

Characteristics and Behavioral Patterns of Proxy Health Information Seekers in China in the Internet Environment (Postprint)

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Abstract

[Purpose/Significance] Proxy health information seeking on the Internet has become an important modality through which non-medical professionals provide health information support to patients; understanding the characteristics and behavioral patterns of proxy seekers will have positive implications for health information services and dissemination. [Method/Process] Individual characteristic variables were examined across three dimensions: participant demographics, health information seeking experience, and family structure; behavioral patterns of proxy health information seekers were analyzed through a 5W (Why-Who-When-Where-What) framework. The behavioral motivation Why was assessed via semi-structured interviews, while all other variables were measured through questionnaire surveys. [Result/Conclusion] The study revealed that 87.0% of online health information seekers had assisted others in searching for health information online within the past 12 months; proxy health information seekers were characterized as female, only children, married, in good health status, possessing extensive online health information seeking experience, and having family members with chronic diseases; behavioral motivations included caring and altruism, among others; proxy seekers more frequently assisted individuals with strong social ties; proxy seekers typically provided assistance before patients' medical consultations; information sources for proxy seekers included search engines, online health communities, and online Q&A communities, among others; proxy seekers demonstrated greater need for general disease-related information, daily health care, and treatment-related information.

Full Text

Preamble

Research on the Characteristics and Behavior Patterns of Surrogate Health Information Seekers in China Under the Internet Environment

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Abstract: [Purpose/Significance] Using the Internet to seek health information on behalf of others has become an important form of health information support provided by non-medical professionals to patients. Understanding the characteristics and behavior patterns of surrogate seekers will have positive implications for health information services and communication. [Method/Process] This study investigated individual characteristic variables from three aspects: participant demographics, health information seeking experience, and family structure, and analyzed the behavior patterns of health information surrogate seekers based on the 5W (Why-Who-When-Where-What) perspective. Among these, semi-structured interviews were used for the behavioral motivation (Why) variable, while all other variables were measured through questionnaire surveys. [Result/Conclusion] The study found that 87.0% of online health information seekers had experience helping others search for health information online in the past 12 months. Characteristics of health information surrogate seekers include being female, an only child, married, in good health, having rich online health information seeking experience, and having family members with chronic diseases. The behavioral motivations of surrogate seekers include caring, altruism, etc. Surrogate seekers are more likely to help people with strong social relationships seek health information online. They generally help patients search for health information online before medical consultation. Their information sources include search engines, online health communities, and online Q&A communities. They particularly need general information related to diseases themselves, daily health care, and treatment-related information.

Keywords: Internet; surrogate health information seeking; individual characteristics; behavior patterns; digital inequality

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Health has always been an important topic of concern. Over the past 20 years, healthcare has continuously shifted toward a consumer-centered model, giving rise to consumer health informatics, a field highly relevant to library and information science. Under this model, health information communication has transformed from health education for consumers to encouraging consumers to

obtain health information and engage in self-health education. With the development of information technology, consumers have increasingly diverse channels for accessing health information. In addition to traditional professional medical personnel, television, newspapers, broadcasts, and interpersonal relationships, Internet-based search engines, online health communities, online Q&A communities, and social media provide convenient access to health information for consumers. Existing research has found that the Internet has become the main channel for consumers to obtain health information.

Although the benefits of online health information seeking are widely recognized—such as facilitating consumer self-diagnosis and improving healthy lifestyles—some groups still find it difficult to enjoy the benefits from the Internet. The phenomenon of digital inequality in the digital age has long been a concern in the field of library and information science, manifesting not only at the level of ICT (information and communications technology) access but also in user ICT usage motivation, information literacy, ICT usage ability, and digital aptitude. Due to physical, cognitive, or psychological limitations, some elderly people and users with lower income or education levels are more or less affected in their ability to use the Internet to obtain health information and the effectiveness of such acquisition.

