



Analysis of the Effect of “Digital Natives” Network Health Information Search Behavior: Fusion of “Stimulus-Organism-Response” Theory

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Abstract. [Purpose/Meaning] It aims to explore the influencing factors of the “Digital Aboriginal” network health information search behavior, improve the effectiveness of its network health information search behavior, provide optimization suggestions for the network health information service platform, and promote the development of network health information services. [Method/Process] The study extracts the historical D&M model and the iterative repetition of classical variables in TAM, fuses the theory of “stimulus-organism-response”, proposes 12 hypotheses, tests hypotheses through empirical research and uses qualitative analysis methods to study the results. Backtracking. [Results/Conclusions] Health literacy, information availability, search efficiency, website design, social norms, information adaptation, information quality perception, information system perception, user trust and user satisfaction affect the “digital indigenous” network health information search behavior. The effect of the search behavior affects its use behavior, and the perceived privacy risk does not pass the hypothesis test. Based on those summarize the relevant revelations.

Keywords: Digital Natives · network health information · information search

1 Introduction

According to the data published by International Telecommunication Union, in 2019, the number of internet users worldwide reached to 4.0 billion, covering over 50% of the global population [1]. The network has greatly changed people’s life style and become one of the channels for people to obtain information. With the development of medical science and the improvement of living standard, people’s awareness of health care and active access to health information has increased significantly [2], and various health information media have developed rapidly, the convenience and rapidity of the Internet has gradually become an important channel for people to obtain health information. However, under the network environment, the health information multi-source, the

crowd-sourcing, in which there are many heterogeneous, the mistake, the omission, the redundant, the forgery even intrudes the disturbing information [3], this has created the enormous barrier to the populace in the network health information search process.

Due to the increasing pressure of work and life, the health problems of the “digital aborigines” group have become increasingly serious. At present, as a group with high information literacy, the health information searching behavior of the digital aborigines on the Internet is not so good. How to improve the effect of health information search on the Internet has become a difficult problem for the digital indigenous community. As the future dominator of Internet and the users of Internet health information search, it is of great practical significance to study the effect of Health Information Search behavior of digital indigenous network.

2 Literature Review

2.1 Digital Natives

Digital Natives, also known as Digital indigenous peoples, are closely related to the concept of Digital migrants. The concept, first formally proposed by Prensky in 2001 [4], seeks to establish new criteria for identifying differences in internet use, understanding, and management among groups in different contexts of upbringing. As Helsper [5] points out, the digital natives are the generation born after 1985. It can be seen that the definition of digital aborigines by foreign scholars is different in years, but it is roughly around 1980, which is related to the Internet access in the United States in 1980, and in China in 1994, therefore, most scholars in China think that digital aborigines refer to the generation born after 1994 who grew up under the background of Internet. In view of the specific situation in China, this paper defines the digital aborigines as the generation born after 1994 who grew up in the context of the Internet. In addition, among the existing digital aborigines, the Internet health information search is more dependent on the youth group [6], and the groups with higher information literacy are more prone to Internet health information search behavior [7]. Therefore, this paper chooses college students as the research object to analyze the effect of health information searching behavior of digital indigenous network.

2.2 Internet Health Information Search Behavior

Internet health information search behavior refers to the oral or non-oral behavior of users in the process of acquiring, clarifying and confirming health-related knowledge or information. The health information search behavior begins with the health information needs of users. The search behavior of network health information is the basis of using behavior, therefore, some scholars have studied the search behavior of network health information from the angle of user utilization, for example, Betsch and others [8] have found that users’ perception of adverse events leads to lower intent to use.

Based on the above research on the search behavior of health information on the Internet, it is found that most of the existing research is focused on the characteristics of the search behavior and the utilization behavior after the search, however, there are

few researches on the effect of Internet health information search behavior. However, Internet health information search and use behavior is only part of the complete and vertical process of user health information behavior, the research on the essence of the users' health information search behavior on the Internet should be concluded to the discussion on the effect of the search behavior. Therefore, this paper studies the effect of web-based health information search on digital aborigines.

3 Research Methodology

At present, both qualitative research and quantitative research have been involved in the field of network health information. However, because of the difference between qualitative research and quantitative research, the research procedure, strategy and tools are different, it is necessary to use a single method, such as splitting the research integrity, making the research into an isolated and narrow scope, etc. In contrast, the use of qualitative and quantitative research methods can be mixed to a certain extent to make up the shortcomings mentioned above. Therefore, this paper uses qualitative and quantitative mixed research methods to study the effect of Health Information Search behavior of digital indigenous network. In this paper, the quantitative method refers to the structural equation modeling method to study the effect of its network health information search behavior; Qualitative research is mainly reflected in the use of semi-structured interview method to randomly select participants to fill in a valid questionnaire retrospective study, the use of quantitative methods to obtain network health information search results of the results of the study.

