} = 2.78$, $Mean_{Kor} = 2.93$), blogs/online forums ($F(2, 798) = 74.693$, $p < .001$; $Mean_{U.S.} = 2.88$, $Mean_{immi} = 4.05$, $Mean_{Kor} = 3.97$), and friends who have kids ($F(2, 804) = 7.412$, $p < .001$; $Mean_{U.S.} = 3.31$, $Mean_{immi} = 3.64$, $Mean_{Kor} = 3.62$) as health information sources with respect to their child(ren) than the other two Korean samples (i.e., immigrant Korean mothers and Korean mothers). Post hoc analyses also indicated that the U.S. mothers tended to prefer doctors ($F(2, 837) = 17.080$, $p < .001$; $Mean_{U.S.} = 4.63$, $Mean_{immi} = 4.27$, $Mean_{Kor} = 4.12$) and other relatives ($F(2, 488) = 7.749$, $p < .001$; $Mean_{U.S.} = 2.50$, $Mean_{immi} = 2.01$, $Mean_{Kor} = 2.06$) significantly as their child(ren)'s health information source than the other two Korean samples. Lastly, a post hoc analysis also revealed that immigrant Korean mothers tended to prefer the World Wide Web ($F(2, 839) = 5.107$, $p < .01$; $Mean_{U.S.} = 4.21$, $Mean_{immi} = 4.48$) significantly more than the U.S. mothers.

To measure the magnitude of differences in preferences, effect sizes for the ANOVA results were calculated using eta squared (η^2). Cohen (1988) explained that $\eta^2 = .02$ denotes a small effect size, $\eta^2 = .13$ denotes a medium effect size, and $\eta^2 = .26$ denotes a large effect size. Among 14 statistically significant information sources, effect size of the three different groups in preferences was medium for blogs/online forums ($\eta^2 = .16$); close to medium for microblogging sites ($\eta^2 = .10$) and nurses ($\eta^2 = .10$); and small for the rest of the 11 sources (η^2 around .02).

4.3.2 Information Horizon Maps by Source Preferences

Sonnenwald (1999, 2005) proposed the information horizon theoretical framework to accurately explore human information-seeking behavior in context. The current study utilized this theoretical framework to graphically represent each group's source preferences. When the participants were asked about each source's preference, a sample of the information horizon map, which was adapted/modified from a previous study (Tsai, 2013), and detailed instructions on how to answer the questions were provided. The information horizon map had five different zones (zone 1 = the most preferred sources through zone 5 = the least preferred sources), and each participant was asked to select the most appropriate place for each source in accordance with her preference. It should be noted that if a participant had not used the specific information source, she was able to select one of the options as "not in my information horizon." Finalized graphical representations of each group's source preferences are displayed in Figure 4.2.

Since the statistical analyses were carried out by the mean values of each source's preference, the following source preferences were drawn by another type of average called *mode*. Mode refers to the most frequent number on the preference of respective source in each group. For instance, in the case of the U.S. mothers, a source named "blogs/online forums" was located in zone 3 because the largest number of the U.S. participants positioned blogs/online forums to zone 3. Mode was also effective to find out unused sources as health-related information sources. As another example, social media sharing sites (e.g., YouTube) was not on the information horizon maps of the U.S. sample because the largest number of the U.S. mothers stated that social media sharing sites (e.g., YouTube) was not in their information horizons.

Figure 4.2.

Mothers' Information Horizons Maps in the Context of their Child(ren)'s Health

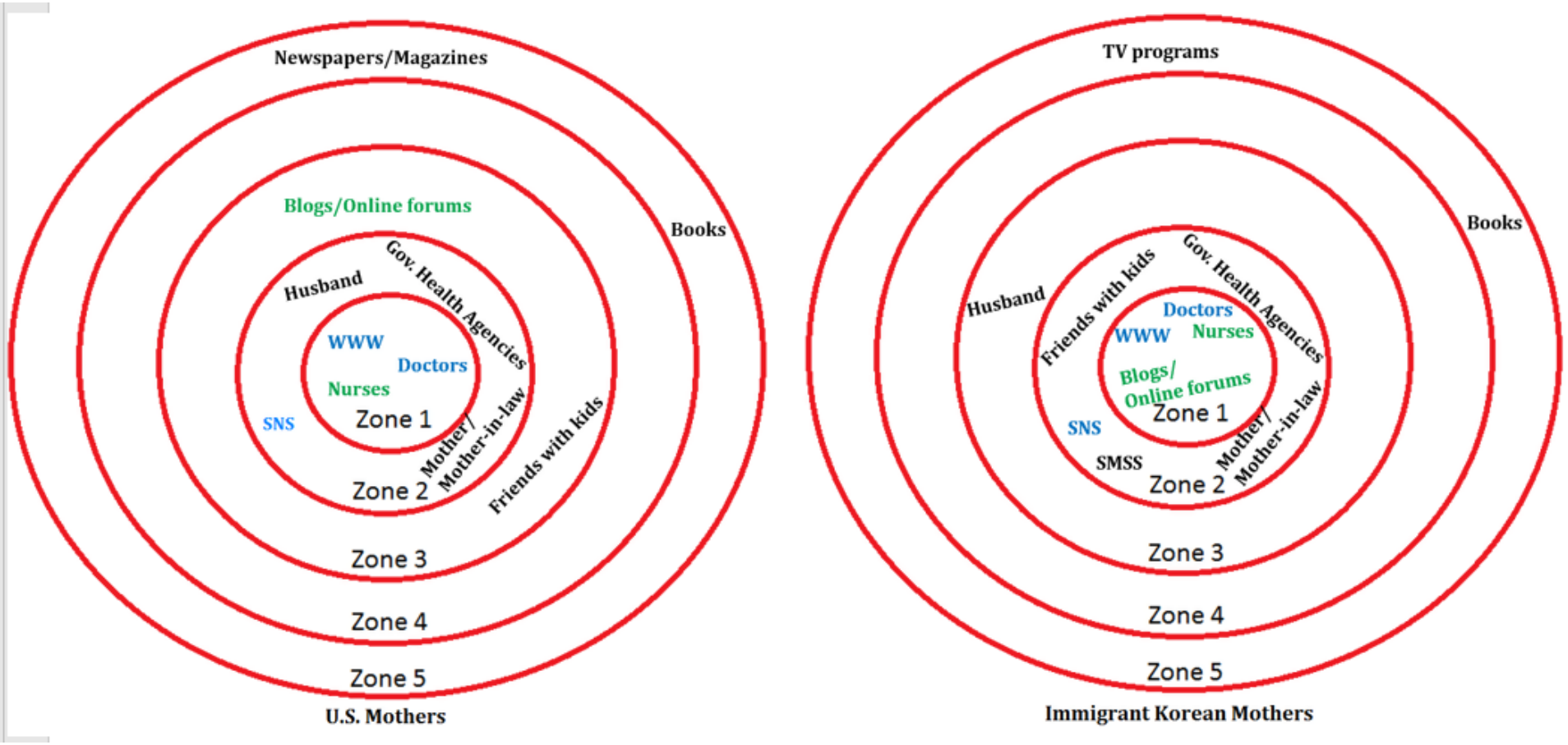
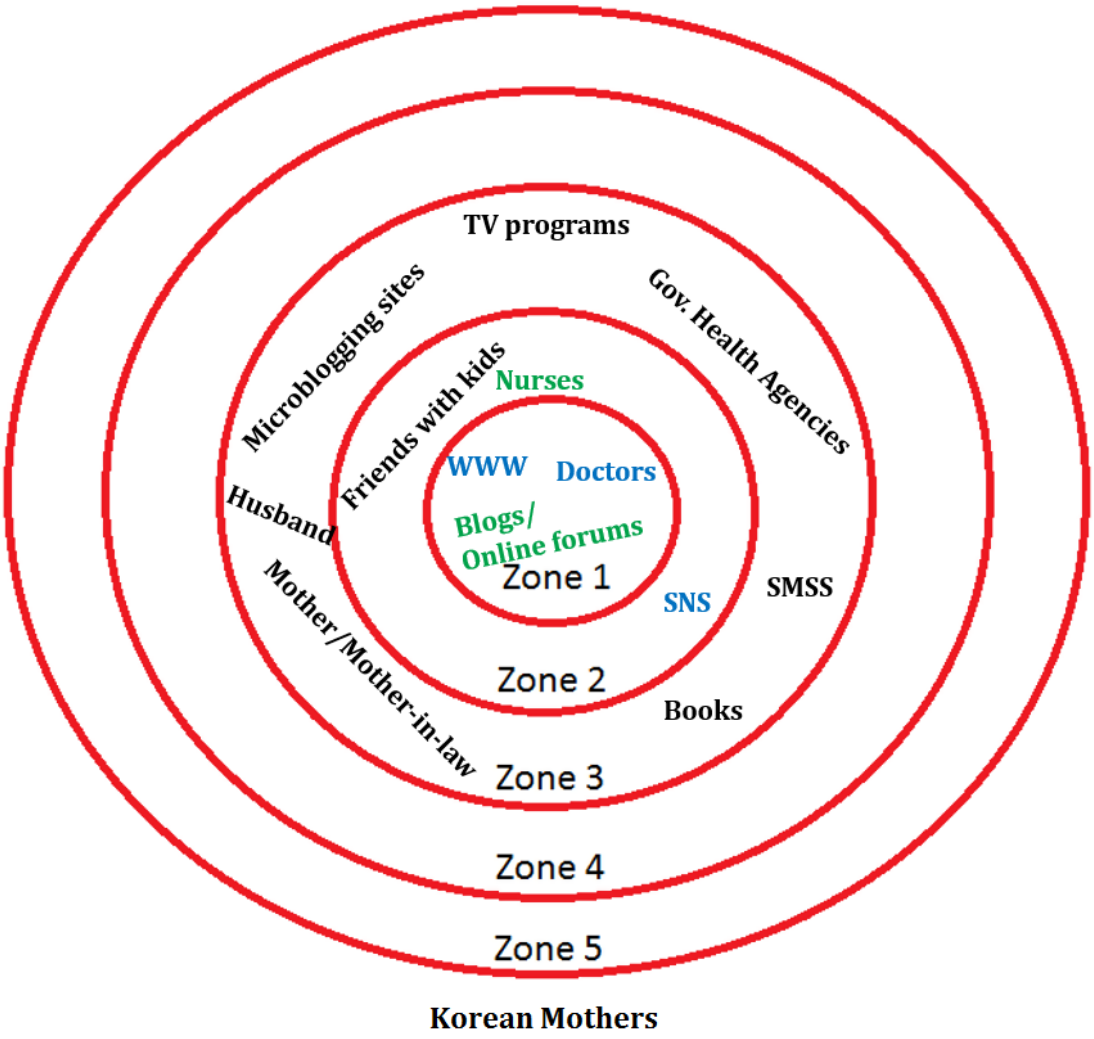


Figure 4.2. (continued).

Mothers' Information Horizons Maps in the Context of Children's Health



In the following sections, each group of mothers' information horizon maps in the context of their child(ren)'s health are illustrated.

4.3.2.1 U.S. Sample

The participants expressed their preferences out of the 19 information sources. Eleven sources were somewhat distributed ranging from zone 1 (the most preferred sources) through zone 5 (the least preferred sources). On the U.S. mothers' information horizon maps, 11 information sources appeared as follows:

- Zone 1: the World Wide Web, doctors, nurses;
- Zone 2: husband/spouse, mother/mother-in-law, social networking sites (e.g., Facebook, Instagram etc.), government health agencies;
- Zone 3: friends with kids, blogs/online forums; and
- Zone 5: books, newspapers/magazines.

When it comes to comparing between personal and non-human sources, the results confirmed that the U.S. mothers tended to prefer non-human sources (5 out of 10, 50%) slightly more to personal sources (6 out of 9, 66.7%) as their health information sources. Furthermore, when sources in zone 1 were carefully examined, U.S. mothers were more likely to prefer doctors, nurses, and the World Wide Web the most. This was consistent with the statistical analyses that were conducted with the mean values of preferences.

Eight sources, including social media sharing sites (e.g., YouTube), TV, microblogging sites (e.g., Twitter), father/father-in-law, other relatives, friends without kids, coworkers, and librarians, were not shown in the U.S. mothers' information horizons. That implies those were unused sources for U.S. mothers. However, it is notable that social media sharing sites (e.g.,

YouTube) and TV programs were represented in the other two groups' information horizons (i.e., social media sharing sites - Immigrant mothers: zone 2, Korean mothers: zone 3; TV programs - Immigrant mothers: zone 5, Korean mothers: zone 3).

4.3.2.2 Immigrant Korean Sample

In the immigrant Korean mothers' information horizons, 12 out of 19 different sources were represented as follows:

- Zone 1: the World Wide Web, doctors, nurses, blogs/online forums;
- Zone 2: friends with kids, mother/mother-in-law, social networking sites (e.g., Facebook, Instagram etc.), social media sharing sites (e.g., YouTube), government health agencies;
- Zone 3: husband/spouse; and
- Zone 5: books, TV programs.

Among those 12 sources, it was interesting to note that nine sources were concentrated either in zone 1 or in zone 2. In terms of comparing between personal and non-human sources, the results indicated that the immigrant mothers were more likely to prefer non-human sources (5 out of 10, 50%) more to personal sources (7 out of 9, 77.8%) as their health information sources. Unlike the U.S. sample, the other two Korean groups of mothers positioned blogs/online forums in zone 1. It was also interesting that the immigrant Korean mothers tended to position nurses in zone 1 (the most preferred sources) because nurses were not that frequently used sources among immigrant Korean mothers when seeking health information. That is, it was inconsistent with the frequency of using the source and mothers' source preference.

Seven sources, including newspapers/magazines, microblogging sites (e.g., Twitter), father/father-in-law, other relatives, friends without kids, coworkers, and librarians, were not

represented in the immigrant mothers' information horizons because the largest number of the immigrant Korean mothers answered that they had not used the above sources as their health information in relation to their child(ren).

4.3.2.3 Korean Sample

On the Korean mothers' information horizon maps, 13 out of 19 information sources were presented as follows:

- Zone 1 (the most preferred sources): the World Wide Web, doctors, blogs/online forums;
- Zone 2: friends with kids, nurses, social networking Sites (e.g., Facebook, Instagram etc.); and
- Zone 3: husband/spouse, mother/mother-in-law, social media sharing sites (e.g., YouTube), microblogging sites (e.g., Twitter), books, government health agencies, TV programs.

It is notable that all the thirteen sources were concentrated in between zone 1 and zone 3. Like the other two samples, Korean mothers also tended to prefer non-human information sources (8 out of 9, 88.9%) to personal sources (5 out of 10, 50%). It was interesting to note that Korean mothers tended to position nurses in zone 2 on their information horizon maps because the other two groups of mothers did in zone 1. Interview results in the following section 4.3 will illuminate this finding.

Six sources including newspapers/magazines, father/father-in-law, other relatives, friends without kids, coworkers, and librarians were not shown in the Korean mothers' information horizons. Compared to the other two samples, it was unique that books (U.S. mothers: zone 5, Immigrant mothers: zone 5, Korean mothers: zone 3) and microblogging sites (e.g., Twitter)

(U.S. mothers: Not appeared; Immigrant mothers: Not appeared; Korean mothers: zone 3) were favored by the Korean mothers as their health information sources.

4.4 Mothers' Information-Seeking Pathways based on Child(ren) Health Status

In the second phase of the current research, semi-structured interviews were conducted with 24 mothers of healthy infants and toddlers (i.e., eight U.S. mothers, eight immigrant Korean mothers, and eight Korean mothers) to understand a sequence of steps that mothers follow when seeking health information with respect to their child(ren). The interviews were carried out either face-to-face, via telephone, or via Skype interviews based on the participant's preference.

Child(ren)'s health status has been noted as one of the influential characteristics that might affect mothers' health information needs and seeking behavior (Baker et al., 2007; Skranes et al., 2014). One of the research goals was to comprehend any differences in information-seeking pathways when their child was ill versus when their child was healthy. That is because, even though all the participants were recruited as mothers of healthy infants and toddlers in this study, the urgency of issues may differ based on their child(ren)'s conditions. When the interview protocol was developed, the major interview questions were divided into two for asking mothers' information-seeking pathways in accordance with their child(ren)'s health status (i.e., when their child was sick vs. when their child was healthy). The completed interview protocol is attached in Appendix C. During the interview session, each participant was asked to draw their health information seeking patterns in relation to their child(ren) based on their previous experiences. Those drawings were analyzed to figure out mothers' information-seeking pathways. Examples of the drawing are shown in Figure 4.3.

In order to synthesize all the participants' drawings, the coding team first identified which sources were used in which step, and the reasons (source characteristics) each source was utilized were also analyzed. Finalized results of each group are described in the following sections. Moreover, the reasons for using the specific sources are illustrated with the interviewees' quotes.

Figure 4.3.

Examples of the Participants' Drawings

4.4.1 U.S. Sample

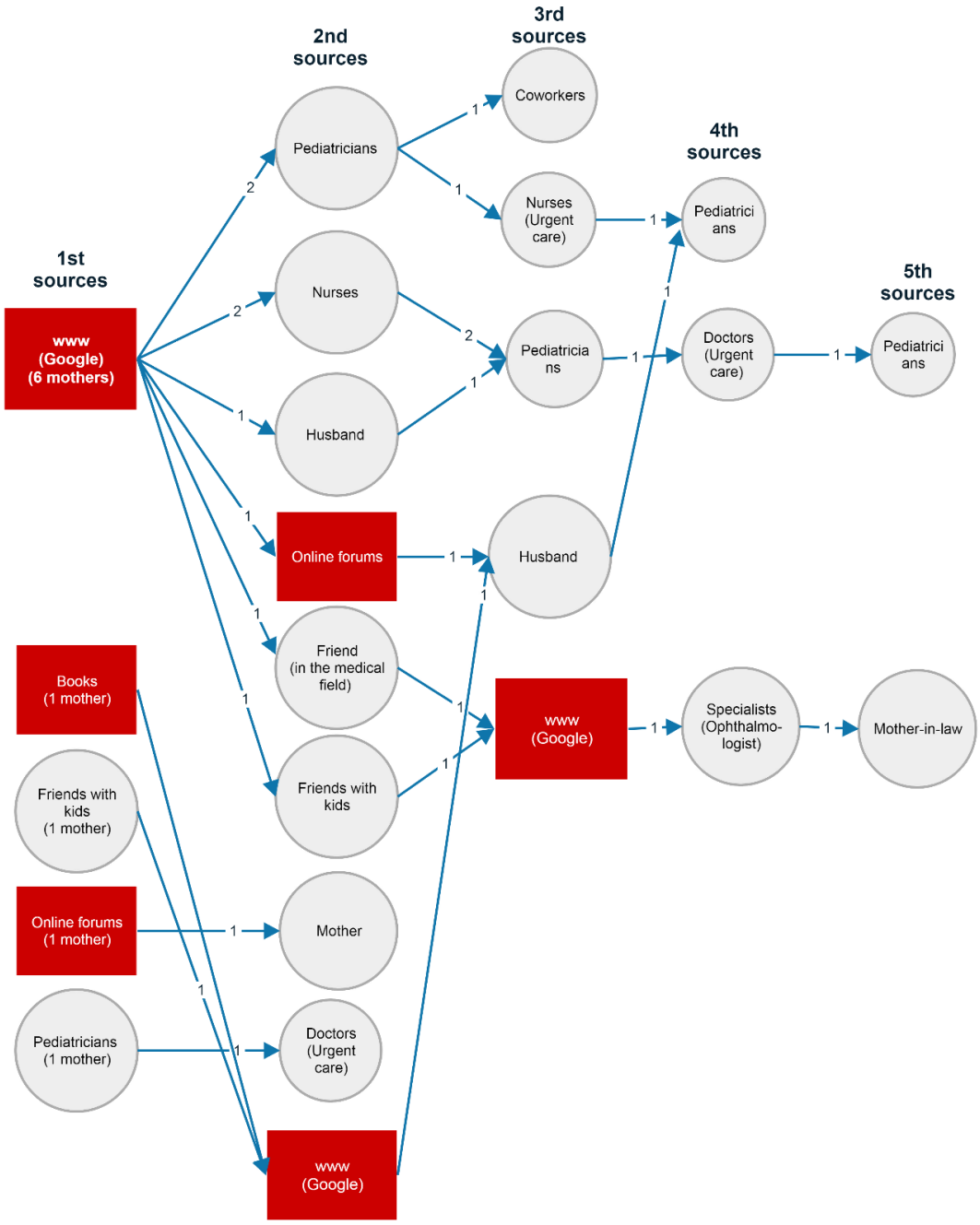
Information-seeking pathways when their child(ren) was sick

U.S. mothers' finalized health information-seeking pathways when their child was ill are shown in Figure 4.4. It should be noted that mothers were able to illustrate their multiple cases of information-seeking experiences during the interviews. Overall, personal sources were more

frequently used in mothers' information-seeking pathways related to their child(ren) compared to non-human sources.

Figure 4.4.

U.S. Mothers' Information-Seeking Pathways when Their Child was Sick



Note. Red rectangles indicate non-human sources and gray circles indicate personal sources.

Results revealed that six out of eight U.S. mothers (75%) used the World Wide Web as their first information source when their child(ren) was sick. Among a lot of resources, websites including Mayo Clinic, CDC, WebMD, Wikipedia, Kidshealth.org, Healthline.com, KellyMom.com, Babycenter.com were utilized by the U.S. mothers (Table 4.12).

Table 4.12.

Online Resources Used by the U.S. Mothers (n = 8)

Rank	Name	URL	Frequency (%)
1	WebMD	https://www.webmd.com/	5 out of 8 (62.5%)
2	CDC	https://www.cdc.gov/	4 out of 8 (50%)
3	Mayo Clinic	https://www.mayoclinic.org/	3 out of 8 (37.5%)
	Baby Center	https://www.babycenter.com/	3 out of 8 (37.5%)
5	Medical News Today	https://www.medicalnewstoday.com/	1 out of 8 (12.5%)
	Kellymom	https://kellymom.com/	1 out of 8 (12.5%)
	Healthline	https://www.healthline.com/	1 out of 8 (12.5%)
	PubMed	https://www.ncbi.nlm.nih.gov/pubmed/	1 out of 8 (12.5%)
	NIH	https://www.nih.gov/	1 out of 8 (12.5%)
	Kids Health	https://kidshealth.org/	1 out of 8 (12.5%)
	Motherly	https://www.mother.ly/	1 out of 8 (12.5%)
	Wikipedia	https://www.wikipedia.org/	1 out of 8 (12.5%)

The major reason the U.S. sample selected *the World Wide Web* as their first information source was because it was *easily accessible* and *convenient*.

> *I usually start with a quick Google search on my phone, just to see what resources are available. (US2)*

> *Um, honestly because it was the middle of the night. Once my kids were asleep, I actually had time to sit down and think about it and look into it. (US5)*

Of those mothers, two highlighted the crosschecking of multiple sources of information in order to help them determine credibility of resources.

Google, probably just, if I recognize the website, or I'll read several things, so if I see the same information in several different places then that helps me know it's more likely true. (US1)

I usually try to look for multiple sources. So even though I go to like the mom's forum and the WebMD, I don't just use one source, I try to go to multiple sources and if I see the same answers coming up, then I realize, you know, my kid's probably okay as long as her symptoms don't worsen. (US3)

On the other hand, there was another group of mothers (two out of eight, 25%) who disliked the World Wide Web as their first information source; instead they used books (e.g., US8) or pediatricians (e.g., US7) as their first information source.

I didn't really want to look at a screen, I think. [Not] to disrupt my sleep, or my idea was like there's a lot of information on the Internet, um, I don't want to get scared, let me look at the hard and fast resources that I have at my disposal to start there. (US8)

My kid got an immunization and had a reaction to it. I don't [didn't] know if he had some kind of GI [gastrointestinal] issues, and he woke up from his nap screaming like a knife was being stabbed into his gut. So, of course, I called my doctor [pediatrician] immediately. (US7)

As seen from the U.S. mothers' information seeking paths (Figure 4.4), diverse types of medical professionals, such as pediatricians, nurses, doctors/nurses at urgent care clinics, and specialists (e.g., ophthalmologists), were used. Seven out of eight U.S. mothers (87.5%) used medical professionals as their information sources when their child(ren) was sick. They argued that medical professionals were one of the most credible/trustworthy sources.

They have medical backgrounds, and I really love our pediatrician … and I appreciate her knowledge. (US6)

I feel like, specialty doctors, like ophthalmologists, they spend a lot of time looking at eyes. So, I feel like they're probably going to have a pretty good idea of what's going on. (US5)

To sum up, while several information sources were used among the U.S. mothers, a greater number of the interviewees started their information seeking online, and their seeking behavior tended to end after they communicated with medical professionals.

