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RESEARCH ARTICLE

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Experiences of health management among people at high risk of stroke in China: A qualitative study

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Abstract

Background: Effective health management of people at high risk of stroke in China is challenging.

Aim: To explore and identify the experiences of health management among people at high risk of stroke in order to provide a foundation for a targeted health management strategy for this special group.

Design: A qualitative, descriptive study based on interviews.

Methods: Semistructured interviews were conducted with 31 people at high risk of stroke. The interviews were collated and analysed using Colaizzi's seven-step method.

Results: A total of 31 people at high risk of stroke were included, and the ages ranged from 40 to 86, with an average age of 60.71 (*SD* = 11.55). The experiences of health management were categorized into three themes. Theme 1: Facing many ongoing problems in health management, limited knowledge, lack of confidence and poor compliance. Theme 2: Accumulated some value experiences of coping with problems of health management, becoming active learners, promoting social interaction and enhancing self-health management. Theme 3: Sensitivity to multiple influencing factors, the severity of disease and complexity of disease management, family income and economic burden and the value of social support.

Conclusions: This study explored the experiences of health management among people at high risk of stroke, and these findings are of great significance in the primary prevention of stroke.

KEYWORDS
experiences, health management, nursing management, qualitative research, stroke

1 | INTRODUCTION

"An ounce of prevention is worth a pound of cure", as Benjamin Franklin put it. Effective health management can reduce the risk of disease, save financial costs and improve people's health status (Kan et al., 2017). Health management was first proposed in the United States (Craig et al., 1999), usually used in patients with, or at high risk of chronic diseases, it was defined as a comprehensive, multi-level process of screening, monitoring, evaluating, analysing and intervening on health risk factors in populations or individuals (Wong et al., 2021). Population health management includes national legislation, public health promotion and health management strategies, epidemiological investigation

of disease screening, monitoring and analysis, which are done primarily in hospitals or health management centres by health managers, doctors or nurses (Jha, 2019). Individual level health management refers to personal health behaviour management, including health-related knowledge acquisition, disease symptom recognition, biochemical indexes monitoring and rational drug use (Dolman et al., 2021).

Health management is a relatively new concept in China over the last decade, and it has not yet become widely established in the current health system. The public's awareness of the concept of health management is not extensive (Lv et al., 2019). Research on health management in this setting has been increasing recently and one previous study (Mazzei et al., 2021) has shown that cost-effective health management can reduce the risk of mortality and reduce the degree of disability in patients with stroke or who are at high risk of stroke. The study mainly focuses on the health management experiences of individuals within the context of a developing population health management system.

2 | BACKGROUND

Stroke is a major public health issue. It has become the second leading cause of death and the primary cause of long-term disability globally (Virani et al., 2020). An estimated increase of 1.5 million stroke survivors is expected in Europe by the year 2025 (Béjot et al., 2016). Stroke also continues to present a significant public health challenge, incurring high economic costs and burdens in the global world during the last 30 years (GBD 2019 Stroke Collaborators, 2021). Furthermore, the situation in low- and middle-income countries has markedly worsened (Norrving & Kissela, 2013). Stroke is the leading cause of death in China, and it is estimated that there will be more than 30 million stroke survivors by 2030, including 75% with varying degrees of disability that will present a tremendous burden to themselves, their families and society (Chen et al., 2017). A systematic review (Ayerbe et al., 2013) of 50 studies reported that the prevalence of depression among people after stroke was 29%, and the cumulative incidence within 5 years of stroke was 39%–52%. This negatively affects the survivors' functional outcomes, their response to rehabilitation and their quality of life. Awareness of prevention of risk factors and adherence to health behaviour management among people at high risk of stroke in China was lower than people in developed countries. In addition, the incidence of anxiety, depression and stroke was higher than that of developed countries (Guo et al., 2019). This situation is especially worse in rural areas (Wu et al., 2019). People at high risk of stroke and their family members were exhausted by long-term care and financial burden.

According to the China National Stroke Screening and Prevention Project (CNSSPP), a person reporting three or more of eight major risk factors, or with a history of transient ischaemic attack (TIA) or with a history of stroke, is at particularly high risk of stroke (Opoku et al., 2019; Wang et al., 2018). These eight major risk factors include: (a) history of hypertension (>140/90 mmHg) or taking antihypertensive drugs; (b) atrial fibrillation and valvular disease; (c) smoking; (d) dyslipidemia; e. diabetes mellitus; (f) low physical activity, i.e. fewer than three times weekly, of 30-minute exercise sessions, for at least 1 year; (g) overweight or obesity (BMI >26 kg/m^2); and h. family history of stroke. Most of these eight major risk factors are modifiable and are closely related to unhealthy lifestyle behaviour. Therefore, if unhealthy lifestyle behaviour is improved in populations at high risk of stroke through planned health management, the incidence and recurrence rate of stroke may be reduced (Brown et al., 2015).

