

Qualitative study on health information-seeking behavior and ability in patients with ischemic stroke based on the COM-B system

Haojie Xie, Dongxu Wu, Yang Liu, Linxue Wu, Liang Xu, Lei Liu, Li Shen, Xuelian Wei, Fengping Lu, Guiling Li

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Abstract

Results: In regard to the low level of health information behavior, three themes and eight sub-themes were extracted: ability factors (electronic product use disorder, negative feedback, insufficient information recognition ability), opportunity factors (environmental factor, multiple external support), and motivation factors (rehabilitation outcome expectation, health information value perception, electronic product experience). Conclusion :Medical staff should develop scientific and effective intervention strategies with high uptake, acceptability, and effectiveness according to intervention factors so as to improve the level of health information behavior of patients with ischemic stroke, promote patient prognosis, and reduce the medical burden.

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Qualitative study on health information-seeking behavior and ability in patients with ischemic stroke based on the COM-B system

Abstract:

Background Given the high prevalence rate of stroke and the increasingly popular concept of "Internet health", improving the health information behavior of patients with ischemic stroke to promote their rehabilitation is critical. However, the reasons for the low level of health information behavior and how to improve it still need to be discussed. **Methods** From July to October 2024, 18 patients with ischemic stroke in the Department of Neurology of the Third Affiliated Hospital of Qiqihar Medical College were interviewed using the semi-structured interview method. Interview data from the subjects were analyzed and summarized based on the COM-B system and Colaizzi 7-step analysis method. **Results:** In regard to the low level of health information behavior, three themes and eight sub-themes were extracted: ability factors (electronic product use disorder, negative feedback, insufficient information recognition ability), opportunity factors (environmental factor, multiple external support), and motivation factors (rehabilitation outcome expectation, health information value perception, electronic product experience). **Conclusion** Medical staff should develop scientific and effective intervention strategies with high uptake, acceptability, and effectiveness according to intervention factors so as to improve the level of health information behavior of patients with ischemic stroke, promote patient prognosis, and reduce the medical burden. **Key words:** ischemic stroke; health information behavior; COM-B system; analysis of influencing factors; qualitative research.

1 Introduction

The incidence of stroke in China continues to rise at the rate of 8.7% per year, with 75% of patients experiencing disability and 1.5 million patients dying. Stroke also imposes a heavy burden on

patients' families and society at large [1].. Studies have pointed out that patients with chronic diseases can effectively improve their self-management ability, improve their condition, and enhance their quality of life by using the Internet to inquire health-related information [2].. However, at present, health information in clinical practice is generally only available through health education by medical staff during hospitalization, telephone return visits to patients after discharge, and other tracking methods (paper letter) [3].. Therefore, the provision of health education could be improved. The Central Committee of the Communist Party of China and The State Council issued the Outline of the Strategic Plan for Expanding Domestic Demand (2022–2035), proposing to actively develop "Internet + medical and health" services [4].. The level of health information-seeking behavior is an effective evaluation index to evaluate whether patients can effectively and actively search for and use health information [5].. Targeted improvement of health information behavior level can enable patients' needs to be more effectively met. The improvement of the level of health information behavior is a process of individual transformation from the cognitive level to the behavioral level. Michie et al. equates to the theory of behavior change wheel (BCW) proposed in 2011. It emphasizes that capacity, opportunity, and motivation are the three basic conditions for behavior change. Also known as the COM-B system [6].., this system describes the framework of behavior change intervention, which can help to further explore the factors that influence behavior. In addition, BCW theory can guide the design process of intervention and make the developed intervention plan more effective by reducing the subjectivity of designers [7].. Based on this, this study utilizes the COM-B system as the analytical framework and adopts the qualitative research method to further explore the reasons for the low level of health information behavior in patients with ischemic stroke in order to provide a basis for formulating individualized intervention strategies.