For those unable to use the Internet to meet their health information needs, family members or friends who can use the Internet play an important role in searching for, identifying, and sharing health information. Searching for online health information on behalf of patients helps them understand their health status and provides necessary support, which may have a positive impact on patient treatment and recovery.

Internet-based “surrogate health information seeking” (SHIS) refers to the behavior of non-medical professionals who, due to others’ requests or out of concern for others, use the Internet to obtain health information on their behalf. Surrogate health information seeking is a common phenomenon. Based on U.S. health survey data, two-thirds of respondents were found to be surrogate health information seekers. Based on European telephone survey data, 61.0% of online health information seekers had experience representing others in health information seeking in the past 12 months. A Pew Research Center report indicated that among consumers who search for health information online, half are helping others search for information, and they have a broader impact. Surrogate health information seeking behavior has important public health significance, as it facilitates the effective dissemination of health information, thereby meeting patients’ health needs, influencing their health decisions, and triggering changes in their health behaviors.

Two main groups are involved in the surrogate health information seeking process: surrogate seekers and principal seekers, with surrogate seekers being those who operate and interact via the Internet. Therefore, to better understand surrogate health information seeking behavior and implement interventions, it is necessary to study the characteristics and behavior patterns of surrogate health

information seekers. A few foreign studies have used secondary data from the United States and Europe to analyze the characteristics of surrogate seekers, while domestic research on this topic is just beginning. From current research, on the one hand, secondary data from abroad contains limited data related to surrogate seeking, making it difficult to accurately describe the individual characteristics of surrogate seekers. On the other hand, there are certain socio-cultural differences between Europe, America, and China in terms of family structure and interpersonal communication. This study argues that it is necessary to conduct research on surrogate health information seekers in the Chinese context and proposes the following two research questions: RQ1: What are the individual characteristics of surrogate health information seekers in China under the Internet environment? RQ2: What behavior patterns do online health information surrogate seekers in China exhibit?

2 Literature Review

2.1 Surrogate Health Information Seeking

Helping others search for health information is a long-standing social phenomenon and an important form of social support that non-medical professionals provide to patients. In 2003, P.J. McKenzie proposed a four-mode everyday life information seeking (ELIS) practice model, in which surrogate seeking is considered an information practice pattern equally important as active seeking. Surrogate seeking is regarded as behavior where participants interact with information sources through an agent. Health information surrogate seeking is a form of information acquisition based on interpersonal social network relationships. Family members, friends, and other interpersonal relationships have always been considered important and trustworthy sources of health information. The development and popularization of the Internet and related devices have provided tremendous convenience for surrogate health information seeking, allowing people to access rich health information anytime and anywhere and share it with patients through various means.

In recent years, more and more researchers have begun to conduct studies related to surrogate health information seeking. J.A. Abrahamson et al. pointed out that non-medical professionals often help others or search for health information because of others. This surrogate seeking behavior may be due to others' requests or may be driven by internal motivations. Health information surrogate seekers may only provide information support to patients and do not necessarily need to continue participating in patients' subsequent health activities, which distinguishes them from traditional patient caregivers. Surrogate seeking is a daily information activity based on interpersonal relationships. Studies have found that patients with larger social support networks are more likely to receive help from others in health information acquisition and technical support. R.S. Sadasivam et al. studied the differences between self-seekers and surrogate seekers, finding that married middle-aged people with children and family members with chronic diseases more often act as surrogate health information

seekers, and they search more for information related to specific diseases, treatments, and hospitals online. Y.S. Oh's research showed that younger people, women, those who are concerned about and trust the Internet, and those with good self-rated health are more likely to become surrogate health information seekers, while education level and race were not significantly correlated with surrogate seeking.