Information-seeking pathways when their child(ren) was healthy

When the U.S. participants' child was healthy, mothers tended to seek information on a variety of topics, such as growth and development (e.g., US1, US3, US4, US6), breastfeeding (e.g., US2), parenting styles (e.g., US8), and nutrition and diets (e.g., US4).

So, in this case, I was looking for information regarding breast feeding. (US2)

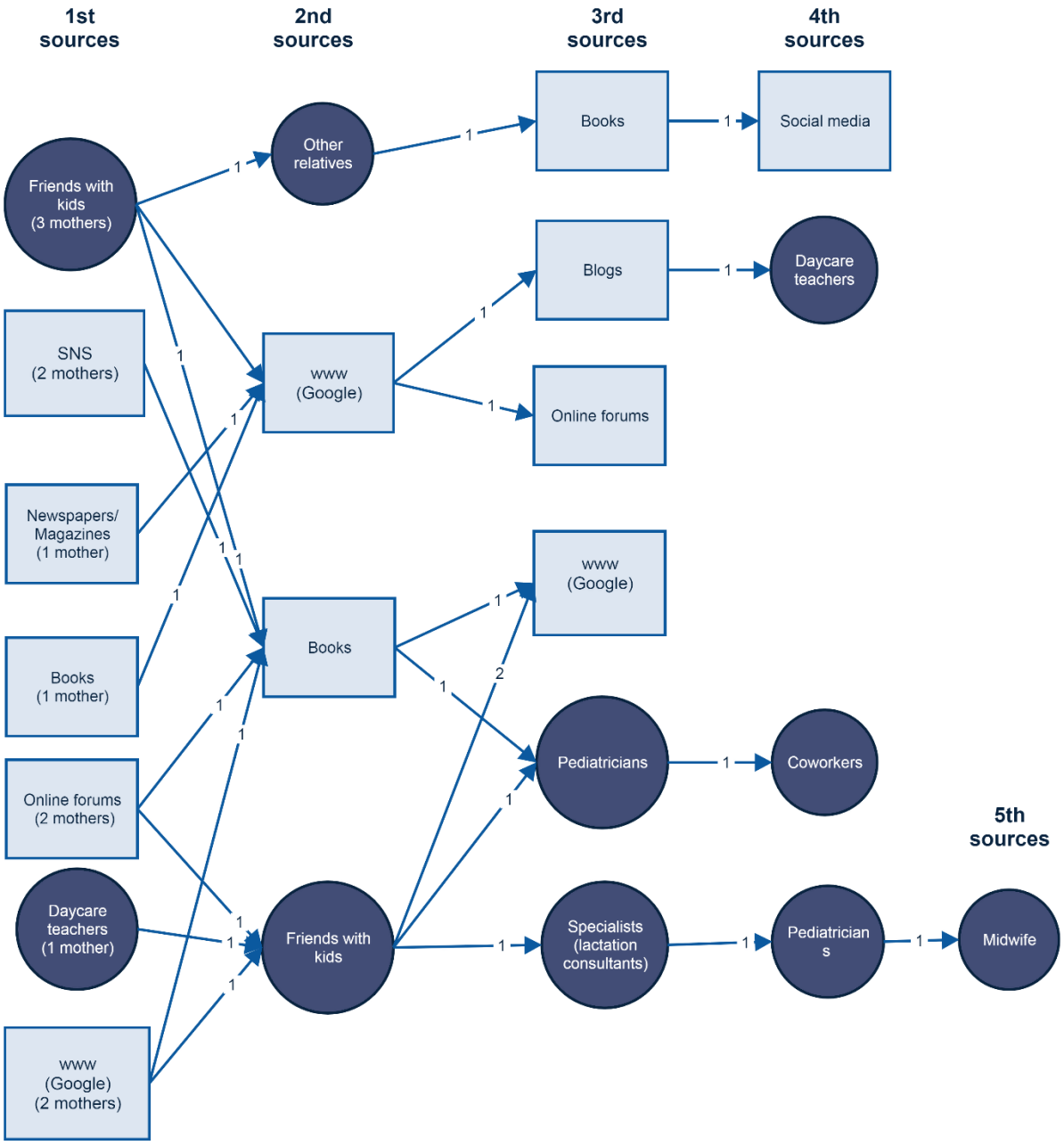
I might just be reading something about child development or child wellbeing. (US3)

I would say it's one of the main things that I have sought information about or seek training in introducing solids and then to a lesser extent, like developmental milestones and what is normal. (US4)

For the U.S. sample, mothers' information seeking tended to start from several different sources (Figure 4.5), such as friends with kids, social networking sites (e.g., Facebook), newspapers/magazines, books, online forums, daycare teachers, and the World Wide Web.

Figure 4.5.

U.S. Mothers' Information-Seeking Pathways when Their Child was Healthy



Note. Rectangles indicate non-human sources, whereas circles indicate personal sources.

It is interesting to note that a higher number of non-human sources appeared in their health-related information-seeking pathways. Also, diverse types of social media platforms

including social networking sites (e.g., Facebook), blogs, and online forums rather than medical professionals were likely to play an important role as their information sources. Of the social media users, two mothers highlighted the importance of online forums as supportive information sources.

> *I would just add that any new mothers to definitely find a group of mothers on social media to be able to use as a resource and actually just having this conversation it kind of solidifies in my mind that, like, if I know that there's mothers that are not connected in social media, just to check on them to see if they have that group think and a safe place to be able to find answers for their questions and that kind of thing just to feel supported. (US7)*

Three online forum users also emphasized their familiarity with the source as one of the reasons for choosing it.

> *Using social media groups is part of my lifestyle now. (US7)*
>
> *Well the Facebook groups, I have been in them for a couple of years, because I have an older child as well. (US5)*

Also, when their child(ren) was healthy, two U.S. participants (25%) mentioned daycare teachers as one of their most accurate/credible health information sources related to child development topics.

> *I consult with daycare teachers a lot, because they have a lot of child development, psychology degrees. (US3)*
>
> *A daycare provider probably has seen a ton of examples throughout her 24 years career… (US6)*

Likewise, friends with kids were also frequently used sources among the U.S. mothers regardless of their child's health status (i.e., both their child(ren) was sick and healthy). The mothers tended to value other mothers' experiences from real life.

> *I really do appreciate real experiences from real people and what works for them … not even just their experiences but their experiences from their friends and they have a lot of exposure to other moms as well because they've been moms for 10 or 15 years, so they talk to a lot of moms in their time. (US1)*

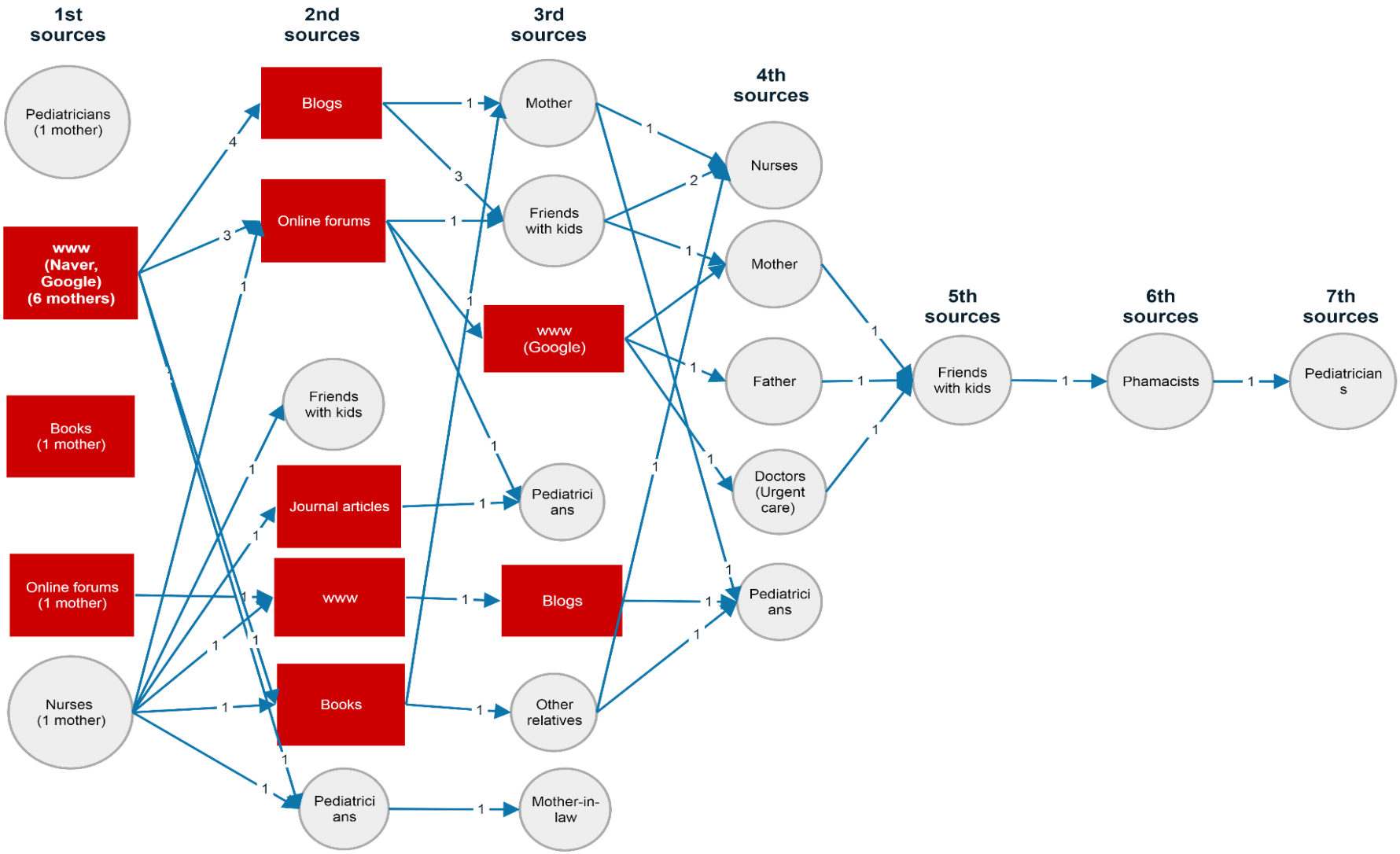
Consequently, based on the analyses of U.S. mothers' interviews, the researcher was able to realize U.S. mothers' information seeking paths, and the reasons of using each source tended to differ by their child(ren)'s health status (i.e., sick vs. healthy). Comparisons with the other two groups will be discussed in Chapter 5.

4.4.2 Immigrant Korean Sample

Information-seeking pathways when their child(ren) was sick

Eight immigrant Korean mothers' finalized health information-seeking pathways when their child was sick are shown in Figure 4.6. Compared to the U.S. sample, immigrant mothers tended to use a greater number of non-human information sources. This could be illuminated by one of the new themes that appeared among the immigrant mothers. Three out of 8 immigrant mothers (37.5%) underlined that language barriers tended to influence their health information seeking behavior.

Figure 4.6. *Immigrant Korean Mothers' Information-Seeking Pathways when Their Child was Sick*



Note. Red rectangles indicate non-human sources and gray circles indicate personal sources.

Talking with health professionals is also uncomfortable due to language barriers. (IM1)

I feel like accessing to the medical services is not easy for me, because it is somewhat difficult to explain my child's symptoms due to the language barriers. That is why I usually do not go to pediatrics [pediatric departments]. (IM3)

One immigrant mother specifically explained difficulties in searching on Google due to the language barriers. Therefore, she was inclined to search using one of the Korean search engines named *Naver*.

If I needed to use Google, you know, I have to use English language, but since I'm not that good at English it is hard for me to pick search terms… Using Naver, however, I can search in more specific ways. By adding more key terms while searching, I prefer to search using Naver to Google. I can find more detailed things using Naver. (IM2)

Six of the eight immigrant mothers (75%) were likely to select the World Wide Web as their first health information source. Among those six immigrant mothers, four of them stated that they utilized both Google and Naver, as well as websites, such as Mayo Clinic, Babycenter, Parents.com, Momjunction.com (see Table 4.13). Compared to the U.S. sample, immigrant Korean mothers' resources were considerably limited. In particular, no resources provided by government health agencies were used by the immigrant Korean sample.

Table 4.13.

Online Resources Used by the Immigrant Korean Mothers (n = 8)

Rank	Name	URL	Frequency (%)
1	Mayo Clinic	https://www.mayoclinic.org/	1 out of 8 (12.5%)
	Baby Center	https://www.babycenter.com/	1 out of 8 (12.5%)
	Parents.com	https://www.parents.com/	1 out of 8 (12.5%)
	Momjunction.com	https://www.momjunction.com/	1 out of 8 (12.5%)

Five out of 8 immigrant mothers (62.5%) chose accessible/convenient as the reasons for using the World Wide Web as their information source.

By searching online, I can get the information I wanted as quickly as possible. (IM2, IM4)

I think the fastest way is to search on the Internet. (IM8)

I think the accessibility matters. If I wanted to ask one of my friends, I need to send a message to her and wait for response. That takes time. Also, with my little one, I feel like my free time is somewhat limited. Thus, I like to search online using my mobile device when my child is asleep. (IM3)

It is also noteworthy that immigrant mothers tended to value health information from other mothers' blogs based on their similar experiences from real life.

I trust health information from other moms' blogs a lot, because they would have lots of experiences than I do. (IM2)

I prefer other mothers' blog posts based on their real experiences. Some postings are very specific. (IM4)

Five out of 8 mothers (62.5%) expressed their difficulties in accessing healthcare professionals as an information source. It was noteworthy that mothers had tried to seek information from healthcare professionals only by meeting them in person or via phone. Thus, making an appointment with pediatricians has been one of the major reasons why they consider healthcare professionals inaccessible.

It takes time to make an appointment with pediatricians. I also feel like they are not treating my baby promptly. Also, when I call the pediatrics and explain my child's symptoms, the nurses tell me other alternative ways for treatments, but they never ask me

to visit the clinic. (IM8)

In my case, it takes approximately 25 minutes to get to the pediatrics [pediatric clinics] by car. Although I get there, waiting takes time, approximately 1 to 2 hrs. (IM4)

Based on my experience, it was difficult for me to make an appointment on that day. (IM1, IM3)

On the other hand, there was an immigrant mother who used nurses as her first information source and had a satisfying information seeking experience. She said that easy accessibility, urgency of the issue, and support from health professionals had affected her information seeking behavior.

When it was urgent situation, I did not have time to search online or utilize books. I needed immediate advice from medical professionals, so I called the pediatrics promptly. … Nurses also let me know a few ways to treat my little one and told me feel free to call back if those ways do not work. At that time, I felt like I was collaborating with the medical professionals to make my child gets better. (IM7)

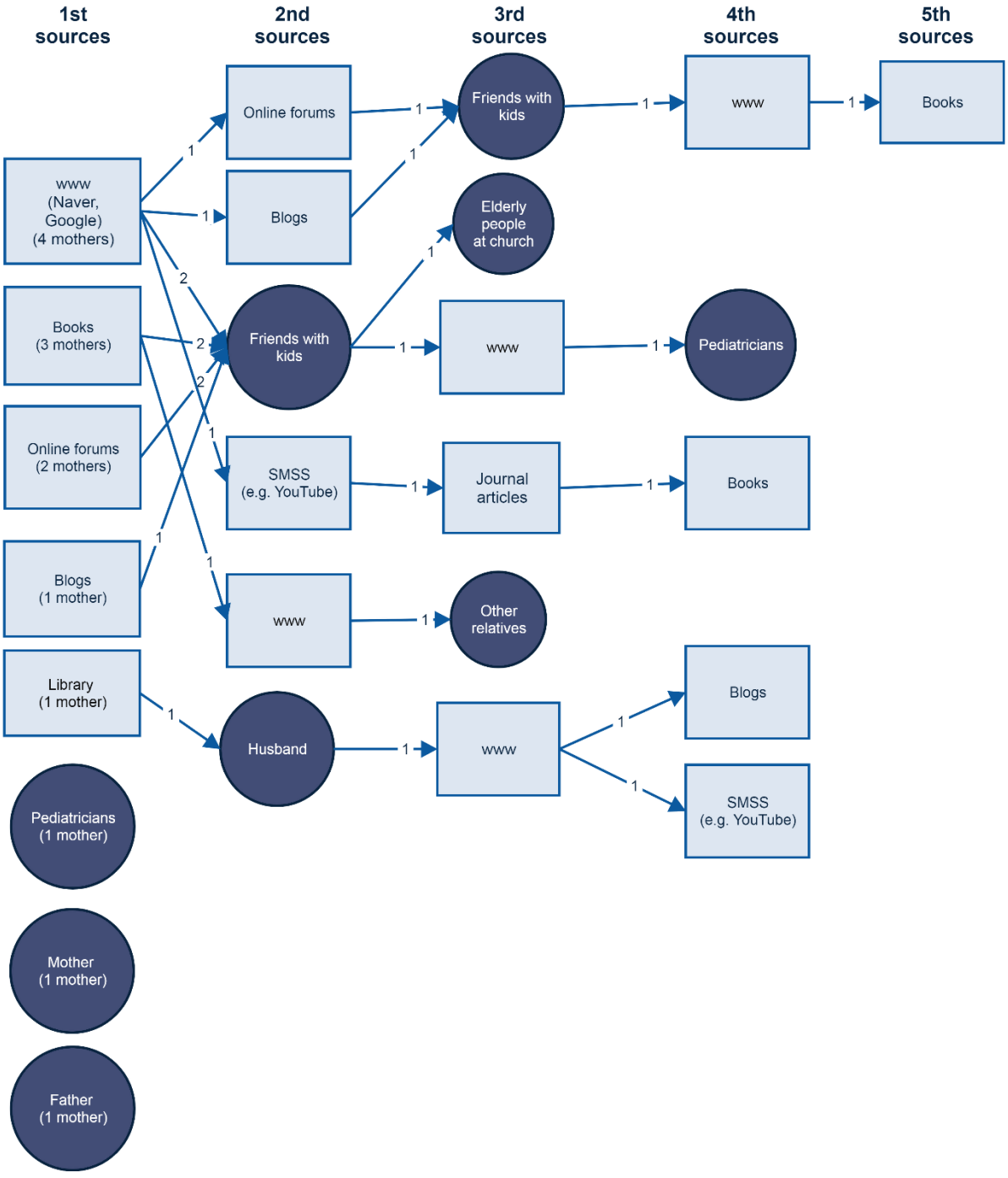
This might lead to implications for information professionals that will be discussed in the following Chapter 5.

Information-seeking pathways when their child(ren) was healthy

Information-seeking pathways by eight immigrant mothers were drawn in Figure 4.7. Like the U.S. sample, the immigrant mothers tended to search health information from relatively diverse sources when their child was healthy including the World Wide Web, books, blogs, online forums, library, pediatricians, mother, and father (Table 4.14). A few unique sources came up in their health information seeking paths such as father, library, journal articles, social media sharing sites (e.g., YouTube), and elderly people at church.

Figure 4.7.

Immigrant Korean Mothers' Information-Seeking Pathways when Their Child was Healthy



Note. Rectangles indicate non-human sources, whereas circles indicate personal sources.

Table 4.14.

Diverse Sources Used by the Immigrant Korean Mothers (n = 8)

Rank	Name	Frequency (%)
1	The World Wide Web	7 out of 8 (87.5%)
2	Friends with kids	5 out of 8 (62.5%)
	Books	5 out of 8 (62.5%)
4	Blogs	3 out of 8 (37.5%)
	Online forums	3 out of 8 (37.5%)
6	Pediatricians	2 out of 8 (25%)
	Social Media Sharing Sites (e.g., YouTube)	2 out of 8 (25%)
8	Husband	1 out of 8 (12.5%)
	Mother	1 out of 8 (12.5%)
	Father	1 out of 8 (12.5%)
	Library (books)	1 out of 8 (12.5%)
	Other relatives	1 out of 8 (12.5%)
	Elderly people at church	1 out of 8 (12.5%)
	Journal articles	1 out of 8 (12.5%)

> *(When my child is not sick,) I frequently go to libraries with my child and try to find books related to "nutrition and diets" or "physical exercise" topics. (IM2)*
>
> *I sometimes get parenting advice from elderly church members, but sometimes it is uncomfortable because their parenting styles tend to be extremely careful and protective. (IM8)*

One immigrant mother (12.5%) pointed out that books not being updated as frequently as online resources was a limitation.

> *I have a few parenting related books. I do not read those books these days, because I feel like those are outdated, and not updated as frequently as the information on the Web. (IM8)*

Four out of 8 mothers (50%) tended to use the World Wide Web as their health information source because a great deal of information exists on the Web, and they claimed that the amount of the information is the strength of this source.

> *For instance, under the topic of growth and development, there are numerous cases on the Web, so I like to get trustworthy information by compiling and synthesizing [those cases]. (IM5)*

One immigrant mother (12.5%) also highlighted different searching strategies when using journal articles as her information source in relation to her child.

> *I think this could be relevant to my jobs. Of course, I feel more comfortable when speaking casually in the Korean language. On the other hand, in terms of cognitive development topic, I would feel more comfortable searching information or articles online in the English language. As my major is in the field of education, I can easily access the journal articles and I feel more confident using key words in the English language. (IM5)*

To summarize, compared to the U.S. sample, there were a variety of sources the immigrant Korean mothers used for their child(ren). Moreover, depending on which topics they searched, the sources they used seemed to be different. For example, related to nutrition and diet topics, library, blogs, and books were utilized more, but the World Wide Web was more likely to provide information on growth and development topics.

4.4.3 Korean Sample

Information-seeking pathways when their child(ren) was sick

Eight Korean mothers' finalized health information searching pathways when their child was unwell are presented in Figure 4.8. Like the other two samples, six out of eight Korean mothers (75%) utilized the World Wide Web as their first health information source. All six participants mentioned that they had used Naver (one of the Korean search engines) as a starting point to search.

> *When my child is sick, I just easily search on the Internet using my mobile device. I think that it is the easiest and fastest way. Also, the information on the Web is very credible. (K4)*

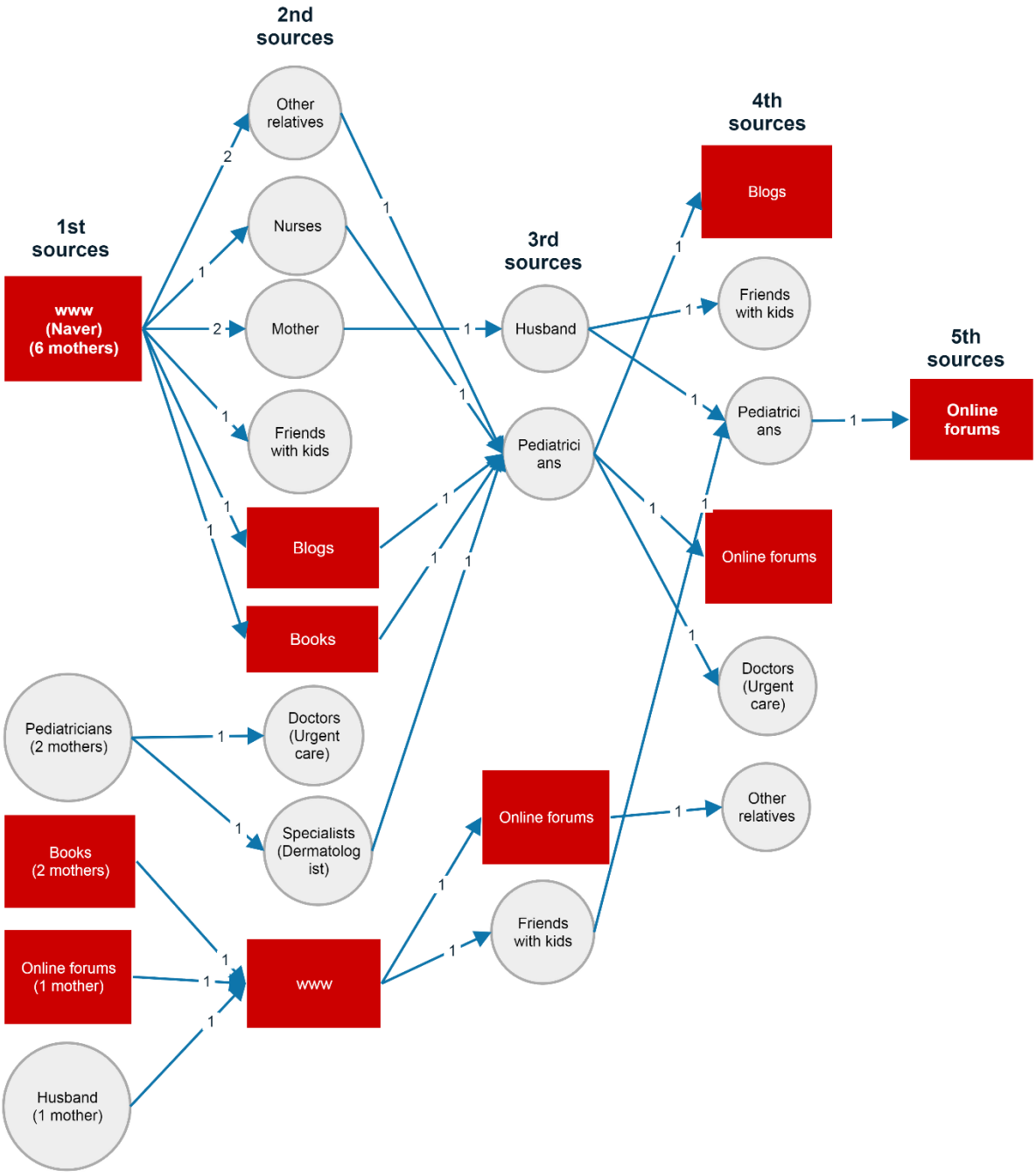
One mother pointed out that her information seeking paths have been different depending on the urgency of the issues.

