

Influencing Factors of Public Online Health Information Seeking on Offline Healthcare-Seeking Behavior: A Postprint

Authors: Wu Yiwei, Wen Tingxiao

Date: 2024-04-03T00:00:00+00:00

Abstract

[Objective/Significance] To analyze the characteristics of public online health information seeking and explore the influencing factors of public online health information seeking on offline healthcare-seeking behavior. [Method/Process] Based on the S-O-R theory, relevant hypotheses were proposed and a relational model of public online health information seeking and offline healthcare-seeking behavior was constructed. Using university students as the primary research subjects, SPSS 25.0 software was employed to conduct reliability and validity analysis, correlation analysis, and factor analysis on 204 valid questionnaires collected. Amos 25.0 software was used to construct a structural equation model for hypothesis testing, and the Bootstrap method was utilized to examine mediating effects. [Results/Conclusion] The study found that: 1) Public online health information seeking significantly influences offline healthcare-seeking behavior; 2) Public online health information seeking significantly influences risk perception; 3) Somatic vigilance significantly influences offline healthcare-seeking behavior; 4) Risk perception and somatic vigilance play a mediating role between public online health information seeking and offline healthcare-seeking behavior.

Full Text

Research on Influencing Factors of Public Online Health Information Search on Offline Medical Treatment Behavior

WU Yiwei, WEN Tingxiao*

(Department of Biomedical Informatics, School of Life Sciences, Central South University, Changsha 410013)

Abstract:

[Purpose/Significance] This study analyzes the characteristics of public online health information search and explores the influencing factors through which

public online health information search affects offline medical treatment behavior. [Method/Process] Based on S-O-R theory, relevant hypotheses were proposed and a correlation model between online health information search and offline medical treatment behavior was constructed. With college students as the primary research subjects, SPSS 25.0 software was employed to conduct reliability and validity analysis, correlation analysis, and factor analysis on 204 valid questionnaires collected. Amos 25.0 software was used to construct a structural equation model for hypothesis verification, and the Bootstrap method was applied to test mediation effects. [Results/Conclusions] The findings reveal that: 1) Public online health information search significantly influences offline medical treatment behavior; 2) Public online health information search significantly influences risk perception; 3) Physical alertness significantly influences offline medical treatment behavior; 4) Risk perception and physical alertness mediate the relationship between public online health information search and offline medical treatment behavior.

Keywords: public online health information search; offline medical treatment behavior; influencing factors; structural equation model

1 Introduction

As of June 2022, China's internet user base reached 1.051 billion, with internet penetration reaching 74.4% [2]. The "Internet+" new economic form has enabled successful economic transformation and rapid growth in national wealth. In 2016, the State Council issued the "Healthy China 2030" plan, explicitly proposing to prioritize health in development strategy and elevate China's health governance level [1]. Particularly in the post-pandemic era, the internet has become a commonly used platform for public disease and medical consultation, with the "Health and Medical Care" theme continuously attracting high attention [3].

Internet giants and traditional pharmaceutical companies are actively exploring the blue ocean of internet healthcare. Baidu has launched tools to help medical professionals convert image-based medical materials into text, while Shanghai Pharmaceuticals invested 100 million yuan to layout prescription drug O2O sales. Under this trend, the frequency of public health information search and self-diagnosis via the internet has significantly increased, which inevitably impacts offline medical treatment behavior. Online health information search typically improves individual health behaviors and corrects unhealthy habits [4], but excessive or improper searching can also have negative effects. Due to the mixed quality of online health information and significant variations in public health literacy, online health information search can increase public health anxiety and lead to healthcare resource waste [5].

Previous research on online health information search has primarily focused on influencing factor analysis, characteristic analysis, and the pathway analysis be-

tween online health information search and health anxiety. Few scholars have focused their research objects and perspectives specifically on offline medical treatment behavior, and there is insufficient discussion on the impact and mechanism of online health information search on offline medical treatment behavior.