2 Objects and methods

2.1 Research objects

Objective sampling and maximum differential sampling were performed to select patients with

ischemic stroke admitted to the Department of Neurology of the Third Affiliated Hospital of Qiqihar Medical College from July to October 2024 as the study objects. The inclusion criteria were as follows: ① Met the diagnostic criteria in the "Chinese Guidelines for the Diagnosis and Treatment of Ischemic Stroke 2019", with ischemic stroke confirmed by head CT and/or MRI examination; ② Age 18–65 years old; ③ Clear consciousness, able to express their views clearly; ④ Stable vital signs and ability to cooperate with the implementation of early activities; and ⑤ General health information behavior scale score of below 59 points. The exclusion were ① cognitive dysfunction or history of mental illness; and ② severe cardiopulmonary disease or cancer, receiving palliative treatment. All subjects agreed to participate in the study voluntarily and Informed consent was obtained. Based on the principle that no new topics appeared in the interview and information saturation was achieved, 18 patients were finally included, numbered P1~P18. The general data are shown in Table 1. This study has been reviewed by the The Third Affiliated Hospital of Qiqihar Medical College’s Ethics Committee, and the ethics review number is (Qi) Ethics [2024]4.

Table 1 General data of patients with ischemic stroke

Patient number	Sex	Age (years)	Education	Occupation	Residence	Duration of illness (Months)	Caregiver
P1	Male	72	High school	Farmer	City	26	Himself
P2	Female	74	Junior high school	Worker	township City	22	Son
P3	Male	68	High school	Worker	City	19	Himself
P4	Male	78	Junior high school	Self-	downtown City	24	Himself

			high	employed	township		
P5	Female	75	school University	Civil	City	19	Herself
P6	Male	76	University	servant Civil	downtown City	15	Himself
P7	Female	70	Junior	servant Farmer	downtown City	23	Herself
			high		township		
P8	Female	68	school High	Worker	City	19	Herself
P9	Male	71	school High	Self-	downtown City	22	Himself
P10	Male	76	school Junior	employed Farmer	township City	23	Himself
			high		township		
P11	Male	78	school High	Worker	City	18	Wife
P12	Female	69	school High	Civil	downtown City	21	Daughte
P13	Female	72	school High	servant Worker	downtown City	19	r Husban
P14	Male	69	school High	Self-	township City	24	d Himself
P15	Male	70	school Junior	employed Farmer	downtown City	22	Himself
			high		township		
P16	Female	74	school Junior	Farmer	City	24	Herself
			high		township		
P17	Female	68	school High	Self-	City	19	Herself
			school	employed	township		

P18	Female	71	High	Civil	City	22	Herself
			school	servant	downtown		

2.2 Research methods

2.2.1 Determine the interview outline

To formulate the outline of the interview, we used the STAR (situation, task, action, and result) method. In detail, situation/task describes the situation at the time, e.g., what is the surrounding situation like? Why are you doing this? What are your considerations? 'Action' addresses the following: How did you react to the situation? What specific actions have been taken? What action steps were taken in handling the incident? 'Result' comprises information about the following: What was the outcome of the event? How did this happen? What kind of feedback did you get? Two experts in the field of stroke nursing were invited to review and revise the interview outline. Pre-interviews were conducted with two patients before the formal interview, and adjustments were made according to the patients' understanding of the problems to finally determine the interview outline, as shown in Table 2.

Table 2 Outline of health information behavior interview for patients with ischemic stroke

Number	Access outline
1	Have you sought health information since your illness? (If not, what do you think are the reasons?)
2	If so, under what circumstances does sought healthy information usually occur? How did you feel?
3	What online channels do you use to find health information? Please give an example.
4	Which aspects of ischemic stroke-related information do you usually use the Internet to find (treatment, care, prevention, rehabilitation.....) ? What kind of information are you most interested in?
5	Do you think the health information obtained through the Internet is helpful

- 6 to you? If you think it is helpful, in what ways?
- 6 What do you think of the quality of health information found on the Internet? What aspects do you think can be used to judge the accuracy and authenticity of online health information?
- 7 During your illness, did a family member or fellow patient provide you with health information? If so, will you follow their advice or not ?
- 8 What difficulties do you have in accessing health-related information on the Internet? What kind of help would you like?
- 9 What difficulties do you find in evaluating the quality of online health information? What kind of help would you like?
- 10 If you have the opportunity to participate in education or training in using the Internet to find health information, what kind of guidance would you like?
-