In the Internet age, mhealth and telecare are increasingly a new driving force supporting basic medical and health services to cover people at scale (Scalvini et al., 2018). These information tools can overcome the limitations of distance and time between health care providers and recipients and shows great potential for improving health management and health care services and promoting the sharing of advantageous medical resources (Poss-Doering et al., 2020). People at high risk of stroke can easily obtain online health-related information about health management through various information tools or social media platform. However, it is increasingly difficult to distinguish reliable health information from misleading content in the information explosion era (Loeb et al., 2019). In addition, Kontos (Kontos et al., 2014) also found that compared to those aged 65 and older, those aged 18–34 were nearly 3.5 times (OR 3.51, 95% CI 1.66–7.44) more likely to use the Internet to search for health information. As age increases, the odds of watching health-related information on social network platform decreased, but they are exactly the people who need this information most (Langford & Loeb, 2019).

In conclusion, research shows that people at high risk of stroke are heterogeneous in their internet-based health management experiences, with most suffering from many challenges to their survival across different situations. Therefore, this study aimed to provide an in-depth description of experiences in health management to provide a foundation for targeted health management strategies for people at high risk of stroke.

3 | METHODS

3.1 | Study design

An exploratory, qualitative descriptive study using semi-structured in-depth interviews was conducted to address the study aim.

3.2 | Participants

Inclusion criteria were adults: (1) with three or more of the eight major stroke risk factors (previously described in the Introduction) or with a history of stroke or transient ischaemic attack (TIA); (2) with comprehension and communication capability; (3) who have provided informed consent to participate. Exclusion criteria included adults who had medical illnesses, serious complications or co-morbidities rendering them unable to cooperate with investigators during the study period.

In a qualitative descriptive study, the general recommendation of sample size for in-depth interviews is 20–30 (Creswell, 2013), which is largely based on ensuring sufficient opportunity to collect relevant data until new information from study participants no longer emerges, that is, reaching data saturation (Johnson et al., 2020).

3.3 | Interview guide

The interview topic guide was developed by the team of authors based on the results of the previous investigation, expert advice and a health behaviour change theory "Knowledge-Attitude-Practice (KAP) model" (Karbalaeifar et al., 2016). First, general broad questions were asked in order to familiarize interviewees with the content of the interview and build trust, followed by more in-depth questioning to gain information about individuals' views, and finally, questions addressed information about possible future developments. The interview guide is presented in Table 1. A pilot study was carried out with five people at high risk of stroke to test the interview schedule and identify potential issues with using the guide and improve the questions where necessary.

3.4 | Ethical considerations

The Ethical Review Board of the first affiliated hospital of Zhengzhou University approved this study. All potential participants were provided with information about the study and given the opportunity to ask questions/seek clarification prior to volunteering to participate in the study. All participants provided written informed consent before the interview was undertaken. Participants had the right to change their decision and end their participation at any time. All data obtained were only used for this study, the information from participants was anonymous, and individual participant information was not identifiable.

3.5 | Data collection

A purposive sampling method was used to recruit participants from the first affiliated hospital of Zhengzhou University, a tertiary grade A hospital in Zhengzhou, Henan Province of China, from September 2018 to April 2019. Patients at high risk of stroke were mainly distributed in the following areas: Physical Examination Department, Cardiology Department, Neurology Department, Endocrinology and Metabolism Department and Rehabilitation Department.

Two interviewers (one interviewer with PhD in Nursing, one with a Master of Nursing) received training in the conduct of qualitative research interviews involving individual, face-to-face data collection methods. The interviews were completed voluntarily by the study participants in the clinical department settings. Interviews were held in the nursing office or the participants' hospital ward, where the environment was quiet. All data collection was both private and anonymous. Before the interview commenced, the main content, purpose and significance of the interview were explained. After obtaining participants' informed consent, the interview was audio-recorded and written notes taken on the main points. Each participant was

TABLE 1 Interview guide

No.	Questions	Improvement and supplement
General broad questions		
1	From your knowledge, who is the high-risk population for stroke?	If the participants do not know, the investigator should explain further to facilitate a more in-depth discussion
2	What is your understanding of the term "health management"?	
In-depth questions		
3	What are your experiences of health management?	If the participants do not know, the investigator should try to list several areas to deepen the participant's knowledge and smooth discussion
4	What is your attitude about health management?	
5	How effective is health management for you?	
6	How did you find it to participate in and adhere to health management?	
7	What are your experiences of using some information tools such as smartphone or internet to learn about health management?	
8	How can health management be improved?	
Possible expanding questions		
9	Have you been able to accept health management guidance from a health manager via an information tool (such as a smartphone, app or telemedicine system)? Have you been involved?	To get as much information as possible, follow-up questions should be asked: What happened next? What were you thinking and doing then? How did that affect you?

interviewed one or two times (with 72 hr between two interviews), on each occasion for 32–129 min, and the median length of the interviews was 55 min. Among them, five participants had to suspend during the interview due to treatment or examinations, or an outburst of emotion, and were subsequently interviewed for a second time. Interviewers used interview techniques including repetition, reflection and summarization to elicit participants' most authentic and in-depth views and feelings. During each interview, attention was also paid to non-verbal communication and expressions, such as silence, crying, sighing and surprise. These were noted by interviewers in written field notes. Data collection and data analysis were carried out simultaneously until the data were saturated and no new topics emerged (Edward & Welch, 2011). Finally, the transcribed interviews were checked with study participants for verification of the authenticity of the content.

