



Online Health Information Seeking Behavior of Pregnant Women: A Social Cognitive Perspective

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Abstract

Introduction: The widespread use of smartphones and the Internet has led to increased online health information-seeking, which can improve public health. This behavior is influenced by individual, environmental, and behavioral factors, all considered in social cognitive theory. This study aims to use social cognitive theory to describe how pregnant women seek health information online.

Methods: This cross-sectional survey was conducted in 2023 to gather data from pregnant women referred to gynecologists' offices in Kerman. A questionnaire was used to collect the data, employing scales validated in prior research that were relevant to this study. The questions were rated on a 5-point Likert scale. The data were analyzed using SPSS version 22.0 and SmartPLS3.

Results: Most participants (45.6%) were in the 20–30 age group and had (53.5%) bachelor's degree. Most of them had their first experience of pregnancy (59.9%) and had no history of chronic disease (65.4%). The internal consistency reliability, convergent validity, and model fit were confirmed. IT self-efficacy and IT innovativeness had a significant positive association with perceived benefits. There was a significant positive association between professional support, social support, and health awareness. Health awareness and perceived benefits did not singularly influence health information-seeking behavior.

Conclusion: According to the study, IT innovation, IT self-efficacy, social support, and professional support encourage pregnant women to seek online health information by increasing perceived benefits and health awareness. Health professionals, particularly gynecologists, should guide pregnant women toward trustworthy online resources for health information.

Keywords: Information Seeking Behavior, Pregnancy, Social Cognitive Theory.

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Introduction

Pregnancy triggers numerous physical, emotional, and social changes, leading to concerns about diet, exercise, tests, body changes, fetal growth, delivery stages, and postpartum care changes (1, 2). Accurate information is crucial for informed decision-making and stress reduction (3). However, the abundance of information sources has complicated the search and processing of information (4). With the proliferation of information and communication technology, utilizing the Internet to seek health information has become prevalent (2, 4, 5). With increased access to mobile phones and the Internet, it plays an essential role in improving society's health and has received everyone's attention

(6, 7). Online health information seeking has become preferred due to its availability, wide-coverage, convenience, and privacy (8, 9). Online health information is widely available, but the challenge lies in finding accurate information and preventing misinformation (10).

Health information-seeking behavior (HISB) describes how individuals seek, find, and use information about diseases, health threats, and health promotion activities (11). Appropriate HISB can influence self-care and promote women's quality of life during pregnancy (12). HISB is influenced by personality traits, beliefs, values, tendencies, background factors and individual emotions, socio-economic status, age and source of information control, performance expectation, self-efficacy, internal fetal health

locus of control, and support from information sources (6, 9, 13). The factors are divided into three general categories: individual, environmental, and behavioral, which are thoroughly analyzed in social cognitive theory (14, 15). According to this theory, individual factors such as self-efficacy, beliefs, and attitudes about information affect the amount and type of information. Environmental factors such as access to information sources and social norms related to information search also affect people's information-seeking behavior. Behavioral factors such as search habits, skills, and barriers influence how information is sought (14, 15). In healthcare, social cognitive theory highlights socio-structural and personal health determinants (16). By integrating health information-seeking behavior with this theory, we can explain and predict individuals' health information and decision-making behaviors and analyze the simultaneous effects of individual and environmental factors on behavior (17). Therefore, this study employs social cognitive theory to explore health information-seeking behavior among pregnant women. Although many studies have been conducted on the information-seeking behavior of pregnant women (5, 7, 18), few studies have investigated the health-seeking behavior of pregnant women with the approach of social cognitive theory.

Methods

Study Design

This cross-sectional study, which took a quantitative approach and focused on pregnant women, was conducted from May to July 2023 in the gynecologists' offices in Kerman. The criteria for inclusion in the study were as follows: participants must own a smartphone, demonstrate proficiency in its use, and provide informed consent to participate in the research.

Measurement

In this study, all measures of the constructs were adapted from previous studies and modified appropriately to fit the current research context. Information technology self-efficacy was measured using items adapted from Shao et al. (19). The IT innovations assessment included three items adapted from Lee (20). Social support and professional support were measured with items from Ma et al. (21). Perceived benefit was measured with three items adapted from Al-

Debei et al. (22). Health awareness was measured with items adapted from Mai and Eisenberg (23). Online health information seeking was measured using three items, adapted from Cao et al. (24). Five-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree) were used.