2 Theoretical Framework

2.1 Online Health Information Search Theory

The Medical Library Association defines health information as health-related information for patients and their families, including health education content [6]. Online health information refers to health information generated in the internet environment—disease-related information obtained through internet platforms such as search engines. This definition has been widely recognized by scholars.

According to Wilson's model in the information behavior field, online health information search can be divided into three elements: health information needs, health information search, and health information evaluation and utilization [7][8]. Search characteristics mainly manifest in search frequency, search motivation, and search content [7]. Different search characteristics can reflect search habits and preferences of different populations, helping to locate health information needs and promote the development of online consultation services.

2.2 Risk Perception Theory

Risk perception belongs to the psychological domain, referring to individuals' feelings and understanding of various objective risks in the external world, emphasizing the entire process of attitudes and decision-making tendencies triggered by subjective judgment [11][12]. In the information behavior field, risk perception degree directly influences individual adoption behavior and efficiency of health information [13].

Common risk perception theoretical models include psychometric paradigm approaches. Fischhoff et al. [14] first used psychometric paradigm to measure risk perception, employing questionnaire surveys to observe public perception of risks and benefits and preferences for risk-benefit trade-offs. Subsequent scholars expanded risk perception theory, which has been applied to study consumer purchase intention, public emotion during public health safety events, and privacy disclosure impact in social media.

Zhao Ruihan et al. [13] constructed a multi-dimensional online health information risk perception theoretical model, subdividing online health information risk perception into six dimensions: information quality risk, service risk, system quality risk, and financial risk. This study adopts risk perception as an important mediating variable in how online health information search influences public offline medical treatment behavior to further explore its mechanism.

2.3 Physical Alertness Theory

Physical alertness refers to the degree of attention individuals pay to their own physical condition [15]. Schmidt et al. [16] developed the Body Vigilance Scale (BVS), which contains 4 items using an 11-point scoring system (0 = “not at all like me” to 10 = “completely like me”) to measure the severity of physical symptoms. Domestic research shows this scale has good reliability and validity [17].

The Patient Health Questionnaire (PHQ-15) can also grade the severity of physical symptoms, with each item rated 0-2 points and total scores ranging 0-30. Scores of 5-9 indicate mild, 10-14 moderate, and 15-30 severe symptoms [17]. Physical symptoms are common in general hospitals, with somatoform disorder prevalence reaching nearly 20% [18]. After online health information search, individuals may misinterpret minor physical issues as serious diseases, generating excessive anxiety and worry, leading to muscle soreness, itching, and other symptoms [19].

Under the “Internet + Healthcare” trend, offline medical treatment guided by online health information search has become increasingly common, but lacks empirical research to further explore the relationship between public online health information search and offline medical treatment behavior.

2.4 S-O-R Theoretical Model

This study employs the S-O-R (Stimulus-Organism-Response) model as the underlying theoretical framework. Originally proposed by environmental psychologist Mehrabian in 1974 [20], this cognitive learning theory suggests that external environmental stimuli affect personal internal perception, leading to individual cognitive and physical changes (e.g., anxiety, worry, fatigue, insomnia), which in turn influence behavioral responses [20][21].

In library and information science, S-O-R theory has been applied to study information communication behavior, information sharing behavior, information discontinuance behavior, and online health information search behavior [21][22][23]. Han Jingti et al. [4] found that online health information search can improve self-health behaviors, including active health management and offline medical visits. Zhu Yiping et al. [5] discovered that after searching health information, individuals often experience excessive panic and seek timely offline medical treatment, expecting effective professional medical care.

3 Research Model and Hypotheses

3.1 Model Construction

Based on S-O-R theory, this study introduces risk perception and physical alertness as mediating variables to construct a model of how online health informa-

tion search influences public offline medical treatment behavior. As shown in Figure 1 [Figure 1: see original paper], four characteristics were selected as measurement indicators for online health information search: search frequency, search platform, search duration, and health information utilization attitude. These external stimuli factors cause different degrees of psychological and physical changes during health information acquisition. Risk perception and physical alertness serve as important organism variables mediating the relationship between search behavior and offline medical treatment behavior.