> *When my baby had a mild diaper rash, I looked up related information using a book first to find similar cases, but I could not find it. After that, I searched online using my mobile device and found the information I wanted. As another experience, my child had a bowel movement with blood. Thus, we went to urgent care immediately. My child had x-rays and received medical treatment. After consulting with healthcare professionals, I realized that it is somewhat common among 12-month-old boys. (K2)*

Compared to the other two groups, online forums tended to be valued by Korean mothers more frequently as they appeared in their information seeking paths in the first, third, fourth, and fifth steps.

Figure 4.8.

Korean Mothers' Information-Seeking Pathways when Their Child was Sick



Note. Red rectangles indicate non-human sources and gray circles indicate personal sources.

These days, I just search on the online communities first. That is because my question had been already posted on the online communities by someone else. Thus, there are lots of data within the online communities. Of course, I do not trust all the information, but at least, I can get some background information before going to pediatrics. (K1)

Interestingly, even though nurses are one of the core healthcare professionals, they were rarely used as Korean mothers' health information source. Four Korean mothers stated that nurses had been inaccessible sources.

Even though I ask questions to nurses, they tried to avoid answering the questions. Instead, they just tell me to consult with pediatricians. (K5)

Based on my experience, I was not able to talk with nurses. They rarely explain about the health information. ... Nurses tend to take care of administrative things, so I would rather consider nurses as administrative staff members. They never provide me health or medical-related information [to me]. (K4)

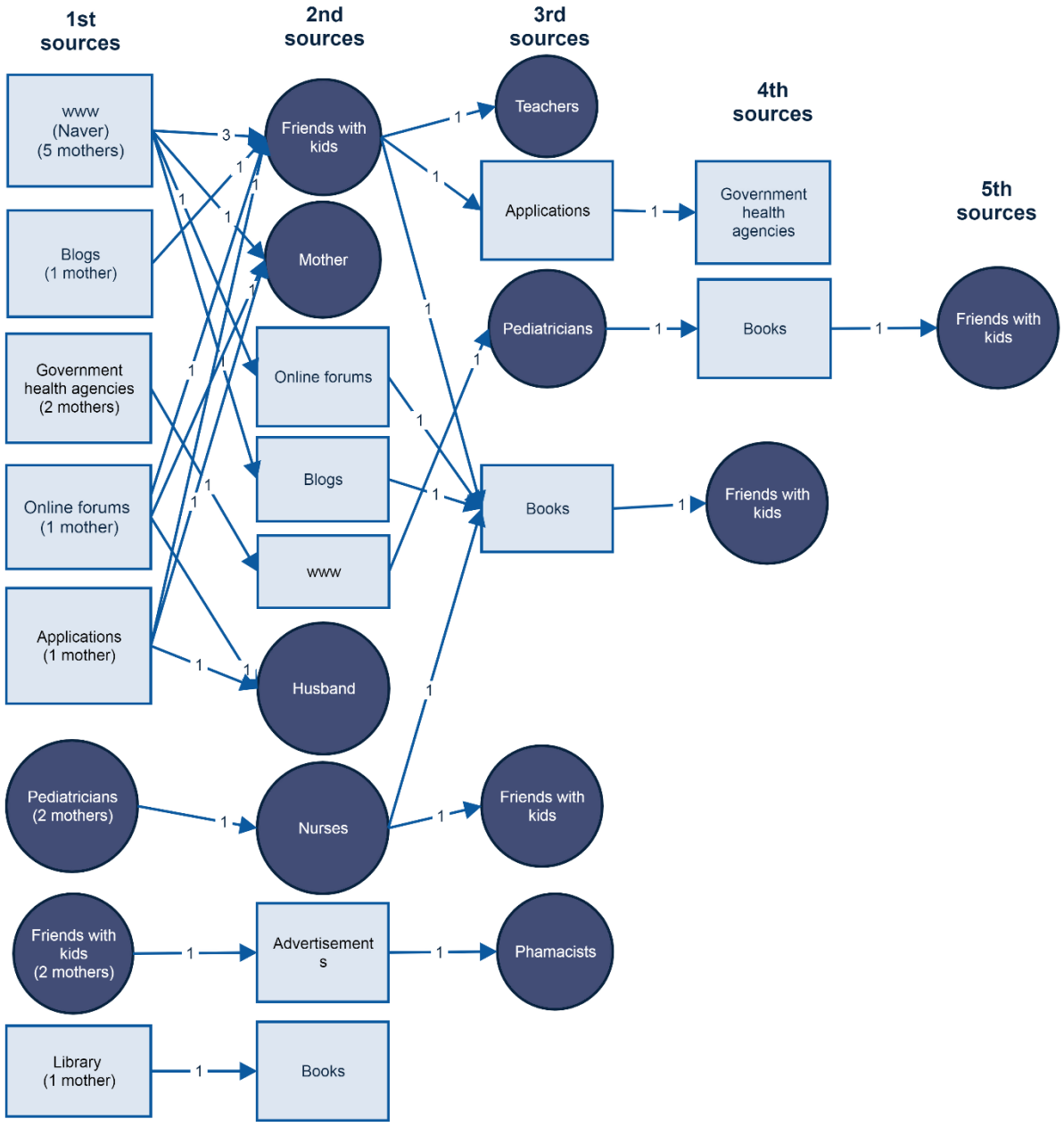
Interview results with eight Korean mothers indicated that accessible/convenient and accurate/credible were the most important characteristics of their information selection criteria. From seven Korean mothers' interviews, the above two characteristics were identified as the major reasons for selecting specific sources.

Information-seeking pathways when their child(ren) was healthy

Like the other two samples, Korean mothers' information seeking was likely to start with diverse sources such as the World Wide Web, blogs, government health agencies, online forums, mobile phone applications, pediatricians, friends with kids, and library (see Figure 4.9).

Figure 4.9.

Korean Mothers' Information-Seeking Pathways when Their Child was Healthy



Note. Rectangles indicate non-human sources, whereas circles indicate personal sources.

Five Korean mothers (62.5%) stated that they had sought health information using the World Wide Web for the two following reasons: (a) easily accessible and (b) considerable amount of information.

> *I searched online first because there are lots of information … and I feel like it is more credible with considerable amount of information. (K5)*
>
> *If I do not have enough time to talk with others and I needed to search needed information quickly, it is the most convenient to use the Web. (K7)*

In this group, two mothers (25%) also highlighted that they considered government health agencies as their first health information source in terms of immunization topics (e.g., K2, K6).

> *There is an application named "immunization guide" which was developed by KCDC (Korean version of CDC). It sometimes sends notifications based on my baby's immunization schedule and I can further search related information using the app. (K2)*

In fact, mothers also claimed that they utilize information from the World Wide Web (e.g., K1, K5) because they thought the Web tended provide objective health-related information.

> *When it comes to the growth and development topic, I think using individuals as health information source is not objective because everyone has [seen and] experienced different cases. In that manner, I think the information from the Web is more objective. That is because [there are variations of numerous cases and] I can see the average of those cases. (K5)*

It was interesting because there was a contrasting opinion by a mother (K8) who evaluated books as objective source and thought information from the Web was not objective.

> *I [had] used books rather than the information from the Web, because I thought the information from books would be more objective than that from the Web. (K8)*

She (K8) also said that she had visited public libraries to find resources in terms of nutrition and diets.

> *To find books related to nutrition and diets, I went to a public library which was closer to my apartment. On the Internet, there were lots of recommended books [in this topic], but I was not sure which one is really good without looking at the real books. Thus, I've visited the public library to see a number of books [in that topic] and [after that,] I purchased a book I liked the most. (K8)*

Although libraries were one of the least frequently used sources as health-related information source in the survey, it was noteworthy that mothers sometime utilize public libraries as their information source.

In sum, based on the survey and interview results, it has been confirmed that mothers of healthy children are still considerably active health information seekers. Results further revealed that there was a difference between their source preferences and frequency of using the sources. For instance, although the World Wide Web was the most frequently used health information source among all three groups of mothers, the U.S. mothers preferred doctors and nurses as their health information sources. Furthermore, there was a lot of similarity between immigrant Korean mothers and Korean mothers who reside in Korea concerning health information-seeking behavior and source preferences. Results of the interview data also indicated that three groups of mothers' health information-seeking pathways also differed in accordance with their child(ren)'s health status (i.e., sick versus healthy). These findings may have some contributions and implications for information professionals and information providers in diverse settings (e.g., CDC, the National Library of Medicine, and even public libraries). Those will be discussed in Chapters 5 and 6.

DISCUSSION

The study's findings identified from the online survey and the supplementary in-depth interviews are discussed in this chapter. The researcher confirmed, compared, and contrasted the findings with the existing body of literature. First, frequency of using health information sources among three groups of mothers will be examined. Second, mothers' preferred information sources using the theoretical concept of information horizons (Sonnenwald, 1999, 2005) will be illustrated. Lastly, mothers' information-seeking pathways in accordance with their child(ren)'s health status will be described.

5.1 Frequency of Using Health Information Sources

In this study, results show that more than 97% of the mothers in all three groups had sought health information regarding their child(ren) in the past six months. This percentage is much higher than what was found in extant health information-seeking studies, which had been conducted solely among U.S. adults (e.g., Fox, 2014; Fox & Duggan, 2013; Jacobs, Amuta, & Jeon, 2017). According to Fox (2014), for example, 72% of U.S. adult Internet users maintained that they had searched online for information about diverse health issues. The current study's finding, however, was consistent with other previous studies, which confirmed that mothers are considerably active health information seekers (e.g., Bernhardt & Felter, 2004; Khoo et al., 2008; Pehora et al., 2015; Skranes et al., 2014). It may be also explained by mothers' classic roles as health managers and caregivers for their family members (Jaks et al., 2019; Lee, 2016; Moon et al., 2019; Yoo, 2004).

However, it should be noted that, even though this study's participants had healthy infants and toddlers, they still seek health-related information for their child(ren) often. This is a surprising similarity to other studies in which participants were recruited from hospital waiting rooms (Pehora et al., 2015) or pediatric emergency departments (Khoo et al., 2008). As their research participants were recruited from hospitals or pediatric departments, they might had been seeking health information actively. The unique finding of the current study may be attributed in part to the rapid diffusion of high-speed Internet in homes and on mobile devices. Indeed, 98.5% in my samples answered that they use mobile devices frequently or very frequently for accessing the Internet. Compared to a study conducted in Canada by Pehora et al. (2015), this number is much higher because only 45.9% of their participants mentioned that they had used their mobile devices to access the Web. Further, *accessible* was one of the most important characteristics among the current study samples selecting health information sources (Table 4.6).

Recent immigrant Korean mothers and Korean mothers who currently live in Korea tended to seek health information more frequently than the U.S. mothers. For instance, 15.3% of the immigrant mothers and 18.2% of the Korean mothers expressed that they had sought health information related to their child(ren) more than once a day, whereas only 3.1% of the U.S. mothers said they had done so. Similar results were found in a comparative study between U.S. mothers and immigrant Korean mothers (Lee, 2018). A few factors might be helpful to understand why the two Korean samples tended to seek health information more actively than the U.S. sample.

First, the cultural background of Korea may explain the above finding. In both Korea and among Korean Americans, fathers used to have a minimal role in caring for infants, and women's roles have been traditional within a strong patriarchal social structure (Choi, 1986,

1995). It has changed somewhat, but the mother is still typically the primary caregiver of children (Park et al., 2016). Park et al. also underlined that mothers' responsibility for child(ren)'s health may have been highlighted in Korean culture, and mothers were more likely than other family members to be influential in maintaining child(ren)'s healthy lifestyles. The two Korean samples' tendency to actively seek health information may reflect their beliefs that child(ren)'s health heavily relies on how they take care of their child(ren). This finding is supported by previous research which noted that immigrants' cultural beliefs may influence their health information-seeking behavior (e.g., Allen, Matthew, & Boland, 2004; Caidi, Allard, & Quirke, 2010; Criss et al., 2015; Dutta & Basu, 2011; Sligo & Jameson, 2000).

Second, when the demographic characteristics of the three groups of mothers were compared in this study, in terms of employment status, 76.3% of the immigrant Korean mothers and 47.6% of the Korean mothers were stay-at-home mothers, whereas 36.4% of the U.S. mothers were stay-at-home mothers. Thus, it may also be likely that two Korean group of mothers might have more free-time to seek a variety of information including health information than the U.S. mothers.

Although the two Korean groups of mothers tended to have similar information-seeking behavior in terms of frequency, specified types of sources used within their families were different. For example, the survey results of the Korean mothers in Korea indicated that they had used their own mother/mother-in-law more often than their husband/spouse or their father/father-in-law (Table 4.4). On the contrary, immigrant Korean mothers in the U.S. tended to use their husband/spouse more frequently than other family members, such as their mother/mother-in-law, their father/father-in-law, or other relatives. Similar to the immigrant sample, the U.S. mothers

also tended to use husband/spouse more frequently as their health information source than any other family members.

The researcher can speculate that, even though the immigrant mothers have such cultural beliefs, they are inclined to adjust to new environments in the host country. Moreover, unique immigration pathways of recent Korean immigrants would possibly illuminate this finding. According to O'Connor and Batalova (2019), 59% of recent Korean immigrants obtained lawful permanent residency through an employer sponsorship, and 34% were sponsored by immediate relatives of U.S. citizens. Although the most common immigration method of Korean immigrants in the U.S. was through an employer sponsorship, only 13.4% of the immigrant sample was working full-time or part-time, and all of the immigrant mothers were married (100%). It implies that, in the recent Korean immigrant populations, there may be few single moms, and they are likely to communicate with their husband/spouse more closely than other family members who probably live in distant places.

When it came to the frequency of using each health information source, this study revealed that the World Wide Web was the information source used most often by all three groups of mothers (ranked #1 out of 19 sources). Our interview data also indicated that 23 out of 24 mothers (95.8%) utilized the World Wide Web as their child(ren)'s health information source. This finding supports a number of other recent studies that the Internet has been a crucial source for mothers when seeking health information (e.g., Jaks et al., 2019; Khoo et al., 2008; Moon et al., 2019; Pehora et al., 2015; Plantin & Daneback, 2009; Scullard, Peacock, & Davies, 2010; Skranes et al., 2014). As other researchers have noted (Jaks et al., 2019; Moon et al., 2019), supplementary interviews in this study confirmed that perceived accessibility (e.g., convenience, familiarity) was a major reason for using the World Wide Web as a health information source.

For example, one of the participants mentioned, “I usually start with a quick Google search on my [mobile] phone, just to see what resources are available. … I can access information online immediately” (US2).

Moreover, the second and the third most frequently utilized health information sources among the U.S. sample were healthcare professionals such as doctors (ranked #2 out of 19 sources) and nurses (ranked #3 out of 19 sources). This is in agreement with studies reporting that the primary sources of pediatric information were physicians and nurses (Baker et al., 2007; Bernhardt & Felter, 2004; Kennedy et al., 2011; Yoo, 2004). This may be partly explained by this study’s survey results regarding important source characteristics as selection criteria. The U.S. mothers tended to consider credible/trustworthy as their the most important characteristic when selecting health information sources for their child(ren). We can speculate that those mothers are more likely to use the World Wide Web most frequently due to easy accessibility and convenience, but they also appreciate doctors or nurses as their credible and accurate information sources. For instance, one of the interview participants stated, “They have medical backgrounds, and I really love our pediatrician … and I appreciate her knowledge” (US6).

The other two Korean samples, on the other hand, tended to use healthcare professionals such as doctors (ranked #4 in both samples) or nurses (ranked #8 in the immigrant Korean sample; ranked #12 in the Korean sample) less frequently than the U.S. sample. Based on the in-depth supplementary interviews, the researcher can hypothesize that language barriers might have influenced the immigrant mothers’ information-seeking behavior when they were seeking health information from healthcare professionals. Only one out of eight immigrant mothers (12.5%) mentioned that she was able to use Korean-speaking doctors as her health information source and three out of eight immigrant mothers (37.5%) emphasized difficulties of using

healthcare professionals as their information source due to language barriers. For example, an immigrant mother said, “I feel like accessing the medical services is not easy for me because it is somewhat difficult to explain my child’s symptoms due to the language barriers” (IM3).

Language barriers have been noted by other scholars who have conducted studies among Korean immigrants living in the U.S. (e.g., Han et al., 1996; Oh et al., 2015; Oh, Kreps, Jun, & Ramsey, 2011; Oh, Zhou, Kreps, & Kim, 2014). For instance, Oh et al. (2015) found that, even though health information from healthcare professionals was the most trustworthy among Korean Americans in their study, healthcare professionals were considered inaccessible or expensive information sources. Furthermore, the language barriers and cultural differences between Korean Americans and native healthcare professionals made it challenging for Korean American women to seek health information from them (Oh et al., 2015). Their survey data also supported the idea that the use of healthcare professionals and traditional English-language media, such as newspapers, magazines, radio, or TV, as health information sources was limited. Han et al. (1996) also underlined that being a more recent immigrant and being less fluent in English were relevant to selecting Korean-speaking doctors versus non-Korean speaking doctors (p =.0001).

In line with that, Oh et al. (2011) found that Korean language newspapers or magazines were a common source of cancer-related information among middle-aged Korean Americans. A contrasting result was found among Korean immigrant mothers in this study, which notes that newspapers or magazines were one of the least utilized health information sources. There are two possible explanations. First, Oh et al.’s (2011) study participants were recruited from a specific geographic region of the U.S. (the Washington, DC metropolitan area), whereas this study’s participants were from 32 different U.S. states and Washington DC. The Washington DC area is

one of the most concentrated metropolitan areas for Korean Americans (O'Connor & Batalova, 2019), so Korean newspapers and magazines are readily available through Korean restaurants or grocery stores in the surrounding area (Oh et al., 2011). Thus, those Korean language newspapers or magazines may not be easily accessible to immigrant mothers who are not living in those areas densely populated by Korean Americans. Second, another reason could be all of the research participants in Oh et al.'s (2011) study were aged 40 or older, whereas 98% of the current study's participants were relatively young mothers under the age of 40. Survey results also indicated that 97.7% of the immigrant mothers answered that they were accessing the Internet frequently (4.7%) or very frequently (93%) using their own mobile devices. Therefore, the participants' characteristics might have caused this conflicting finding on the use of newspapers/magazines as their health information sources.

Language barriers may have influenced immigrant Korean mothers' information-seeking behavior, whereas there may be other reasons that might have influenced Korean mothers' information-seeking behavior. It is remarkable that Korean mothers who currently reside in Korea also tended to use doctors or nurses less frequently than other sources, such as the World Wide Web, blogs/online forums, and friends with kids.

The above finding may be surprising to people who are familiar with Korean health care systems. Korea has a very different health care system from that of the U.S. It has a social health insurance system providing medical benefits and long-term care (Boslaugh, 2013). All Korean citizens including women and children are included in the system, and medical services are provided by health professionals, clinics, and hospitals under contract with the National Health Insurance Corporation (Kwon, 2008; National Health Insurance Service in Korea, 2019). Ball (2011) also supported the low cost on medicines in Korea by emphasizing that South Korea

charges a standard value-added tax (VAT) of only 10% on medicines. Due to the easily accessible and low-cost healthcare services, some people might have expected that healthcare professionals had been used more often than other sources, but the current study's finding was different. Possibly, this may be explained by the interviews with Korean mothers. Six out of eight Korean mothers (75%) illustrated that they were having difficulties in asking pediatricians questions because the only way to communicate with their pediatricians was via face-to-face, and the pediatric clinics were likely to be always busy with patients. Indeed, one of the Korean mothers commented, "When I meet [my child's] pediatrician, the pediatric clinic is likely to be crowded and the [consultation] times are very limited like 2-3 minutes. I think it is too short to ask questions and get information" (K1). Similar finding was found in Chae and Quick (2015) study that Korean mothers in Korea tended to use healthcare professionals as information source less frequently than online mothering communities or friends with kids.

Results of this study also indicated that Korean mothers and immigrant Korean mothers were inclined to utilize blogs or online forums frequently (ranked #2 out of 19 sources in both samples). This trend is reflected in the increased number of recent studies which noted high usages of social media as mothers' health information sources (e.g., Chae & Quick, 2015; Kim & Kim, 2007; Lebron, St. George, Eckembrecher, & Alvarez, 2019; Moon et al., 2019; Morris, 2014; Wagg, Callanan, & Hassett, 2019). Some scholars particularly emphasized that social media platforms such as social networking sites and online forums are used frequently because they provide health information and emotional support, as well as self-esteem support (Lebron et al., 2019; Moon et al., 2019; Wagg et al., 2019).

The current study also contributes to the existing body of literature (e.g., Jaks et al., 2019; Moon et al., 2019; Pretorius et al., 2019; Wagg et al., 2019) the fact that, out of four types of

social media platforms (i.e., social networking sites, social media sharing sites, microblogging sites, and blogs/online forums), mothers of healthy infants and toddlers tend to use social networking sites (e.g., Facebook, Instagram) or blogs/online forums more frequently than the other two platforms. The researcher can speculate that mothers are likely to value information from blogs/online forums because they appreciate other mothers' similar experiences from real life. For example, an immigrant mother in our interviews stated, "I prefer other moms' blog posts based on their real experiences. Some postings are very specific" (IM4). This trend was also confirmed by the U.S. sample in this study. Another possible reason may be postings in microblogging sites (e.g., Twitter) are likely to have character limits, so it may not be useful for the mothers who would like to specifically illustrate their child(ren)'s symptoms as much as other social media platforms such as social networking sites or blogs/online forums.

