Research on Influencing Factors of Proxy Online Health Information Seeking: Based on the Health Belief Model and Social Support Theory (Post-print)

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Abstract

[Purpose/Significance] Online health information proxy seeking represents a daily information practice pattern grounded in interpersonal collaboration. Exploring the influencing factors and mechanisms of this behavior through classical theories holds significant importance for achieving a deeper understanding of this information behavior. [Method/Process] Grounded in the Health Belief Model and Social Support Theory, this study constructs an influencing factor model for health information proxy seeking and proposes 12 research hypotheses. Data were collected through a questionnaire survey, yielding 475 valid responses, and analyzed using SmartPLS software. [Results/Conclusion] The findings indicate that empathy, information support willingness, perceived severity, and perceived benefits positively influence health information proxy seeking willingness, whereas perceived barriers exert a negative influence. Perceived susceptibility and self-efficacy demonstrate no direct relationship with health information proxy seeking willingness. Mediation analysis reveals that empathy completely mediates the relationship between perceived susceptibility and health information proxy seeking willingness; empathy partially mediates the relationship between perceived severity and health information proxy seeking willingness; and information support willingness partially mediates the relationship between self-efficacy and health information proxy seeking willingness. These results provide valuable references for motivating, managing, and intervening in online health information proxy seeking practices.

Full Text

Preamble

Research on Influencing Factors of Online Surrogate Health Information Seeking: Based on the Health Belief Model and Social Support Theory

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Abstract:
[Purpose/Significance] Online surrogate health information seeking represents an everyday information practice mode based on interpersonal cooperation. Exploring the influencing factors and mechanisms of this behavior through classical theories is crucial for deeply understanding this information behavior. [Method/Process] Based on the Health Belief Model and Social Support Theory, this study constructed an influencing factors model of surrogate health information seeking and proposed 12 research hypotheses. Data were collected through a questionnaire survey yielding 475 valid responses, and analyzed using SmartPLS software. [Results/Conclusion] The results show that empathy, information support intention, perceived severity, and perceived benefits positively influence surrogate health information seeking intention, while perceived barriers negatively influence it. Perceived susceptibility and self-efficacy showed no direct relationship with surrogate health information seeking intention. Mediation analysis revealed that empathy completely mediates the relationship between perceived susceptibility and surrogate health information seeking intention, partially mediates the relationship between perceived severity and surrogate health information seeking intention, and information support intention partially mediates the relationship between self-efficacy and surrogate health information seeking intention. These findings provide references for further motivating, managing, and intervening in online surrogate health information seeking practices.

Keywords: surrogate health information seeking; influencing factors; health belief model; social support; health informatics
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Introduction

With the rapid development of information technology, using the internet to obtain health information has become a common everyday information practice [1]. Research has found that people do not merely search for health information for themselves; a substantial portion of online health information seeking

behavior is related to others. This behavior—where non-medical professionals represent others in using the internet to obtain health information due to others' requests or out of concern for them—is termed surrogate health information seeking [2]. Large-scale survey data from 28 EU member countries found that 61% of online health information seekers had experience searching on behalf of others in the past year, with no significant differences between countries [3]. U.S. survey data revealed that over half of online health information seeking activities were conducted on behalf of others, with fewer than 40% of internet users searching only for themselves [4]. Survey analysis of surrogate health information seeking behavior in China similarly found that over 80% of online health information seekers frequently search on behalf of family members and friends [5]. Surrogate health information seeking behavior holds significant importance, as it can indirectly disseminate online health information to patients, fulfill their information needs, enhance their ability to cope with health issues, and to some extent promote health equity.

Despite being a widespread and important phenomenon, research on surrogate health information seeking remains limited compared to active self-directed health information seeking. Scholars have integrated various cognitive psychological and information behavior theories to investigate influencing factors of self-directed health information seeking [6-7]. However, current research on influencing factors of surrogate health information seeking behavior mostly relies on secondary data or interview analysis, focusing primarily on individual characteristics' impact on surrogate seeking [6-7], with few empirical studies combining theoretical models to examine internal influencing factors.

Surrogate health information seeking involves both the surrogate seeker who interacts with ICT (information and communication technology) to provide health information support, and the principal seeker who has health information needs and indirectly obtains online resources, with the surrogate seeker being the primary behavioral agent [8]. Therefore, from the surrogate seeker's perspective and combining the Health Belief Model and Social Support Theory, this study employs empirical analysis to explore factors influencing people's surrogate health information seeking behavior.