2.2.2 Data collection methods

The interview was conducted within 1 week of admission, and an appropriate time and quiet and comfortable location for the interview were determined with the interviewees in advance. The purpose and confidentiality principle of the study were explained before the interview, and recording was commenced after patient consent was obtained. The interview lasted for 28 to 45 minutes for each patient. During the interview, relevant questions were explored in depth according to the patient's answers and specific situations, and introduction of the subjective opinions of the interviewer was avoided as far as possible. Notes were taken on the interview. By the time the 17th and 18th interviewees were interviewed, there was no further new topic precipitation, indicating that the data was saturated; accordingly, at this point, the interviewing was stopped.

2.2.3 Data sorting and analysis

Within 24 hours of the interview, the recorded content was repeatedly listened to and transcribed into words sentence by sentence, and collated and analyzed using the 7-step Colaizzi analysis method, as follows: two researchers collected data at the same time, analyzed the data as a whole, extracted

keywords and representative sentences, analyzed the theme, extracted the description line sentences, and identified the essence of the content. During this process, comparisons with the original data were made repeatedly, patients were asked about the ambiguous answers in time, and the help of qualitative research experts was sought to reach a final consensus.

2.2.4 Quality control

① A research team with expertise in qualitative research, consisting of a graduate student in clinical nursing, a professor of clinical nursing, a deputy chief nurse in the hospital, and a clinical doctor in the hospital was established. (2) Following the principle of maximum differentiation, the basic data for patient gender, age, duration of illness, employment status, and highest education level were extracted to ensure that the research objects conform to this study; (3) Two staff members and one patient participated in the interview at the same time, the psychological dynamics of the interviewees was observed and carefully recorded during the interview, the meaning underlying non-verbal actions was interpreted, and the answers to the questions were also carefully recorded. (4) In accordance with the principle of the law of conformity, the interview data were analyzed and sorted by two people at the same time, and the final meaning was determined with the patient in a timely manner in case of disagreement to ensure the accuracy and objectivity of the findings. Patient privacy was maintained; patients were informed in advance that their real names would not be disclosed and that the interview materials would only be used for scientific research.

3 Results

In this study, the COM-B system was used as the analysis framework to extract 3 themes (ability factor, opportunity factor, and motivation factor) and 8 sub-themes: (1) Ability factor: Difficulties using electronic devices, negative feedback, and insufficient information recognition ability; (2) Opportunity factors: Information blocking environment, and multiple external sources of support; (3) Motivational factors: rehabilitation outcome expectation, health information value perception, and electronic product experience.

3.1 Ability factor

3.1.1 Difficulties using electronic devices

Most patients with ischemic stroke are over 60 years old; as a result, despite the rapid development of the electronic age, being older, they lack familiarity with the use of electronic products. Most patients are also resistant to using electronic products, e.g.: P1: "Yesterday my family also told me that I could use my mobile phone to check the knowledge of medication, but I don't even know where to check." (Helpless expression); "P4:" Usually the mobile phone is used to make phone calls, but also want to know some health information, but do not know how to check." P17: "I have to pay for the hospital, I can't understand the electronic products anyway, I just ask the doctor."

3.1.2 Negative feedback

Negative feedback is common among patients with ischemic stroke. When combined with somatosensory disorders, negative feedback makes it more difficult for patients to accept new things. Despite the advantages and benefits of providing information to them, patients demonstrate varying degrees of denial and rejection owing to the lack of confidence in their own abilities. P2: "If you have this disease, it is useless to check the relevant knowledge of the disease (sad expression);" P4: "Now I crouch down to pick up something is afraid of falling down, there is not much else to ask, just hope to be safe on the line."