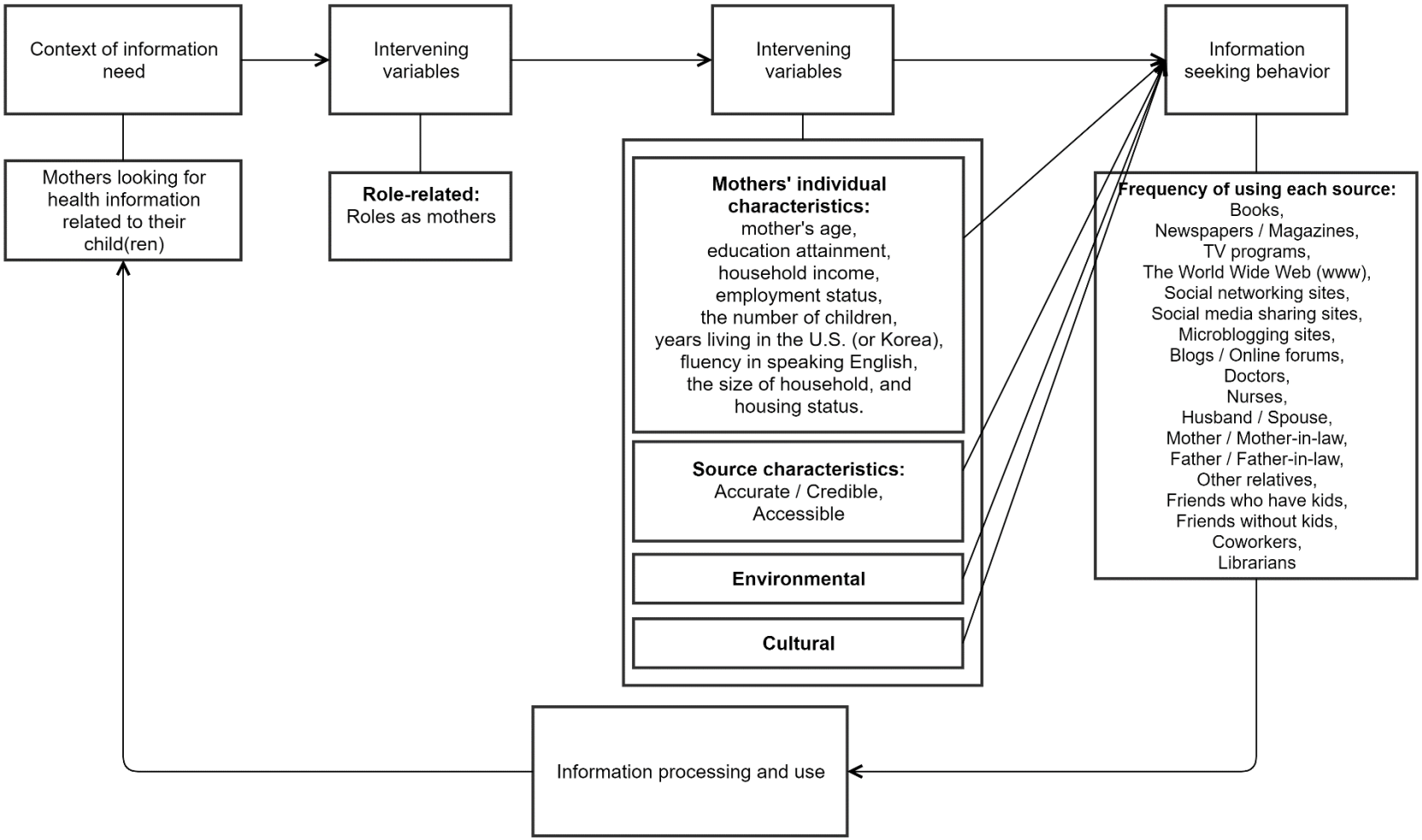
Concerning source characteristics as selection criteria, it should be emphasized that an extensive list of source characteristics was developed in this study based on the previous literature (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002; Fox & Duggan, 2013; Lee, 2018). When the research participants were asked to report the most important characteristics for their selection criteria of health information sources, accurate/credible and accessible were the most crucial characteristics in all three groups of mothers. Accurate/credible, accessible, and active/updated were the top three important characteristics for selection criteria for the U.S. mothers and immigrant mothers. Korean mothers who live in Korea, on the other hand, were inclined to value accurate/credible as the most important selection criterion, followed by organized, accessible, and time saving. In previous literature, credibility and accessibility were consistent as the most significant characteristics that influence information users' selection criteria (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002). However, unlike

other previous studies (Eysenbach & Köhler, 2002; Fox & Duggan, 2013b; Lee, 2018), other source characteristics such as free, interactive/able to respond, and time saving were evaluated relatively less important as source selection criteria in the current samples of this research.

In terms of relationships between socio-demographic characteristics and frequency of using each information source, nine out of 11 attributes were found to be affecting mothers' specific source use and it is shown in Figure 5.1. Those nine characteristics are as follows: mother's age, educational attainment, annual household income, employment status, the number of children, the size of household, fluency in speaking English, housing status, and years lived in the U.S. for American and immigrant mothers or years lived in Korea for Korean mothers. This result is supported by findings from prior studies concluding that a few key demographic characteristics, such as age (e.g., Jenkins et al., 2001; Pinquart & Duberstein, 2004; Ramanadhan & Viswanath, 2006; Silliman et al., 1998), educational attainment (e.g., Galarce et al., 2011; Viau et al., 2002), income (e.g., Braveman et al., 2001; Shieh et al., 2010; Song et al., 2013), the number of children (e.g., Baker et al., 2007; Lee, 2018), and fluency in English (e.g., Han et al., 1996; Oh et al., 2012; Oh et al., 2015), might have affected people's health information-seeking behavior.

Figure 5.1.

Conceptual Model of Factors Influencing Mothers' Health Information Seeking



It is worth highlighting that three characteristics, including mother's age, educational attainment, and employment status, were highly significant predictors of mothers' specific health information source use for all three groups. For instance, in this study, younger mothers tended to seek health information more actively than mothers aged 36 or older. This is consistent with extant literature that younger people tend to seek health information more actively from various sources than older people do (e.g., Jenkins et al., 2001; Oh et al., 2012; Pinquart & Duberstein, 2004; Silliman et al., 1998). There are two possible explanations. First, mother's age may have been associated with the number of children. The survey results of this study illustrated that mothers with only one child are more likely to seek health information frequently than mothers with two or more. That is, young first-time mothers might have been seeking health information more actively using many different sources (e.g., the World Wide Web, microblogging sites, books, government health agencies, doctors, nurses) than mothers aged 36 or older with two or more children. Second, there is also a possibility that younger mothers might have learned new types of information sources quickly than older mothers. Oh et al. (2012) also argued that age was highly associated with the likelihood of their Internet use as a health information source. Indeed, in the current research samples, younger mothers tended to utilize diverse social media platforms (e.g., social networking sites, microblogging sites) as their information source.

Results regarding educational attainment should be interpreted with caution due to disagreement of the findings in accordance with the three groups. Among the U.S. mothers, well-educated mothers (i.e., master's or doctoral degree) are likely to use the World Wide Web and friends with children more frequently than less-educated mothers (i.e., two years of college or less). Similar finding was found in Oh et al. (2014) study. In their Korean Americans and native Korean samples, Oh et al. (2014) found that there was a significant association between health information seeking on the Internet and educational attainment.

The authors maintained that those with higher level of education were more likely to seek health information from the Internet than those with lower level of education. Interestingly, in the current immigrant sample and native Korean sample, there was no significant association between health information seeking on the Internet and educational attainment. Further research may be needed to explain this trend explicitly.

In this study, results showed that less-educated immigrant mothers are likely to use TV and social media sharing sites (e.g., YouTube) more often as their health information sources than well-educated immigrant mothers. This also contradicts with Oh et al. (2014)'s finding. Oh et al. (2014) emphasized that educational attainment was not significantly associated to use TV for health information in both Korean Americans and native Koreans. In the current research, however, there was significant association between educational attainment and TV usage as a health information source.

In the case of Korean mothers, the well-educated are likely to use mother/mother-in-law, friends with kids, and books more frequently than less-educated Korean mothers. This contrasts with findings from other studies that have claimed that well-educated people are likely to seek health information more actively than less-educated people (Galarce et al., 2011; Ramanadhan & Viswanath, 2006; Viau et al., 2002). Based on this study's results, this may not be true depending on two conditions: (a) which sources they are using, and (b) which sample they belong to. Thus, these sharp differences associated with educational attainment and specific source use should be taken into account carefully when information providers at diverse organizations (e.g., CDC, Mayo Clinic, kidshealth.org) provide health information resources to a certain population.

In this study, results indicated that employment status was also one of the most significant characteristics that would differentiate mothers' health information-seeking behavior in all three groups. This finding is noteworthy because employment status was not

noted importantly as a factor which may influence people's health information seeking in the previous literature. Instead, there are several studies which focused on the relationships between socio-economic status such as household income and people's health information-seeking behavior (Braveman et al., 2001; Shieh et al., 2010; Song et al., 2013).

In fact, the current study revealed that, in terms of employment status, working moms (i.e., full-time or part-time) were more likely to utilize coworkers as their health information source than stay-at-home mothers in all three groups. As expected, it is unlikely for stay-at-home mothers to have coworkers, so they tended to use the World Wide Web or blogs/online forums more often than working mothers (i.e., full-time or part-time). High use of the World Wide Web and blogs/online forums implies that those two sources could be effective health-related information sources when information professionals at the National Library of Medicine, and other information providers at diverse organizations such as CDC, Mayo Clinic, or Kidshealth.org provide health information resources to this specific population.

5.2 Mothers' Health Information Source Preferences

When mothers were asked to report their preferences on 19 information sources, there was a difference between their source preferences and frequency of using the sources.

First, the U.S. mothers preferred healthcare professionals including doctors (#1 out of 19 sources, $M = 4.63$) or nurses (#2 out of 19 sources, $M = 4.32$) the most. This signifies that even though they tend to use the World Wide Web the most frequently, their most preferred sources are still healthcare professionals such as doctors and nurses. As briefly mentioned, a possible reason is that they acknowledge doctors and nurses as credible/accurate sources. This is not surprising because healthcare professionals have been trustworthy and reliable sources among mothers in prior studies (e.g. Criss et al., 2015; Khoo et al., 2008; National

Cancer Institute, 2019). This is particularly similar to the finding, as described by one of the recent Health Information National Trends Survey [HINTS] briefs (National Cancer Institute, 2019). Among a number of information sources, the most trustworthy source among American adults was doctors or healthcare practitioners (94.2%; National Cancer Institute, 2019). Moreover, the current study's supplementary interview data support the above idea because six out of eight mothers (75%) evaluated pediatricians and nurses as accurate/credible sources. For example, a U.S. mother in this study commented, "Well, I consulted with our pediatrician's office because I figured that they would know what was wrong" (US4).

The two Korean groups of mothers, on the other hand, still preferred the World Wide Web the most (#1 out of 19 sources, immigrant mothers: M = 4.48, Korean mothers: M = 4.30). It was consistent with the survey finding concerning frequency of using the source. That is, the World Wide Web was the most frequently utilized and most preferred source among immigrant Korean mothers and Korean mothers in Korea. When further examining the reasons for using the World Wide Web, the interview data of this study indicated that mothers were likely to utilize it because of perceived accessibility (e.g., convenience, familiarity), amount of information (e.g., lots of information on the Web), and quality of information (e.g., credibility assessment via crosschecking multiple resources). This result is similar to a previous finding that the Internet could be a way to quickly crowdsource or gather multiple viewpoints when trying to make a decision related to their child(ren) (Moon et al., 2019). For example, one of our interviewees said,

> I'm using the Internet when I have lots of free time and would like to have lots of information from multiple resources. After searching online, I feel assured. Since I can gather lots of information in a short period of time, I feel like I'm armed with information. (IM7)

It is remarkable that nurses were rarely used as health-related information sources in the two Korean samples but were preferred as health information sources. Four out of eight (50%) Korean mothers expressed that nurses were an inaccessible information source. For instance, two participants described, “Even though I ask questions to nurses, they tried to avoid answering the questions. Instead, they just tell me to consult with pediatricians” (K5), and:

> Based on my experience, I was not able to talk with nurses. They rarely explain about the health information. ... Nurses tend to take care of administrative things, so I would rather consider nurses as administrative staff members. They never provide me health or medical-related information [to me] (K4).

When all three groups of mothers’ information horizon maps were carefully investigated, government health agencies seemed to be one of the preferred sources (zone 2 for the U.S. and immigrant Korean mothers; zone 3 for the Korean mothers), but in fact, they have not been used very often. Thus, there is a possibility for information providers at government health agencies (e.g., CDC) to become helpful sources to mothers who are likely to seek health information actively. Indeed, two Korean mothers in our interviews shared their experiences that they started seeking health information after getting notifications from resources provided by government health agencies. For example,

> In my experience, there is an application named “Immunization Assistant” which was created and maintained by the Korea Centers for Disease Control & Prevention (KCDC). My child’s immunization records are fully listed in this app, so when it is time to get immunizations for my child, I’m getting a notification in advance. After receiving the notifications, I easily seek health information within this app. This app is super helpful for me. (K2)

Notably, social media sharing sites (e.g., YouTube) was not on the information horizon maps of the U.S. mothers. Our survey finding also indicated that social media sharing sites (e.g., YouTube) was one of the least frequently used sources among the U.S. sample. Our interview data were also consistent with the survey data indicating that none of the U.S. mothers used YouTube as a health information source.

This was quite surprising because social media sharing sites such as YouTube have received a lot of attention as a health information source in the past few years (e.g., Asiodu, Waters, Dailey, & Lyndon, 2017; Criss et al., 2015; Pretorius, Johnson, & Rew, 2019; Sundstrom, 2016; Walker et al., 2017). A possible reason could be that YouTube was considered as a helpful source for expectant mothers or mothers of newborns regarding specific newborn care or mothering activities such as bathing and breastfeeding (Criss et al., 2015; Sundstrom, 2016; Walker et al., 2017). However, the samples of this study were mothers of infants and toddlers aged newborn to 3 years old. Thus, there may be different information seeking practices when their child gets older and more active. Our supplementary interview data with the immigrant Korean sample may have implications that YouTube could also be a useful health information source for mothers of healthy infants and toddlers. In fact, two immigrant mothers said that they have been using YouTube in terms of growth and development topics (e.g., exercise, physical activities, and diverse activities to improve cognitive development). For example, one of them mentioned, “On the YouTube videos, other mothers record their child[ren]’s physical activities and their reactions simultaneously. Those diverse activities and their child[ren]’s reaction make me [believe] the videos credible” (IM2). Indeed, the survey results in this study also supported the interview data in that social media sharing sites (e.g., YouTube) was one of the preferred health information sources among two Korean samples. Approximately 56.7% of the immigrant mothers and 48.3% of

the Korean mothers placed this source either on zone 1 (the most preferred health information sources), zone 2, or on zone 3.

Overall, there were several sources that corresponded to mothers' frequency of using the sources and their source preferences. However, it is worth noting that there were also differences between their source preferences and frequency of using the sources, including doctors and nurses, the World Wide Web, government health agencies, and social media sharing sites (e.g. YouTube).

5.3 Mothers' Information-Seeking Pathways based on Child(ren) Health Status

In the previous sections, mothers' frequency of using health information sources and their source preferences were discussed. Based on the concept of information-seeking pathways, this section is about the sequence of information-seeking steps and the relationships among sources in two different situations: (a) when their child(ren) was sick, and (b) when their child(ren) was healthy.

Mothers' information-seeking pathways when their child(ren) was sick

Based on the interview results, the researcher found that mothers divided into two groups when choosing their first stop for health information: one group turned to non-human sources first while the other group turned to personal sources first. Results indicated that 22 out of 24 mothers (91.7% – eight U.S. mothers, seven immigrant Korean mothers, seven Korean mothers) started seeking health information from non-human sources when their child(ren) was ill. For example, 18 mothers mentioned that they first had been seeking from the World Wide Web using search engines (e.g., Google or Naver – the latter a Korean search

engine), whereas six mothers indicated they had utilized books (e.g., US8, IM1, K2, K4) or online forums (e.g., US7, IM6, K1) as their first source. Two participants (IM1, K4) expressed that they tended to use the World Wide Web or books as the starting point of their information-seeking behavior depending on what they needed.

Earlier studies on mother's health information-seeking behavior confirmed that the Internet is a common and crucial health information source related to their child(ren)'s health (Criss et al., 2015; Khoo et al., 2008; Moon et al., 2019; Pehora et al., 2015; Plantin & Daneback, 2009; Skranes et al., 2014). The current study's finding further specifies the above finding in that the World Wide Web used to be the first source when mothers sought health information for their children. When examining the reasons why this source was used as the first source, mothers tended to quickly crowdsource information and be prepared before talking to personal sources, especially prior to consulting healthcare professionals such as pediatricians or nurses. This tendency was also consistent with previous research that used information horizons as a theoretical framework (Tsai, 2013). For instance, an U.S. mother described,

> I usually start with a quick Google search on my phone, just to see what resources are available. […] Rather than just calling the doctor's office and not really having an idea of what's going on, I like to try to see, um, what might be the issue first [by] myself. There's something that I can do to make my child feel better, while I'm waiting for the doctor's office to get back to me. (US2)

As a number of previous scholars noted (e.g., Chung, Oden, Joyner, Sims, & Moon, 2012; Criss et al., 2015; Moon et al., 2019; Scullard et al., 2010), one may be curious about how mothers would determine credibility of the online resources. When using the World Wide Web as a health information source, all three groups of mothers pointed out that crosschecking multiple sources helps to determine the credibility of the online sources. For

example, one of the U.S. mothers commented, “I like to consult multiple sources for [health] information and I have a few books that I trust, and I just like to compare different information” (US8). A Korean mother (K5), however, expressed that she would trust the first source shown on the search results. It might have implications for information professionals at public libraries who could provide health-related information services such as searching classes. Specified implications will be discussed in the following chapter 6.2.3.

On the other hand, seven out of 24 mothers (29.2% – 2 U.S. mothers, 2 immigrant Korean mothers, 3 Korean mothers) illustrated their health-information seeking experiences, which started from personal sources such as healthcare professionals (pediatricians or nurses) (e.g., US7, IM6, IM7, K1, K2), friends with kids (e.g., US3), and husband (e.g., K5). Mothers’ information-seeking pathways were likely to differ in accordance with the urgency of the issue. For example, one of the Korean moms described,

> When my baby had a mild diaper rash, I looked up related information using a book first to find similar cases, but I could not find it. After that, I searched online using my mobile device and found the information I wanted. As another experience, my child had a bowel movement with blood, so we went to urgent care immediately. My child had x-rays and received medical treatment. After consulting with healthcare professionals, I realized that it is somewhat common among 12-month-old boys. (K2)

Mothers’ information-seeking pathways when their child(ren) was healthy

When the participants’ child(ren) was healthy, their two health information-seeking strategies were still detected: non-human source first and personal source first strategies. Twenty-two out of 24 mothers (91.7% – 6 U.S. mothers, eight immigrant Korean mothers, eight Korean mothers) shared their experiences in which they first used the non-human

sources, but it is noteworthy that diverse non-human sources were also utilized in this circumstance. For example, mothers claimed that a wide range of non-human sources were used as their first health information sources including the World Wide Web, social networking sites (e.g., Facebook), government health agencies, books, library, newspapers/magazines, blogs/online forums, and mobile phone applications. A possible reason may be that this is not an urgent situation and may not impact their child(ren)'s health. Therefore, a few mothers said that their information-seeking behavior sometimes started with browsing information first. For example, one of the U.S. participants mentioned,

> Generally I just read something in the magazine that'll bring up a question like […] different methods on how to parent or discipline or [… in terms of] food, ways to get your kid to eat healthy food or things that should be in your kids weekly diet. And then, I just usually go to Google to double check what the Internet says because I figured I'd never just take from one source. (US3)

As illustrated in section 5.2 concerning government health agencies as a health information source, mobile phone applications may be another useful health information source that satisfies mothers' information needs. Similar findings were noted by other health information-seeking research among mothers (e.g., Guerra-Reyes et al., 2016; Hearn, Miller, & Lester, 2014). If it is not an urgent issue, notifications from applications might also stimulate active health information seekers like mothers to start searching.

Furthermore, an emerging finding from the interviews is that a social media platform such as instant messaging may become as an effective communication channel when health professionals need to interact with mothers. Mothers in this study tended to easily communicate with other friends with kids via instant messaging applications. Surprisingly, there were only two ways that mothers communicate with healthcare professionals: in person or via telephone. A variety of communication channels between mothers and healthcare

professionals might need to be considered and developed such as emails, microblogging sites (e.g., Twitter), or instant messaging. Also, it would be helpful if healthcare professionals could let mothers know that other communication channels are available when interacting with them. This may be particularly informative especially for immigrant mothers who may not be familiar with the new environment and healthcare system. Sontag and Schacht's (1994) classic study would support this argument because they maintained that ethnic minorities show greater difficulty in obtaining health information for their children.

Regarding personal source first information-seeking strategies, nine out 24 mothers (37.5% – four U.S. mothers, one immigrant Korean mothers, four Korean mothers) indicated that they had used personal information sources as their starting point. Compared to when their child(ren) was sick, mothers utilized diverse information sources when their child(ren) was healthy. Those sources include friends with kids (e.g., US1, US3, US4, K1, K4), daycare teachers (e.g., US6), pediatricians (e.g., K3, K8, IM5), their own mother (e.g., IM5), and their own father (e.g., IM5). Like other studies noted (e.g., Bailey, 2008; Slomian et al., 2017; Weiner et al., 2015), friends and family members have been frequently used health information sources. In this study, it is also worth mentioning that daycare teachers had been considered as a reliable source in terms of growth and development topics among U.S. mothers. Two U.S. mothers used daycare teachers as their health information sources: one as her first information source and the other one as her fourth source. For example, one of them described,

> She [daycare teacher]'s around him so much and she's been around kids so much developmentally and she's seen it all across the board, because kids in his daycare group, who do get intervention who come in and work with them. So I figured, a daycare provider has probably has seen a ton of examples throughout her 24 years career, so I thought, maybe I'll ask her first since I've grown to trust her. (US6)

This may be partly because, mothers are likely to value daycare teachers' real experiences with numerous children in their careers. Moreover, since daycare teachers tend to spend lots of time with the children, mothers are likely to consider them as reliable caregivers and observers whom they can consult with.

CONCLUSION

This chapter first illustrates the key findings of the current research. Second, this study's theoretical contributions, methodological contributions, and implications for information professionals are discussed. Lastly, the researcher discusses the current study's limitations and ideas for future research.

6.1 Summary of Key Findings

6.1.1 Frequency of Using Health Information Sources

The following major findings are emphasized. First, although mothers have been classically noted as active health information seekers reflecting their roles as caregivers for their family members, this study demonstrates that mothers of healthy infants and toddlers are considerably active information seekers in the context of their child(ren)'s health. Even though all the research participants had healthy infants and toddlers, results indicated that they still seek health information in relation to their child(ren) very actively. For example, 15.3% of the immigrant Korean mothers and 18.2% of the Korean mothers answered that they tended to seek health-related information more than once a day.

As discussed in Chapter 5, there are two possible explanations: (a) cultural backgrounds of Korea, and (b) mothers' employment status in the study samples. First, in

both Korea and among Korean Americans, fathers used to have a minimal role in caring for infants within a strong patriarchal social structure, and mothers may feel substantially responsible to take care of their child(ren) as health managers for their kids (Choi, 1986, 1995). Second, in this study samples, compared to the U.S. mothers, there was a greater number of stay-at-home mothers in two Korean samples (U.S. mothers 36.4%, Immigrant Korean mothers 76.3%, Korean mothers 47.6%). Thus, it is also likely that the two Korean groups might have more free-time to seek diverse information including health information related to their child(ren). This finding implies that mothers with healthy infants and toddlers have greater information needs in the context of their children's health.

Second, with respect to the main information sources used, a difference was detected between the U.S. sample and the two Korean samples. For instance, out of 19 different information sources, the U.S. mothers were likely to use the World Wide Web, doctors, and nurses most frequently, whereas the Korean mothers utilize the World Wide Web, blogs or online forums, and friends who have kids most frequently as their health information sources. Post hoc analyses of the one-way ANOVA tests further indicated that the U.S. mothers were more likely to utilize doctors, nurses, and other relatives as their child(ren)'s health information source than the two Korean samples.

Interestingly, among the four different types of social media, all three groups of mothers used blogs or online forums, and social networking sites (e.g., Facebook, Instagram) more frequently than the other two platforms such as social media sharing sites (e.g., YouTube) and microblogging sites (e.g., Twitter). The interview results might illuminate this finding that the mothers truly valued other mothers' experiences in their real lives, which were shared either on online forums or on social networking sites (e.g., Facebook). This finding is also supported by other recent social media studies conducted in which mothers were participants (e.g., Lebron et al., 2019; Moon et al., 2019; Wagg et al., 2019).

A few sources, including father/father-in-law, friends without kids, and librarians, were the least frequently used sources by all three groups of mothers. It is also noticeable that the immigrant Korean mothers were less likely to use coworkers as a health information source than the mothers in the U.S. and Korea. Employment status of the research participants may be able to explain the finding. In this study, 76.3% of the immigrant mothers were stay-at-home mothers, whereas 36.4% of the U.S. mothers and 47.6% of the Korean mothers were stay-at-home mothers. Thus, there is less opportunity for Korean immigrant mothers to use coworkers as an information source. Interestingly, another post hoc analysis of the ANOVA test revealed that the Korean mothers who reside in Korea tended to use newspapers or magazines significantly more frequently than the immigrant Korean mothers. This finding contrasts with what had been reported by Oh et al. (2014), who found that Korean Americans tended to use newspapers or magazines more frequently than native Koreans. A possible reason may be the immigrant mothers in this sample were from 32 different states and Washington DC, whereas Oh et al.'s (2014) study sample was drawn from Washington DC, where Korean immigrants may have better access to newspapers or magazines in the Korean language.

Third, it should be highlighted that an extensive list of source characteristics was developed in this study, and the research participants were asked to evaluate the most important characteristics for their selection criteria of health information sources. Concerning ten source characteristics that were identified from previous literature (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002; Fox & Duggan, 2013; Lee, 2018), results revealed that accurate/credible and accessible were the most crucial characteristics in all three groups of mothers. Accurate/credible, accessible, and active/updated were the top three important characteristics for selection criteria for the U.S. mothers and immigrant Korean mothers. On the other hand, Korean mothers who live in Korea were inclined to value

accurate/credible as the most important selection criterion, followed by organized, accessible, and time saving. In previous literature, credibility and accessibility were consistent as the most significant characteristics that influence information users' selection criteria (Cao et al., 2016; Eysenbach & Köhler, 2002; Eysenbach et al., 2002). However, unlike other previous studies (Eysenbach & Köhler, 2002; Fox & Duggan, 2013b; Lee, 2018), other source characteristics such as free, interactive/able to respond, and time saving were evaluated as less important as source selection criteria in the current samples of this research.