Literature Review

2.1 Surrogate Health Information Seeking

The information behavior field has long focused on the surrogate seeking pattern. In 2003, P.J. McKenzie studied everyday life information seeking (ELIS) behaviors and developed a model of information practices containing four seeking modes, among which the surrogate seeking mode was considered a behavior where participants connected information sources through an intermediary agent, with the information needer being a passive information recipient [9]. In 2006, J.A. Abrahamson and M. Dodel and G. Mesch noted that information seeking by non-professionals on behalf of others deserved attention, pointing

out that helping family members search for health information on the Web was a common form [10]. Previous research indicates that online surrogate health information seeking behavior differs significantly from self-seeking behavior in several key aspects: (1) the need for surrogate health information seeking originates from others, involving greater uncertainty regarding health status and information needs; (2) surrogate health information seeking is closely related to social bonds, with people having stronger beliefs in solving family members'/friends' health problems; and (3) surrogate health information seeking involves more complex information processing, including acquisition, processing, and sharing. J.A. Abrahamson et al.'s LIMB (lay information intermediary behavior) model suggests that surrogate health information seeking behavior may be driven by explicit social support purposes and is motivated by internal factors arising from social relationships [2].

Research on internal influencing factors of surrogate health information seeking is limited. J.A. Abrahamson et al. believe surrogate health information seeking is more related to intrinsic rather than extrinsic motivation, finding that surrogate seeking can be intentional or unintentional, that surrogate seekers have high self-efficacy, and that the behavior is often motivated by concern for others [2]. J.M. Taber et al. argue that self-affirmation can promote prosocial behavior and is associated with positive outcomes in health contexts, with research showing self-affirmation correlates with seeking health information for others [11]. S.L. Cutrona et al. suggest surrogate health information seeking is related to empathy, altruism, and satisfaction from helping others [12]. D. Reifegerste et al., based on an improved Comprehensive Model of Information Seeking (CMIS), studied factors influencing surrogate health information seeking, finding that health beliefs and salience of health threats to family/friends play important roles in surrogate health information seeking intention [13]. Wan Wenzhi et al. conducted grounded theory analysis of influencing factors of surrogate health information seeking, identifying four main categories: patient needs, seeker psychological motivation, seeker cognitive motivation, and environmental factors, including specific elements like health concern, care, altruism, and self-efficacy [14].

2.2 Health Belief Model

The Health Belief Model (HBM) is one of the most widely recognized conceptual frameworks for health behavior [15], extensively applied in research explaining health behavior to understand why individuals engage in or refrain from various health-related behaviors. I.M. Rosenstock explained health beliefs as a force that moves people away from negative health conditions. The HBM posits that three conditions must be met for people to adopt health-avoidance behavior: (1) sensitivity to disease; (2) belief that disease occurrence would significantly impact personal health; and (3) belief that health action would reduce disease risk [16]. M. Dodel and G. Mesch presented various variables of the HBM and their relationships, with the model including six main variables: perceived suscep-

tibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action [17].

As a classic theoretical model in health behavior research, the HBM has been widely applied. J. Mou et al. consider online health information seeking behavior a preventive action taken to cope with health problems and call for applying the HBM to research on online health information seeking intention. Their study found that perceived susceptibility, perceived severity, and perceived benefits were significantly positively correlated with online health information seeking intention, perceived barriers were significantly negatively correlated, and self-efficacy had no significant impact [18]. M.F. Chen et al. used the HBM to study factors influencing parents' decisions to vaccinate their children, where health beliefs referred to parents' perceptions of health risks and benefits for their children, finding that perceived susceptibility of children to influenza, perceived benefits of vaccination, barriers to vaccination, and cues to action significantly influenced parents' intention to vaccinate their children [19].

2.3 Social Support Theory

Researchers began focusing on social support in the mid-1970s, conceptualizing it as interaction, interpersonal relationships, or social assistance [20]. S. Cobb defined social support primarily as caring, respect, caregiving, and shared responsibility based on social connection and recognition [21]. Social support includes social interaction among multiple actors and encompasses multiple dimensions, including four types: emotional support, information support, instrumental support, and social companionship [22]. J. Shakespeare-Finch and P.L. Obst view social support as bidirectional, divided into actively providing support and passively receiving support. As a positive mediating factor in physical and mental health, receiving social support is associated with better health and well-being, faster recovery from illness, more positive post-surgical outcomes, and prevention of depressive disorders [23]. Like receiving support, providing support is also important, with the bidirectionality of social support reflecting its reciprocal nature.