3.2 Research Hypotheses

H1: Online health information search positively influences offline medical treatment behavior

In the 1950s, Hochbaum proposed the Health Belief Model, suggesting that strong health beliefs can lead to individual behavior change [26]. The model proposes perceived disease threat (including disease susceptibility and severity) as an influencing factor that can motivate individuals to adopt preventive actions. When individuals perceive disease threats and believe actions can prevent disease, they tend to visit hospitals or clinics for professional help. Peng Yanni's [19] research on outpatients found that most patients use the internet for health information search, believing it helps them better understand medical terminology and communicate with doctors. Therefore, we hypothesize that online health information search positively influences offline medical treatment behavior.

H2: Online health information search positively influences risk perception

Previous research links online health information search with risk perception. Individuals with higher risk perception are more motivated to seek health information [24]. Zhao Yating [25] found that online health information search frequency positively influences health status. Therefore, we hypothesize that online health information search positively influences risk perception.

H2a: Risk perception positively influences offline medical treatment behavior

H2b: Risk perception mediates the relationship between online health information search and offline medical treatment behavior

Factors influencing medical treatment behavior include symptom cognition. When individuals develop risk perception about diseases, they are induced to seek offline medical treatment. However, research shows that risk information alone online is insufficient to motivate healthier lifestyles or enhance clinical communication [36]. Therefore, we hypothesize that risk perception positively influences offline medical treatment behavior and mediates the relationship between search behavior and treatment behavior.

H3: Online health information search positively influences physical alertness

Zhao Yating [25] found that search frequency, platform, and information type are important characteristics of online health information search that can serve as measurement indicators. Online health information search may cause individuals to over-interpret minor physical issues, generating physical alertness. Therefore, we hypothesize that online health information search positively influences physical alertness.

H3a: Physical alertness positively influences offline medical treatment behavior**H3b: Physical alertness mediates the relationship between online health information search and offline medical treatment behavior**

Physical alertness affects offline medical treatment behavior at different levels. When physical symptoms are severe enough to threaten daily life, individuals tend to seek medical help. Therefore, we hypothesize that physical alertness positively influences offline medical treatment behavior and mediates the relationship between search behavior and treatment behavior.

4 Research Design

4.1 Questionnaire Design

Based on research hypotheses and the theoretical model, the questionnaire was divided into two parts. The first part collected basic personal information and online health information search characteristics (search scenario, information type, and disease type) to understand subjects' search behavior preferences. The second part operationalized four variables (online health information search, risk perception, physical alertness, and offline medical treatment behavior) with 13 observable indicators, all adapted from authoritative domestic and international scales. A screening question ("Have you ever searched for health information online?") was included to filter valid respondents. All items used a 5-point Likert scale (1 = completely disagree to 5 = completely agree). Table 1 shows the measurement indicators and reference sources.

4.2 Data Collection

Considering that the main internet users are young people born between the 1990s and early 2000s, and that college students are significantly influenced by digital information technology and smartphone products with strong needs for health information and disease consultation services, the target subjects were primarily college students. Questionnaire links were distributed via WeChat Moments and groups. A total of 204 valid questionnaires were collected. Table 2 presents the descriptive statistical analysis.

5 Data Analysis

5.1 Sample Descriptive Statistics

The sample showed that females aged 18-25 with undergraduate education accounted for a relatively high proportion, consistent with the characteristics of young populations. The overall gender ratio was balanced, and the education level was relatively high.

From search preferences, individuals commonly search for health information online when physical problems occur. Today's younger generation can accomplish most daily tasks using smart devices and often turn to the internet when encountering confusing or interesting matters. After entering symptom or disease keywords in search engines, they can understand disease profiles and conduct self-diagnosis promptly. The vast majority search for health information for themselves or others (family, friends), known as proxy search behavior, as children or disabled individuals face many obstacles in searching health information [30].

Young people generally focus more on disease symptoms and manifestations during searches. Online consultation services are not yet widely used, though young people are the main users of platforms like Dingxiang Doctor. They can access comprehensive disease symptom information, medical advice, and health Q&A content on these platforms. However, the credibility, timeliness, and institutional guarantee of online consultations cannot be ensured [30].