3.6 | Data analysis

Each interview was transcribed verbatim into text and checked for accuracy within 24 hr of completion of the interview. Colaizzi's seven-step methodology (Wirihana et al., 2018) was used to guide data analysis. The seven steps include: (1) Read and re-read all the participants' descriptions carefully. (2) Extract significant statements from each description. (3) Code meaningful points from these significant statements. (4) Organize these coded meaningful points into themes. (5) Write a detailed and unambiguous description. (6) Identify similar points of view and sublimate thematic concepts. (7) Return to participants for verification. Two researchers transcribed and collated the original data together. Next, the data were coded independently and classified and themes were identified. When the individual researchers could not reach an agreement, the research team reached a consensus through discussion to ensure the accuracy of the results.

4 | RESULTS

4.1 | Participant recruitment and characteristics

A total of 31 participants were included, 20 (64.5%) were male and 11 (35.5%) were female, the ages were ranged from 40 to 86, with an average age of 60.71 ($SD = 11.55$). Their characteristics are shown in Table 2. Findings present illustrative quotations and use the participant number to indicate the source of the quote.

4.2 | Qualitative results

4.2.1 | Theme 1: Facing many ongoing problems in health management

This group experienced many health management problems. As their basic health management needs were not met or supported for a long period, health management problems were increasingly aggravated. They survived a difficult situation and sustained physical, psychological and social stress. They wanted to maintain good health management, but they were always vulnerable to internal and external influences; most of them were in a state of exhaustion, collapse and helplessness in relation to many aspects of health management.

They demonstrated limited knowledge of health management:

The acquisition of medical information was limited, especially in remote rural areas.

> …It's too far for us to go to a big hospital. There is a clinic in our village, and only one doctor there. Sometimes we can't find him…I seldom hear about stroke prevention…We elderly people are not like young people, can easily use mobile phones and computers to read health information on the Internet (with a sign and smile)
>
> (P5).

There was a relative shortage of medical resources and an unbalanced distribution of these resources between urban and rural areas, to time and geographical constraints. The participants often got information that was provided by their relatives or friends based on their own experiences, not from professional staff, which was consequently not targeted to their particular needs and lacked detail and accuracy.

> …know a little about the health management of stroke, such as 'more exercise' or 'less greasy food'… However, it is not clear how and how much to do… Prevention is mostly based on our own feelings, sometimes. It would be great if a specialist doctor talked to us more and helped us more (excited)…
>
> (P29).

In addition, this group of people were vulnerable to the temptation of interest-oriented advertising, because of their urgent need for health management knowledge about the risk of stroke. The reliability of information was not guaranteed and the potential harm of misleading medical advertising remained.

> …There are also some false health information and advertising on the Internet, and the people around me have been cheated…also some campaigns in the parks or squares that sell medicine, they said it can lower blood pressure and even prevent stroke from a secret traditional Chinese medicine prescription, I bought some, but didn't feel any effect… (with grieving and anger)…
>
> (P14).

They demonstrated a lack of confidence in health management:

The high risk of stroke experienced by these participants affected their psychological state. The main theme was depression, confusion and bewilderment. The long-term existence of chronic

TABLE 2 Characteristics of the participates

No.	Age	Gender	Marriage	Province	Habitation	Education	Occupation	Types	Duration	ADL	Times
P1	76	Female	Married	Henan	Urban	High	Retired	3	5Y3 M	C	Two
P2	62	Male	Married	Henan	Rural	Low	Farmer	3	2Y8M	B	One
P3	55	Male	Married	Henan	Rural	Medium	Civil servant	3	2Y6 M	B	One
P4	54	Female	Widow	Shanxi	Urban	Medium	Office worker	2	1 Y	A	One
P5	65	Male	Married	Hubei	Rural	Low	Farmer	1	10 Y6 M	A	One
P6	58	Female	Married	Henan	Rural	Low	Farmer	1	7 Y3 M	C	One
P7	74	Male	Widow	Henan	Rural	Low	Farmer	1	20 Y5M	D	Two
P8	46	Male	Married	Henan	Urban	High	Office worker	1	8 M	A	One
P9	63	Male	Widow	Henan	Urban	High	Teacher	1	15 Y9M	C	One
P10	57	Male	Married	Hebei	Urban	High	Police	1	3 Y10M	A	One
P11	68	Male	Married	Shanxi	Rural	Medium	Farmer	2	2 M	B	One
P12	69	Female	Widow	Henan	Rural	Low	Farmer	2	21Y3 M	B	One
P13	40	Male	Unmarried	Henan	Urban	Medium	Driver	1	1 Y8M	A	One
P14	43	Female	Remarried	Henan	Urban	Medium	Merchant	1	6 M	A	One
P15	46	Male	Married	Henan	Rural	Low	Worker	3	2Y5M	B	One
P16	63	Male	Married	Henan	Urban	High	Engineer	1	13Y3 M	A	One
P17	52	Female	Married	Henan	Urban	Low	Employed	1	2Y2M	B	One
P18	72	Female	Widow	Shandong	Urban	Medium	Medical staff	3	6Y8M	B	One
P19	62	Female	Married	Hebei	Rural	Low	Farmer	3	3Y4M	B	One
P20	66	Female	Married	Henan	Urban	Medium	Retired	3	5Y6 M	B	One
P21	58	Male	Married	Henan	Rural	Low	Farmer	3	1Y3 M	C	Two
P22	68	Male	Remarried	Shanxi	Urban	Low	Merchant	1	17Y5M	C	One
P23	56	Male	Married	Shanxi	Rural	Medium	Worker	1	3Y1M	A	One
P24	55	Male	Married	Shandong	Rural	Low	Worker	1	3Y3 M	A	One
P25	82	Male	Widow	Henan	Rural	Medium	Retired	3	21Y4M	D	Two
P26	86	Female	Married	Henan	Urban	Low	Retired	3	23Y3 M	B	Two
P27	79	Female	Married	Henan	Urban	Medium	Retired	1	11Y2M	A	One
P28	58	Male	Married	Henan	Rural	Medium	Teacher	1	6Y2M	B	One
P29	53	Male	Married	Henan	Rural	Low	Civil servant	1	3Y9M	A	One
P30	49	Male	Married	Henan	Rural	Low	Merchant	2	7 M	D	One
P31	47	Male	Married	Henan	Rural	Medium	Driver	1	3 M	C	One

