BMJ Public Health

Health-seeking behaviours of the families with older adults during the COVID-19 epidemic in rural China: a qualitative inquiry from the perspective of migration and social support networks

Huiyu Yang [1], Zixi Ouyang [2], Fei Sun [3], Daniel Velez Ortiz [3]

To cite: Yang H, Ouyang Z, Sun F, *et al*. Health-seeking behaviours of the families with older adults during the COVID-19 epidemic in rural China: a qualitative inquiry from the perspective of migration and social support networks. *BMJ Public Health* 2024;**2**:e000794. doi:10.1136/bmjph-2023-000794

Received 29 November 2023
Accepted 28 August 2024

[1]School of Law & Public Affairs, Nanjing University of Information Science and Technology, Nanjing, Jiangsu, China
[2]Hunan Normal University, Changsha, China
[3]School of Social Work, Michigan State University, East Lansing, Michigan, USA

Correspondence to
Dr Daniel Velez Ortiz;
velezda@msu.edu

ABSTRACT

Introduction Health behaviours during a public health crisis for families with vulnerable ageing relatives are worth studying. After the Chinese government's zero-tolerance policy on COVID-19 ended at the close of 2022, a significant surge in COVID-19 cases was observed among the Chinese population. This surge exposed a notable disparity in medical resources between urban and rural areas in China, with rural regions experiencing a pronounced lag in healthcare infrastructure. Amidst this backdrop, the health-seeking behaviour for rural older adults during the COVID-19 epidemic emerged as a critical subject for investigation. Chinese society heavily relies on interpersonal relationships. As such, access to medical resources for the older adults depends on their family members. How family members access higher-quality medical resources is a subject worthy of research. This study will explore the health-seeking behaviour for rural older Chinese from the perspective of migration and social support network in COVID-19 epidemic.

Methods This study used qualitative methods and conducted interviews with 20 rural Chinese families where older relatives resided. The interviewees primarily consisted of adult children of older adults, alongside two grandchildren and two older adults themselves. After interviews, thematic analysis method was used to analyse the collected data and extracted three themes based on the questions raised.

Results The study found that older adults had to leverage their extended family network to access urban medical facilities and resources to prevent and manage COVID-19 infections. The study also highlighted the significant influence of structural and cultural factors on the social support networks within rural families.

Conclusion Families with older adults used their social support network to access better medical resources. The social support networks of families with older adults are also influenced by other structural and cultural factors. The health-seeking behaviour of families with older adults relies on private relationship resources, which make necessary task to build public health resources in rural China.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ There are regional differences in China's medical resources, as urban medical resources are significantly better than rural areas in terms of both quantity and quality. Out-migrant children can affect the health of older parents left behind in both positive and negative ways, such as negative association between migration of adult children and health of older parents with chronic diseases left behind. But migrant children's impact on health-seeking behaviour for the older adults with acute diseases is lacking.

WHAT THIS STUDY ADDS

⇒ This study explores the heath-seeking behaviours of families for older adults with acute diseases in rural China through COVID-19 epidemic from the perspectives of migration and social support networks, highlighting the significant influence of structural and cultural factors on the social support networks within rural families.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ As the health-seeking behaviour of families with older adults relies on personal relationship resources, it is therefore essential to build accessible public healthcare resources in rural China.

INTRODUCTION

COVID-19 has severely impacted populations across the entire globe and it has been classified as a pandemic virus.[1 2] Many countries differ on policies about how to respond to the pandemic virus, including China. In China, the approach was zero-tolerance policy until the end of 2022. The zero-tolerance policy is to quickly isolate an infected person and close their place of residence, prohibiting the movement of close contacts until they have

completely tested negative within 14 days before lifting the lockdown. Right after the Chinese government's zero-tolerance policy on the COVID-19 ended at the end of 2022, most Chinese people were quickly infected with COVID-19. According to the weekly report by China Center for Disease Control and Prevention,[3] it is speculated that more than 82% of the population (according to official population data in China, 82% of the population is 1.158 billion) in the country were infected with COVID-19 between December 2022 and February 2023.[3] In this wave of infection, people from different regions and groups had different ways of accessing medical resources.

There are nearly 360 million older adults above 60 years old in China, of which 120 million live in rural areas in 2020.[4] There are regional differences in China's medical resources, as urban medical resources are significantly better than rural areas in terms of both quantity and quality.[5–7] Different groups have different ways of accessing medical resources, and the more a person is formally situated within the government system, especially high-level officials, the faster they can access high-quality medical resources. Lay citizens, especially those who lack relevant relationships within the government system, have more difficulty accessing medical resources. Further, differences in economic development levels and various resources between urban and rural areas have led to an increasing number of young people from rural areas going to work in cities.[8 9] In an extended family (extended family means a large family that includes parents, children and even grandchildren), children often go to live in cities, while the older adults stay in rural areas. In this situation, rural older adults have remained behind in rural areas, thus making them the most vulnerable group. They are in underdeveloped rural areas with underdeveloped medical resources, and at the same time, they face difficulties in accessing medical resources due to factors such as income and social connections. Inadequate access to healthcare was significantly higher among older adults in rural areas than in urban areas.[10] Typically, during non-emergency periods, rural older adults tend to seek medical treatment from local community healthcare institutions and district hospitals, which are more geographically and financially accessible.[11] But in the COVID-19 pandemic, as the group with the greatest impact of the COVID-19, the rural older adults must bear greater psychological pressure and exposure risk when facing the epidemic. As a result, it is of great significance to study the characteristics and performance of health-seeking behaviour of families with older adults in rural China during the COVID-19, which may also lead to formulate public health policies to improve the medical situation of this group.