Most online searches concern gastrointestinal diseases, which show a trend toward younger onset. 67% of doctors observed an increasing proportion of patients aged 23-34 in recent years [31]. With accelerating life rhythms and irregular diets and schedules due to late nights for study and work, young people are prone to gastrointestinal problems. Some search for gynecological diseases online, possibly because women find such private conditions difficult to discuss offline and prefer online investigation [32].

5.2 Reliability Analysis

Reliability was tested using internal consistency. Cronbach's alpha values above 0.7 indicate high reliability. As shown in Table 3, all Cronbach's alpha coefficients exceeded 0.7, demonstrating good questionnaire reliability.

5.3 Validity Analysis

Validity analysis includes convergent and discriminant validity. Convergent validity is acceptable when $AVE > 0.5$ and $CR > 0.6$ [29]. Table 3 shows all variables met these standards, indicating good convergent validity.

Discriminant validity requires that a variable's AVE square root be greater than its correlation coefficients with other variables [33]. Table 4 shows all variables satisfied this criterion, demonstrating good discriminant validity.

5.4 Structural Equation Model Testing

5.4.1 Model Fit Analysis Based on the theoretical framework, Amos 25.0 was used to construct the structural equation model shown in Figure 2 [Figure 2: see original paper]. Model fit was assessed using CMIN/DF, RMSEA, GFI, NFI, and CFI. Table 5 shows all parameters met acceptable standards (CMIN/DF >1 and <3, RMSEA <0.08, GFI/NFI/CFI >0.8), indicating high model-data fit.

Path analysis results (Table 6) showed that online health information search significantly influenced offline medical treatment behavior ($\beta = 0.234$, $p < 0.05$) and risk perception ($\beta = 0.610$, $p < 0.05$), but did not significantly influence physical alertness. Risk perception did not significantly influence offline medical treatment behavior, while physical alertness showed significant influence ($\beta = 0.638$, $p < 0.05$). All hypotheses were supported except H2a (risk perception $\rightarrow$ offline medical treatment behavior) and H3 (online health information search $\rightarrow$ physical alertness).

5.4.2 Mediation Effect Analysis Using SPSS 25.0 Process plugin with Bootstrap sampling (5,000 samples, 95% confidence interval), mediation effects were tested. Table 7 shows that both risk perception and physical alertness mediated the relationship between online health information search and offline medical treatment behavior. For risk perception, the direct effect was 0.130 (55.80% of total effect) and indirect effect was 0.103 (44.00%). For physical alertness, the direct effect was 0.131 (44.20%) and indirect effect was 0.165 (55.80%). This indicates online health information search can both directly and indirectly predict offline medical treatment behavior through these mediators.

6 Conclusions and Recommendations

6.1 Integrate Online Resources to Drive Offline Traffic

This study reveals that online health information search has both direct and indirect effects on offline medical treatment behavior. Internet healthcare companies should not only focus on offline hospital services but also accumulate reputation through online platforms, which will facilitate full utilization of China's medical resources [35]. Companies can develop personalized health management plans based on public search behavior and create health maps with POI (Point of Interest) visualization showing nearby clinics, operating hours, and appointment processes to facilitate convenient offline medical visits.

6.2 Build Health Index to Predict Disease Manifestations

Risk perception is an important mediating variable. Public health information search can cause excessive panic and anxiety, potentially leading to either information avoidance (refusing treatment) or excessive treatment-seeking for psychological comfort, both wasting medical resources. National health management departments and health management centers should collect residents' online health data to establish a unified, credible urban resident health evaluation index system. By conducting index-based health assessments for different gender, age, and occupational groups and building differentiated health profiles based on search behaviors, disease manifestations can be predicted to reduce public panic about illnesses [38].

Limitations and Future Research

Most subjects in this study were college students, and the questionnaire distribution scope was limited, making the results less representative. Future research should expand the scope to include middle-aged and elderly subjects to enhance the persuasiveness of conclusions.

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