Social support has extended to online environments, with internet-mediated social support gradually gaining researchers' attention. H.J. Oh et al. believe internet-mediated social support can supplement face-to-face support, enabling people to obtain needed support based on the internet when they cannot meet face-to-face. Their study found that Facebook-based online health information seeking was significantly associated with social support [24]. C.J. McKinley and P.J. Wright studied the relationship between social support, online health information seeking, and healthy eating intention among college students, finding that social support was positively associated with online information seeking and better impressions of nutrition/healthy eating information online, and that social support indirectly influenced healthy eating intention through the process of perceiving online resources [25].

In summary, surrogate health information seeking, as an everyday information practice mode based on interpersonal support, awaits empirical research on influencing factors based on mature theories. The Health Belief Model is a classic health behavior theoretical framework suitable for perceiving others' health risks and benefits and online health information seeking behavior. Therefore, we argue that variables related to the Health Belief Model and Social Support Theory will help understand the formation mechanism of surrogate health information seeking intention.

Research Hypotheses and Model Construction

Based on the Health Belief Model and Social Support Theory, this study constructs an empirical model of influencing factors of surrogate health information seeking. Specific constructs include: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, empathy, information support intention, self-efficacy, and surrogate health information seeking intention. Twelve research hypotheses are proposed.

(1) Empathy. Empathy refers to people's emotional and imaginative understanding of others' situations without having personally experienced those situations or feelings, a phenomenon common among both psychological experts and ordinary people [26]. C.D. Batson et al. proposed the empathy-altruism hypothesis in 1981, arguing that empathy makes people more motivated to help others and increase others' benefits [27]. Based on this empathy effect model, empathy is an important antecedent factor for generating attitudes and behaviors to help others [28]. In user behavior research, empathy is an uncommon but potentially important variable [29]. In health contexts, empathy is considered an important psychological characteristic of information supporters, with an individual's level of empathy potentially related to their willingness to help others. J.B. Stiff et al. found that empathy is proportional to the likelihood of volunteering and the quality of comforting information provided to close friends, and positively correlates with communication willingness with others [30]. J.M. Sorrell's research found that nurses' empathy in caring for older adults in hospitals could influence their supportive behaviors toward older adults [31]. Empathy tends to strengthen when people face strong interpersonal relationships and those in need, increasing their willingness to help [32]. In the context of surrogate health information seeking, people also form their own cognition and behavior based on others' health status and needs. Perceiving others' health problems may influence surrogate health information seeking behavior through the formation of empathy. Therefore, we propose:

H1: Empathy is positively correlated with surrogate health information seeking intention.

(2) Information Support Intention. According to Social Support Theory, information support and emotional support are two important types of support content [33]. Information support refers to people communicating and sharing

relevant information with others in need. Providing information support to others also motivates people to search for relevant information. The LIMB model suggests that people tend to seek information to provide health information support to others with health problems [2]. E. Link et al.'s research indicates that information support is the most common form of support among family members facing health issues, and that family-based information support can improve health decision-making capacity [34]. E.A. Chavarria et al.'s study of Latino college students in the U.S. found that college students often serve as family health information sources, and that the drive to provide health information support to family members motivates their online health information seeking behavior [35]. Family members or friends search for more health information online to provide patients with treatment-related information, so providing information support for them may be an influencing factor for surrogate health information seeking. We propose:

H2: Information support intention is positively correlated with surrogate health information seeking intention.

(3) Perceived Susceptibility. Based on the Health Belief Model, perceived susceptibility refers to people's belief about the possibility of being at risk for a health problem [16]—a health risk belief that one might develop a health condition. Health behavior depends on individuals' belief that they are subject to health hazards; thus, when perceived susceptibility is high, people are more likely to take preventive action against health threats [18]. Health information seeking is often viewed as a preventive behavior to cope with health risks, with research showing that perceived susceptibility is significantly related to health information seeking behavior [36]. In HBM applications, perceived susceptibility represents not only individuals' perception of their own health risk but also their perception of others' health risk. M.F. Chen et al.'s research found that perceived susceptibility of children to influenza significantly influenced parents' intention to vaccinate their children [19]. In surrogate health information seeking behavior, people need to form their own cognition and behavior based on others' health status and needs. Perceived susceptibility to others' health problems may influence surrogate health information seeking behavior through empathy. Therefore, we propose:

H3: Perceived susceptibility is positively correlated with empathy.
H4: Perceived susceptibility is positively correlated with surrogate health information seeking intention.