3.1.3 Insufficient information-recognition ability

Information recognition ability refers to the ability of individuals to effectively evaluate, identify, and use health information. Improved health information behavior level will help patients understand their own diseases, effectively prevent complications, and promote rehabilitation. For example, according to P3: "I heard the patients around me say that I can see popular science knowledge with my mobile phone, but sometimes I can't search it and I don't pay much attention to it."; P7: "When I have time, I will watch the advertisements for buying medicine on TV, regardless of whether they are useful or not, I think I can learn some knowledge by watching them."; P11: "Knowing that I have this

disease, I need to pay attention to it in the future, and I also hope to have a reminder or reference object to know how to do after discharge (optimistic expression)."

3.2 Opportunity factors

3.2.1 Positive environmental factors

A positive environment helps improve patients' health information behavior level. For example, as P6 states: "For patients in the same ward, some patients can use their mobile phone to check their test report after the doctor tells them that the test results are coming during the ward round. Sometimes I ask him to help me check, and over time I will be able to do it."; according to P15: "In the past, we wanted to ask the doctors and nurses about something and were afraid of disturbing others, but now we all check it ourselves, which is very convenient."; and P18 reported that: "We have a group, who has health knowledge to post in the group, everyone has nothing to look at."

3.2.2 Multiple sources of external support

The support and companionship of family members and peers are indispensable to the recovery path of patients with chronic diseases. ① Family members' participation: for example, P2 stated: "My son takes care of me, sometimes he will forward some stroke videos to me, I watch each several times."; P12: "Every time my daughter will take each medicine how to ah, pay attention to what ah check clearly, slowly I also check myself."; P11: "It is her (wife) who has been here with me, I usually love to smoke, when I smoke, she will show me those videos of smoking harm to the body." ② Peer support: for example, P15 reported: "My eldest brother in the next room is heavier than me, and sometimes he tells me not to drink or anything. We often go downstairs for walks together to control ourselves."; P14: "We have lived in bed 49 for a long time. Her family members are familiar with stroke and are willing to tell them anything."

3.3 Motivation factors

3.3.1 Rehabilitation outcome expectation

Rehabilitation outcome expectations are double-sided. The expectation of high level rehabilitation

outcome is more conducive to the subsequent development of the disease, and patients are more willing to accept new things and are more likely to stick to them, which can promote positive health behavior and improve the level of self-control; meanwhile, the expectation of low-level rehabilitation outcomes is undoubtedly an important obstacle to the recovery of patients. Patients' negative perception of outcomes impedes healthy behaviors. ① High level of rehabilitation outcome expectation: P5 said: "The nurse told me that the later stage of my disease is equally important. I think as long as I don't relax and maintain the present state, I should have no problem. When I am free, I will read knowledge popularization on Tiktok (happy expression)."; P12: "Sometimes I swipe my we-chat official account and find that as long as I pay attention to keep it, there will be no big problem." ② Low level of rehabilitation outcome expectation: P8 states: "Strokes are getting worse and worse, and now what else can you do but wait."; P13: "I don't think it's necessary to check health information in my current state."

3.3.2 Health information value perception

The benefits patients with ischemic stroke receive from health information largely determine their level of health information behavior in the future. P10: "It's really useful to have health information, the one next to me, the doctor said that controlling high blood pressure is very important for stroke, he didn't listen, he had to drink, and the result was serious... I read it on the Internet, and if it says you can't drink it, you can't drink it! (Emotional expression); P16: "Sometimes my right leg is numb. I read online that it is recommended to install a bathroom handrail. I installed it immediately afterwards, I feel pretty good."

3.3.3 Electronic product usage experiences

A wide variety of electronic products are available, and patients' evaluation of these products is mixed. ① Good experiences include, for example, P6's account: "Sometimes when the doctor says something about medicine, I don't understand it, so I will take a picture and check it myself, and gradually I will know the knowledge of medicine." P9: "Check ah, test what, as long as there is a

record I will check myself, but also know some knowledge." ② Negative experiences include those of P17: "Because my illness has worsened, this is the second time I have been hospitalized, I feel that nothing is more important than receiving treatment, and I have no energy to deal with other things" P1: "Sometimes I watch it, but I don't know whether it is true or not. I say it is very serious, and gradually I stop watching it."