4 Related Models and Theoretical Basis

SOR theory (Stimulus-Organism-Response) by American psychologist Tolman [9] first proposed, this theory fully considers the subjective initiative of people (O, Organism) on the basis of the SR (Stimulus - Response) theory, and negates that the connection between stimulus and response is direct, Mechanically, it is believed that in the process of people's behavior from stimulus (S) to Response (R), the “internal state of the organism”, that is, the internalized perception of the individual (O), plays a mediating role. At present, this theory is mostly used in user behavior research, and it has become one of the research theories about the mechanism of external stimulus on user psychology and behavior. In this article, the research on the effect of digital indigenous online health information search behavior needs to fully consider the difference of its (O) as the main body under different external Stimulus (S) in its search behavior effect (R). Therefore, this article deeply integrates the theory of “Stimulus-Organism-Response” to study the effect of digital indigenous online health information search behavior with a high degree of compatibility and feasibility.

5 Empirical Research

5.1 Hypothetical Development and Model Construction

D&M Model

The D&M model is a commonly used theoretical model in the research of user behavior and usage of information systems, and has a high explanatory power in the analysis of user behavior [10]. Among them, information quality is an important variable in the D&M model. Therefore, this article combines the D&M model and proposes the following hypotheses:

H1: The digital indigenous health literacy and the perception of network health information quality have a positive relationship;

H2: There is a positive relationship between the usability of information and the perception of network health information quality.

TAM

Perceived usefulness and perceived ease of use has been the ancient TAM of core variables, TAM think when the user face information system, perceived usefulness and perceived ease of use is a factor in their decision to use intention and usage behavior [11]. For users, their satisfaction is affected by the information system, such as the efficiency of the system positively affects users' satisfaction with the mobile network group buying A PP information [12]. Based on this, this article combines TAM with the following hypotheses:

H3: Retrieval efficiency has a positive relationship with network health information system perception;

H4: Website design and network health information system perception have a positive relationship.

Theory of “Stimulus-Organism-Response”

The effect of users' online health information search behavior is affected by many factors, such as social norms, information adaptation, perceived privacy risks, user trust, and user satisfaction. Social norms, also known as subjective norms, represent the degree to which users are influenced by important people (such as family, relatives, and friends). In the network environment, if family members, relatives, friends, etc. support or approve of the health information that users receive, then users Satisfaction will be improved [13]; Information adaptation refers to the degree of consistency between the searched health information and the user's description. If the degree of consistency is higher, user satisfaction will be improved [14]; Perceived privacy risk refers to the user's perception of the risk of privacy leakage in the process of searching for health information. The greater the user's perceived risk, the lower user satisfaction [15]; User trust refers to the degree of user trust in online health information. If the user's degree of trust in online health information is higher, user satisfaction will be improved; User satisfaction refers to the positive or negative emotional response of users to online health information.

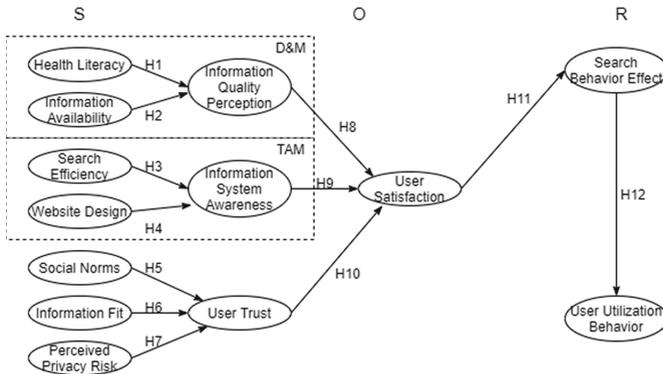


Fig. 1. The effect model of digital indigenous online health information search behavior

The higher the user satisfaction, the better the effect of users’ online health information search behavior.

Based on this, this paper integrates the “stimulus - body - response” theory, clusters variables such as social norms, information adaptation, and perceived privacy risks into “Stimulus (S)”, and clusters variables such as user trust and user satisfaction into “Organism (O)” takes the user’s use behavior as “Response (R)”. And put forward the following hypothesis:

- H5: There is a positive relationship between social norms and user trust in network health information search;
- H6: There is a positive relationship between information adaptation and user trust in network health information search;
- H7: There is a positive relationship between perceived privacy risk and user trust in network health information search;
- H8: There is a positive relationship between information quality perception and user satisfaction in network health information search;
- H9: There is a positive relationship between information system perception and user satisfaction in network health information search;
- H10: There is a positive relationship between user trust and user satisfaction in network health information search;
- H11: There is a positive relationship between user satisfaction and user search behavior in network health information search;
- H12: There is a positive relationship between the effect of user search behavior and user utilization behavior in network health information search.