Data Collection

The sample size was calculated using G-Power version 3.1 software of 240 people. The parameters set for this calculation were an alpha level (α) of 0.01, a statistical power of 0.95, an effect size of 0.2, and six predictor variables (25) (Figure 1). An additional 10% of questionnaires were distributed to compensate for potential non-responses or dropouts. A systematic random sampling technique was employed to select participants. Data was gathered through pregnant women referring to gynecologists' offices in Kerman, Iran.

Data Analysis

SPSS26 and SmartPLS3 were used to analyze data, evaluate relationships between variables, and test hypotheses. PLS path models consist of two sets of linear equations: the measurement and the structural model. The measurement model is beneficial in quantifying the relationship between latent constructs and observed variables (26). Assuming the significance of these hypotheses, it helps determine the strength and direction of the effects exerted by the latent variables. All variables in this study are reflective. The tests of the reflective measurement model are the homogeneity Test, construct reliability, and validity (27). The homogeneity test is a confirmatory factor analysis that seeks to eliminate items that do not contribute much to the measurement of the latent variable and are not homogeneous with other indicators. Construct reliability in analysis refers to the consistency of measuring a specific construct, as demonstrated by Cronbach's alpha, rho_A, composite reliability (CR), and commonality. The Cronbach's alpha, CR, and rho_A values for each variable should be higher than 0.7. A commonality index value higher than 0.5 means the questionnaire has acceptable generalizability, and similar findings will be collected in other samples (27). Convergent validity refers to the observation of strong correlations between two tests that are assumed to measure the same construct.

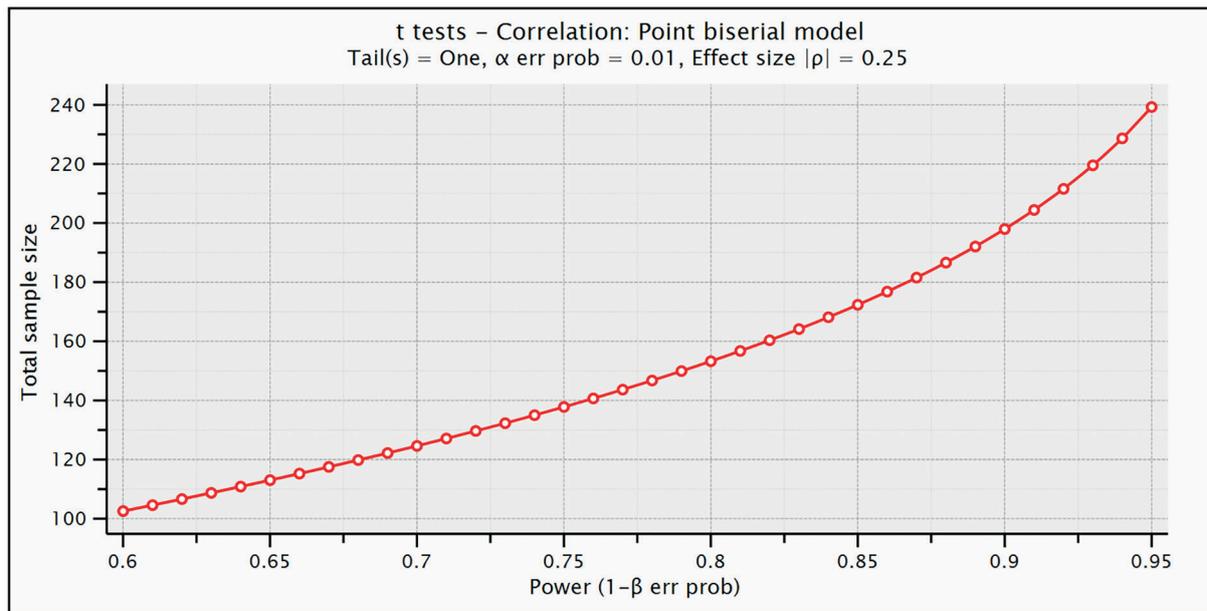


Figure 1: Sample size calculation in GPower3.1

Convergent validity is tested with Average Variance Extracted (AVE) >0.5 and 2) CR $>$ AVE (28). Discriminant validity is measured using the Heterotrait-Monotrait ratio of correlation (HTMT). The acceptable level of discriminant validity is suggested to be less than 0.90. (29). The structural model shows the interrelationships between latent variables, and the direction of these effects is determined. It is essential to confirm that independent research variables do not have collinearity (29). This study checked for collinearity. After measurement and structural model analysis, we will use the Goodness-of-Fit (GoF) method to assess the model fit. Tenenhaus states that the values 0.1, 0.25, and 0.36 are used to interpret GoF (30).