Lastly, when the relationships between frequency of using each information source and demographic characteristics were examined, three characteristics including age, educational attainment, and employment status were statistically significant factors that may have influenced specific source use in all three groups of mothers.

6.1.2 Mothers' Health Information Source Preferences

Table 6.1 shows the top five most preferred health information sources by three different groups of mothers. There was a similarity between the two Korean samples, but a difference was detected between the U.S. mothers and the other two groups of mothers. The results indicated that the U.S. mothers preferred doctors the most, followed by nurses, the World Wide Web, husband/spouse, and friends with kids. The two Korean samples, on the other hand, preferred the World Wide Web the most, followed by doctors, blogs/online forums, nurses, and friends with kids. This finding signifies that the Korean mothers' preferences appear to hold whether they are in their native country or in the U.S. That is, even though the Korean immigrants have emigrated from Korea to the U.S., their source preferences tend to stay the same. It may have implications when information professionals or information providers in diverse settings (e.g., CDC or National Library of Medicine) try

to provide health information resources to this population. Using their preferred sources, the health information resources may be more utilized by the targeted population.

Table 6.1.

Top 5 Preferred Sources by the Three Samples (N = 851)

Rank	U.S. Mothers (*n* = 255)		Immigrant Korean Mothers (*n* = 300)		Korean Mothers (*n* = 296)	
	Source	***M (SD)***	**Source**	***M (SD)***	**Source**	***M (SD)***
1	Doctors	4.63 (.82)	The World Wide Web (www)	4.48 (.86)	The World Wide Web (www)	4.30 (1.10)
2	Nurses	4.32 (.97)	Doctors	4.27 (1.06)	Doctors	4.12 (1.15)
3	The World Wide Web (www)	4.21 (1.08)	Blogs or online forums	4.05 (1.17)	Blogs or online forums	3.97 (1.15)
4	Husband or Spouse	3.49 (1.26)	Nurses	3.76 (1.31)	Friends with kids	3.62 (1.06)
5	Friends with kids	3.31 (1.09)	Friends with kids	3.64 (1.07)	Nurses	3.33 (1.32)

Note 1. Mean scores based on 5-point Likert scale: 5 = Zone 1 (the most preferred sources); 1 = Zone 5 (the least preferred sources).
Note 2. Participants who did not use the specific source and answered, *Not in my information horizon*, were excluded from the analysis.

Moreover, the researcher found a difference between their source uses and source preferences. For instance, although the U.S. mothers tended to utilize the World Wide Web more frequently than any other sources, they seemed to prefer doctors and nurses the most as their health information sources. It is also interesting to note that even though mothers in the two Korean samples were likely to use blogs or online forums more frequently than doctors, they tended to prefer doctors to blogs or online forums as their health information source when it came to accuracy and reliability. This finding was consistent with other previous studies (e.g., Criss et al., 2015; Khoo et al., 2008; National Cancer Institute, 2019), which demonstrated healthcare professionals as trustworthy and credible sources among mothers and American adults.

When three groups of mothers' information horizon maps were drawn based on their source preferences, there was a difference across the groups. For instance, blogs or online forums were one of the most preferred health information sources (zone 1) by the two Korean samples, while the largest number of U.S. mothers positioned that in zone 3.

It was also remarkable that social media sharing sites (e.g., YouTube) did not appear in information horizons in the U.S. sample, whereas the two Korean samples tended to prefer that source (immigrant Korean mothers - zone 2; Korean mothers - zone 3). In this study, the survey data also confirmed the above finding because the social media sharing sites (e.g., YouTube) were one of the least frequently used sources among the U.S. mothers. It was quite surprising because social media sharing sites such as YouTube have been getting lots of attention as a health information source in the past few years (e.g., Asiodu et al., 2017; Criss et al., 2015; Pretorius et al., 2019; Sundstrom, 2016; Walker et al., 2017). It may be possible that YouTube is a useful source for expectant mothers related to pregnancy nutrition, or mothering activities such as breastfeeding (Criss et al., 2015), whereas this study was conducted among mothers of healthy infants and toddlers aged newborn to 3 years old. Therefore, their information seeking practice might be different when their child(ren) gets older and more dynamic.

6.1.3 Mothers' Information-Seeking Pathways based on Child(ren) Health Status

Mothers' information-seeking pathways when their child(ren) was sick

The interview results revealed that mothers in this study were divided into two groups when choosing their first stop for health information: one group turned first to non-human sources, whereas the other group turned first to personal sources. Indeed, 22 out of 24 mothers (91.7% – eight U.S. mothers, seven immigrant Korean mothers, seven Korean mothers) started seeking health information from non-human sources, and 18 of them said

they had started their information seeking from the World Wide Web. Also, concerning the utilized online resources (Tables 4.12 and 4.13), the results confirm that immigrants' information resources were a lot more limited than those of the mothers in the U.S. native population.

The analyses of the interview data also revealed that mothers tended to consider health information on the World Wide Web as accessible/convenient, while healthcare professionals including doctors, specialists, and nurses were likely to be acknowledged as credible/trustworthy sources. Results further indicated that mothers were likely to quickly crowdsource or gather multiple perspectives by using the Web as a health information source when their child(ren) was sick.

On the other hand, seven out of 24 mothers (29.2% – two U.S., two immigrant Korean, three Korean) described her health-information seeking experiences that started from personal sources such as healthcare professionals (pediatricians or nurses; e.g., US7, IM6, IM7, K1, K2), friends with kids (e.g., US3), and husband (e.g., K5). Mothers' information-seeking pathways tended to differ in accordance with urgency of the issues.

Mothers' information-seeking pathways when their child(ren) was healthy

When the participants' child(ren) was healthy, there were still two health information-seeking strategies among mothers: non-human source first and personal source first strategies. Twenty-two out of 24 mothers (91.7% – six U.S., eight immigrant Korean, eight Korean) shared their experiences in which they first used the non-human sources. It is noteworthy that a lot more diverse non-human sources, such as books, newspapers or magazines, social media sharing sites (e.g., YouTube), government health agencies, journal articles, and libraries, were utilized in this circumstance compared to cases in which their child(ren) was ill.

Regarding personal source first information-seeking strategies, nine out 24 mothers (37.5% – four U.S., one immigrant Korean, four Korean) indicated that they had used a personal information source as the starting point for their information-seeking behavior. Like various non-human sources used, mothers utilized diverse personal information sources when their child(ren) was healthy. Those sources included friends with kids (e.g., US1, US3, US4, K1, K4), daycare teachers (e.g., US6), pediatricians (e.g., K3, K8, IM5), their own mother (e.g., IM5), their own father (e.g., IM5), and elderly people at church (e.g., IM8). In terms of growth and development health topics, mothers tended to value daycare teachers as a reliable source due to their extensive experience with children.

6.2 Contributions and Implications

The contributions of the study for both practice and research are discussed in this section. The researcher first describes theoretical contributions as well as methodological contributions and then illustrates implications for information professionals.

6.2.1 Theoretical Contributions

The current research has theoretical contributions. One of the current research goals was to graphically represent two things: (a) mothers' health-related information horizons using the theoretical concepts of Sonnenwald's (1999, 2005) information horizons, and (b) mothers' health information-seeking pathways that were derived from Johnson et al.'s (2006) research. As shown in Chapters 4.3.2 and 4.4, the researcher explored the health information horizons and information-seeking pathways among the three groups of mothers, which have never been reported in the prior literature. Results confirmed that the U.S. mothers, the

immigrant Korean mothers, and the Korean mothers who reside in Korea all tended to have different information horizons and information-seeking pathways. In particular, mothers' information-seeking pathways were different in accordance with their child(ren)'s health status (i.e., when their child was sick vs. healthy).

6.2.2 Methodological Contributions

This study has methodological contributions. Methodologically, this study was modified from previous literature (Savolainen & Kari, 2004; Tsai, 2013) and adapted the conceptual framework of information horizons to the survey, which had been never done before. Using this method, the information horizons could potentially be applied to diverse populations and further expand in future research. This is important because the research using information horizons could be conducted among a greater number of participants in the surveys. This novel approach may be helpful when researchers need to generalize the findings to a certain population.

In addition, when it comes to analyzing the data, ordinal regression was a useful method to test the relationship between individual characteristics and each information source's frequency of use. This study could be an exemplary study for future scholars who try to determine the relationships between an ordinal-level dependent variable and more than one independent variable.

6.2.3 Implications for Information Professionals

This study has implications for information professionals and information providers in diverse settings both in the U.S. and in Korea. First, the findings of this study may have

implications at public libraries in the U.S. Although the researcher understands that there are concerns about providing health-related resources at public libraries, there is a possibility that public librarians could become a valuable source for mothers of healthy children by instructing them on ways to evaluate health information resources for credibility. The researcher argues that this type of instruction would be important for this population because one of the interviewees expressed that she would trust the first source on the search results which is not always accurate.

Indeed, the survey results also confirmed that mothers tended to be remarkably active health information seekers regarding their child(ren) and are likely to value accurate/credible and accessible sources the most. However, the online resources they have been using were somewhat limited. The situation was worse among the immigrant mothers. For example, there are readily available and credible health information resources online provided by Centers for Disease Control and Prevention (CDC) and the National Library of Medicine (MedlinePlus). The interview results, however, revealed that immigrant mothers may not be aware of those trustworthy information resources. Although one of the current study's findings was that librarians were one of the least frequently used sources when mothers seek information related to their child(ren)'s health, supplementary interview results indicated that mothers were actually using public libraries and its resources as their health information sources when their child(ren) was healthy.

In order to make public librarians invaluable as health information sources, constant and updated training through webinars and conferences are necessary. Previous studies found that some public library staff are often not trained to answer health-related information queries (Danhoundo, Whistance, Lemoine, & Konkin, 2019; Gillaspy, 2000), and they were not fully aware of trustworthy resources provided by the National Library of Medicine (Arnott Smith, 2011). Flaherty (2018) also argued that public librarians have an opportunity

and obligation to assist the public by providing access to accurate, authoritative, and high-quality resources such as MedlinePlus.

Second, the current research has implications for public librarians in Korea as well. In Korea, public librarians' roles as leading the general public to credible health-related information resources have been neglected. Health information provision for patients is considered the role of healthcare professionals or medical librarians at medical or hospital libraries (Seo et al., 2008). Moreover, Noh (2011) found that only 8.3% of public libraries in Korea provided consumer health information resources to their library patrons by providing online links. Noh (2011) further found that there was no consumer health information training for public librarians in Korea, but users expected to be able to obtain free, easily accessible, and trustworthy health information resources from public libraries (Noh & Oh, 2011). Therefore, even though there had been existing concerns on providing health-related information resources from public libraries, there is a possibility that public libraries could become valuable resources to mothers actively seeking health information.

Lastly, this research may have implications when information professionals at the National Library of Medicine or information providers in diverse organizations (e.g., CDC, Mayo Clinic, kidshealth.org) try to provide health information resources to this population. Using their preferred sources, the health information resources may be more utilized by the targeted population.

6.3 Limitations

There were a few limitations raised from the current research. First, the results may not be generalized beyond the survey samples. Even though the overall demographics of the U.S. sample was diverse in terms of age, marital status, employment status, state of residence

at the time of the study, housing status, and the number of children, it may not be representative in education level or status of health insurance. For example, 25.1% of the U.S. sample had a master's or doctoral degree, whereas only 12.4% of the U.S. population holds those degrees (U.S. Census Bureau, 2017d). As another example, in the most recent dataset provided by the Kaiser Family Foundation (2017), 88% of U.S. adults with dependent children have health insurance, whereas 94.5% of the U.S. respondents in this study had it.

Also, for the two Korean samples, most of their marital status was married. Thus, there is a possibility that information-seeking behavior among single mothers may be different from the current study's findings. This limitation was unavoidable because the researcher used an online survey method with a non-probability sampling method. Since the potential participants were recruited from several online communities, it was challenging for the researcher to know their demographic characteristics in advance in order to implement other sampling techniques.

Second, any conclusions drawn about the relationships between frequency of using each information source and demographic characteristics are only generalizable to the samples of this study inasmuch as the socio-demographic characteristics were not exhaustive. Although 11 demographic characteristics were tested to see if there are any associations between frequency of using specific sources and individual attributes, there may be other variables that were not tested in this study.

6.4 Future Studies

In this study, there may be some takeaways for future studies. First, future studies may be expanded to include other immigrants of other ethnicities living in the U.S. or even in other countries that accept a lot of immigrants. That is because this study confirmed that there

was a lot of similarity of information-seeking behavior between immigrant Korean mothers and Korean mothers who reside in Korea. That is, understanding the cultural background of a certain sample and unique characteristics of immigrants would be highly important when information professionals at a variety of organizations guide trustworthy health information resources to a specific population.

Second, the current research would also have some implications for Korea. Unlike the past, South Korea is no longer a racially homogeneous nation (Korean Statistical Information Service, 2019). With a growing number of transnational marriages and the influx of foreign workers, its society is becoming more diverse, with the particular addition of minorities from Southeast Asia. Furthermore, a number of new diseases are manifesting themselves every year. However, Korea, like much of the rest of the world, is not prepared for appropriate prevention and treatment of diseases for its minorities. Through this and further research, the researcher intends to further strengthen the foundation for work in the field of information science both in Korea and Southeast Asia in the near future.

Lastly, this study could be expanded to other information behavior research using new social media platforms on mobile devices. For instance, a newly identified health information source among mothers in the current study was instant messaging applications. Indeed, among the interviews with eight immigrant Korean mothers and eight Korean mothers who reside in Korea, five out of 16 mothers (31.3%) mentioned that they have been using the Kakaotalk[12] as their health-related information source. With the high usage of a few social media platforms (e.g., social networking sites, blogs, or online forums) as health information sources was confirmed in this study, constant investigation on newly emerging social media platforms may be necessary in the future studies.

[12] Kakaotalk is a free mobile instant messaging application for smartphones with free text and free call features, operated by Kakao Corporation (Kakao Corporation, 2019). It is one of the most popular messaging applications among Koreans and it is available worldwide.

In conclusion, using mixed research methods, this research finds that mothers of healthy infants and toddlers are active health information seekers considering their roles as health managers and caregivers for their children. When three distinctive group of mothers' information-seeking behavior and their source preferences were compared, there was a similarity between the immigrant Korean sample and the Korean sample. Furthermore, results also confirmed that accurate/credible, and accessible were the most important characteristics for mothers' selection criteria of health information sources. Concerning the mothers' information-seeking pathways, there were behavioral differences in accordance with their child(ren)'s health status. These findings would implications for information professionals. Even though librarians were one of the least frequently used sources among mothers, the interview analysis revealed that mothers have been using libraries as their health-related information source when their child(ren) was healthy. It implies that there is a possibility that information professionals in diverse settings (e.g., public libraries) could become a valuable source for mothers of healthy children by instructing them on ways to evaluate health information resources for credibility. Moreover, understanding the cultural background of a sample and unique characteristics of immigrants would be highly important when the information professionals guide trustworthy health information resources to a specific population.

REFERENCES

Ahuvia, A. (2001). Traditional, interpretive and reception based content analyses: improving the ability of content analysis to address issues of pragmatic and theoretical concern. *Social Indicators Research, 54*(2), 139-172.

Allen, K., & Rainie, L. (2002). Parents online. Washington, DC: The Pew Internet & American Life Project. http://www.pewinternet.org/2002/11/17/parents-online/

Allen, M., Matthew, S. & Boland, M. J. (2004). Working with immigrant and refugee populations: issues and Hmong case study. *Library Trends, 53*(2), 301-328.

Alwhaibi, M., Goyat, R., & Kelly, K. M. (2017). The use of herbal remedies among mothers of young children living in the central Appalachian region. *Evidence-Based Complementary & Alternative Medicine, 2017,* Article ID 1739740. https://www.hindawi.com/journals/ecam/2017/1739740/

Archibald, M. M., Caine, V., Ali, S., Hartling, L., & Scott, S. D. (2015). What is left unsaid: an interpretive description of the information needs of parents of children with asthma. *Research in Nursing & Health, 38*(1), 19–28.

Arnott Smith, C. (2011). "The easier-to-use version": Public librarian awareness of consumer health resources from the National Library of Medicine. *Journal of Consumer Health on the Internet, 15*(2), 149-163.

Asiodu, I. V., Waters, C. M., Dailey, D. E., & Lyndon, A. (2017). Infant feeding decision-making and the influences of social support persons among first-time African American mothers. *Maternal & Child Health Journal, 21*(4), 863-872.

Bailey, M. (2008, September 18). *A new study reveals moms' most trusted sources of information*. Washington, DC: Centers for Disease Control and Prevention. https://www.cdc.gov/healthcommunication/pdf/thisjustin/tji_18_200912.pdf

Baker, L. M., Wilson, F. L., Nordstrom, C. K., & Legwand, C. (2007). Mothers' knowledge and information needs relating to childhood immunizations. *Issues in Comprehensive Pediatric Nursing, 30*(1-2), 39-53.

Ball, D. (2011). *Regulation of mark-ups in the pharmaceutical supply chain – Review series on pharmaceutical pricing policies and interventions.* Geneva, Switzerland: World Health Organization and Health Action International. https://www.ncbi.nlm.nih.gov/books/NBK258615/

Barnett, G. A. (Ed.). (2011). Mothers communities. In *Encyclopedia of social networks* (pp. 550-553). Thousand Oaks, CA: SAGE Publications.

Bernhardt, J. M., & Felter, E. M. (2004). Online pediatric information seeking among mothers of young children: Results from a qualitative study using focus groups. *Journal of Medical Internet Research, 6*(1): e7.

Beverley, C. A., Bath, P. A., & Barber, R. (2007). Can two established information models explain the information behavior of visually impaired people seeking health and social care information? *Journal of Documentation, 63*(1), 9-32.

Boslaugh, S. E. (2013). Health care in South Korea. *Health care systems around the world: A comparative guide* (pp. 425-428). Los Angeles, CA: Sage Publications.

Boyd, D. M., & Ellison, N. B. (2007). Social networking sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*(1), 210-230.

Braveman, P., Cubbin, C., Marchi, K., Egerter, S., & Chavez, G. (2001). Measuring socioeconomic status/position in studies of racial/ethnic disparities: Maternal and infant health. *Public Health Reports, 116*(5), 449-463.

Caidi, N., Allard, D., & Quirke, L. (2010). The information practices of immigrants. *Annual Review of Information Science and Technology, 44*, 493-531.

Cao, W., Zhang, X., Xu, K., & Wang, Y. (2016). Modeling online health information-seeking behavior in China: The roles of source characteristics, reward assessment, and internet self-efficacy. *Health Communication, 31*(9), 1105-1114.

Carolan, M. (2007). Health literacy and the information needs and dilemmas of first-time mothers over 35 years. *Journal of Clinical Nursing, 16*(6), 1162-1172.

Case, D. O. (2016). *Looking for information: A survey of research on information seeking, needs, and behavior* (4th ed.). Bingley, UK: Emerald Group Pub.

Chae, J., & Quick, B. L. (2015). An examination of the relationship between health information use and health orientation in Korean mothers: Focusing on the type of health information. *Journal of Health Communication, 20*(3), 275-284.

Choi, E. C. (1986). Unique aspects of Korean-American mothers. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 15*(5), 394-400.

Choi, E. C. (1995). A contrast of mothering behaviors in women from Korea and the United States. *Journal of Obstetric, Gynecologic & Neonatal Nursing, 24*(4), 363-369.

Chung, M., Oden, R. P., Joyner, B. L., Sims, A., & Moon, R. Y. (2012). Safe infant sleep recommendations on the Internet: Let's Google it. *Journal of Pediatrics, 161*(6), 1080–1084.e1

City moms blog network. (2019, February 23). *Our sites* [Online forum]. https://www.citymomsblog.com/our-sister-sites/

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. (2nd ed.). Hillsdale, NJ: Erlbaum Associates.

Creswell, J. W. (2011). *Controversies in mixed methods research*. In N. K. Denzin, & Y. S. Lincoln (Eds.), The SAGE Handbook of Qualitative Research (pp. 269-284). Thousand Oaks, CA: SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). London, UK: SAGE Publications.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Los Angeles, CA: SAGE Publications.

Criss, S., Woo Baidal, J. A., Goldman, R. E., Perkins, M., Cunningham, C., & Taveras, E. M. (2015). The role of health information sources in decision-making among Hispanic mothers during their children's first 1000 days of life. *Maternal and Child Health Journal, 19*(11), 2536–2543.

Danhoundo, G., Whistance, S. D., Lemoine, D., & Konkin, J. (2019). Provision of consumer health information in Alberta's Rural Public Libraries. *Health Information & Libraries Journal, 36*(1), 41–59.

Davis, R. E., Cole, S. M., McKenney-Shubert, S. J., Jones, S. J., & Peterson, K. E. (2017). An exploration of how Mexican American WIC mothers obtain information about behaviors associated with childhood obesity risk. *Journal of Nutrition Education & Behavior, 49*(3), 187-195.

Dervin, B. (1997). Given a context by any other name: Methodological tools for taming the unruly beast. In P. Vakkari, R. Savolainen, & B. Dervin (Eds.), *Information seeking in context* (pp. 13-38).

Dutta, M., & Basu, A. (2011). Culture, communication, and health. In T. L. Thompson, R. Parrott & J. F. Nussbaum (Eds.), *The Routledge handbook of health communication* (2nd ed., pp. 320-324). New York, NY: Routledge.

Eaves, L., Ho, H., Laird, B., & Dickson, S. (1996). Raising a child with Down syndrome: parents' evaluations of health information and support. *Down Syndrome Research and Practice, 4*(2), 65–69.

Emmanuel, E., Creedy, D., & Fraser, J. (2001). What mothers want: a postnatal survey. *The Australian Journal of Midwifery, 14*(4), 16-20.

Eysenbach, G., & Köhler, C. (2002). How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. *British Medical Journal, 324*, 573-577.

Eysenbach, G., Powell, J., Kuss, O., & Sa, E-R. (2002). Empirical studies assessing the quality of health information for consumers on the World Wide Web: A systematic review. *Journal of the American Medical Association, 287*(20), 2691-2700.

Facebook. (2019). *Facebook groups*. https://www.facebook.com/help/1629740080681586

Fain, N. (2009). *Internet use among parents of children with autism spectrum disorders (ASD).* (Doctoral dissertation, The University of Texas Medical Branch).

Field, A. (2009). *Discovering statistics using SPSS.* (3rd ed.). Los Angeles, CA: Sage Publications.

Flaherty, M. G. (2018). Health information provision in public libraries. In *Promoting individual and community health at the library* (pp. 33-51). Chicago, IL: American Library Association.

Fox, S. (2014). *The social life of health information.* Washington, DC: Pew Research Center. http://www.pewresearch.org/fact-tank/2014/01/15/the-social-life-of-health-information/

Fox, S., & Duggan, M. (2013a). *Health online 2013.* Washington, DC: The Pew Internet & American Life Project. http://www.pewinternet.org/2013/01/15/health-online-2013/

Fox, S., & Duggan, M. (2013b). *The diagnosis difference: Part two: Sources of health information.* Washington, DC: Pew Research Center. http://www.pewinternet.org/2013/11/26/part-two-sources-of-health-information/

Galarce, E. M., Ramanadhan, S., & Viswanath, K. (2011). *Health information seeking.* In T. L. Thompson, R. Parrott, & J. F. Nussbaum (Eds.), The Routledge handbook of health communication (pp. 167-180). New York, NY: Routledge.

Garson, G. D. (2014). *Ordinal regression*. Asheboro, NC: Statistical Associates Publishing.

Gaskell, G., & Bauer, M. W. (2000). Towards public accountability: beyond sampling, reliability and validity. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound* (pp. 336-350). London, UK: Sage Publications.

Gazmararian, J., Dalmida, S., Merino, Y., Blake, S., Thompson, W., & Gaydos, L. (2014). What new mothers need to know: perspectives from women and providers in Georgia. *Maternal & Child Health Journal, 18*(4), 839-851.

Gillaspy, M. L. (2000). Starting a consumer health information service in a public library. *Public Library Quarterly, 18*(3-4), 5-19.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report, 8*(4), 597-607.

Greyson, D. (2017). Health information practices of young parents. *Journal of Documentation, 73*(5), 778-802.