According to the above assumptions and path relationship, a theoretical model is obtained, as shown in Fig. 1.

5.2 Survey Design and Data Collection

In this study, in 15th March, 2019 to 30th April, 2019 to obtain empirical research using the raw data in the questionnaire survey of Japanese star platform way. There are two parts in the questionnaire. The first part is the collection of basic personal information

Table 1. Demographic characteristics of questionnaire samples

Index	Classification	Number of People	Ratio (%)
Gender	Male	222	60.99%
	Female	142	39.01%
Age	18 years old and below18	29	7.97%
	19–22	329	90.38%
	Over 22 Years Old	6	1.65%
Grade	Freshman	41	11.26%
	Sophomore	289	79.40%
	Junior	21	5.77%
	Senior	13	3.57%

of the questionnaire, such as gender, age, and major. In addition, in the first part of the questionnaire, set up the screening options for the validity of the questionnaire-whether you have used the Internet to search for health-related information. The second part of the questionnaire is the elaboration of the operable observation variables. This paper designs 12 variables and 53 operable observation variables. Operability observed variable term use of Likert5 scale. Scale measure in 1 strongly disagree, measure 5 strongly agree, measure 3 to indicate uncertainty.

A total of 391 questionnaires were collected in the study, and removed 27 pieces invalid ones finally obtained 364 pieces by empirical analysis questionnaires used herein, the questionnaire effective rate 93.09% (Table 1).

5.3 Variable Reliability, Validity

Reliability testing is mainly to judge the consistency and stability of the measurement data. In this paper Cronbach α coefficient, and Composite Reliability Values of reliability test. According to Table 2, the Cronbach's alpha coefficient value and the combined reliability value are both greater than 0.7, and the scale is considered to have high reliability. The validity of the scale is mainly measured by content validity, convergence validity and discriminative validity. The variables in this article are all derived from previous studies. It can be considered that the scale items have good content validity. Further, each of the latent variables AVE values are greater than 0.5. As a result, the research results are more efficient.

5.4 Hypothesis Testing

Through the least partial squares method, Smart PLS is used to test the significance of the latent variables of the structural equation model. The relevant path coefficients and significance of the model are obtained through the test, see in Table 3.

Table 2. Variable reliability, validity test results

Construct	AVE	CA	CR
Health literacy (HL)	0.590	0.769	0.852
Information availability (IP)	0.617	0.701	0.828
Search efficiency (RE)	0.567	0.809	0.867
Website design (WD)	0.711	0.797	0.887
Social norms (SN)	0.626	0.802	0.870
Information fit (IAD)	0.750	0.833	0.900
Perceived Privacy Risk (PPR)	0.710	0.905	0.924
Information Quality Perception (IQP)	0.707	0.896	0.923
Information System Awareness (ISP)	0.584	0.822	0.875
User trust (CT)	0.659	0.827	0.885
User satisfaction (USD)	0.667	0.875	0.909
User Utilization Behavior (UUB)	0.598	0.775	0.856
Search Behavior Effect (SBE)	0.749	0.832	0.899

Table 3. Model path relationship and significance

Hypothesis	Path correlation	Path coefficient	T value	Significance
H1	HL → IQP	0.281	2.258	YES
H2	IP → IQP	0.37	3.243	YES
H3	RE → ISP	0.328	3.28	YES
H4	WD → ISP	0.434	4.321	YES
H5	SN → CT	0.44	3.763	YES
H6	IAD → CT	0.286	2.544	YES
H7	PPR → CT	-0.167	1.434	NO
H8	IQP → USD	0.172	1.87	YES
H9	ISP → USD	0.26	2.879	YES
H10	CT → USD	0.524	5.408	YES
H11	USD → SBE	0.669	8.36	YES
H12	SBE → UUB	0.714	11.253	YES

6 Research Backtracking

6.1 Research Methods

This article adopts qualitative research methods, chooses semi-structured interview method to interview subjects, and obtains the original data of the effect of online health information search behavior, aiming to verify the factors influencing the effect of search behavior obtained from empirical research. The text coding method is used to encode and analyze the interview data with the help of NVivo 12 software which is highly compatible with qualitative analysis, and the influencing factors of the digital indigenous online health information search behavior effect are summarized based on the original data of the online health information search behavior.