Note: Education: Low = middle school or less regularly; Medium = high school or professional education; High = undergraduate or more. Types: 1 = having three or more of the eight major risk factors (mentioned above in Introduction), 2 = with a history of transient ischaemic attack (TIA), 3 = with a history of stroke. Duration: the period from diagnosed with three or more of the eight major risk factors, or with stroke or with TIA to the interview time; Y = year; M = month. ADL, activities of daily living, assessed by Barthel Index (BI). A = BI≥60, basically independent; B = 41 ≤ BI≤59, moderate dysfunction, needs help. C = 21 ≤ BI≤40, severe dysfunction, obviously dependent. D=BI≤20, completely dependent; Times: one = interviewed 1time, two = interviewed 2 times.

diseases had worn down their hopes and led to a lack of motivation and confidence for long-term health management; the high stroke recurrence rate made them more fearful.

> …After so many years of insisting on health management, I can't see any hope. I really don't know when I will give up. If the disease recurs again, I really can't live (eyes grew moist)…
>
> (P26).

Different levels of disability affected their ability to work, resulting in a lack of self-worth and self-denial. They had a strong sense of guilt because of the huge financial and caring burden for their family members over a long time period.

> …After I got sick, I was no longer the economic backbone of my family. I felt insecure and useless. I let the family worry, and spend money to see doctors and buy medicines, I am very sorry for the family, I owe

them too much. Sometimes I think about it, to die early is better (hit himself on the head with his own hand)…

(P15).

They showed poor compliance with health management:

The need to be aware of general health management in this high risk of stroke group was limited and their understanding of health management was poor. They reported that breaking their original personal habits that lead to their stroke was difficult and many found it hard to adapt to their new lifestyle. They worried that their special lifestyle needs cause difficulties for their families, friends and colleagues, and for some, the economic situation did not allow continued health management. Older people accounted for a large proportion of the participants, and in most cases, they reported experiencing a combination of other chronic diseases and poor memory that made ongoing health management difficult. Many lacked supervision and care from their family members and found fighting alone was not conducive to long-term persistence with health management.

…I just take a tablet of antihypertensive medicine when I feel dizzy. If I don't feel dizzy, I won't take it, maybe there's nothing wrong (laughing)… now there is small electronic tool to remind people to take medicine regularly, which will facilitate regular medication. However, few people use it at present…

(P31).

…I don't want my family to follow me and change the type and taste of meals… It's hard for me to stick to a new lifestyle by myself, and I also have a bad memory… It always bothers my family, and sometimes they are exhausted…

(P1).

4.2.2 | Theme 2: Accumulated value of experiences of coping with problems of health management

A traditional Chinese proverb says "long-term illness makes a patient be a doctor." Some valuable experiences were accumulated among people at high risk of stroke, although they felt they were in a precarious situation. Distress and confusion caused by illness prompted them to become active learners and they sought to acquire knowledge in various ways, such as using smartphones, computers, through magazines and attending health lectures. They reported they had expanded their social circles and developed special friendships. Over time, they gradually adapted to their adversities, and their self-health management ability slowly improved.

They reported becoming active learners:

People tried to learn about stroke and gain health guidance in various ways, seeking further relevant help based on their own health needs.

…Every month there is a health lecture in the Department where I used to be hospitalized. I often listen to it. Many problems and doubts can be solved…

(P8).

…I downloaded a 'Talk about stroke' APP, which is rich in content and can also consult experts online. It's good…

(P9).

They described promoting social interaction:

Participants at high risk of stroke did their best to communicate with people around them and get help, when they encountered problems that they could not solve; they made great efforts to seek help from professional medical staff and got psychological counselling when they were troubled by negative emotions. Moreover, they expanded their social interaction by fostering interests and hobbies; they had their own "patients group" and "social groups," sharing and encouraging each other, obtaining emotional support and social support.

…I joined a walking club and we have regular activities. I can exercise, and also chat with friends, it's good for my physical and mental health…

(P20).

…I have the Wechat group (Wechat, a communication software) for stroke patients, we often exchange and share information in this group…I also added professional medical staff as friends, many times I can get professional advice from them…

(P4).

They reported enhancing self-health management:

Those at high risk of stroke paid more attention to self-health management once they understood their physical condition. They learned to actively control risk factors, reduce complications and prevent disease recurrence. In addition, they improved their ability to identify and deal with emergencies.

…I know Stroke is closely related to blood pressure, blood sugar and blood lipid. I take aspirin and antihypertensive tables on time every day…test my blood pressure and blood sugar every day and record them.