It is worth noting that early research related to surrogate health information seeking more often used "proxy searching" to describe this phenomenon, referring to the behavior where others generate questions on behalf of patients and use the Internet to search. In previous reviews, this phenomenon was also more defined as non-medical professionals representing patients to interact with information systems, thus using the concept of "proxy searching." However, in interviews with users, it was found that they not only rely on ICT tools for information interaction but also rely on online interpersonal network relationships for health information acquisition, such as information seeking through social media and online consultations. Therefore, this paper tends to use the more general term "surrogate health information seeking" for conceptual definition.

2.2 Consumer Health Information Seeking Behavior

Due to the limited research related to surrogate health information seeking behavior, this paper reviews literature related to consumer health information seeking behavior. Health information seeking behavior refers to the behaviors exhibited by users in the process of obtaining, clarifying, and confirming health information based on specific events or contexts. With the development of network technology, current research focuses more on users' online health information seeking behavior.

Through a review of domestic and foreign research on health information seeking behavior, the main research objects include the following aspects: users' health information seeking motivation, subjects of health information seeking, timing of information seeking, information sources, and types of health information needed by consumers. This paper reviews from the 5W (Why-Who-When-Where-What) perspective. Regarding health information seeking motivation, T. Wilson's information seeking model points out that users' information needs can motivate their information behavior. The Comprehensive Model of Information Seeking (CMIS) indicates that users' perceived threat level and beliefs about health issues can stimulate their health information seeking behavior. Y. Zheng, based on interviews with young people, concluded that the main motivations for online health information seeking include knowledge realization, entertainment, social interaction, and instrumentality. In the context of surrogate health information seeking, S.L. Cutrona et al.'s research pointed out that empathy, altruism, and psychological satisfaction are related to surrogate health information seeking. Regarding the subjects of health information seeking, Li Yuelin and Cai Wenjuan, through a review of foreign health information seeking behavior, found that the subjects of information seeking include the elderly, ordinary

adults, and adolescents. In the context of surrogate seeking, users search for health information not only for themselves but also for others. D. Reifegerste et al.'s research indicated that users search for health information for themselves, spouses, parents, children, other family members, friends, and colleagues. Regarding the timing of health information seeking, users may have different needs when searching for health information at different times. Existing research has found that patients themselves access cancer information services during diagnosis, treatment, or remission stages, while family members often begin to pay attention to relevant health information services only when patients are already in the advanced stage of cancer. Regarding information sources, Y. Zhang, based on a review of literature related to health information source selection, summarized six types of health information sources, including interpersonal sources, traditional mass media, traditional Internet resources, Web 2.0 sources, databases, and government agencies/social services. Shi Yilong and Xu Xin, in their review research on online health information seeking behavior, pointed out that health information sources include search engines, professional health websites, and online health communities. Regarding health information types, L.J.F. Rutten et al., through a study of cancer patients, found that their health information needs roughly include ten categories: disease itself, treatment, prognosis, rehabilitation, testing, interpersonal and social information, economic and legal information, healthcare system, and body image. W. Pian et al. believed that consumers searching for health information on the Internet include three types of users: those who search for health information for themselves, those who help others search for health information, and those who do not consider health purposes. Through analysis of mouse click and eye-tracking data, they found that the three types of users have certain behavioral differences, with users who help others search for health information paying more attention to general health information such as medical terminology, drug names, and drug instructions. H. Li studied the health information needs of patient caregivers, finding that caregivers search for information about their own and their relatives' health, particularly regarding diagnosis, treatment options, managing patients' daily activities and behaviors, and emotional support.

3 Research Design

3.1 Measurement of Variables Related to Surrogate Seeker Characteristics

Existing research has shown that consumers' demographic characteristics, Internet usage experience, and personal living status affect surrogate seeking behavior. Surrogate seekers use the Internet to obtain and disseminate health information. D. Reifegerste et al.'s research indicated that surrogate seekers mainly search for health information for family members. There are certain differences in family structure between China and Western countries. In traditional Chinese culture, the family (not the individual or group) is the core of social life and order, and "filial piety culture" is also a basic moral norm in Chinese

society. Affected by the family planning policy, Chinese family structures have become smaller and more nuclear, with only children playing an important role in family life and elderly care. Therefore, to better describe the characteristics of surrogate health information seekers in China, this paper further incorporates variables related to Chinese family structure based on existing research. The measurement of variables related to surrogate seeker characteristics is shown in Table 1 .