(4) Perceived Severity. Based on the Health Belief Model, perceived severity is also a perceived risk belief, referring to people's perception of various difficulties and harms that developing a health problem might cause, including physical, work, and family impacts [37]. When people believe a health problem could cause serious consequences, they are often willing to take necessary actions to avoid or mitigate such harm, such as seeking health information [38]. In the surrogate health information seeking context, perceived severity does not stem from personal health risks but from perceptions of others' health risks.

The optimistic bias theory of risk perception suggests that people typically perceive others' risks as higher than their own [39]. D. Reifegerste et al.'s research indicates that intimate relationships may influence people's perception of severity regarding others' health risks, showing that perceived severity of others' health risks is related to surrogate health information seeking behavior [13]. Similarly, people may perform surrogate seeking based on their perception and understanding of others' actual health conditions. Therefore, we propose:

H5: Perceived severity is positively correlated with empathy.
H6: Perceived severity is positively correlated with surrogate health information seeking intention.

(5) Perceived Benefits. Based on the Health Belief Model, perceived benefits refer to the expected benefits of performing a health behavior. The magnitude of expected benefits often influences whether people are willing to perform a behavior [16]. If individuals believe the benefits of preventive health behavior outweigh perceived barriers, they are more likely to adopt that behavior [40]. People need to perceive benefit-related beliefs that link behavior with expected health outcomes, which also helps avoid impulsive behaviors leading to negative health outcomes. P.J. O'Connor et al.'s research shows that perceived benefits are important influencing factors for people seeking health help from others [41]. Social support research suggests attention must be paid to costs and benefits for both providers and recipients; providers may perform social support behaviors to maintain reciprocal relationships or improve others' lives [42]. In the surrogate health information seeking context, participants may want to provide information support to others due to perceived usefulness and health benefits. Therefore, we propose:

H7: Perceived benefits are positively correlated with information support intention.
H8: Perceived benefits are positively correlated with surrogate health information seeking intention.

(6) Perceived Barriers. Based on the Health Belief Model, perceived barriers refer to obstacles people perceive in performing a health behavior [16]. While perceiving benefits of a behavior, there are also negative aspects like barriers; strong perceived barriers motivate people to avoid a behavior. In the internet environment, perceived barriers are multidimensional, including psychological stress [43], performance issues [44], and time costs [45]. Both authoritative social supporters (e.g., doctors or social workers) and informal supporters (e.g., family, friends) face certain costs and barriers when providing social support [42], such as psychological and cognitive pressures. In the surrogate health information seeking context, people using the internet to provide information support for others also face obstacles in judging information credibility and time costs; these perceived barriers may hinder willingness to provide information support for others. Therefore, we propose:

H9: Perceived barriers are negatively correlated with information support in-

tention.
H10: Perceived barriers are negatively correlated with surrogate health information seeking intention.

(7) Self-Efficacy. Based on the Health Belief Model, self-efficacy refers to individuals' perceived ability to perform a health behavior and the likelihood of achieving desired outcomes, especially when the behavior requires certain skill levels or theoretical understanding [17]. People generally avoid participating in behaviors they lack confidence to complete. W. Cao et al.'s research indicates that higher internet use self-efficacy leads to greater returns from online health information seeking and more active engagement in online health information seeking activities [46]. J. Mou et al.'s research shows that self-efficacy is significantly related to people's intention to seek health information online to cope with health problems [18]. W. Arif et al. also found that users with high self-efficacy used television and the internet more to seek health information to cope with COVID-19 during the health crisis [47]. Online surrogate health information seeking is a process of interacting with ICT to acquire, process, and share health information, requiring certain internet use abilities and health information comprehension skills; self-efficacy may be an important factor influencing people's provision of information support and surrogate seeking. Therefore, we propose:

H11: Self-efficacy is positively correlated with information support intention.
H12: Self-efficacy is positively correlated with surrogate health information seeking intention.