(P24).

…When I first suffered from stroke, I delayed the best thrombolytic therapy and regretted it because I didn't have relevant disease knowledge. But now, I

> can identify the precursors of acute stroke according to the 'FAST' judging method, and know how to do emergency management…
>
> (P1).

4.2.3 | Theme 3: Sensitivity to multiple influencing factors

The severity of disease and complexity of disease management:

Usually, the more serious the stroke and more complications a person experiences, the greater the demand for knowledge and skills for health management. Accordingly, there were more risk factors that needed to be controlled, which may have affected the person's coping strategies and were associated with an increased burden of health management.

> …Although the symptoms were quickly controlled after stroke, I am afraid of relapse. I have spent a long time learning how to manage the risk factors for relapse, but I still have a lot to learn and suffer from many problems. I am worried about whether I could cope with them…
>
> (P3).

> …I have high blood pressure, hyperlipidemia, diabetes, and my kidney is not so good…just taking medicine brought me a lot of trouble. And I must take good care of my work and family, it is really difficult…
>
> (P10).

Family income and economic burden:

Self-health management needed to be financially supported, and reasonable medication, healthy diet and regular physical examination all required expenditure. Economic conditions affected health management to a large extent.

> …My older parents and two children in college need a lot of financial support. It's very difficult to spend money on medicine, let alone regular physical examination and healthy diet. Our economic situation does not supported this…
>
> (P17).

> …Only my wife earns money, I can't work like a normal person anymore. The financial situation does not allow me to invest too much money in my health management…
>
> (P21).

Value of social support:

The recognition, support and care from family members and friends for participants' health management ensured they felt respected and encouraged to be more active in coping with various problems.

> …Family members, relatives and friends are very concerned about me, often enlighten me and help me, the support of family members and friends is my greatest motivation, so I am not afraid of any problems encountered (full of sweet happiness)…
>
> (P24).

Medical staff's suggestions about health management directly affected decisions and behavioural changes of people at high risk of stroke, as they expected to be encouraged and given professional guidance by medical staff.

> …Doctors and nurses are more professional. They have rich experience and give me detailed guidance. Now when I encounter problems, I call doctors for help. I have learned a lot of knowledge and skills. When I encounter problems in health management, I know what to do…
>
> (P16).

If this group of people lacked social support, their health management was unlikely to be as effective.

5 | DISCUSSION

This is the first reported study to use a qualitative descriptive method among people at high risk of stroke to explore the experience of health management. This qualitative study is highly valuable to nursing research, supplementing quantitative research, using a phenomenology method can describe the real experiences and feelings of people at high risk of stroke in the process of health management, and explain the deep-seated views and emotional reactions. The findings are of significance to clinical nursing practice and can assist health care professionals to develop targeted interventions to promote health management among people at high risk of stroke and further reduce the incidence rate, recurrence rate and disability rate of stroke.

The findings indicate that health management by people at high risk of stroke faces a series of challenges mainly reflected in three aspects: limited knowledge, lack of confidence and poor compliance. One related previous study reported that low income, poor education status and poor health systems are the main factors that lead to low health expectation and awareness of health management in rural regions (Chau, 2010). Yuan et al. (2019) also pointed out that the capacity and use of primary care and community health providers are inadequate, suggesting that public health problems and challenges remain a major constraint to promoting universal coverage of chronic disease health management despite great efforts. The complexity of individuals' socioeconomic

characteristics and poor health system conditions was a major constraint to the knowledge of, confidence in and compliance with health management among people at high risk of stroke, all of which contribute to the problems reported by this group of people facing a difficult situation. Health management staff should actively exchange health knowledge with people at high risk of stroke, regularly evaluate and promote coping skills (Lai et al., 2017). Practitioners can also explain the purpose, importance and necessity of health management to them and their families by using various ways, and presenting successful cases to them can help patients to realize the benefits of health management to the improvement of their quality of life (Chang et al., 2015). In addition, health managers should assess the psychological state of people at high risk of stroke and encourage them to express their inner feelings and negative emotions, offering professional psychological guidance to whom with mental disorders or giving medicine and other psychotherapy when necessary (Harrison et al., 2017). When it comes to improving participant compliance, Ding et al. (2020) showed that innovative telemonitoring can improve compliance with self-health management, and a telehealth tool is a promising method for supporting both patients and practitioners in health management.

When people at high risk of stroke are able to accumulate some valuable experiences in health management, they gradually become active learners, improve self-health management and expand social interaction. One recent study (Faiz et al., 2019) reported that stroke survivors improved their stroke-related knowledge through active learning over 3–12 months, and a significant proportion of patients made changes in lifestyle behaviour. Thus, knowledge acquisition and behaviour change have a positive influence on health management and can reduce the risk of new stroke events. It is interesting that self-health management was seen as significant to health management, which is consistent with a previous study by Lo et al. (2018) who showed that self-health management can improve self-efficacy, outcome expectation and satisfaction with the performance of health management behaviours of stroke patients. Social interaction improved health practices that positively predicted health management outcomes, and negatively correlated with psychological processes, such as stress and depression (Holt-Lunstad et al., 2010). Social interaction was also shown to have a critical role in neurogenesis and recovery after stroke, and this was confirmed in an animal experiment (Venna et al., 2014). Health management staff should regard active learning, self-health management and social interaction as positively significant predictors of health management among people at risk of stroke, and encourage them to maintain these at a better level by information tools in the Internet age.