6.2 Data Collection

Determine the Interviewee

Aiming at the empirical analysis and research results, this paper uses the semi-structured interview method to retrospect the research results. Because the sample size of qualitative research is more suitable between 20–30. Therefore, this article screened 24 college students who met the research criteria who filled out the questionnaire before.

Design Interview Outline

Based on the above empirical research and related literature research, this paper designs a semi-structured interview outline (Constantiou et al., 2007, p. 51–55). Before the formal interview, the researcher conducts a pre-test on the outline and revises and perfects the semi-structured interview outline based on the actual interview situation to make it have good content validity. Semi-structured interview outline divided into two parts, the first part defines the term interviewee and basic information, the second part is verified against the obtained empirical analysis above conclusions.

Interview Process

The interview time span was one week, and two researchers interviewed one subject in teams. All interview data totaled 528 min and 35 s, and the average interview time was 22 min and 12 s. The interview process strictly followed the Nuremberg Guidelines. Before the start of the formal interview, the researcher informed the subjects of their responsibilities, read out the precautions, and signed a written informed consent form with the subjects with their consent. The researcher informed the subjects that the interview is expected to take time, and confirmed whether the interview can be recorded with the subjects, and recorded the entire interview with the subject's consent. After the interview, the two researchers worked together to normalize the transcribed audio data to form 24 documents, each of which is the interview data of a subject, named after R01–R24.

6.3 Coding and Analysis

This article is based on the above-built digital indigenous online health information search behavior effect model, using content analysis and text coding to analyze data. This paper designs a set of strict document coding schemes before text coding, including document import methods and coding rules. Then, according to the document coding scheme, the 24 interview materials after the standardized processing were imported into the NVivo 12 software, and two rounds of coding were carried out. The purpose of the coding is to construct a coding table by extracting common concepts that affect the effect of digital indigenous online health information search behaviors. Common concepts include health literacy, information availability, retrieval efficiency, website design, social norms, and information adaptation. And correspondingly include information quality perception, information system perception, and user trust, and then merge information quality perception, information system perception, and user trust into user satisfaction. Finally summarized in the coding table.

7 Research Inspiration

Based on the above analysis, this paper builds a structural model and path coefficient diagram, as shown in Fig. 2. Based on this, summarize the relevant enlightenment.

7.1 Stimulus (S)

Model verification shows that the effect of digital indigenous online health information search behavior is affected by health literacy, information availability, retrieval efficiency, website design, social norms, and information adaptation. Perceived privacy risks have not passed the hypothesis test. These factors belong to the objective level of influencing

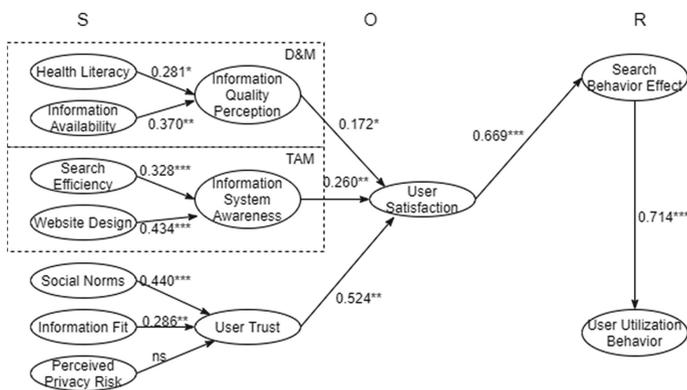


Fig. 2. Structural model and the path coefficient diagram. Note: *P < 0.05, ** P < 0.01, *** P < 0.001, ns, not significant.

factors, that is, relative to the influencing factors under “organism” and “reaction”, these factors have a certain universality.

Health Literacy

Health literacy refers to the ability of individuals to obtain and understand health information, and to use this information to maintain and promote their own health. The empirical research results found that the path of health literacy → information quality perception → user satisfaction → search behavior effect has been verified, and health literacy positively affects the effect of digital indigenous online health information search behavior. In the research retrospective, there is also relevant evidence. Therefore, training institutions and universities should be when health care to foster literacy. In order to enable the development of online health information services to truly serve the general public, in the future, the cultivation of people’s health literacy cannot be slackened.

Information Availability

Information practicality refers to the actual use value of information, such as whether the searched network health information is clear. The path of information practicality → information quality perception → user satisfaction → search behavior effect has been verified, and the information practicality positively affects the effect of digital indigenous online health information search behavior. Therefore, online health information service providers should provide users with clear and easy-to-understand information, and should provide users with more professional health information that is difficult to understand. On the basis of ensuring the quality of information, try to convert it into more colloquial information that users can easily understand.