The surrogate health information seeking influencing factors model is shown in Figure 1 [Figure 1: see original paper].

Questionnaire Design and Distribution

To test the research hypotheses, we used a questionnaire survey for data collection, adapting measurement scales from existing research to form scales for relevant constructs in this study.

4.1 Scale Design

The questionnaire consisted of four parts: questionnaire instructions, demographic information survey, online health information seeking situation survey, and measurement scales for eight constructs in the research model. Due to the large number of constructs in this study, we used shorter scales adapted from previous research to avoid errors caused by respondents losing patience during completion. The measurement scales are shown in Table 1 , using a five-point Likert scale where 1-5 represent "strongly disagree," "disagree," "uncertain," "agree," and "strongly agree."

Although all scales were adapted from existing research, many items were being used for the first time in the surrogate health information seeking context.

Therefore, we first conducted a pilot survey. The pilot survey began on July 1, 2020, and yielded 107 valid questionnaires over five days. Based on reliability and validity tests of the pilot data, we made certain revisions. The formal survey used the revised scales (see Table 1). Participants were recruited through paid public recruitment on the Wenjuanxing platform (www.wjx.cn) and public recruitment in social media circles, with requirements of being at least 18 years old and having experienced surrogate health information seeking within the past year. The formal survey began on July 10, 2020, and collected 475 valid questionnaires meeting the criteria over 14 days.

4.2 Questionnaire Distribution

From the formal questionnaire data, female respondents slightly outnumbered males. In terms of age, respondents aged 26-35 were the largest group, accounting for 53.5%. Regarding education level, most respondents had bachelor's degrees or higher, exceeding 80% of the total sample, indicating respondents had the ability to understand and complete the questionnaire carefully. The majority of respondents were married (62.5%). Most respondents had more than seven years of internet use experience (78.9%). Respondents reported substantial online health information seeking experience, with fewer than 6% indicating they rarely used the internet to seek health information. Details are shown in Table 2 .

Data Analysis and Hypothesis Testing

5.1 Descriptive Statistical Analysis

[Content continues with analysis…]

5.2 Common Method Bias

Common method bias refers to systematic error caused by the same data source, measurement environment, measurement context, and collection method [52], which can negatively impact data accuracy. Harman's single-factor test is commonly used to measure common method bias, where the most significant single factor's explained variance should not exceed 50% of total explained variance [53]. Using SPSS, we conducted exploratory factor analysis on all variables. Five common factors were extracted with a total explained variance of 64.394%, showing good explanatory power. No single factor's explained variance exceeded 50%, indicating no significant common method bias in this study.

5.3 Reliability and Validity Testing

We used Partial Least Squares Structural Equation Modeling (PLS-SEM) for model and data analysis, selecting PLS-SEM for two main reasons: (1) compared to CB-SEM, PLS-SEM relaxes the normal distribution assumption [54], and our health-related measurement questions showed positive response bias,

with data not meeting normal distribution; and (2) PLS-SEM can estimate complex models with relatively small sample sizes [55]. Our model includes eight constructs with numerous indicators and complex relationships, and the sample size is not sufficiently large. For these reasons, PLS-SEM is suitable for this study, and we used SmartPLS (version 3.3.2) for data analysis.

Reliability and validity results are shown in Table 3 . Reliability was assessed through Cronbach's Alpha and Composite Reliability (CR). All constructs showed Cronbach's Alpha and CR values above 0.7, indicating good reliability [56]. Measurement model validity was evaluated from three aspects: content validity, convergent validity, and discriminant validity [57]. For content validity, all measurement items were adapted from existing research and tested through the pilot questionnaire, confirming clear and valid content. For convergent validity, all constructs' Average Variance Extracted (AVE) values were above 0.5, indicating good convergent validity [58]. For discriminant validity, we used the Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) ratio. Fornell-Larcker criterion results in Table 4 show that the square root of each construct's AVE on the diagonal was significantly greater than its correlations with other constructs [59], and HTMT values in Table 5 were all below 0.9 [60], indicating good discriminant validity among constructs. Table 3 also reports item means, standard deviations, factor loadings, and variance inflation factors, showing good item affiliation and no serious multicollinearity.

5.4 Hypothesis Testing

We used SmartPLS for structural model assessment, employing bootstrapping for significance testing with 5,000 resamples. Model results are shown in Figure 2 [Figure 2: see original paper]. The R^2 values for empathy, information support intention, and surrogate health information seeking intention were 0.601, 0.206, and 0.556 respectively, indicating good explanatory power. Hypothesis testing results in Table 6 show that among the 12 hypotheses, all were supported except H4 and H12.