Results

Sample Characteristics

Out of 265 distributed questionnaires, 225

items were returned. The response rate was 86%, suitable for the questionnaire tool. After screening, 217 met the criteria for inclusion in our analysis. Among the respondents, 45.6 % were between 20 and 30, and 53.5% held a bachelor’s degree. Most of them had a history of pregnancy (59.9%) but did not have chronic diseases (65.4%) (Table 1).

IT self-efficacy and professional support, with an average of 2.90, was the highest, and Social support, with an average of 2.47, had the lowest mean. The descriptive statistics of the details related to each variable are listed in Table 2.

Measurement Model Analysis Homogeneity Test

The confirmatory factor analysis test showed that all indicators are above the cutoff point of 0.7 and are homogeneous.

Table 1: Essential characteristics of participants

		Frequency	Percent
Age	<20	12	5.5
	20-30	99	45.6
	30-40	82	37.8
	>40	24	11.1
Education	Diploma and less	15	6.9
	Associate Degree	43	19.8
	Bachelor’s degree	116	53.5
	Master’s degree	31	14.3
	PhD	12	5.5
Primigravida	No	130	59.9
	Yes	87	40.1
Chronic Disease	No	142	65.4
	Yes	75	34.6

Table 2: Descriptive information test results

	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
IT self-efficacy	1	5	2.90	1.109	1.230	0.192	-0.897
IT innovativeness	1	5	2.74	1.040	1.082	0.351	-0.519
Social support	1	5	2.47	1.026	1.054	0.511	-0.277
Professional support	1	5	2.90	1.056	1.117	0.302	-0.629
Perceived benefit	1	5	2.84	1.152	1.329	0.376	-0.782
Health awareness	1	5	2.67	1.065	1.136	0.310	-0.780
Online health information seeking	1	5	2.83	1.058	1.119	0.178	-0.677

Table 3: Internal consistency reliability and convergent validity

Cronbach's Alpha	rho_A	Composite Reliability	Communality	CR	AVE
0.835	0.841	0.883	0.603	0.883	0.603
0.835	0.856	0.890	0.669	0.890	0.669
0.880	0.883	0.913	0.677	0.913	0.677

Assessment of Construct Reliability

The results of four tests, Cronbach’s alpha, rho_A, CR, and commonality, indicated that the reflective measurement model is reliable, and its results can be generalized to other samples in the same population (Table 3).

Assessment of Validity

Before distributing the questionnaires, the researcher and experts confirmed the information collection tool’s validity. Convergent validity results indicated that all variable coefficients

were above 0.5, satisfying the first condition. Additionally, the second condition was met for all study variables, confirming convergent validity.

Also, the uniqueness of the indicators is measured using discriminant validity with the HTMT. This value was less than 0.9 for all reflective variables and considered acceptable. Consequently, the model demonstrates discriminant convergence.

Structural Model Analysis

Figure 2 shows the structural model in standard estimation mode.