Guendelman, S., Broderick, A., Mlo, H., Gemmill, A., & Lindeman, D. (2017). Listening to communities: Mixed-method study of the engagement of disadvantaged mothers and pregnant women with digital health technologies. *Journal of Medical Internet Research, 19*(7), 1-11.

Guerra-Reyes, L., Christie, V., Prabhakar, A., Harris, A., & Siek, K. (2016). Postpartum health information seeking using mobile phones: experiences of low-income mothers. *Maternal & Child Health Journal, 20*(S1), S13-S21.

Guillaume, L. R., & Bath, P. A. (2004). The impact of health scares on parents' information needs and preferred information sources: a case study of the MMR vaccine scare. *Health Informatics Journal, 10*(1), 5-22.

Hammond, M. (2017). What is an online community? A new definition based around commitment, connection, reciprocity, interaction, agency, and consequences. *International Journal of Web Based Communities, 13*(1), 118-136.

Han, E., Song, H., & Kim, S. H. (1996). Doctor visits among Korean Americans in Los Angeles County. *Asian American and Pacific Islander Journal of Health, 4*(1-3), 146-148.

Hearn, L., Miller, M., & Fletcher, A. (2013). Online healthy lifestyle support in the perinatal period: what do women want and do they use it? *Australian Journal of Primary Health, 19*(4), 313-318.

Hearn, L., Miller, M., & Lester, L. (2014). Reaching perinatal women online: The healthy you, healthy baby website and app. *Journal of Obesity, 2014*, article id 573928.

Hoeffel, E. M., Rastogi, S., Kim, M. O., & Shahid, H. (2012). *The Asian Population: 2010 Census Briefs.* Washington DC: U.S. Census Bureau. http://www.census.gov/prod/cen2010/briefs/c2010br-11.pdf

Huh, J., Delorme, D. E., Reid, L. N., & Kim, J. (2013). Korean Americans' prescription drug information seeking and evaluation and use of different information sources. *Journal of Health Communication, 18*(5), 498-526.

Iversen, G. R. (2004). Quantitative research. In M. Lewis-Beck (Ed.), *The SAGE encyclopedia of social science research methods*. Thousand Oaks, CA: Sage Publications. http://ezproxy.library.wisc.edu/login?url=https://search.credoreference.com/content/entry/sagessrm/quantitative_research/0?institutionId=1177

Jacobs, W., Amuta, A. O., & Jeon, K. C. (2017). Health information seeking in the digital age: An analysis of health information seeking behavior among US adults. *Cogent Social Sciences, 3*(1).

Jaks, R., Baumann, I., Juvalta, S., & Dratva, J. (2019). Parental digital health information seeking behavior in Switzerland: A cross-sectional study. *BMC Public Health, 19*(1), 225.

Jenkins, V., Fallowfield, L., & Saul, J. (2001). Information needs of patients with cancer: results from a large study in UK cancer centres. *British Journal of Cancer, 84*(1), 48-51.

Johnson, J. D. (1997). *Cancer-related information seeking*. Cresskill, NJ: Hampton Press.

Johnson, J. D. E., Case, D. O., Andrews, J., Allard, S. L., & Johnson, N. E. (2006). Fields and pathways: Contrasting or complementary views of information seeking. *Information Processing & Management, 42*(2), 569–582.

Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research, 1*(2), 112-133.

Kaiser Family Foundation. (2017). *Health coverage & uninsured.* San Francisco, CA: Kaiser Family Foundation. https://www.kff.org/state-category/health-coverage-uninsured/health-insurance-status/

Kakao Corporation. (2019). Kakaotalk. In *Service*. https://www.kakaocorp.com/service/KakaoTalk?lang=en

Kennedy, A., Basket, M., & Sheedy, K. (2011). Vaccine attitudes, concerns, and information sources reported by parents of young children: Results from the 2009 Health Styles Survey. *Pediatrics, 127*(S1), S92-S99.

Khoo, K., Bolt, P., Babl, F. E., Jury, S., & Goldman, R. D. (2008). Health information seeking by parents in the Internet age. *Journal of Paediatrics & Child Health, 44*(7/8), 419–423.

Kilicarslan-Toruner, E., & Akgun-Citak, E. (2013). Information-seeking behaviours and decision-making process of parents of children with cancer. *European Journal of Oncology Nursing, 17*(2), 176–183.

Kim, K-S., Sin, S-C. J., & Tsai, T-I. (2014). Individual differences in social media use for information seeking. *The Journal of Academic Librarianship, 40*(2), 171-178.

Kim, M. H., & Kim, H. J. (2007). Participation of mothers in the Internet community: relationship to their perceptions of social support and parenting efficacy. *Korean Journal of Children, 28*(3), 1–17.

Kim, S., & Yoon, J. (2012). The use of an online forum for health information by married Korean women in the U.S. *Information Research, 17*(2), paper 514. http://www.informationr.net/ir/17-2/paper514.html

Kim, W. (2013). *The role of social support and social networks in health information seeking behavior among Korean Americans.* (Doctoral dissertation, George Mason University).

Kim, W., Kreps, G. L., & Shin, C-N. (2015). The role of social support and social networks in health information-seeking behavior among Korean Americans: a qualitative study. *International Journal for Equity in Health, 14*(1), 1-10.

Koehly, L., Peters, J., Kenen, R., Hoskins, L., Ersig, A., Kuhn, N., & ... Greene, M. (2009). Characteristics of health information gatherers, disseminators, and blockers within families at risk of hereditary cancer: implications for family health communication interventions. *American Journal of Public Health, 99*(12), 2203-2209.

Korean Statistical Information Service. (2019). *Status of Marriage Migrant by Nationality/Region*. Statistics Korea. http://kosis.kr/eng/statisticsList/statisticsListIndex.do?menuId=M_01_01&vwcd=MT_ETITLE&parmTabId=M_01_01

Kowal, S. P., Jardine, C. G., & Bubela, T. M. (2015). "If they tell me to get it, I'll get it. If they don't…": immunization decision-making processes of immigrant mothers. *Journal of Public Health, 106*(4), 230-235.

Kwon, S. (2008). Thirty years of national health insurance in South Korea: Lessons for achieving universal health care coverage. *Health Policy and Planning, 24*, 63-71.

Lagan, B. M., Sinclair, M., & Kernohan, W. G. (2006). Pregnant women's use of the Internet: a review of published and unpublished evidence. *Evidence Based Midwifery, 4*(1), 17-23.

Lambert, S. D., & Loiselle, C. G. (2007). Health information-seeking behavior. *Qualitative Health Research, 17*(8), 1006-1019.

Lebron, C. N., St. George, S. M., Eckembrecher, D. G., & Alvarez, L. M. (2019). "Am I doing this wrong?" Breastfeeding mothers' use of an online forum. *Maternal & Child Nutrition, September*, e12890.

Lee, H. S. (2016). Research trends in mothers' health information seeking behaviors: a review of the literature. *Proceedings of the 79th ASIS&T Annual Meeting*: Article No. 130.

Lee, H. S. (2017). Health information needs and seeking behaviors among Korean mothers of young children in the United States. *Journal of the Korean Biblia Society for Library and Information Science, 28*(1), 209-228.

Lee, H. S. (2018). A comparative study on the health information needs, seeking and source preferences among mothers of young healthy children: American mothers compared to recent immigrant Korean mothers *Information Research, 23*(4), paper 803. http://www.informationr.net /ir/23-4/paper803.html

Lincoln, Y. S., & Guba, E. G. (1985). Establishing trustworthiness. In Y.S. Lincoln & E.G. Guba (Eds.), *Naturalistic inquiry* (pp. 289-331). Newbury Park, CA: Sage Publications.

Loudon, K., Buchanan, S., & Ruthven, I. (2016). The everyday life information seeking behaviours of first-time mothers. *Journal of Documentation, 72*(1), 24-46.

Lwoga, E. T., & Mosha, N. F. (2013). Information seeking behaviour of parents and caregivers of children with mental illness in Tanzania. *Library Review, 62*(8/9), 567–584.

Machet, M., & Govender, K. S. (2012). Information behaviour of recent Chinese immigrants in Auckland, New Zealand. *South African Journal of Libraries & Information Science, 78*(1), 25–33.

Medical Library Association and Consumer & Patient Health Information Section. (1996). The librarian's role in the provision of consumer health information and patient education. *Bulletin of the Medical Library Association, 84*(2), 238-239.

Ministry of Education in Korea. (2018, September 18). *Educational attainment among Korean population aged 25-64*. http://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx_cd=1530

MissyUSA. (2019). *About us.* https://www.missyusa.com/company/content/company.asp

Moon, R. Y., Mathews, A., Oden, R., & Carlin, R. (2019). Mothers' perceptions of the Internet and social media as sources of parenting and health information: Qualitative study. *Journal of Medical Internet Research, 21*(7), e14289.

Morris, M. R. (2014). Social networking site use by mothers of young children. *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing* (pp. 1272-1282). Baltimore, MD: ACM. https://dl.acm.org/citation.cfm?id=2531603

Murphree, A. M., Whitehead, M. T., & Painter, S. (2011). Providing literature and resources to expectant mothers of children with Down Syndrome. *Journal of Women's Health Physical Therapy, 35*(1), 30.

National Cancer Institute. (2017). Health information national trends survey 5, Cycle 1 [Data set]. https://hints.cancer.gov/data/survey-instruments.aspx

National Cancer Institute. (2018). Health information national trends survey 5, Cycle 2 [Data set]. https://hints.cancer.gov/data/survey-instruments.aspx

National Cancer Institute. (2019). Trust in health information sources among American adults. *Health Information National Trends Survey Briefs, 39*. https://hints.cancer.gov/docs/Briefs/HINTS_Brief_39.pdf

National Health Insurance Service. (2019). *About us: History*. https://www.nhis.or.kr/static/html/wbd/g/a/wbdga0203.html

Naver corp. (2019). *Company profile.* https://www.navercorp.com/en/naver/company

Neuendorf, K. A. (2002). *Content analysis guidebook*. Thousand Oaks, CA: Sage Publications.

Neuendorf, K. A. (2017). *Content analysis guidebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Noh, Y. (2011). An analyzing of the current consumer health information (CHI) services in Korean public libraries. *Journal of the Korean Society for Library and Information Science, 45*(2), 415–437.

Noh, Y., & Oh, S. (2011). An analysis of users' perception of providing CHI services in public libraries. *Korean Library and Information Science Society, 42*(3), 45–75.

Nvivo (Version 12). [Computer Software]. Melbourne, Australia: QSR International.

O'Connor, A., & Batalova, J. (2019, April 10). *Korean immigrants in the United States.* Washington, DC: Migration Policy Institute. https://www.migrationpolicy.org/article/korean-immigrants-united-states

OECD Statistics. (2017). *Fertility rates* [Data set]. OECD. https://data.oecd.org/pop/fertility-rates.htm

OECD Statistics. (2018). *Labor Force Statistics by sex and age* [Data set]. OECD. https://stats.oecd.org/Index.aspx?DataSetCode=LFS_SEXAGE_I_R

Oh, K. M., Jun, J., Zhao, X., Kreps, G. L., & Lee, E. E. (2015). Cancer information seeking behaviors of Korean American women: a mixed-methods study using surveys and focus group interviews. *Journal of Health Communication, 20*(10), 1143-1154.

Oh, K. M., Kreps, G. L., Jun, J., Chong, E., & Ramsey, L. (2012). Examining the health information-seeking behaviors of Korean Americans. *Journal of Health Communication, 17*(7), 779–801.

Oh, K. M., Kreps, G. L., Jun, J., & Ramsey, L. (2011). Cancer information seeking and awareness of cancer information sources among Korean Americans. *Journal of Cancer Education, 26*(2), 355-364.

Oh, K. M., Zhou, Q., Kreps, G., & Kim, W. (2014). The influences of immigration on health information seeking behaviors among Korean Americans and Native Koreans. *Health Education & Behavior, 41*(2), 173–185.

Park, H., & Park, M. S. (2014). Cancer information-seeking behaviors and information needs among Korean Americans in the online community. *Journal of Community Health, 39*(2), 213-220.

Parker, K., & Stepler, R. (2017, September 14). *As U.S. marriage rate hovers at 50%, education gap in marital status widens*. Pew Research Center. https://www.pewresearch.org/fact-tank/2017/09/14/as-u-s-marriage-rate-hovers-at-50-education-gap-in-marital-status-widens/

Pehora, C., Gajaria, N., Stoute, M., Fracassa, S., Serebale-O'Sullivan, R., & Matava, C. T. (2015). Are parents getting it right? A survey of parents' Internet use for children's health care information. *Interactive Journal of Medical Research, 4*(2), e12.

Pew Research Center. (2015). *Modern immigration wave brings 59 million to U.S. driving population growth and change through 2065: Views of immigration's impact on U.S. society mixed.* https://www.pewresearch.org/hispanic/2015/09/28/modern-immigration-wave-brings-59-million-to-u-s-driving-population-growth-and-change-through-2065/

Pinquart, M., & Duberstein, P. R. (2004). Information needs and decision-making processes in older cancer patients. *Critical Reviews in Oncology/Hematology, 51*(1), 69-80.

Plantin, L., & Daneback, K. (2009). Parenthood, information and support on the internet: A literature review of research on parents and professionals online. *BMC Family Practice, 10*(34).

Potnis, D. (2015). Wilson's information-seeking behavior models (1981, 1996, 1999). In M. N. Al-Suqri, & A. S. Al-Aufi. (Eds.). *Information seeking behavior and technology adoption: Theories and trends* (pp. 94-112). Hershey, PA: IGI Global.

Pretorius, K., Johnson, K. E., & Rew, L. (2019). An integrative review: Understanding parental use of social media to influence infant and child health. *Maternal & Child Health Journal, 23*, 1360-1370.

Radford, J. (2019). *Key findings about U.S. immigrants*. Washington, DC.: Pew Research Center. https://www.pewresearch.org/fact-tank/2019/06/17/key-findings-about-u-s-immigrants/

Ramanadhan, S., & Viswanath, K. (2006). Health and the information nonseeker: A profile. *Health Communication, 20*(2), 131-139.

Renkert, S., & Nutbeam, D. (2001). Opportunities to improve maternal health literacy through antenatal education: An exploratory study. *Health Promotion International, 16*(4), 381-388.

Rutten, L. J. F., Squiers, L., & Hesse, B. W. (2006). Cancer-related information seeking: Hints from the 2003 Health Information National Trends Survey (HINTS). *Journal of Health Communication, 11*(S1), 147-156.

Ryan, J. (2013). *A history of the Internet and the digital future*. London, UK: Reaktion Books.

Sandelowski, M. (2004). Qualitative research. In M. Lewis-Beck (Ed.), *The SAGE encyclopedia of social science research methods*. Thousand Oaks, CA: Sage Publications. http://ezproxy.library.wisc.edu/login?url=https://search.credoreference.com/content/entry/sagessrm/qualitative_research/0?institutionId=1177

Savolainen, R., & Kari, J. (2004). Placing the Internet in information source horizons: A study of information seeking by Internet users in the context of self-development. *Library & Information Science Research, 26*(4), 415-433.

Sayakhot, P., & Carolan-Olah, M. (2016). Internet use by pregnant women seeking pregnancy-related information: a systematic review. *BMC Pregnancy and Childbirth, 16*, 65-75.

Schoth, D. E., Golding, L., Johnson, E., & Liossi, C. (2016). Anxiety sensitivity is associated with attentional bias for pain-related information in healthy children and adolescents. *Journal of Health Psychology, 21*(10), 2434–2444.

Scullard, P., Peacock, C., & Davies, P. (2010). Googling children's health: Reliability of medical advice. *Archives of Diseases in Childhood, 95*(8), 580-582.

Seo, J.-W., Park, J. H., Ki, H., Park, J. Y., Park, M.-J., & Kim, H.-Y. (2008). Korean medical libraries and professional associations: changing services and roles. *Health Information & Libraries Journal, 25*(2), 142–149.

Shieh, C., Broome, M. E., & Stump, T. E. (2010). Factors associated with health information-seeking in low-income pregnant women. *Women & Health, 50*(5), 426-442.

Silliman, R. A., Dukes, K. A., Sullivan, L. M., & Kaplan, S. H. (1998). Breast cancer care in older women. *Cancer, 83*(4), 706–711.

Sin, S-C. J., & Kwon, N. (2017). Displacement or complementarity? assessing the relationship between social media and public library usage in U.S., South Korea, and Singapore. *Library and Information Science Research, 39*(3), 169-179.

Sirikul, P., & Dorner, D. (2016). Thai immigrants' information seeking behaviour and perception of the public library's role during the settlement process. *Library Review, 65*(8/9), 535–548.

Skranes, L., Løhaugen, G., Botngård, A., & Skranes, J. (2014). Internet use among mothers of young children in Norway: a survey of Internet habits and perceived parental competence when caring for a sick child. *Journal of Public Health, 22*(5), 423-431.

Sligo, F., & Jameson, A. M. (2000). The knowledge-behavior gap in use of health information. *Journal of The American Society for Information Science, 51*(9), 858-869.

Slomian, J., Bruyère, O., Reginster, J. Y., & Emonts, P. (2017). The internet as a source of information used by women after childbirth to meet their need for information: a web-based survey. *Midwifery, 48*, 46-52.

Song, H., Cramer, E. M., McRoy, S., & May, A. (2013). Information needs, seeking behaviors, and support among low-income expectant women. *Women & Health, 53*(8), 824-842.

Sonnenwald, D. H. (1999). Evolving perspectives of human information behaviour: Contexts, situations, social networks and information horizons. In T. D. Wilson & D. K. Allen (Eds.), *Exploring the contexts of information behavior: Proceedings of the second international conference in information needs, seeking and use in different contexts* (pp. 176-190). London, UK: Taylor Graham.

Sonnenwald, D. H. (2005). Information horizons. In K. Fisher, S. Erdelez, & L. McKechnie (Eds). *Theories of information behavior* (pp. 191-197). Medford, NJ: Information Today.

Sonnenwald, D. H., Wildemuth, B. M., & Harmon, G. (2001). A research method using the concept of information horizons: An example from a study of lower socio-economic students' information seeking behavior. *The New Review of Information Behavior Research, 2*, 65-86.

Sontag, J. C., & Schacht, R. (1994). An ethnic comparison of parent participation and information needs in early intervention. *Exceptional Children, 60*(5), 422-433.

SPSS (Version 26) [Computer software]. Armonk, NY: IBM.

Statistics Korea. (2019, March 22). *Korean social indicators 2018* [Press release]. http://www.kostat.go.kr/portal/korea/kor_nw/1/1/index.board?bmode=read&aSeq=373801

Suh, H.-J. (2004). Use of Internet as sources of information for purpose of rearing: differences between Korean and U.S. parents. *Korean Journal of Children, 25*(6), 321–335.

Suh, M., & Hsieh, G. (2019). The "Had Mores": Exploring Korean immigrants' information behavior and ICT usage when settling in the United States. *Journal of the Association for Information Science & Technology*, *70*(1), 38–48.

Sundstrom, B. (2016). Mothers Google it up: Extending communication channel behavior in diffusion of innovations theory. *Health Communication, 31*(1), 91-101.

Teddlie, C., & Tashakkori, A. (2009). Sampling strategies for mixed methods research. *Foundations of mixed methods research: integrating quantitative and qualitative approaches in the social and behavioral sciences* (pp. 168-196). Los Angeles, CA: Sage Publications.

Tsai, T. (2013). *Socialization and information horizons: Source use behavior of first-generation and continuing-generation college students* (Doctoral dissertation, University of Wisconsin - Madison).

U.S. Census Bureau. (2017a). *2013-2017 American community survey 5-year estimates* [Data set]. https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml

U.S. Census Bureau. (2017b). *Median household income (in 2017 dollars), 2013-2017.* https://www.census.gov/quickfacts/geo/chart/US/INC110217

U.S. Census Bureau. (2017c). *Selected housing characteristics* (2013-2017 American community survey 5-year estimates) [Data set]. https://data.census.gov/cedsci/table?d=ACS%205-Year%20Estimates%20Data%20Profiles&table=DP04&tid=ACSDP5Y2017.DP04&lastDisplayedRow=69

U.S. Census Bureau (2017d). *Random samplings: Immigrant families and educational attainment* [Blog post]. https://www.census.gov/newsroom/blogs/randomsamplings/2017/03/immigrant_familiesa.html

Viau, P., Padula, C. A., & Eddy, B. (2002). An exploration of the health concerns and health promotion behaviors in pregnant women over age 35. *The American Journal of Maternal/Child Nursing, 27*(6), 328-334.

Wagg, A. J., Callanan, M. M., & Hassett, A. (2019). Online social support group use by breastfeeding mothers: A content analysis. *Heliyon, 5*(3), e01245.

Walker, L. O., Mackert, M. S., Ahn, J., Vaughan, M. W., Sterling, B. S., Guy, S., & Hendrickson, S. (2017). e-Health and new moms: Contextual factors associated with sources of health information. *Public Health Nursing, 34*, 561-568.

Weiner, J. L., Fisher, A. M., Nowak, G. J., Basket, M. M., & Gellin, B. G. (2015). Childhood immunizations: first-time expectant mothers' knowledge, beliefs, intentions, and behaviors. *American Journal of Preventive Medicine, 49*(6), S426-S434.

Wildemuth, B. M. (2017). Mixed methods. *Applications of social research methods to questions in information and library science* (pp. 114-122). Santa Barbara, CA: Libraries Unlimited.

Willig, C. (2016). Qualitative research. In L. H. Miller (Ed.), *The Sage encyclopedia of theory in psychology*. Thousand Oaks, CA: Sage Publications. http://ezproxy.library.wisc.edu/login?url=https://search.credoreference.com/content/topic/qualitative_research?institutionId=1177

Wilson, T. D. (1997). Information behaviour: An interdisciplinary perspective. *Information Processing and Management, 33*(4), 551-572.

Wilson, T. D. (2000). Human information behavior. *Informing Science, 3*(2), 49-55. http://inform.nu/Articles/Vol3/v3n2p49-56.pdf

Worrall, A., & Oh, S. (2013). The place of health information and socio-emotional support in social questioning and answering. *Information Research, 18*(3), paper 587.

Yee, L., & Simon, M. (2010). The role of the social network in contraceptive decision-making among young African-American and Latina women. *Journal of Adolescent Health, 47*(4), 374-380.

Yi, Y. J., Stvilia, B., & Mon, L. (2012). Cultural influences on seeking quality health information: an exploratory study of the Korean community. *Library & Information Science Research, 34*(1), 45-51.

Yi, Z. (2016). Effective techniques for the segmentation of academic library users. *Library Management, 37*(8/9), 454-464.

Yoo, E. (2004). *Factors affecting middle-aged women's information seeking on the web* (Doctoral dissertation, University of Wisconsin–Madison).

Zimmerman, M. S. (2018). Information horizons mapping to assess the health literacy of refugee and immigrant women in the USA. *Information Research, 23*(4), paper 770. http://informationr.net/ir/23-4/paper802.html

APPENDICES

Appendix A. Search Strategies

	Database	Limits	Query	Total citations retrieved
1	Library and Information Science Abstracts (LISA)	Peer-reviewed; Publication date from 19940101 to 20191231, English	MAINSUBJECT.EXACT("Information seeking behavior") AND (mother* OR parent* OR wom*n) AND (health OR med* OR nurs*)	167
2	Library and Information Science and Technology Abstracts (LISTA)	Peer-reviewed; Publication date from 19940101 to 20191231, English	((DE "Information needs") OR (DE "Information-seeking behavior" OR DE "Information-seeking strategies")) AND (mother* OR parent* OR wom#n) AND (health* OR med* OR nurs*)	101
3	Library Literature & Information Science Full Text	Peer-reviewed; Publication date from 19940101 to 20191231, English	((DE "Information needs") OR (DE "Information-seeking behavior" OR DE "Information-seeking strategies")) AND (mother* OR parent* OR wom#n) AND (health* OR med* OR nurs*)	68
4	MEDLINE (PubMed)	Publication date from 19940101 to 20191231, English	(("Information Seeking Behavior"[Mesh] OR "information seeking")) AND ("Mothers"[Mesh] OR "woman" OR "women" OR “mother*”)	540
5	CINAHL	Peer-reviewed; Publication date from 19940101 to 20191231, English Source Type: Academic journals	(MM "Information Seeking Behavior" OR MM “Information Needs”) AND (mother* OR parent* OR wom*)	602
6	ProQuest Dissertations & Theses Global	Publication date from 19940101 to 20191231, English	("information seeking" OR "information needs") AND (mother* OR parent* OR wom*n) AND ((med* OR nurs*) AND su.Exact("health"))	236
	Total			**1714**

Appendix B. Recruitment Messages

Version 1. Recruitment message for US mothers of young children

Health information seeking behavior research among mothers of young children (aged 0 to 3 years old)

Are you a mother of at least a child less than 3 years old? Also, were you born in the United States and do you have US American citizenship? If yes, please follow the link below to determine if you are eligible for the survey. Only eligible participants will be asked to take the brief survey, approximately 10 - 15 minutes, and will be able to enter to win one of fifteen $50 Amazon e-gift cards! The overall purpose of the research is to identify the health information seeking behaviors of mothers of young healthy children aged newborn to 3 years old.