We further analyzed mediation effects in the model, with detailed results in Table 7 . SmartPLS bootstrapping calculates direct, indirect, and total effects of independent variables on dependent variables. The indirect effects show that both empathy and information support intention have significant indirect effects. We further tested mediation using VAF (variance accounted for), the ratio of indirect to total effect. VAF < 0.2 indicates no mediation, $0.2 \leq$ VAF ≤ 0.8 indicates partial mediation, and VAF > 0.8 indicates full mediation [61]. Therefore, empathy fully mediates the relationship between perceived susceptibility and surrogate health information seeking intention ($\beta = 0.144$, T = 4.951, P < 0.001); empathy partially mediates the relationship between perceived severity and surrogate health information seeking intention ($\beta = 0.125$, T = 4.614, P < 0.001); and information support intention partially mediates the relationship between self-efficacy and surrogate health information seeking intention ($\beta = 0.058$, T = 3.998, P < 0.001).

Results Discussion

Based on the Health Belief Model and Social Support Theory, this study examined how HBM-related variables (perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy) and social support-related variables (information support intention and empathy) influence surrogate health information seeking intention. Data analysis revealed that empathy, information support intention, perceived severity, and perceived benefits positively influence surrogate health information seeking intention, while perceived barriers negatively influence it. Perceived susceptibility and self-efficacy showed no direct relationship with surrogate health information seeking intention, but empathy and information support intention played mediating roles.

(1) Empathy. The study found empathy to be the most important influencing factor of surrogate health information seeking, consistent with previous research [28]. Understanding and experiencing others' emotions and situations is an important prerequisite for generating attitudes and behaviors to help others. In the surrogate health information seeking context, people who deeply experience others' health conditions and needs and transform others' feelings and needs into their own internal emotions will be more willing to help others use the internet to seek health information. This result aligns with J.A. Abrahamson et al.'s [2] view that surrogate health information seeking is more related to internal factors. Perceived susceptibility showed no significant direct relationship with surrogate health information seeking intention, inconsistent with some previous HBM research [19] but consistent with P.J. O'Connor et al. [41]. In surrogate health information seeking contexts, when people perceive that others are likely at health risk, they do not necessarily help them use the internet to seek health information, as people tend to believe others are more likely to face adverse conditions but may not be inclined to act without sufficient information. To further analyze this relationship, we examined empathy's mediating effect, finding that perceived susceptibility was significantly positively correlated with empathy, and empathy completely mediated the relationship between perceived susceptibility and surrogate health information seeking intention. That is, only when people transform their perception of others' health risk possibilities into their own emotions and needs will they search for health information on their behalf. Perceived severity was significantly positively correlated with both empathy and surrogate health information seeking intention, consistent with some HBM research [38]—when people perceive that a health problem could cause serious harm to others, they can better understand others' needs and choose to help them seek health information online to avoid or mitigate this health risk. Meanwhile, the relationship between perceived severity of others' health risks and surrogate health information seeking intention was also partially mediated by empathy.

(2) Information Support Intention. The study found information support intention positively correlated with surrogate health information seeking intention, consistent with previous research [19]—people search for more online health

information to provide information support to family/friends. In the surrogate health information seeking context, when people learn that others face health problems or have health information needs, providing relevant health information to others is an influencing factor driving them to use the internet to seek health information on behalf of others.

(3) Health Risk Factors in the Health Belief Model. Perceived susceptibility and perceived severity in the HBM are considered health risk factors. We found perceived susceptibility had no significant relationship with surrogate health information seeking intention, inconsistent with some HBM research [19] but consistent with P.J. O'Connor et al. [41]. In surrogate health information seeking contexts, when people perceive that others are likely at health risk, they do not necessarily help them use the internet to seek health information. Further mediation analysis revealed that empathy completely mediates the relationship between perceived susceptibility and surrogate health information seeking intention. Perceived severity was significantly positively correlated with both empathy and surrogate health information seeking intention, consistent with HBM research [38]. In surrogate health information seeking contexts, when people perceive that health problems could cause serious harm to others, they can better understand others' needs and choose to help them seek health information online to avoid or mitigate this health risk. The relationship between perceived severity of others' health risks and surrogate health information seeking intention was also partially mediated by empathy.