Whether health management is effective or not is closely related to the severity and complexity of the disease, family income and social support. Greater severity and complexity of the disease can threaten belief in the benefits of health management and increase the probability of ineffective coping with self-health management (Jespersen et al., 2013). One explanation is that greater severity of disease leads to more rapid functional decline and more complex diseases require greater knowledge and skills for health management, thus, individuals are more likely to burn out resulting in poor health management outcomes. Family income is a very important and even a decisive factor in health management. A previous study (Zhuang et al., 2014) including 6,413 community residents found that high monthly income is a protective factor for better health management. Good family income is the basis of health management and the foundation to promote better education and health management awareness. Better social support significantly predicts effective health management and is positively associated with chronic disease self-management (Bustamante et al., 2018). It is helpful for patients to get support and help from friends and family members, and to get advice and encouragement from healthcare providers. The receipt of timely, stroke-specific, targeted, social support improves stroke survivors' confidence and coping ability, and prompts them to solve their health management problems.

5.1 | Limitations

This study has been carried out using a qualitative method in a Chinese context. Therefore, it may not be generalizable to other contexts and cultures. In addition, this study only recruited participants in hospitals, and more high-risk groups for stroke exist in the community. Therefore, we should further expand the research scope to investigate people at high risk of stroke in the community.

6 | CONCLUSIONS

This study explored the experiences of health management among people at high risk of stroke and identified a number of changes to effective health management thereby providing a clear theoretical basis to inform future development of intervention measures to support ongoing health management. These findings have important reference value for the primary prevention of stroke. Health administrators and health providers should respond to this study with reform to the health system financial support, social support and information tools applicable to the Internet age.

AUTHOR CONTRIBUTIONS

Lina Guo, Yuanli Guo, Jo Booth, Miao Wei, Lin Wang, Yiru Zhu, Yu He and Yanjin Liu were responsible for the conception and design; Lina Guo, Yuanli Guo, Yiru Zhu, Miao Wei, Lin Wang and Yu He made contributions to data collection; Lina Guo and Yuanli Guo involved in data analysis and drafting of the manuscript; Lina Guo and Jo Booth performed the manuscript revision; Yanjin Liu was responsible for supervision and support of this study.

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CONFLICT OF INTEREST

The authors stated that they have no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data used to support the findings of this study are available from the corresponding author upon reasonable request.

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REFERENCES

Ayerbe, L., Ayis, S., Wolfe, C. D., & Rudd, A. G. (2013). Natural history, predictors and outcomes of depression after stroke: Systematic review and meta-analysis. *The British Journal of Psychiatry*, *202*(1), 14–21. https://doi.org/10.1192/bjp.bp.111.107664

Béjot, Y., Bailly, H., Durier, J., & Giroud, M. (2016). Epidemiology of stroke in Europe and trends for the 21st century. *Presse Medicine*, *45*(12 Pt 2), e391–e398. https://doi.org/10.1016/j.lpm.2016.10.003

Brown, D. L., Conley, K. M., Sánchez, B. N., Resnicow, K., Cowdery, J. E., Sais, E., Murphy, J., Skolarus, L. E., Lisabeth, L. D., & Morgenstern, L. B. (2015). A multicomponent behavioral intervention to reduce stroke risk factor behaviors: The stroke health and risk education cluster-randomized controlled trial. *Stroke*, *46*(10), 2861–2867. https://doi.org/10.1161/STROKEAHA.115.010678

Bustamante, A. V., Vilar-Compte, M., & Ochoa Lagunas, A. (2018). Social support and chronic disease management among older adults of Mexican heritage: A U.S.-Mexico perspective. *Social Science & Medicine (1982)*, *216*, 107–113. https://doi.org/10.1016/j.socscimed.2018.09.025

Chang, A. K., Park, Y. H., Fritschi, C., & Kim, M. J. (2015). A family involvement and patient-tailored health management program in elderly Korean stroke patients' day care centers. *Rehabilitation Nursing*, *40*(3), 179–187. https://doi.org/10.1002/rnj.95

Chau, K. L. (2010). Ecological analysis of health care utilisation for China's rural population: Association with a rural county's socio-economic characteristics. *BMC Public Health*, *10*, 664. https://doi.org/10.1186/1471-2458-10-664

Chen, Z., Jiang, B., Ru, X., Sun, H., Sun, D., Liu, X., Li, Y., Li, D., Guo, X., & Wang, W. (2017). Mortality of stroke and its subtypes in China: Results from a Nationwide population-based survey. *Neuroepidemiology*, *48*(3–4), 95–102. https://doi.org/10.1159/000477494

Craig, D. E., Hartka, L., Likosky, W. H., Caplan, W. M., Litsky, P., & Smithey, J. (1999). Implementation of a hospitalist system in a large health maintenance organization: The Kaiser Permanente experience. *Annals of Internal Medicine*, *130*(4 Pt 2), 355–359. https://doi.org/10.7326/0003-4819-130-4-199902161-00005

Creswell. (2013). *Qualitative inquiry & research design*. SAGE Publications.