Here is a link to a set of brief questions to see if you are eligible for the current study and the survey itself:

https://uwmadison.co1.qualtrics.com/jfe/form/SV_0P8IHmcCoeiJhad

Thank you very much for your interests on the research! Please contact a student researcher Hanseul Stephanie Lee (hlee535@wisc.edu) if you have any questions on this study.

Version 2. Recruitment message for recent Korean immigrant mothers

Health information seeking behavior research among mothers of young children (aged 0 to 3 years old)

Are you a Korean mother of at least a child less than 3 years old? Also, have you immigrated to the United States within the past 10 years? If yes, please follow the link below to determine if you are eligible for the survey. Only eligible participants will be asked to take the brief survey, approximately 10 - 15 minutes, and will be able to enter to win one of fifteen $50 Amazon e-gift cards! The overall purpose of the research is to identify the health information needs and seeking behaviors of mothers of young healthy children aged newborn to 3 years old.

Here is a link to a set of brief questions to see if you are eligible for the current study and the survey itself:

https://uwmadison.co1.qualtrics.com/jfe/form/SV_0P8IHmcCoeiJhad

Thank you very much for your interests on the research! Please contact a student researcher Hanseul Stephanie Lee (hlee535@wisc.edu) if you have any questions on this study.

Version 3. Recruitment message for recent Korean immigrant mothers in Korean language

영유아 엄마들의 건강정보 탐색에 관한 행동 연구

Health information seeking behavior research among mothers of young children (aged 0 to 3 years old)

안녕하세요! 귀하께서는 만 3 세 이하의 자녀를 한 명 이상 두신 한인 어머니이신가요? 그리고, 지난 10 년 안에 미국으로 이주해 오셨나요? 만약 그러시다면, 아래 링크를 따라 설문 연구에 참여할 수 있는지 확인해보세요. 본 설문 조사(약 10-15 분 소요예정)에 참여해주신 분들 가운데 추첨을 통해 열다섯분 (15 명)께 50 불 상당의 아마존 기프트카드를 드립니다. 본 연구의 목적은 어머니들이 자녀와 관련한 건강정보를 어떻게 찾으시는지를 이해하는 것입니다.

https://uwmadison.co1.qualtrics.com/jfe/form/SV_0P8IHmcCoeiJhad

궁금한 사항이 있으시다면, 위스콘신 주립대 학생 연구자 이한슬 (hlee535@wisc.edu) 에게로 연락주십시오. 본 연구에 관심을 가져주셔서 대단히 감사합니다.

Version 4. Recruitment message for Korean mothers living in Korea (in Korean language)

영유아 엄마들의 건강정보 탐색에 관한 행동 연구

Health information seeking behavior research among mothers of young children (aged 0 to 3 years old)

안녕하세요! 귀하께서는 만 3 세 이하의 자녀를 한 명 이상 두신 어머니이신가요? 맞으시다면, 아래 링크를 따라 설문 연구에 참여할 수 있는지 확인해보세요. 본 설문 조사(약 10-15 분 소요예정)에 참여해주신 분들 가운데 추첨을 통해 열다섯분 (15 명)께 50 불 상당의 백화점 상품권을 드립니다. 본 연구의 목적은 어머니들이 자녀와 관련한 건강정보를 어떻게 찾으시는지를 이해하는 것입니다.

https://uwmadison.co1.qualtrics.com/jfe/form/SV_6ooemsObNdaNZPL

궁금한 사항이 있으시다면, 위스콘신 주립대 학생 연구자 이한슬 (hlee535@wisc.edu) 에게로 연락주십시오. 본 연구에 관심을 가져주셔서 대단히 감사합니다.

Appendix C. Cover Letter and Questionnaire

Dear mothers of infants and toddlers (aged newborn to 3 years old),

Welcome to a study titled **"Health information seeking behavior of mothers of infants and toddlers"**! You are invited to participate in our research because you are a mother (a) who is at least 18 years of age, (b) was born either in the United States or in Korea, and (c) has at least one child between the ages of newborn to 3 years old. The purpose of the research is to identify the health information seeking behavior of mothers of young children aged 0 to 3 years old. The Institutional Review Board of the UW-Madison has approved this study.

If you decide to participate in this research, you will be asked to complete an online questionnaire (that should take about 10-15 minutes to complete) that asks questions about your health information seeking behavior related to your child.

Your confidentiality will be maintained. Neither your name nor any other identifiable information will be reported. While there will probably be publications as a result of this study, only group characteristics will be published. Your data will be coded under a random identifier that cannot be linked to you.

There are no direct benefits and this survey is entirely voluntary. If you decide not to participate or withdraw from the study, there is no penalty. **However, you can help us very much by taking a few minutes to share your experiences and thoughts.**

At the end of the questionnaire, you will be asked to provide your preferred contact information (e.g., email address) for participating in a drawing **to receive one of fifteen $50 Amazon e-gift cards**. There may be a slight risk of a confidentiality breach in the event of a data breach. However, your contact information will be stored separately from your survey responses, so your responses will remain confidential.

You may save or print a copy of this information for your records. If you have any questions or comments about this study, we would be happy to talk with you. You can write to **Hanseul Stephanie Lee** at hlee535@wisc.edu

Also, if you are not satisfied with the response of the research team, have more questions, or want to talk with someone about your rights as a research participant, you should contact the Education and Social/Behavioral Science IRB office at 608-263-2320.

Thank you very much for helping with this important study.

Truly yours,

Hanseul Stephanie Lee, MSLS.
Doctoral Candidate
The Information School
University of Wisconsin-Madison
hlee535@wisc.edu

Catherine Arnott Smith, PhD.
Professor
The Information School
University of Wisconsin-Madison
catherine.arnott.smith@wisc.edu

By continuing on to the survey, I confirm that I am at least 18 years old, have read this consent, and consent to participate in this study.

Screening Questions

1. Are you a mother of at least one child aged newborn to 3 years old?

□ Yes

□ No

2. How old are you?

□ Under 18

□ 18 or older

3. What is your country of birth?

□ The United States

□ Korea

□ Other (Please specify) _____

4. What is your citizenship?

□ The United States

□ Korea

□ Other (Please specify) _____

5. How many years have you lived in the United States?

□ 10 years or less

□ 11 years or more

6. Have any of your children (aged newborn to 3 years old) been diagnosed with any of the following conditions?

- Any form of chronic or recurrent pain; OR
- Severe learning disability; OR
- Presence of a psychiatric or neurological condition; OR
- Serious medical illness.

□ Yes

□ No

7. Congratulations! You are eligible to participate in our study. If you agree to take part in this survey, please click the "Proceed to the survey" button.

□ Proceed to the survey.

□ I do not wish to participate.

Part 1A. Using the Internet to Find Information

1. Do you ever go online to access the Internet or World Wide Web, or to send and receive e-mail?

□ Yes

□ No

2. How often do you access the Internet through each of the following?

	Never	Rarely	Occasionally	Frequently	Very Frequently	Not Applicable
a. Computer at home	1	2	3	4	5	8
b. Computer at work	1	2	3	4	5	8
c. Computer in a public place (library, community center etc.)	1	2	3	4	5	8
d. On a mobile device (cell phone, smart phone, tablet)	1	2	3	4	5	8

Part 1B. Looking for Health Information

3. In the past 6 months, have you ever looked online or offline for health information related to your child(ren) (e.g., immunization, nutrition & diets, growth & development, fever, virus etc.)?

> *According to the Medical Library Association (2013), consumer health information is defined as "information on health and medical topics provided in response to requests from the general public, including patients and their families. In addition to information on the symptoms, diagnosis, and treatment of disease, CHI encompasses information on health promotion, preventive medicine, the determinants of health and accessing the health care system."*

□ Yes

□ No

4. In the past 6 months, how often have you sought health-related information related to your child(ren)?

□ More than once a day

□ 4-7 times a week

□ 1-3 times a week

□ A few times a month

□ Less than once a month

Part 2A. Information Sources

5. In the past 6 months, how often did you use the following information sources when looking for health information related to your child(ren)? Please check the box that best represents your behavior for each source.

	Never	Rarely	Occasionally	Frequently	Very Frequently
a. Books on health information	1	2	3	4	5
b. Newspapers or magazines on health information	1	2	3	4	5
c. Health-related programs on TV	1	2	3	4	5
d. Resources provided by government health agencies	1	2	3	4	5
e. The World Wide Web (www)	1	2	3	4	5
f. Social networking sites (e.g., Facebook, Instagram etc.)	1	2	3	4	5
g. Social media sharing sites (e.g., YouTube, Flickr etc.)	1	2	3	4	5
h. Microblogging sites (e.g., Twitter etc.)	1	2	3	4	5
i. Blogs or online forums (e.g., online communities etc.)	1	2	3	4	5
j. Doctors	1	2	3	4	5
k. Nurses	1	2	3	4	5
l. Husband / Spouse	1	2	3	4	5
m. Mother / Mother-in-law	1	2	3	4	5
n. Father / Father-in-law	1	2	3	4	5

	Never	Rarely	Occasionally	Frequently	Very Frequently
o. Other relatives	1	2	3	4	5
p. Friends who have kids	1	2	3	4	5
q. Friends without kids	1	2	3	4	5
r. Coworkers	1	2	3	4	5
s. Librarians	1	2	3	4	5
t. Other (Specify) _____	1	2	3	4	5

6. In the previous question, you mentioned that you have used [automatically filled based on the participant's Q5 response] most frequently related to your child's health in the past 6 months.

How important was each of the following characteristics to you when using ***the above sources***?

Please check the box that best represents your opinions.

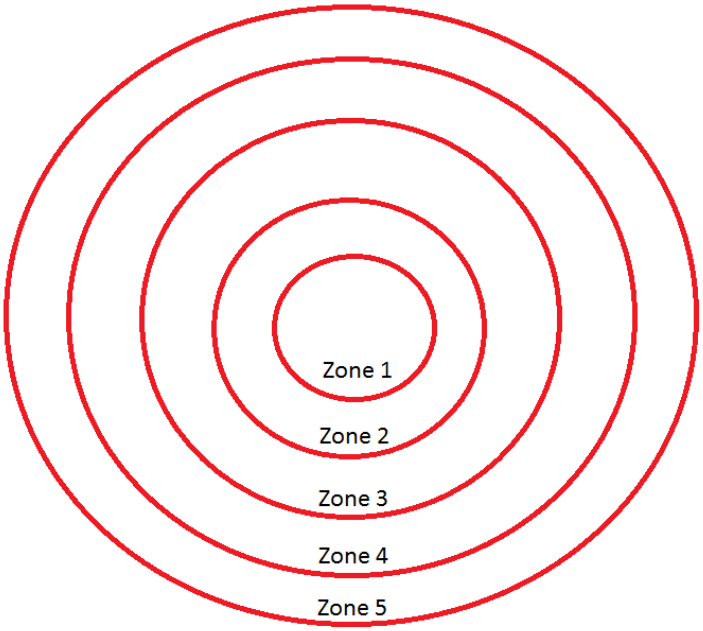
	Not important at all			Neutral			Extremely important
1) Accessible	1	2	3	4	5	6	7
2) Active / Updated	1	2	3	4	5	6	7
3) Accurate / Credible	1	2	3	4	5	6	7
4) Comprehensive	1	2	3	4	5	6	7
5) Easy to read	1	2	3	4	5	6	7
6) Free	1	2	3	4	5	6	7
7) Interactive / Able to respond	1	2	3	4	5	6	7
8) Objective	1	2	3	4	5	6	7
9) Organized	1	2	3	4	5	6	7
10) Time saving	1	2	3	4	5	6	7

Part 2B. Information Source Preference

7. Let's draw a map describing your child's health-related information source preference. By information source preference, we mean the sources you like the most and these may or may not be same as the ones you use most frequently.

Below is a list of information and human sources. Imagine that you are ranking all the information and human sources you used when seeking your child's health information.

Please place the sources you prefer the most in zone 1*, the second-most preferred sources in zone 2, the third-most preferred sources in zone 3, the fourth-most preferred sources in zone 4,* ***and the least preferred sources in zone 5****.* ***Please keep in mind that there may be multiple sources in each zone.*** *If you did not use a specific source when seeking health information related to your child, select "Not in my information horizon".*



	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Not in my Information Horizon
a. Books on health information	5	4	3	2	1	8
b. Newspapers or magazines on health information	5	4	3	2	1	8
c. Health-related programs on TV	5	4	3	2	1	8
d. Resources provided by government health agencies	5	4	3	2	1	8

	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Not in my Information Horizon
e. The World Wide Web (www)	5	4	3	2	1	8
f. Social networking sites (e.g., Facebook, Instagram etc.)	5	4	3	2	1	8
g. Social media sharing sites (e.g., YouTube, Flickr etc.)	5	4	3	2	1	8
h. Microblogging sites (e.g., Twitter etc.)	5	4	3	2	1	8
i. Blogs or online forums (e.g., online communities etc.)	5	4	3	2	1	8
j. Doctors	5	4	3	2	1	8
k. Nurses	5	4	3	2	1	8
l. Husband / Spouse	5	4	3	2	1	8
m. Mother / Mother-in-law	5	4	3	2	1	8
n. Father / Father-in-law	5	4	3	2	1	8
o. Other relatives	5	4	3	2	1	8
p. Friends who have kids	5	4	3	2	1	8
q. Friends without kids	5	4	3	2	1	8
r. Coworkers	5	4	3	2	1	8
s. Librarians	5	4	3	2	1	8
t. Other (Specify) _____	5	4	3	2	1	8

8. In the previous question, you mentioned that you preferred [automatically filled based on the participant's Q7 response] the most.

How important was each of the following characteristics for your ***most preferred sources*** in relation to your child(ren)'s health?

Please check the box that best represents your opinions.

	Not important at all			Neutral			Extremely important
1) Accessible	1	2	3	4	5	6	7
2) Active / Updated	1	2	3	4	5	6	7
3) Accurate / Credible	1	2	3	4	5	6	7
4) Comprehensive	1	2	3	4	5	6	7
5) Easy to read	1	2	3	4	5	6	7
6) Free	1	2	3	4	5	6	7
7) Interactive / Able to respond	1	2	3	4	5	6	7
8) Objective	1	2	3	4	5	6	7
9) Organized	1	2	3	4	5	6	7
10) Time saving	1	2	3	4	5	6	7

Part 3. Possible barriers to your health information seeking

9. *When seeking health information related to your child(ren) aged newborn to 3 years old, **how strongly do you agree or disagree** with each of the following statements? Please check the box that best represents your opinion.*

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
a. It took a lot of effort to get the information I needed.	5	4	3	2	1
b. I felt frustrated during my search for the information.	5	4	3	2	1
c. I was concerned about the quality of the information.	5	4	3	2	1
d. Accessing health care services was somewhat challenging.	5	4	3	2	1
e. The information I found was hard to understand.	5	4	3	2	1

Part 4. Demographic information

10. Currently, what age group are you in?

□ 18-20
□ 21-25
□ 26-30
□ 31-35
□ 36-40
□ 41-45
□ 46 or older

11. Which of the following categories best describes your ethnicity?

□ American Indian
□ Asian or Pacific Islander
□ Black / African American, not of Hispanic origin
□ Other (Please specify):_____
□ Hispanic or Latino/a
□ White, not of Hispanic origin
□ Multiracial

12. What is your marital status? (Please mark only **one.**)

□ Married
□ Living as married
□ Divorced
□ Widowed
□ Separated
□ Single, never been married

13. What is your highest level of education completed?

□ Some high school or less
□ High school diploma or equivalent
□ Some college (attended but did not graduate)
□ 2-year college degree (associate's)
□ 4-year college degree (bachelor's degree: e.g., BA, BS, etc.)
□ Master's degree (e.g., MA, MS, MBA etc.)
□ Doctoral degree (e.g., PhD, MD, JD, SJD etc.)
□ Other (Please specify) _____

14. Are you a first-time mother?

□ Yes
□ No

15. **Including yourself,** how many people live in your household?

□ 1
□ 2
□ 3
□ 4
□ 5
□ 6
□ 7
□ 8 or more

16. Currently, who do you live with? (Check all that apply.)

□ Husband / Spouse
□ Child(ren)
□ Mother / Mother-in-law
□ Father / Father-in-law
□ My siblings
□ Friends
□ Others _____

17. Do you currently rent or own your home?

□ Own
□ Rent
□ Occupied without paying monetary rent
□ Other (Please specify) _____

18. In the previous year, what was your total household income from all sources? (If you are unsure about the amount, what is your best estimate?)

□ $0 - $9,999
□ $10,000 - $14,999
□ $15,000 - $19,999
□ $20,000 - $34,999
□ $35,000 - $49,999
□ $50,000 - $74,999
□ $75,000 - $99,999
□ $100,000 - $149,999
□ $150,000 or more
□ Don't know

19. What is your current employment status?

□ Work outside the home (full-time)
□ Work outside the home (part-time)
□ Stay-at-home (full-time)
□ Student
□ Retired
□ Disabled
□ Other (Specify) _____

20. Is your health-care currently covered by insurance?

□ Yes □ No

21. Is your child's health-care currently covered by insurance?

□ Yes □ No

22. What is your country of birth?

□ The United States

□ Korea

□ Other (Please specify) _____

23. In which state do you currently live in the United States?

My current state is...

▼ (Dropdown menu) Alabama ... Washington DC

24. What is your citizenship? Please check all that apply.

□ The United States

□ Korea

□ Other (Please specify) _____

25. How many years have you lived in the United States? _____

26. What is your primary language? Please check all that apply.

□ English □ Other -- Specify

□ Spanish _____

□ Korean

27. How well do you speak English?

□ Very well □ Not well

□ Well □ Not at all

28. Currently, how many children under the age of 18 live in your household?

□ 1

□ 2

□ 3 or more

Appendix D. Informed Consent Form

Health Information Seeking Behavior among Mothers of Healthy Infants and Toddlers

INFORMED CONSENT FORM

You are invited to participate in our research because you are a mother (a) who is at least 18 years of age, (b) was born either in the United States or in Korea, and (c) has at least one child between the ages of newborn to 3 years old. The purpose of the research is to help us identify how mothers of healthy infants and toddlers (aged newborn to 3 years old) seek their child(ren)'s health information.

WHAT WILL MY PARTICIPATION INVOLVE?

If you decide to participate in this research, you will be asked to participate in an interview either in-person, by telephone or Skype. The format of the interview will be selected based on your preference. During the interview, you will be asked to draw how you seek health information related to your child(ren). The interview will be audio taped. Your participation will require about (or less than) 45 minutes.

ARE THERE ANY RISKS TO ME?

There are no known risks to the study participants. However, if you select a Skype interview, we cannot guarantee security.

ARE THERE ANY BENEFITS TO ME?

There are no direct benefits to the participants. However, the findings we get from this research may be utilized to better understand health information seeking behavior and source preferences among mothers of healthy infants and toddlers. Moreover, the findings would be potentially beneficial when designing health information services/programs and publishing health information for those mothers.

IS THERE ANY COMPENSATION?

At the end of the interview session, we will provide you with a $15 gift card.

HOW WILL MY CONFIDENTIALITY BE PROTECTED?

Your confidentiality will be maintained. During the interview session, neither your name nor any identifiable information will be used. A random ID will be assigned to each participant and the assigned ID, instead of the real name, will be used throughout the interview.

WHOM SHOULD I CONTACT IF I HAVE QUESTIONS?

You may ask any questions about the research at any time. If you have questions about the research, please do not hesitate to contact the Principal Investigator (Catherine Arnott Smith, catherine.arnott.smith@wisc.edu) or the student researcher (Hanseul Stephanie Lee, hlee535@wisc.edu). If you are not satisfied with the response of the research team, have more questions, or want to talk with someone about your rights as a research participant, you should contact the Educational Research and Social & Behavioral Science IRB Office at 608-263-2320.

Your participation is completely voluntary, and you can withdraw from the study at any time. Withdrawal from the study would mean that you would not receive the $15 compensation.

Your signature indicates that you have read this consent form, had an opportunity to ask any questions about your participation in this research and voluntarily consent to participate. You will receive a copy of this form for your records.

☐ I give consent to be quoted in the publications without my real name.

Printed Name of Participant _____

_____ _____

Signature Date

Appendix E. Interview Protocol **ID: _____**

Part A: Introduction

1. Thank the participant for her time and willingness to participate in this research.
2. Introduce the goal of this study, the procedure for the interview session, and how the researcher will maintain the research confidentiality.
3. Explain that her participation in this study is voluntary, emphasize that there are no right or wrong answers. Ask for permission to record the interview and obtain the participant's consent with their signatures on the consent form.

Part B: Background Demographic Questions

1. Are you a mother of at least one child aged newborn to 3 years old? □ Yes □ No
2. Currently, how many children under the age of 18 live in your household?
   _____
3. How old is (are) your child (children)? _____
4. Is your child's health-care currently covered by insurance? □ Yes □ No
5. What was your age on your last birthday? _____
6. In which state do you currently live in the United States? _____
   (To Korean mothers, in which city/province do you currently live in Korea?)
7. How many years have you lived in the United States? _____ years
   (To Korean mothers, how many years have you lived in Korea?)
8. What was/were your academic major(s)?
   _____

Part C: Health Information Seeking Experience (When your child was sick)

Think about your previous experience of seeking health information related to your child(ren) in the past 12 months. Please come up with an experience ***when your child was sick*** to answer the following questions. You can also bring up other cases if needed.

1. (An activity sheet is given to the participant.) Please feel free to draw a diagram / picture / illustration of what you did when your child was sick.
2. Can you briefly explain your health information seeking experience related to your child(ren)?
3. Where did you start looking for information? What did you do next? Any other resources did you utilize? Why did you take these steps? Please feel free to describe about your experience.
4. What sources did you use to find information you needed? Who did you consult with and why did you consult with them?

[Probe: If started from non-human sources—How do you feel about talking to people first (or what's your concerns)? If started from human sources—How do you feel about starting with information sources?]

5. Among these resources and people, were there any resources or people that led you to other resources, or referred you to other resources or people? Can you describe the situation?
6. Were you satisfied with the outcome?

[Probe: If yes, why? If no, why?]

7. How did you decide if you could trust the health information related to your child(ren)?
8. What was the most difficult or the most challenging / frustrating thing you encountered in this case?
9. Would you do it this way again if you needed similar information in the future? If not, what would you do differently?

Part D: Health Information Seeking Experience (When your child was not sick)

Think about your previous experience of seeking health information related to your child(ren) in the past 12 months. Please come up with an experience ***when your child was not sick*** to answer the following questions. You can also bring up other cases if needed.

1. (An activity sheet is given to the participant.) Please feel free to draw a diagram / picture / illustration of what you did when your child was healthy (not sick).
2. Can you briefly explain your health information seeking experience related to your child(ren)?
3. Where did you start looking for information? What did you do next? Any other resources did you utilize? Why did you take these steps? Please feel free to describe about your experience.
4. What sources did you use to find information you needed? Who did you consult with and why did you consult with them?

[Probe: If started from non-human sources—How do you feel about talking to people first (or what's your concerns)? If started from human sources—How do you feel about starting with information sources?]

5. Among these resources and people, were there any resources or people that led you to other resources, or referred you to other resources or people? Can you describe the situation?
6. Were you satisfied with the outcome?

[Probe: If yes, why? If no, why?]