3.2 Measurement of Variables Related to Surrogate Seeker Behavior Patterns

In this paper, behavior patterns refer to the general term for motivations, methods, and content related to surrogate seeking behavior, reflecting the characteristics and logic of how people perform this behavior. For respondents with surrogate seeking experience, further investigation was conducted on questions related to behavior patterns. Based on a review of relevant literature, this paper analyzes from the 5W perspective. Since current research on surrogate health information seeking is still in the preliminary exploration stage and the behavioral motivations of surrogate seekers are not yet clear, this paper uses semi-structured interviews to measure the Why variable. The other four variables are measured by developing a multi-option list questionnaire. Specific variables and measurement methods are shown in Table 2 .

3.3 Questionnaire Survey

Participants in this study were recruited publicly through two methods: first, paid public recruitment on the Wenjuanxing platform (<https://www.wjx.cn>), and second, recruitment through the researchers' WeChat Moments. Participants needed to meet the following conditions: be at least 18 years old; have experience in online health information seeking; voluntarily and actively participate in the research. During the 14-day public recruitment period, 594 feedback samples were obtained. Participants first self-reported demographic characteristics, family structure-related questions, and Internet health information seeking experience. For participants who self-reported having surrogate seeking experience, further investigation was conducted on surrogate seeking frequency and their health information needs. After manual screening, a total of 546 samples met the requirements, with an effective recovery rate of 91.9%. Among the eligible participants, 282 were female (51.6%) and 264 were male (48.4%), with an average age of 30 years, the oldest being 64 and the youngest 18.

3.4 Analysis Methods

This study had 546 participants complete the questionnaire. To obtain the functional relationship between surrogate health information seeking experience and observed variables, this paper chose multiple regression for data analysis because this method can fully reflect the relationship between dependent variables and a

set of predictors and has been widely used. This study constructed the following two regression models:

$$\text{SHISE}_i = \beta_0 + \beta_1 \text{Gender}_i + \beta_2 \text{Age}_i + \beta_3 \text{Edu}_i + \beta_4 \text{HS}_i + \beta_5 \text{Marriage}_i + \beta_6 \text{IE}_i + \beta_7 \text{HISE}_i + \beta_8 \text{Chronic}_i + \beta_9 \text{LS}_i + \quad (\text{Model 1})$$

$$\text{SHISE}_i = \beta_0 + \beta_1 \text{Gender}_i + \beta_2 \text{Age}_i + \beta_3 \text{Edu}_i + \beta_4 \text{HS}_i + \beta_5 \text{Marriage}_i + \beta_6 \text{IE}_i + \beta_7 \text{HISE}_i + \beta_8 \text{Chronic}_i + \beta_9 \text{LS}_i + \beta_{10} \text{OC}_i + \beta_{11} \text{EN}_i + \beta_{12} \text{FCE}_i + \quad (\text{Model 2})$$

Where Model 1 is a model constructed based on previous research, with variables including surrogate health information seeking experience (SHISE), gender (Gender), age (Age), education level (Edu), health status (HS), marital status (Marriage), Internet usage experience (IE), health information seeking experience (HISE), whether family members have chronic diseases (Chronic), and living status (LS). In Model 2, this paper added three new variables reflecting Chinese family structure: whether an only child (OC), number of direct elders (EN), and frequency of communication with direct elders (FCE).