4 Discussion

4.1 Overcome information barriers and promote improved health information behavior

The findings of this study show that most patients are not skilled in using electronic products, have a negative attitude towards diseases (so they do not look up health information), and do not know how to look up accurate health information, which is consistent with the research results of Dandan et al. [8].. The national medical system has been fully improved, which has greatly reduced the incidence of difficulties in seeing a doctor, seeking medical treatment, and rehabilitation. However, the Internet is a double-edged sword. While bringing convenience to people, it also harbors many potential threats [9].. Although health education, knowledge popularization, and psychological care are available in all hospitals, they can only barely ensure the popularization of health information during hospitalization, which is tantamount to "treating the symptoms rather than the root cause". As a carrier of effective health information, new media are closely related to the health management of the elderly. The use of new media for health information dissemination is also one of the most economical and effective measures to improve the health literacy of the population [10].. The combination of Internet and medical service is of great significance to reducing medical burden, improving medical services, and enhancing treatment effectiveness in China [11].. The interview results also suggest that medical staff should pay attention to patients' low use rate of electronic products, given the low health information literacy and weak ability to screen health information among the elderly [12].., causing them to be easily misled by inaccurate information, which could affect the rehabilitation process [13].. It should be ensured that patients can perform simple searches

and then gradually transition to self-seeking health information, improve their health information behavior level, and improving their prognosis.

4.2 Foster motivation to engage in health-promoting activities and improve the level of health information behavior

These findings show that rehabilitation outcome expectations, health information value perception, and electronic product experience directly affect patients' health information behavior. In this study, patients with high rehabilitation outcome expectations used health information more actively than those with low expected outcomes of rehabilitation, and harbored greater hope for recovery, which is consistent with Cao et al. [14]. Good value perception of health information can promote the use of health information. The usage experience of electronic products also directly determines whether patients will continue to seek health information using such devices. Therefore, medical staff should emphasize the value of health information in clinical work, cultivate patients' ability to use electronic products, and encourage a positive psychological mindset. Further, the society and community should share more access to health information to help patients improve their confidence in recovery and popularize health information. In addition, this can promote the rehabilitation of patients, reduce the probability of repeated hospitalization, and making it easier for the national health care team in the context of aging.

4.3 Create a positive rehabilitation environment and promote the improvement of health information behavior

Through this study, it becomes evident that the impact of environmental factors and multiple sources of external support on health information behavior cannot be ignored. Studies have pointed out that a long-term active treatment environment can effectively promote patient recovery [15], and patients with external support play a more active role in improving their disease prognosis than those without external support [16]. Some studies have shown that strengthening the provision and dissemination of health information represents a scientific and effective method to address the challenges elderly

people face during the recovery period [17].. In addition, new forms of media are communicative and interactive, and new media platforms can promote health information sharing among the elderly [18].. Therefore, major hospitals should provide a positive environment that not only effectively promotes the initiative of patients to take steps to enhance their recovery but also reduces the need for knowledge education by medical staff. In addition, strengthening of multiple external support sources is also advantageous for the rehabilitation of patients. Studies have shown that American community doctors provide comprehensive health education and health consultation services while treating patients [19].. The medical industry should pay attention to such positive influencing factors and identify appropriate successful cases for knowledge sharing, strengthen the participation of patients' families in treatment during hospitalization, and thus devise strategies to promote the recovery of patients.

5 Summary

Given the variety of chronic diseases and increasing complexity of treatment methods, it is particularly important to provide patient-centered, whole-course, whole-life cycle nursing interventions to facilitate maximal independence on leaving the hospital and enable patients to carry out simple self-health management . By using the semi-structured interview method and COM-B system as the analysis framework, this study deeply explored the causes and ways to improve the low level of health information behavior in patients with ischemic stroke, aiming to help medical staff provide relevant intervention strategies. Further, the findings help establish a theoretical basis and practical basis for improving the level of health information behavior in patients with ischemic stroke.

6 Limitations

Limitations of this study include constraints on the study period and the complexity of factors affecting the level of health information behavior, which may have influenced the results. In future research, owing to the correlations with the field of psychology and sociology, this topic should be

analyzed from these additional perspectives.

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