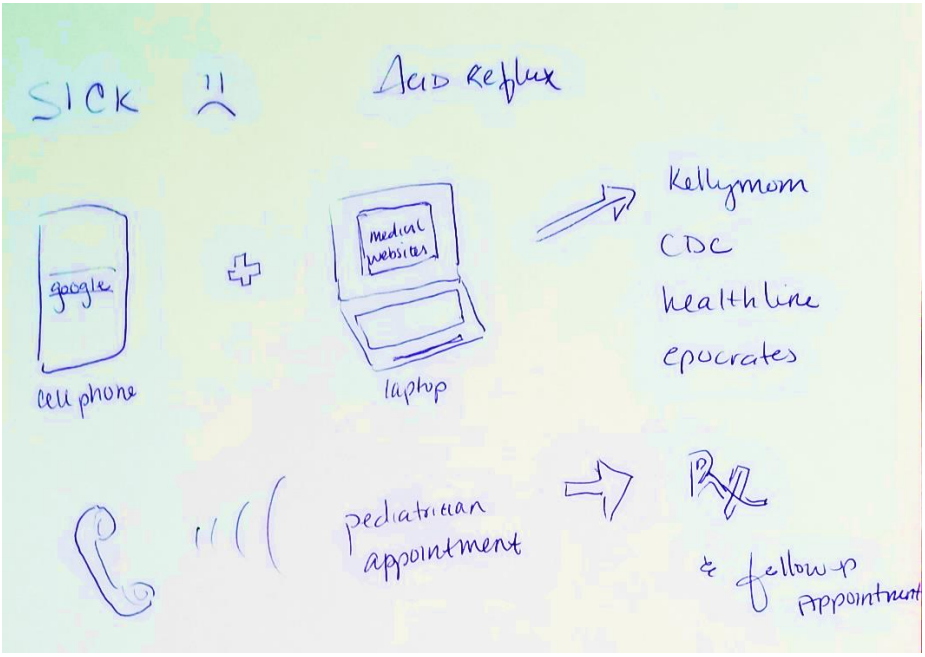
7. How did you decide if you could trust the health information related to your child(ren)?
8. What was the most difficult or the most challenging / frustrating thing you encountered in this case?
9. Would you do it this way again if you needed similar information in the future? If not, what would you do differently?

Part E: Closing Remarks

1. Ask the participant if there is anything else she wants to share on this topic.
2. Give the participant a gift certificate as an incentive for her participation in this study.
3. Thank the participant again for her participation.

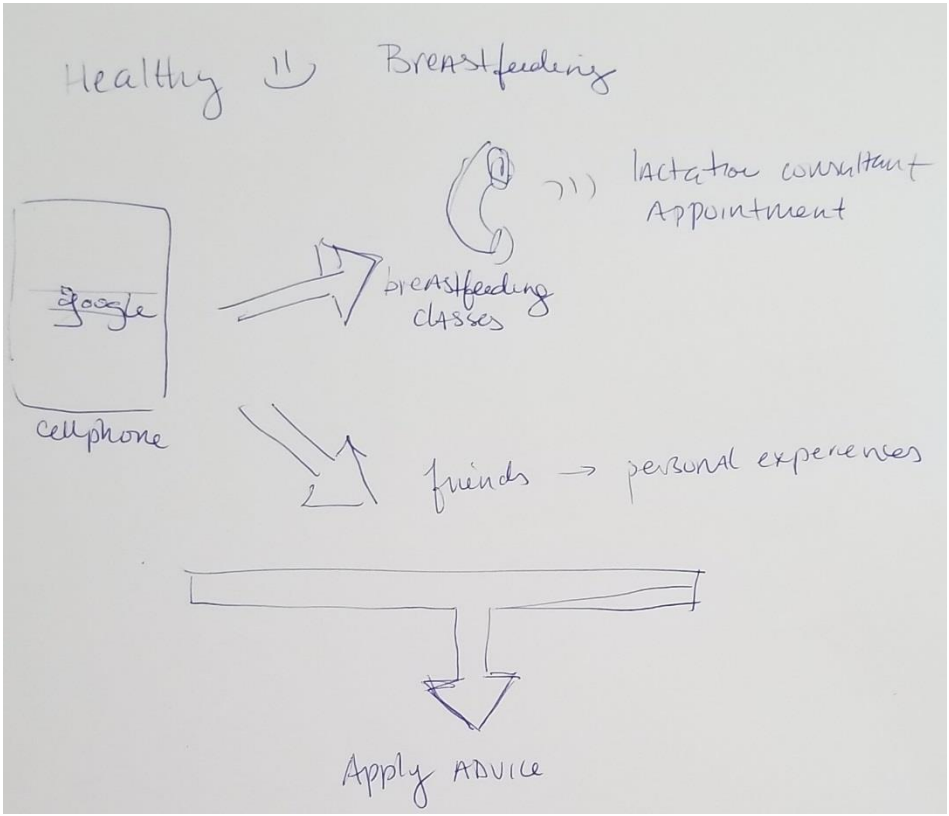
Activity sheet 1. Think about your previous experience of seeking health information related to your child(ren) in the past 12 months. Please come up with an experience ***when your child was sick.***

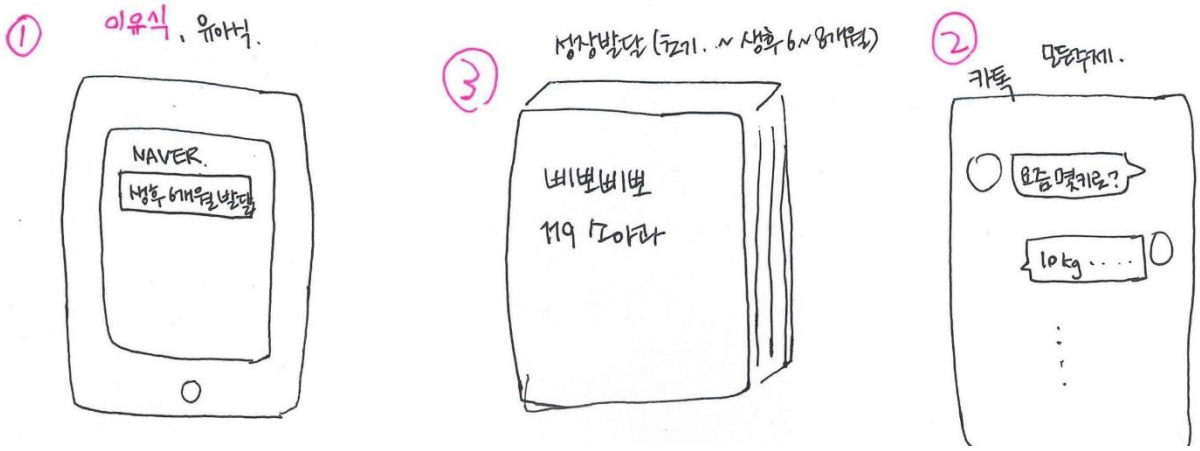
Please feel free to draw a diagram / picture / illustration of what you did when your child was sick.



Activity sheet 2. Think about your previous experience of seeking health information related to your child(ren) in the past 12 months. Please come up with an experience ***when your child was healthy (not sick).***

Please feel free to draw a diagram / picture / illustration of what you did when your child was healthy (not sick).





Appendix F. Final Codebook

A. Information Seeking Behavior (Sick)

1. Steps
(1) 1st step
(2) 2nd step
(3) 3rd step
(4) 4th step
(5) 5th step

2. Strategy
(1) Non-human source first and reasons
(2) Human source first and reasons

3. Reasons for using a source
(1) Accessible / Convenient
(2) Accurate / Credible
(3) Familiar
(4) Lots of information
(5) Supportive
(6) Had similar experiences
(7) Interactive / able to respond
(8) Objective
(9) Well-organized

4. Reasons for not using a source
(1) Inaccessible
(2) Inaccurate / Not credible
(3) Expensive
(4) Unfamiliar / Unknown
(5) Outdated
(6) Unkind / Unsupportive
(7) Not meet information needs
(8) Previous knowledge / experience
(9) Uncomfortable
(10) Language barriers

5. Experience with source use
(1) Satisfying
(2) Frustrating / Challenging

B. Information Seeking Behavior (Healthy)

1. Steps
(1) 1st step
(2) 2nd step
(3) 3rd step
(4) 4th step
(5) 5th step

2. Strategy
(1) Non-human source first and reasons
(2) Human source first and reasons

3. Reasons for using a source
(1) Accessible / Convenient
(2) Accurate / Credible
(3) Familiar
(4) Lots of information
(5) Supportive
(6) Had similar experiences
(7) Interactive / able to respond
(8) Objective
(9) Well-organized

4. Reasons for not using a source
(1) Inaccessible
(2) Inaccurate / Not credible
(3) Expensive
(4) Unfamiliar / Unknown
(5) Outdated
(6) Unkind / Unsupportive
(7) Not meet information needs
(8) Previous knowledge / experience
(9) Uncomfortable
(10) Language barriers

5. Experience with source use
(1) Satisfying
(2) Frustrating / Challenging

Appendix G. Ordinal Regression Results

Table G1

U.S. mothers (Non-human information sources)

		Books	Newspapers /Magazines	TV	Gov. health agencies	**www***	SNS	SMSS	Micro-blogging sites	Blogs/ Online forums
Age	18-30	1.32	0.91	0.67	1.60	2.13	1.04	1.32	0.82	1.37
	31-35	0.97	1.01	0.69	1.14	1.71	0.87	1.79	1.20	1.28
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	1.76	2.01	1.28	1.23	0.35**	0.58	1.36	0.93	0.65
	4-year college	1.16	1.20	1.04	0.73	0.58	1.05	1.50	0.99	1.04
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	$0-$34,999	1.80	1.04	1.67	0.68	0.58	0.53	0.95	0.71	0.76
	$35,000-$49,999	1.24	0.51	0.57	0.57	0.63	0.57	0.77	0.76	0.50
	$50,000-$74,999	1.25	0.86	1.22	1.23	1.15	1.08	0.79	0.85	0.72
	$75,000-$99,999	1.17	1.24	1.33	0.75	0.83	0.93	0.83	0.87	0.85
	$100,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	1.30	2.38*	1.24	1.34	0.65	0.78	0.72	1.47	0.67
	Working (Part-time)	1.91	1.25	2.20	1.25	0.96	1.06	1.54	0.87	0.93
	Other	0.64	0.60	0.53	0.97	1.55	1.17	0.59	1.01	0.76
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Marital status	Single, divorced, living as married, separated	1.14	0.98	0.71	0.77	1.11	0.96	1.13	1.21	1.06
	Married †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

First-time mother	Yes	1.62	0.42	1.14	0.26	0.44	0.78	0.15	0.77	0.84
	No †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Housing status	Own	1.66	1.00	1.02	0.64	1.00	0.99	0.95	1.15	0.89
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in the U.S.		1.04	1.05	1.00	1.04	1.04	0.96	1.00	1.02	1.04
Number of children	1	1.80	5.33	4.25	13.80**	4.31	0.97	30.74**	0.96	1.96
	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	0.86	0.59	0.15*	0.53	0.70	1.17	0.20*	1.54	0.99
	4	1.31	0.96	0.80	1.14	1.46	0.57	0.96	1.39	1.65
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		551.58	450.427	351.41	642.68	544.21*	700.01	541.22	314.34	635.81

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to *annual household income* and *years lived in the U.S.* questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named *fluency in speaking English* was not tested with the U.S. sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables named *age, education, annual household income, employment status, marital status, housing status, number of children,* and *size of household* were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.

Table G2

U.S. mothers (Human information sources)

		Doctors	Nurses	Husband	Mother/ Mother-in-law	Father/ Father-in-law	**Other relatives ****	**Friends with kids****	Friends without kids	**Coworkers*****	Librarians
Age	18-30	2.96*	2.57*	1.97	2.15	1.44	1.69	1.13	3.77	0.95	2.44
	31-35	2.00	2.01*	1.10	1.59	1.23	1.10	2.19*	2.20	2.91**	1.97
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	0.81	1.53	0.96	0.60	0.88	1.21	0.30**	0.99	1.73	0.86
	4-year college	1.08	1.34	1.58	1.12	1.03	1.07	0.89	1.08	2.29*	1.64
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	$0-$34,999	0.96	1.39	1.68	3.91**	2.40	3.56*	1.52	1.49	1.35	
	$35,000-$49,999	0.93	0.67	0.51	2.32	0.67	0.69	0.59	1.68	0.88	
	$50,000-$74,999	0.82	1.15	0.65	1.78	1.10	1.06	0.82	1.64	0.66	
	$75,000-$99,999	0.81	1.31	0.74	1.79	0.59	0.93	0.75	1.53	0.77	
	$100,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Employment status	Working (Full-time)	1.26	1.94*	0.91	1.76	1.78	0.93	0.79	1.32	36.68***	
	Working (Part-time)	0.92	1.03	1.09	0.98	1.11	1.63	2.51*	2.16	18.49***	
	Other	1.47	0.89	1.46	3.07*	2.64	2.79	2.44	2.00	6.15**	
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Marital status	Single, divorced, living as married, separated	1.24	1.53	0.55	0.66	1.24	1.20	1.37	1.11	1.20	1.29
	Married †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
First-time mother	Yes	0.38	0.51	1.04	1.05	0.90	2.61	0.36		0.47	
	No †	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	

Housing status	Own	0.74	0.81	1.19	1.16	1.30	1.64	1.03	1.29	0.97	3.94
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in the U.S.		1.04	1.04	1.00	1.01	1.00	1.02	1.01	1.18*	1.03	1.07
Number of children	1	3.87	3.26	1.55	1.57	1.44	1.81	7.47*		5.30	
	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0		1.0	
Size of household	3 or less	0.70	0.49	0.91	0.80	1.33	0.27	0.34	2.46	0.69	0.98
	4	1.42	1.94*	1.47	1.28	1.64	1.04	0.85	1.38	1.13	0.48
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		582.90	651.23	673.73	691.30	403.05	535.09***	625.43**	280.99	436.14***	127.97

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to *annual household income* and *years lived in the U.S.* questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named *fluency in speaking English* was not tested with the U.S. sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables named *age, education, annual household income, employment status, marital status, housing status, number of children,* and *size of household* were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.

Note 6. Two independent variables named *number of children* and *first-time mothers* were excluded when those were tested with a dependent variable named *friends without kids* because its zero frequency in a few categories makes the model unstable. Four independent variables were also excluded when those were tested with a dependent variable named *librarians* due to the same reason.

Table G3

Immigrant Korean mothers (Non-human information sources)

		Books	Newspapers /Magazines	**TV***	**Gov. health agencies ***	**www***	SNS	SMSS	Micro-blogging sites	**Blogs/ Online forums *****
Age	18-30	1.18	0.73	0.46*	1.89	1.40	1.02	0.96	1.24	1.50
	31-35	1.51	1.01	1.06	1.79*	1.06	1.02	1.13	1.04	1.26
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	0.60	0.91	2.74**	2.10	1.11	1.60	2.55*	1.86	1.98
	4-year college	0.67	0.93	1.06	0.86	0.75	1.33	1.31	1.11	1.37
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	$0-$34,999	1.42	1.31	1.31	0.94	0.98	0.68	0.73	1.28	1.23
	$35,000-$49,999	0.87	1.48	1.43	0.77	1.80	0.99	0.83	1.41	1.42
	$50,000-$74,999	0.87	2.12*	1.71	1.38	1.66	1.21	1.03	1.24	1.37
	$75,000-$99,999	1.10	1.31	2.17*	0.84	1.18	1.00	1.06	1.18	1.83
	$100,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	0.55	1.59	1.18	1.79	0.24**	0.81	0.79	1.26	0.55
	Working (Part-time)	0.37*	0.37	1.05	0.75	1.52	1.05	0.97	0.84	0.78
	Other	1.0	2.30	1.39	1.87	1.33	1.11	1.04	1.36	0.57
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
First-time mother	Yes	2.07	1.28	1.83	0.63	1.21	1.16	0.96	2.16	0.68
	No †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Housing status	Own	1.85*	1.61	1.31	1.13	0.87	1.26	1.18	1.17	0.87
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in the U.S.		1.01	1.00	0.96	0.96	0.98	1.02	0.98	0.96	0.87**

Number of children	1	2.23	0.61	0.46	0.69	1.30	1.51	1.21	0.63	0.81
	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	0.98	1.13	0.64	0.79	1.64	0.70	1.59	0.64	4.15*
	4	0.97	0.88	0.54	0.46	2.29	0.99	1.00	0.65	2.61*
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fluency in speaking English	Very well / Well	0.83	1.30	0.86	1.90*	0.65	0.73	0.65	0.73	0.73
	Not well / Not at all †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		732.88	575.15	638.65*	721.92*	470.53*	850.06	826.78	814.20	620.16**

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to *annual household income* and *years lived in the U.S.* questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named *marital status* was not tested with the immigrant sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables named *age, education, annual household income, employment status, housing status, number of children, size of household* and *fluency in speaking English* were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.

Table G4

Immigrant Korean mothers (Human information sources)

		Doctors	Nurses	Husband	Mother/ Mother-in-law	Father/ Father-in-law	Other relatives	Friends with kids	Friends without kids	**Coworkers*** **	Librarians
Age	18-30	1.78	1.44	0.78	1.79	1.01	0.98	0.91	0.68	0.37	0.10*
	31-35	1.77*	1.48	1.12	1.44	1.22	1.43	1.23	0.91	0.78	0.57
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	0.87	0.86	1.20	0.76	1.05	1.14	0.91	1.12	1.55	0.39
	4-year college	0.70	0.51*	1.05	1.19	1.11	0.85	1.23	1.35	1.34	1.41
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	$0-$34,999	0.99	1.35	0.65	0.85	1.14	0.71	0.89	0.51	1.26	0.70
	$35,000-$49,999	1.22	0.75	0.66	1.46	1.85	1.53	0.76	1.45	1.35	2.65
	$50,000-$74,999	1.01	1.49	1.14	1.43	1.98	2.71**	1.04	1.37	2.67*	3.24
	$75,000-$99,999	1.20	1.63	1.29	1.80	2.01	1.60	0.86	0.80	2.08	3.13
	$100,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	1.40	0.72	1.01	1.26	2.13	1.59	0.48	1.32	9.33***	1.16
	Working (Part-time)	1.34	0.59	0.67	1.18	0.64	1.14	1.03	1.72	3.73*	3.98
	Other	2.04	0.95	0.45	1.01	0.51	1.26	2.15*	1.01	5.03***	2.83
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
First-time mother	Yes	2.15	1.25	1.60	1.70	1.03	1.83	1.97	3.23	0.60	0.74
	No †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Housing status	Own	1.49	1.51	0.71	1.04	1.75	1.12	1.08	1.05	0.86	1.65
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in the U.S.		0.95	1.04	0.93	0.93	0.98	1.04	0.93	1.00	0.94	0.98
	1	0.62	1.36	1.08	1.30	0.64	0.47	0.58	2.82	0.58	1.07

Number of children	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	0.37	0.69	1.06	0.72	1.62	1.48	2.94	1.82	3.74	4.38
	4	0.65	1.26	1.27	1.36	1.28	0.90	1.79	4.88	1.59	3.71
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fluency in speaking English	Very well / Well	1.49	1.22	1.50	1.18	1.32	1.39	1.77*	1.14	2.76**	1.46
	Not well / Not at all †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		680.56	781.20	810.71	793.19	563.71	528.03	689.67	250.65	409.93***	159.62

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to *annual household income* and *years lived in the U.S.* questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named *marital status* was not tested with the immigrant sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables named *age*, *education*, *annual household income*, *employment status*, *housing status*, *number of children*, *size of household* and *fluency in speaking English* were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.

Table G5

Korean mothers (Non-human information sources)

		Books**	Newspapers / Magazines	**TV*****	Gov. health agencies	**www****	SNS	SMSS	Micro-blogging sites	**Blogs/ Online forums *****
Age	18-30	0.55	0.69	1.18	0.69	1.28	3.14**	2.05	3.90**	0.82
	31-35	0.82	0.70	0.47**	0.64	1.33	1.40	1.16	3.03***	1.46
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	0.39*	0.81	1.28	1.10	1.00	1.43	1.26	0.74	1.09
	4-year college	0.74	1.03	1.31	1.12	1.07	1.37	1.32	0.75	0.88
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	₩0-₩34,999,999	2.23	1.25	1.05	2.03	0.93	0.91	2.07	1.25	1.06
	₩35,000,000-₩49,999,999	1.28	0.75	1.31	0.96	1.47	1.04	1.17	0.86	1.71
	₩50,000,000-₩74,999,999	1.27	1.34	1.14	1.18	1.03	0.89	1.20	0.83	1.66
	₩75,000,000-₩99,999,999	2.14*	0.79	0.71	0.99	1.93	1.13	0.80	0.76	1.59
	₩100,000,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	1.67	1.61	1.14	2.07*	0.62	0.57	0.91	1.35	0.50*
	Working (Part-time)	1.24	1.65	1.55	1.40	0.24***	1.21	1.18	2.03	0.36**
	Other	1.47	0.90	1.15	1.14	0.94	0.77	1.19	1.00	1.09
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Yes	1.20	1.84	1.46	1.10	0.45	1.38	1.07	0.56	0.48

First-time mother	No †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Housing status	Own	1.18	1.40	1.23	1.07	1.02	0.80	0.92	1.06	1.03
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in Korea		1.01	1.03	1.01	0.98	0.94*	1.03	1.04	1.04	0.92**
Number of children	1	1.01	1.87	1.10	1.91	1.86	1.31	0.68	1.49	2.48
	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	1.56	0.46	0.27*	0.31*	0.84	0.44	0.84	0.91	1.16
	4	1.12	0.73	0.39*	0.55	0.86	0.71	0.41*	0.94	1.43
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fluency in speaking English	Very well / Well	1.57	1.00	0.43**	1.88*	1.43	0.97	0.82	0.76	1.50
	Not well / Not at all †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		722.28**	626.36	692.35***	731.81	538.87**	857.77	814.69	837.44	630.14***

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to *annual household income* and *years lived in the U.S.* questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named *marital status* was not tested with the Korean sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables named *age, education, annual household income, employment status, housing status, number of children, size of household* and *fluency in speaking English* were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.

Table G6

Korean mothers (Human information sources)

		Doctors	Nurses	Husband	**Mother/ Mother-in-law***	Father/ Father-in-law	Other relatives	Friends with kids	Friends without kids	**Coworkers****	Librarians
Age	18-30	1.48	1.68	1.01	1.62	1.25	0.66	0.98	0.87	0.60	0.75
	31-35	1.19	1.44	1.08	0.88	0.95	0.71	1.13	1.17	0.93	0.75
	36 or older †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Education	2-year college or less	0.98	1.01	0.97	0.36**	0.48	1.06	0.39*	0.59	0.49	0.52
	4-year college	0.90	1.27	1.26	0.91	1.02	1.19	0.55*	0.60	0.79	0.85
	Master or Doctoral degrees †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Annual household income	₩0-₩34,999,999	0.82	1.61	1.17	0.97	0.90	1.63	0.54	1.37	0.71	1.08
	₩35,000,000-₩49,999,999	0.75	1.18	0.80	0.78	1.05	1.65	1.02	0.69	0.82	0.54
	₩50,000,000-₩74,999,999	1.14	1.42	1.09	0.73	1.22	2.09	0.83	0.95	1.36	0.48
	₩75,000,000-₩99,999,999	1.27	1.39	1.13	0.99	0.98	1.58	1.56	1.42	0.93	0.68
	₩100,000,000 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Employment status	Working (Full-time)	0.90	1.21	0.73	0.81	0.78	1.17	0.69	1.02	3.08***	1.31
	Working (Part-time)	0.61	0.82	0.84	0.57	0.90	0.86	1.08	1.49	2.06	1.41
	Other	0.64	0.81	0.75	0.66	0.49	1.01	1.05	0.61	1.45	0.69
	Stay-at-home †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
First-time mother	Yes	0.46	0.49	1.20	0.93	0.90	0.70	0.71	0.82	0.51	3.53
	No †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Housing status	Own	1.00	1.23	0.90	0.77	0.88	1.30	0.93	1.26	0.97	1.39
	Rent or others †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Years lived in the U.S.		0.99	1.01	1.01	0.99	1.00	0.99	1.00	0.97	1.02	0.33
Number of children	1	2.66	1.24	0.70	1.03	0.78	1.76	1.13	1.23	0.92	0.33
	2 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Size of household	3 or less	0.85	0.56	1.48	0.60	0.67	1.00	0.97	0.61	1.58	2.14
	4	1.88	0.70	1.11	0.38	0.77	1.07	0.85	0.65	1.20	0.89
	5 or more †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fluency in speaking English	Very well / Well	2.09*	1.16	1.22	1.19	0.76	0.53*	0.72	0.49	0.82	0.70
	Not well / Not at all †	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Model fit: Likelihood ratio test, -2 log likelihood		733.05	789.66	780.28	763.39*	655.53	607.88	703.09	450.62	646.58**	310.44

Note 1. * $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Note 2. The dagger (†) indicates a reference group.

Note 3. Participants who did not clearly answer to *annual household income* and *years lived in the U.S.* questions were excluded in analyzing the data for this research question.

Note 4. An independent variable named *marital status* was not tested with the immigrant sample because its zero frequency in a few categories makes the model unstable.

Note 5. Independent variables named *age, education, annual household income, employment status, housing status, number of children, size of household* and *fluency in speaking English* were recoded due to considerably limited number of participants in each category. For instance, age was recorded into three separate groups: (a) 18-30, (b) 31-35 and (c) 36 or above.