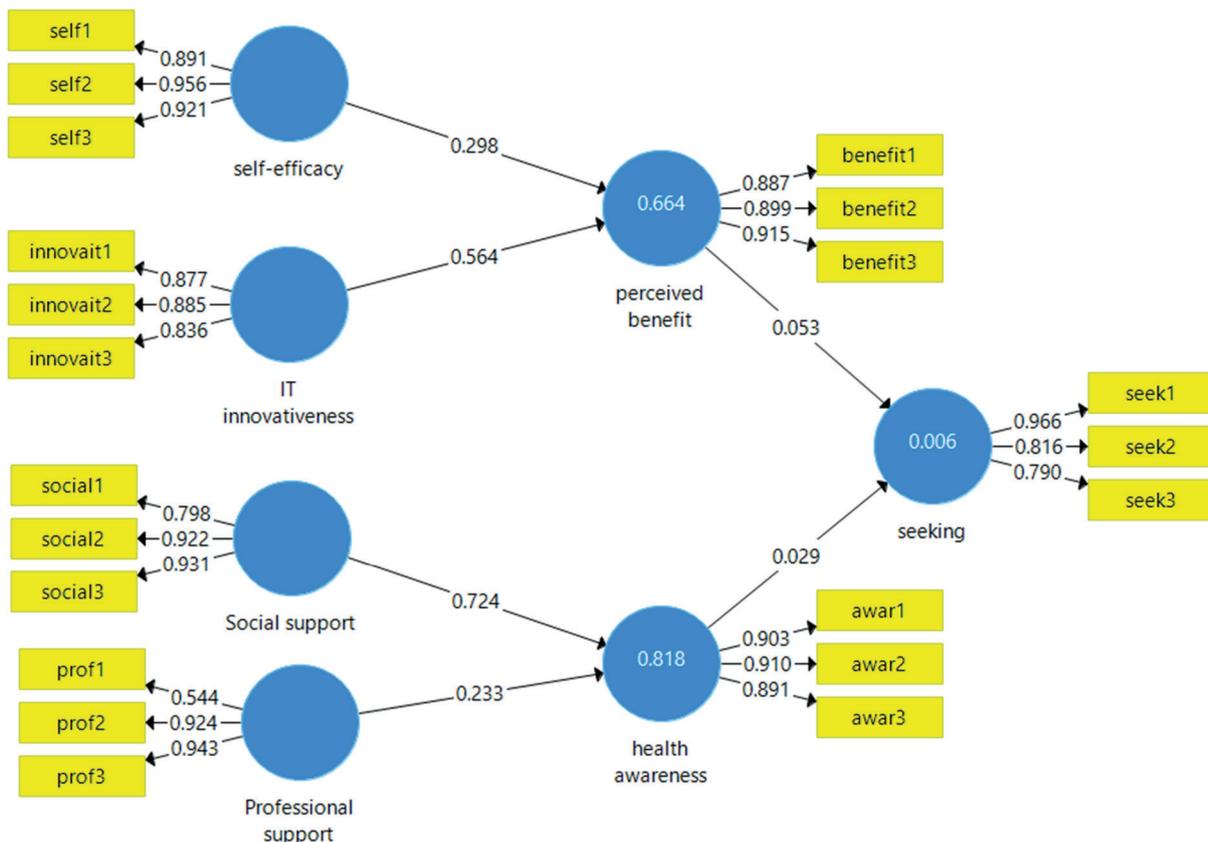


Figure 2: Structural model in standard estimation mode

Table 4: Hypotheses test results

Hypothesis	Relationship	Path Coefficient	P value	T-value	Status
H1	IT innovativeness -> perceived benefit	0.060	0.000	9.469	Supported
H2	IT self-efficacy -> perceived benefit	0.063	0.000	4.749	Supported
H3	Professional support -> health awareness	0.052	0.000	4.529	Supported
H4	Social support -> health awareness	0.042	0.000	17.079	Supported
H5	Health awareness -> online health information seeking	0.177	0.870	0.164	Not Supported
H6	Perceived benefit -> online health information seeking	0.180	0.771	0.292	Not Supported

Hypotheses Test

At the 95% confidence level, four out of six structural relationship hypotheses were significant due to bootstrapping. IT innovativeness and self-efficacy significantly influenced perceived benefit ($P=0.000$). In addition, professional support and social support significantly affected health awareness ($P=0.000$). On the other hand, the relationship between perceived benefits with online health information seeking ($P=0.870$) and health awareness with online health information seeking ($P=0.771$) was not significant. All hypotheses had a positive relationship (Table 4). This study considered age, education, primigravida, and chronic disease as control variables.

The findings found that the uncollinearity of professional support with health awareness and social support with health awareness was below two, thus meeting the criteria for the ideal. Also, the uncollinearity of other exogenous variables was acceptable.

Model Fit

In this model, the GoF value is 0.28, which falls within the medium to high range and indicates that the model fits well.