Ding, H., Jayasena, R., Chen, S. H., Maiorana, A., Dowling, A., Layland, J., Good, N., Karunanithi, M., & Edwards, I. (2020). The effects of telemonitoring on patient compliance with self-management recommendations and outcomes of the innovative telemonitoring enhanced care program for chronic heart failure: Randomized controlled trial. *Journal of Medical Internet Research*, *22*(7), e17559. https://doi.org/10.2196/17559

Dolman, G. E., Koffas, A., Phipps, E., & Kennedy, P. (2021). Clinical and occupational health management of healthcare workers living with chronic hepatitis B: UKpolicy and international comparisons. *Journal of Viral Hepatitis*, *28*(7), 976–981. https://doi.org/10.1111/jvh.13494

Edward, K. L., & Welch, T. (2011). The extension of Colaizzi's method of phenomenological enquiry. *Contemporary Nurse*, *39*(2), 163–171. https://doi.org/10.5172/conu.2011.163

Faiz, K. W., Labberton, A. S., Thommessen, B., Rønning, O. M., & Barra, M. (2019). Stroke-related knowledge and lifestyle behavior among stroke survivors. *Journal of Stroke and Cerebrovascular Diseases*, *28*(11), 104359. https://doi.org/10.1016/j.jstrokecerebrovasdis.2019.104359

GBD 2019 Stroke Collaborators. (2021). Global, regional, and national burden of stroke and its risk factors, 1990-2019: A systematic analysis for the global burden of disease study 2019. *The Lancet Neurology*, *20*(10), 795–820. https://doi.org/10.1016/S1474-4422(21)00252-0

Guo, L., Zauszniewski, J. A., Liu, Y., Yv, S., & Zhu, Y. (2019). Is resourcefulness as a mediator between perceived stress and depression among old Chinese stroke patients? *Journal of Affective Disorders*, *253*, 44–50. https://doi.org/10.1016/j.jad.2019.04.083

Harrison, M., Ryan, T., Gardiner, C., & Jones, A. (2017). Psychological and emotional needs, assessment, and support post-stroke: A multi-perspective qualitative study. *Topics in Stroke Rehabilitation*, *24*(2), 119–125. https://doi.org/10.1080/10749357.2016.1196908

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social relationships and mortality risk: A meta-analytic review. *PLoS Medicine*, *7*(7), e1000316. https://doi.org/10.1371/journal.pmed.1000316

Jespersen, L., Abildstrøm, S. Z., Hvelplund, A., Galatius, S., Madsen, J. K., Pedersen, F., Højberg, S., & Prescott, E. (2013). Symptoms of angina pectoris increase the probability of disability pension and premature exit from the workforce even in the absence of obstructive coronary artery disease. *European Heart Journal*, *34*(42), 3294–3303. https://doi.org/10.1093/eurheartj/eht395

Jha, A. K. (2019). Population health management: Saving lives and saving money? *JAMA*, *322*(5), 390–391. https://doi.org/10.1001/jama.2019.10568

Johnson, J. L., Adkins, D., & Chauvin, S. (2020). A review of the quality indicators of rigor in qualitative research. *American Journal of Pharmaceutical Education*, *84*(1), 7120. https://doi.org/10.5688/ajpe7120

Kan, Y. C., Chen, K. H., & Lin, H. C. (2017). Developing a ubiquitous health management system with healthy diet control for metabolic syndrome healthcare in Taiwan. *Computer Methods and Programs in Biomedicine*, *144*, 37–48. https://doi.org/10.1016/j.cmpb.2017.02.027

Karbalaeifar, R., Kazempour-Ardebili, S., Amiri, P., Ghannadi, S., Tahmasebinejad, Z., & Amouzegar, A. (2016). Evaluating the effect of knowledge, attitude and practice on self-management in patients with type 2 diabetes. *Acta Diabetologica*, *53*(6), 1015–1023. https://doi.org/10.1007/s00592-016-0905-6

Kontos, E., Blake, K. D., Chou, W. Y., & Prestin, A. (2014). Predictors of eHealth usage: Insights on the digital divide from the health information National Trends Survey 2012. *Journal of Medical Internet Research*, *16*(7), e172. https://doi.org/10.2196/jmir.3117

Lai, Y. J., Hu, H. Y., Lee, Y. L., Ku, P. W., Yen, Y. F., & Chu, D. (2017). A retrospective cohort study on the risk of stroke in relation to a priori health knowledge level among people with type 2 diabetes mellitus in Taiwan. *BMC Cardiovascular Disorders*, *17*(1), 130. https://doi.org/10.1186/s12872-017-0568-4

Langford, A., & Loeb, S. (2019). Perceived patient-provider communication quality and sociodemographic factors associated with watching health-related videos on YouTube: A cross-sectional analysis. *Journal of Medical Internet Research*, *21*(5), e13512. https://doi.org/10.2196/13512

Lo, S., Chang, A. M., & Chau, J. (2018). Stroke self-management support improves Survivors' self-efficacy and outcome expectation of self-management behaviors. *Stroke*, *49*(3), 758–760. https://doi.org/10.1161/STROKEAHA.117.019437

Loeb, S., Sengupta, S., Butaney, M., Macaluso, J. N., Jr., Czarniecki, S. W., Robbins, R., Braithwaite, R. S., Gao, L., Byrne, N., Walter, D., & Langford, A. (2019). Dissemination of Misinformative and biased information about prostate cancer on YouTube. *European Urology*, *75*(4), 564–567. https://doi.org/10.1016/j.eururo.2018.10.056