Search Efficiency

Retrieval efficiency refers to the time and cost spent in the retrieval process, such as whether the required health information can be searched quickly. The path of retrieval efficiency → information system perception → user satisfaction → search behavior effect has been verified, and the search efficiency positively affects the effect of digital indigenous online health information search behavior. Therefore, online health information needs to have a certain degree of integration so that users can obtain more comprehensive health information at a relatively small cost.

Website Design

Website design includes website navigation appearance and interface interaction design. The path of website design → information system perception → user satisfaction → search behavior effect has been verified, and the website design is positively affecting the effect of digital indigenous online health information search behavior. Therefore, government departments can consider providing certain financial support for the health information service industry in this regard.

Perceived Privacy Risks

Perceived privacy risk refers to the user’s perception of the risk of privacy leaks through the use of the Internet during the search for health information. Perceived privacy risk fails the hypothesis test. If we start from improving the effect of users’ online health

information search behavior, the perceived privacy risk plays a smaller role, that is, the perceived privacy risk has less impact on the effect of users’ online health information search behavior. Therefore, relevant departments should pay attention to the change in public awareness, improve relevant laws and personal information leakage reporting systems, etc., increase the protection of personal privacy information, and strengthen the promotion of privacy information protection.

Social Norms

Social norms refer to others’ evaluations of health information found by users. The path of social norms → user trust → user satisfaction → search behavior effect has been verified. The higher the evaluation of the online health information searched by the digital natives by others, the better the effect of their online health information search behavior. It can be seen that the transmission of online health information between different users can improve the effect of users’ online health information search behavior. Therefore, the importance of online health communities should not be underestimated, and sufficient attention should be paid to them in the future.

Information Adaptation

Information adaptation refers to the degree of consistency between the searched health information and the situation described by the user. The path of information adaptation → user trust → user satisfaction → search behavior effect has been verified, and the information adaptation degree positively affects the effect of digital indigenous online health information search behavior. Therefore, it is still very important to improve the digital indigenous health literacy. The health information service platform needs to divide users, such as labeling and building user portraits to divide user groups to provide different user groups with health information that is highly relevant to their own conditions.

7.2 Organism (O)

Model verification shows that the effect of digital indigenous online health information search behavior is affected by information quality perception, information system perception, user trust and user satisfaction. These factors are subjective factors, that is, for the same information, different individuals may have differences in the body.

Information Quality Perception

Information quality perception refers to the user’s perception of the quality of the health information found. The path of information quality perception → user satisfaction → user utilization behavior has been verified. The search behavior is more effective. Therefore, health information service providers can also introduce measures such as evaluation mechanisms, user likes, and disclosure of medical information by doctors to enable users to have a clearer understanding of the platform, thereby enhancing the effect of users’ online health information search behavior.

Information System Perception

Information system perception refers to the user’s knowledge of the information system used in the search process, such as network and communication equipment, computer

software, and information resources. The path of information system perception → user satisfaction → user utilization behavior is verified, and user information system perception positively affects the effect of their search behavior. Therefore, relevant personnel may consider focusing the future development of the health information system on interaction with users to further enhance the user network Health information search behavior effect.

User Trust

User trust refers to the user's trust in health information searched through the Internet. The path of user trust → user satisfaction → user utilization behavior has been verified, and user trust positively affects the effect of users' online health information search behavior. Therefore, the health information service platform may consider increasing information screening and strictly reviewing all health information released.

7.3 Response (R)

Model verification shows that the effect of digital indigenous online health information search behavior is positively affecting their online health information utilization behavior. It can be seen that the health information service platform needs to improve the effect of user search behaviors to increase user stickiness and promote the stable development of the online health information service industry. Secondly, the user's online health information use behavior occurs after the search behavior, and most users hope that the health information searched can improve their health. Therefore, it is very important to divide the user groups more finely and to give targeted network health information and precautions when using it.

8 Conclusion

This article analyzes the effect of digital indigenous online health information search behavior from the perspective of SOR theory, and the research conclusions can provide relevant theoretical basis for online health information service users to improve their online health information search behavior effect. However, due to the large number of users searching for online health information, this article only discusses part of the digital natives. Whether the research results have good universality among other user groups remains to be studied. In addition, there may be differences in the variables under the body. Therefore, the follow-up can consider further expanding the group of subjects and consider the differentiation between different groups to carry out research.

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