Discussion

Based on social cognitive theory, this study examined the impact of personal and environmental factors on the online information-seeking behavior of pregnant women. The findings revealed that two critical personal factors, namely IT self-efficacy and IT innovativeness, significantly enhance online information-seeking behaviors within this population. Notably, IT self-efficacy had a more pronounced influence than IT innovativeness. Additionally, the study underscored the importance of two environmental factors, social support, and professional support, with professional support demonstrating a more significant effect on enhancing information-seeking behaviors.

The bootstrapping analysis demonstrates that IT innovativeness and IT self-efficacy substantially impact the perceived benefits associated with information technology. This finding is consistent with previous studies that underscore the importance of self-efficacy in the behavior of pregnant women when seeking health-related information (15, 31, 32). Pregnant women with high IT self-efficacy will likely experience a more effective and efficient search for health information, which leads to favorable outcomes. Additionally, a high level of innovation in information technology contributes to positive results, enhancing individuals' experiences and confidence in utilizing these resources effectively (21). According to social cognitive theory, parents' self-efficacy and expectations of outcomes represent two critical factors that can enhance online health information-seeking behavior (33).

The bootstrapping technique indicates that professional and social support significantly affected health awareness. Professional support involves seeking assistance from medical professionals, while social support includes access to resources provided by others through interpersonal communication, such as information, aid, and comfort (34). Notably, social support has emerged as a critical factor in predicting individuals' engagement in online health information-seeking behaviors, as it motivates them to participate actively in their health management (21, 35).

The bootstrapping analysis indicates that the relationships between perceived benefits and online health information seeking and between health awareness and online health information seeking were not statistically significant. These findings differ from those reported in prior studies (36-38). The study results may be impacted by specific characteristics of the sample population, including age, gender, pregnancy status, access to healthcare resources, availability of technology, and the online platforms utilized by pregnant women. Furthermore, contextual

factors and cultural norms play a significant role in shaping online health information-seeking behaviors, which may result in outcomes that differ from those observed in other research studies. Generally, health awareness is employed to evaluate individuals' readiness to engage in health-related behaviors (21, 37). In the current study, neither health awareness nor perceived benefits directly impacted online health information-seeking behaviors; somewhat, these factors were influenced indirectly by individual and social determinants. This indirect effect has also been confirmed in a study on older people (21). Specifically, the findings indicate that IT self-efficacy and IT innovativeness significantly affect the pursuit of online health information through the recognition of perceived benefits. Additionally, social and professional support is vital in enhancing health awareness, further influencing these individuals' information-seeking activities (21).

Limitations, Strengths, and Suggestions

Based on preliminary research, this study examines pregnant women's online health information-seeking behavior for the first time, but it also has limitations. Firstly, its cross-sectional nature limits its ability to infer causality. Future research should use a longitudinal study design. Secondly, demographic variables were not included in the model, and their effect on the dependent variable was not investigated. Future studies could examine the effect of demographic variables using specialized software such as Mplus.

Conclusion

This study examines pregnant women's online health information-seeking behavior in Iran using a social cognitive theory that has not been investigated before. According to this, IT innovation, IT self-efficacy, social support, and professional support encourage pregnant women to seek online health information by increasing perceived benefits and health awareness. These findings provide significant theoretical and practical implications. Because choosing and using correct and timely information is vital, it is suggested that health professionals, especially gynecologists, introduce pregnant women to reliable and up-to-date online information sources. Also, to minimize the health problems

caused by wrong and poor information searches, digital health awareness campaigns or discussions and educational workshops on searching for health-related information from reliable sources are needed.

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Authors' Contribution

MSh: Conceptualization and study design, methodology, evaluation and curation, writing-original draft preparation.

Data Availability

Research data are not publicly available and will be available upon reasonable request from the corresponding author.

Ethical Approval

Ethical considerations were diligently followed. Before enrollment, each participant provided verbal informed consent. Participation was voluntary, and the study's objectives and methods were thoroughly explained. Confidentiality of all data was ensured. The study received ethical approval from the Research Ethics Committee of Kerman University of Medical Sciences, Kerman, Iran (IR.KMU.REC.1403.026).

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Informed Consent

The purpose of this study was explained to all participants; their contribution was voluntary, and oral informed consent was obtained from all participants.

Conflict of Interest

There are no conflicts of interest.

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