(4) Behavioral Expectancy Factors in the Health Belief Model. Perceived benefits and perceived barriers in the HBM are considered behavioral expectancy factors. We found perceived benefits positively influence both information support intention and surrogate health information seeking intention, consistent with previous HBM research [40]—when people perceive sufficient expected benefits from a behavior, they are more motivated to perform it. In surrogate health information seeking contexts, when people believe that helping others search for and provide information can bring certain health benefits to them, they are willing to provide health information support and perform surrogate health information seeking activities for others. Perceived barriers were found to negatively influence both information support intention and surrogate health information seeking intention, consistent with previous HBM research [62]—when people anticipate obstacles from performing a behavior, they tend to avoid it. In surrogate health information seeking contexts, when people believe that helping others search for and provide information may cost significant time and cause substantial psychological pressure, these perceived barriers reduce their willingness to provide health information support and engage in surrogate health information seeking behavior.

(5) Self-Efficacy Factor in the Health Belief Model. The study found self-efficacy had no significant relationship with surrogate health information seeking, inconsistent with some HBM research [63] but consistent with J. Mou et al. [18]. In surrogate health information seeking contexts, self-efficacy level is

not a direct influencing factor for representing others in online health information seeking; other factors based on interpersonal relationships may play more important roles. To further analyze this relationship, we examined the mediating role of information support intention, finding that information support intention partially mediated the relationship between self-efficacy and surrogate health information seeking intention. That is, people with higher self-efficacy are more likely to provide information support when others have health information needs, thereby promoting surrogate health information seeking behavior.

This study primarily investigated influencing factors of surrogate health information seeking, constructing a research model including eight constructs: surrogate health information seeking intention, empathy, information support intention, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and self-efficacy, proposing 12 research hypotheses. We adapted measurement scales from previous research and revised them through a pilot questionnaire. Structural equation modeling results found that only perceived susceptibility and self-efficacy had no significant relationship with surrogate health information seeking intention, while the remaining 10 hypotheses were supported. We further analyzed the model's mediation effects. The theoretical contribution lies in constructing an online surrogate health information seeking influencing factors model and demonstrating the applicability of the Health Belief Model and Social Support Theory in the surrogate health information seeking context, enriching relevant theoretical results. The findings also help understand the triggering causes and influencing mechanisms of online surrogate health information seeking behavior. The study also has practical significance: since surrogate seeking often occurs between adult children and older parents, relevant managers can promote adult children's empathy and information support intention toward their older parents through education and publicity, thereby facilitating their surrogate health information seeking behavior for older parents and indirectly achieving health information services for older adults.

This study has limitations. We only constructed the online surrogate health information seeking influencing factors model at the theoretical level, potentially overlooking some factors. Future research could conduct more detailed qualitative studies on surrogate health information seeking behavior, using in-depth interviews or critical incident techniques to derive more behavioral influencing factors from user-based data to enrich our model.

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Author Contributions

Song Xiaokang: Research design, data collection, and paper writing;
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Research on Influencing Factors of Online Surrogate Health Information Seeking: Based on the Health Belief Model and Social Support Theory

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Abstract: [Purpose/Significance] Online surrogate health information seeking is an everyday information practice mode based on interpersonal cooperation. It is of great significance to deeply understand this information behavior by exploring its influencing factors and mechanisms through classical theories. [Method/Process] Based on the Health Belief Model and Social Support Theory, this paper constructed an influencing factors model of surrogate health information seeking and put forward 12 research hypotheses. 475 valid data were collected through questionnaire survey and analyzed by SmartPLS software. [Result/Conclusion] The results show that empathy, information support intention, perceived severity and perceived benefits have positive impact on surrogate health information seeking intention, while perceived barriers have negative impact. Perceived susceptibility and self-efficacy have no direct relationship with surrogate health information seeking intention. Mediation analysis shows that empathy completely mediates the relationship between perceived susceptibility and surrogate health information seeking intention, partially mediates the relationship between perceived severity and surrogate health information seeking intention, and information support intention partially mediates the relationship between self-efficacy and surrogate health information seeking intention. The results of this study provide reference for further motivating, managing and intervening in online surrogate health information seeking practices.

Keywords: surrogate health information seeking; influencing factors; health belief model; social support; health informatics

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