4 Data Analysis Results and Discussion

Based on analysis of 546 valid samples, 475 had surrogate health information seeking experience in the past 12 months, accounting for 87% of the total sample, while 71 only searched for health information online for themselves, accounting for 13% of the total sample. The following analysis is conducted from two aspects: characteristics of surrogate seekers and their health information needs.

4.1 Analysis of Surrogate Seeker Characteristics

4.1.1 Descriptive Analysis of Variables As shown in Table 3, participants ranged in age from 18 to 64, most had college education or above, and had rich Internet usage and online health information seeking experience. Participants were in good health, 58.9% were married, 62.5% had family members with chronic diseases, 43.8% lived with their parents, 38.8% were only children, and most participants communicated with direct relatives at least once a week.

4.1.2 Regression Results Analysis (1) Demographic variables. From the regression results of Model 1 and Model 2 (see Table 4), women are more likely than men to help others search for health information online, which is consistent with previous research. Women are advocates for family health and are more willing to help family members search for health information in daily life. Age has no significant effect on surrogate health information seeking. D. Reifegerste et al.'s research found that age has a curvilinear relationship with surrogate health information seeking, with middle-aged people having the highest frequency of surrogate seeking. Education level has no significant effect on

surrogate health information seeking, which is consistent with Y.S. Oh' s research results. However, N.A. Kinnane and D.J. Milne' s research pointed out that people with higher education are more likely to use the Internet to search for health-related information for others. Health status has a significant positive effect on surrogate health information seeking; people with good self-perceived health are more likely to help others search for health information online. Married people are more likely than unmarried people to become surrogate health information seekers, which is consistent with previous research. Married people have a stronger sense of family responsibility and search for health information online not only for themselves but also for their spouses, children, and parents.

(2) Health information seeking experience variables. From the regression results of Model 1 and Model 2, Internet usage experience has no significant effect on surrogate health information seeking, because participants had an average of more than 7 years of Internet usage experience and almost no barriers to Internet usage. Online health information seeking experience has a significant positive effect on surrogate seeking; people who frequently search for health information online often have strong health literacy and health awareness. They trust and rely on the Internet to obtain health information, so when encountering health-related issues, they search for health information online not only for themselves but also for their family members.

(3) Family structure variables. From the regression results of Model 1 and Model 2, participants whose family members have chronic diseases are more likely to become surrogate seekers, which is consistent with R.S. Sadasivam et al.' s research results. People often search for health information online on behalf of patients out of family care. Living status has no significant effect on surrogate health information seeking, because although participants did not live with their parents, their communication frequency was high. From Model 2, compared with non-only children, only children are more likely to become surrogate health information seekers. In China, elderly people mainly age at home, and children' s care and help for the elderly are important prerequisites for achieving healthy aging. Only children are the only ones in the family to care for the elderly and connect family members emotionally. Adult only children face undeniable responsibilities in caring for the health of the elderly, so they participate more in surrogate health information seeking activities. The number of direct elders and the frequency of communication with direct elders have no significant effect on surrogate health information seeking, because affected by family atmosphere, some elders generally do not tell their children about their health problems to avoid worrying them, making it impossible for the younger generation to know their health needs.

4.2 Analysis of Surrogate Seeker Behavior Patterns

Among the 546 participants, 475 had surrogate health information seeking experience. A behavior-related survey was conducted on participants who reported having surrogate health information seeking experience, and the behavior pat-

terns of surrogate seekers were analyzed based on the 5W perspective, including behavioral motivation, objects for whom they search for health information, timing of searching for others (before, during, or after medical consultation), selection of health information sources, and types of health information searched.

4.2.1 Motivation (Why) Although surrogate health information seeking is a common phenomenon that has existed for a long time, current domestic and international research on the behavioral motivations of surrogate seekers is very limited, making it difficult to obtain theoretical explanations about surrogate seekers' behavioral motivations through literature review and difficult to measure quantitatively. However, motivation is very important for understanding surrogate seekers' behavior. Therefore, this paper recruited 18 volunteers with surrogate health information seeking experience for semi-structured interviews, including 10 males (55.6%) and 8 females (44.4%). Through independent coding by two researchers and final integration, the behavioral motivations of surrogate seekers were obtained, mainly including caring, altruism, self-value realization, self-efficacy, perceived usefulness, and learning health knowledge.