Lv, Q., Jiang, Y., Qi, J., Zhang, Y., Zhang, X., Fang, L., Tu, L., Yang, M., Liao, Z., Zhao, M., Guo, X., Qiu, M., Gu, J., & Lin, Z. (2019). Using Mobile apps for health management: A new health care mode in China. *JMIR mHealth and uHealth*, *7*(6), e10299. https://doi.org/10.2196/10299

Mazzei, D. R., Ademola, A., Abbott, J. H., Sajobi, T., Hildebrand, K., & Marshall, D. A. (2021). Are education, exercise and diet interventions a cost-effective treatment to manage hip and knee osteoarthritis?A systematic review. *Osteoarthritis and Cartilage*, *29*(4), 456–470. https://doi.org/10.1016/j.joca.2020.10.002

Norrving, B., & Kissela, B. (2013). The global burden of stroke and need for a continuum of care. *Neurology*, *80*(3 Suppl 2), S5–S12. https://doi.org/10.1212/WNL.0b013e3182762397

Opoku, S., Gan, Y., Fu, W., Chen, D., Addo-Yobo, E., Trofimovitch, D., Yue, W., Yan, F., Wang, Z., & Lu, Z. (2019). Prevalence and risk factors for dyslipidemia among adults in rural and urban China: Findings from the China National Stroke Screening and prevention project (CNSSPP). *BMC Public Health*, *19*(1), 1500. https://doi.org/10.1186/s12889-019-7827-5

Poss-Doering, R., Kuehn, L., Kamradt, M., Glassen, K., & Wensing, M. (2020). Applying digital information delivery to convert habits of antibiotic use in primary Care in Germany: Mixed-methods study. *Journal of Medical Internet Research*, *22*(10), e18200. https://doi.org/10.2196/18200

Scalvini, S., Bernocchi, P., Zanelli, E., Comini, L., Vitacca, M., & Maugeri Centre for Telehealth and Telecare (MCTT). (2018). Maugeri Centre for Telehealth and Telecare: A real-life integrated experience in chronic patients. *Journal of Telemedicine and Telecare*, *24*(7), 500–507. https://doi.org/10.1177/1357633X17710827

Venna, V. R., Xu, Y., Doran, S. J., Patrizz, A., & McCullough, L. D. (2014). Social interaction plays a critical role in neurogenesis and recovery after stroke. *Translational Psychiatry*, *4*(1), e351. https://doi.org/10.1038/tp.2013.128

Virani, S. S., Alonso, A., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., Carson, A. P., Chamberlain, A. M., Chang, A. R., Cheng, S., Delling, F. N., Djousse, L., Elkind, M., Ferguson, J. F., Fornage, M., Khan, S. S., Kissela, B. M., Knutson, K. L., Kwan, T. W., Lackland, D. T., … American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. (2020). Heart disease and stroke Statistics-2020 update: A report from the American Heart Association. *Circulation*, *141*(9), e139–e596. https://doi.org/10.1161/CIR.0000000000000757

Wang, X., Li, W., Song, F., Wang, L., Fu, Q., Cao, S., Gan, Y., Zhang, W., Yue, W., Yan, F., Shi, W., Wang, X., Zhang, H., Zhang, H., Wang, Z., & Lu, Z. (2018). Carotid atherosclerosis detected by ultrasonography: A National Cross-Sectional Study. *Journal of the American Heart Association*, *7*(8), e008701. https://doi.org/10.1161/JAHA.118.008701

Wirihana, L., Welch, A., Williamson, M., Christensen, M., Bakon, S., & Craft, J. (2018). Using Colaizzi's method of data analysis to explore the experiences of nurse academics teaching on satellite campuses. *Nursing Research*, *25*(4), 30–34. https://doi.org/10.7748/nr.2018.e1516

Wong, A., Wong, F., & So, C. (2021). Cost-effectiveness of a preventive self-care health management program for community-dwelling older adults: A randomised controlled trial. *Age and Ageing*, *50*(2), 440–446. https://doi.org/10.1093/ageing/afaa127

Wu, S., Wu, B., Liu, M., Chen, Z., Wang, W., Anderson, C. S., Sandercock, P., Wang, Y., Huang, Y., Cui, L., Pu, C., Jia, J., Zhang, T., Liu, X., Zhang, S., Xie, P., Fan, D., Ji, X., Wong, K. L., … China Stroke Study Collaboration. (2019). Stroke in China: Advances and challenges in epidemiology, prevention, and management. *The Lancet Neurology*, *18*(4), 394–405. https://doi.org/10.1016/S1474-4422(18)30500-3

Yuan, B., Balabanova, D., Gao, J., Tang, S., & Guo, Y. (2019). Strengthening public health services to achieve universal health coverage in China. *BMJ (Clinical Research ed.)*, *365*, l2358. https://doi.org/10.1136/bmj.l2358

Zhuang, R., Xiang, Y., Han, T., & Zhang, Y. (2014). The status and risk factors of self-health management among community residents in Shenzhen. *Zhonghua Yu Fang Yi Xue Za Zhi [Chinese journal of preventive medicine]*, *48*(7), 587–591.

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