4.2.2 Surrogate Objects (Who) Understanding who surrogate seekers mainly represent in health information seeking is also very important for understanding their behavior. As shown in Figure 1 [Figure 1: see original paper], 78.7% of surrogate health information seekers reported helping parents search for health information online, followed by helping friends, accounting for 55.6%. People rarely help colleagues or strangers search for health information online, accounting for 18.1% and 3.8% respectively. D. Reifegerste et al.'s research on European survey data found that surrogate health information seeking behavior is affected by relationship strength; people are more likely to search for health information for family members and less likely to help people with weak relationships (such as colleagues) search for health information. The strong/weak tie theory in social network theory can also provide theoretical support for this phenomenon. Strong ties are more intimate, involve more self-disclosure and various forms of resource exchange, and are more likely to engage in surrogate health information seeking, while weak ties include less intimate communication.

4.2.3 Search Timing (When) Surrogate seekers searching for health information at different time stages will generate different health information needs. According to statistical results, 89.3% of surrogate seekers help patients search for health information online before medical consultation, 35.8% help patients search during medical consultation, and 30.7% help patients search after medical consultation. Existing research on cancer patients and their caregivers found that family members often begin to pay attention to relevant health information services only when patients are already in the advanced stage of cancer. The results of this paper show that with the popularization of smartphones, when family members or friends have health problems, people can help them search

for relevant health information online anytime and anywhere. This search behavior generally occurs before patients' medical consultation, which will help disease prevention and early diagnosis.

4.2.4 Health Information Sources (Where) Information sources are carriers of information. In the health field, the choice of information sources is particularly important and even affects the success of health information seeking, because information from different sources varies greatly in quality and completeness. This difference may lead consumers to form different disease mental models and health beliefs, thereby affecting their health behaviors and decisions. This study found through a survey of surrogate health information seekers (see Table 5) that search engines are the most important source for people to search for health information, accounting for 81.1%. Consumers have rich experience using search engines, and when facing health problems, using search engines allows them to quickly start information seeking for immediate needs. Next are online health communities and online Q&A communities, accounting for 66.7% and 54.5% respectively. In the Web 2.0 environment, online health communities and social Q&A communities based on user-generated content have developed rapidly. Online health communities provide consumers with an open network platform for information exchange, experience sharing, Q&A consultation, and social support on health and medical-related issues. In social Q&A communities, users can ask or answer questions based on their interests and can search and browse specific questions and answers in the community. Fewer consumers choose medical institution or government websites and professional databases, accounting for 33.5% and 5.3% respectively, and some participants choose other sources such as Toutiao and Bilibili.

4.2.5 Health Information Types (What) There are many types of health information resources on the Internet, and information type preference is the most direct reflection of consumers' health information needs. Identifying the types of health information consumers need will help provide useful health information and resources. As shown in Table 6 , surrogate health information seekers have needs for many types of health information. The most common information need is general information about the disease itself, accounting for 88.4%. Next is daily health care-related information (such as diet, exercise, etc.) and disease treatment-related information (such as medication, surgery, etc.), accounting for 61.9% and 57.3% respectively. The demand for medical insurance and interpersonal relationship-related information is relatively low, accounting for 17.7% and 4.8% respectively.

Based on the above analysis, a comprehensive model of surrogate health information seekers in China is obtained, as shown in Figure 2 [Figure 2: see original paper]. The middle layer represents the individual characteristics of surrogate health information seekers, and the outer layer represents the behavior patterns from the 5W perspective.

5 Research Implications

- (1) Surrogate health information seeking is a common phenomenon in China under the Internet environment and will help bridge the impact of digital inequality on individual health. This study found that 87.0% of online health information seekers had experience helping others search for health information online in the past 12 months. Research on surrogate health information seeking is meaningful because people's daily health information needs are increasing, and there is a massive amount of health information on the Internet. Surrogate seeking provides an indirect way for non-Internet users or users with low information literacy to use the Internet for health information seeking. For health policymakers, surrogate seeking promotes the effective dissemination of health information, enabling those who do not frequently use the Internet to be included in health information services. For example, China has attached great importance to improving the health level of all people in recent years. The "Healthy China 2030" Planning Outline points out the need to highlight solving health problems of women, children, the elderly, disabled people, low-income groups, and other groups to promote social fairness. The Healthy China Action (2019-2030) points out that the government, society, and individuals should work together to promote the shift from disease-centered to health-centered approaches and improve people's health levels. As a daily social collaboration behavior based on interpersonal relationships using ICT (including technology and tools), surrogate health information seeking will help bridge health differences caused by digital inequality and promote universal health.
- (2) Identify the group of surrogate health information seekers and provide necessary support and help to enhance their ability to provide health information support to others. Through empirical analysis, this paper found that characteristics such as being female, an only child, married, in good health, having rich online health information seeking experience, and having family members with chronic diseases can predict surrogate health information seekers, while age, education level, Internet usage experience, living status, number of direct elders, and frequency of communication with direct elders have no significant effect on surrogate health information seeking. Among them, having family members with chronic diseases is the strongest predictor of surrogate health information seekers. In Chinese culture, caring for family members is an important moral obligation, and using the Internet to help family members with chronic diseases search for health information is a common way to demonstrate care and social support. The only-child group, as a product of China's family planning policy, has made great contributions to the country's and nation's long-term development, and also bears more responsibilities and risks than multi-child families in caring for the health of the elderly. Women and married individuals are also important predictive factors for surrogate

seekers. They need to spend time and energy in daily life helping others search for health information online and share the screened and processed health information with those in need. This surrogate seeking behavior may bring them anxiety and psychological pressure. Therefore, when formulating health policies or providing health information services, it is necessary to focus on surrogate health information seekers, starting from their group characteristics, and provide more health literacy education, training, and psychological counseling to enhance their health information seeking ability to better provide health information support for the digitally disadvantaged.

- (3) Understand the behavior patterns of surrogate health information seekers and work together to create a good environment for surrogate health information seeking. This paper analyzed the behavior patterns of health information seeking from the 5W perspective. Through semi-structured interviews with users who have surrogate health information seeking experience, the behavioral motivation factors of surrogate seekers were obtained. Through questionnaire surveys, it was found that surrogate seekers are more likely to help people with strong social relationships search for health information, such as parents and friends. They generally use the Internet to search for health information before patients' medical consultation. In terms of information sources, surrogate seekers mainly use search engines, online health communities, and online Q&A communities, with less use of medical institution or government websites and professional databases. They need more general information related to diseases themselves, daily health care, and treatment-related information. Social network theory and social support theory can provide theoretical support for surrogate seekers mainly helping people with strong social relationships. I. Ramsey et al.'s research found that consumers mainly use health information for symptom checking, enhancing understanding of diseases or medical conditions, identifying potential causes of diseases, and deciding whether to see a doctor. For surrogate health information seekers, out of care for patients, they also generally search for health information before patients' medical consultation and provide some health advice to patients. Most surrogate health information seekers obtain health information through search engines or user-generated content-based online communities. The content from these sources is not targeted enough and varies in quality, which can cause certain confusion for consumers. Therefore, it is recommended that authoritative medical institutions or government departments build authoritative, user-friendly health service platforms and effectively publicize professional health websites to improve health information seekers' use of official websites to ensure the quality of health information they find.

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Note: Figure translations are in progress. See original paper for figures.

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