In developing countries, the out-migration of adult children is common. The situation where adult children and the older adults do not reside in the same place affects the older adult's health status, health-seeking behaviour, as well as the health-seeking behaviour of adult children for the older adults. Evidence from the literature shows that migration can affect the health of those left behind in both positive and negative ways.[12] In terms of health-seeking behaviour, existing studies mainly focus on the migrant children's effect on health-seeking behaviour of the older adults with chronic diseases. A study found that there is a negative association between migration of adult child and physical health, mental health and health-care utilisation of older parents with chronic diseases left behind in China.[13] A study about the India indicates that older individuals with migrant children were less likely to receive medical and other care facilities than older persons without migrant children if they suffer from chronic diseases.[14] Some studies show that parents of migrants persistently scored worse self-rated health across ages than their counterparts whose children had not migrated. Additionally, long-term migration of adults takes a heavier toll on the health of their elderly parents than short-term migration.[15] But there is little research on the migrant children's impact on health-seeking behaviour for the older adults with acute diseases, such as COVID-19. This study explores the impact of migrant children on health-seeking behaviour for older adults with acute illnesses through COVID-19.

China is a collectivist culture where parents and children have obligation to take care of and support each other, and even after their children reach adulthood, parents still help them financially, while children also need to take responsibility for their parents' medical and elderly care issues. Given the aforementioned culture context, the health-seeking behaviour of families with older adults in China rural areas during the COVID-19 epidemic refers to the health-seeking behaviour of the older adults and their adult children for the prevention and treatment of COVID-19 for the older adults in families with 60 years old and over. In an extended family, when an older adult falls ill, other members of the family take on the role of taking care of the older adult while seeking medical services, which creates interdependence and influence among family members. Health-seeking behaviour refers to actions taken to seek medical treatment from the healthcare system. In Chinese culture, the health-seeking behaviour for older adults entails two main aspects: first, older adults actively seek healthcare for themselves, and second, their family members also seek healthcare on behalf of the older adults. The health-seeking behaviour of older adults is largely influenced by family members, and it also greatly affects the health-seeking behaviour of their family members for the older adults.

Migrant children have brought better urban medical resources to the older adults in the rural areas, forming a social support network for the older adults. However, this social support network is also influenced by other structural and social factors. There have been studies on the influencing factors of health-seeking behaviour among Chinese older adults or overseas Chinese older adults, which can be divided into two levels: structural factors

and cultural factors. Structural factors include income (affordability),[16–19] availability (accessibility)[15 18 19] and medical insurance.[17 20] Scholars have also studied the impact of spatial factors on health-seeking behaviour.[21] Cultural factors include belief, acceptance of medical services, social support networks[22–24] and education level.[25] In this study, the authors attempt to explore structural and cultural factors influencing social support networks. Social support networks are regarded as cultural factors, but they are influenced by other structural factors such as income of children and other cultural factors such as children's filial piety. Social networks also combine structural factors of differences in medical resources between urban and rural areas to affect the health-seeking behaviour for older adults.

Summarising the literature above, we identified three major research gaps: (1) Amidst significant disparities in medical resources between urban and rural areas in China, exacerbated by the COVID-19 pandemic, the literature lacks investigations of the health-seeking behaviour of a particularly vulnerable demographic: rural older adults. (2) While existing research in developing nations has primarily focused on the impact of migrant children working in urban areas on the chronic health conditions of older adults, there remains a dearth of studies examining their influence on health-seeking behaviours among older adults during an acute infectious disease crisis. (3) While previous studies have delved into the various factors influencing health-seeking behaviours, encompassing structural and cultural elements, this study adopts a novel approach by examining the role of social support networks. These networks, inherently cultural, present a multifaceted dynamic deserving of deeper exploration regarding their influence on health-seeking behaviours. Therefore, this study aims to explore the health-seeking behaviours of rural Chinese families with older adults during the post zero-tolerance phase of the COVID-19 epidemic, considering the perspectives of migration and social support networks. This study raises the following three questions:

1. What are the perceived health-seeking behaviours of older adults and other family members for the older adults in rural China in COVID-19 epidemic?
2. How has the families' social support network affected the health-seeking behaviour for older adults?
3. What are important structural or cultural factors that affected their social support network's capacity to assist older adults?

METHODS

This study used qualitative research methods through interviews with rural families with older adults in Shangdong Village, Yizhang County, Hunan Province, China. The interviewees were recruited through purposive sampling, mainly through one of the author's (ZO) personal network to maximise the variance in their sociodemographic characteristics. The aforementioned author's family is in Shangdong Village, Yizhang County, Hunan Province, where the participants were recruited. As there is a dearth of research in this domain, qualitative research methods were employed. Given that the older adults and their children speak dialects, in-person interviews were chosen to gain insight into their circumstances. The region is characterised by relative impoverishment and a significant presence of migrant workers, which is typical. Therefore, purposive sampling was used to ensure the sample included families with at least one child who had migrated to urban cities. The interviewees are mainly adult children of older adults, a few grandchildren of older adults and a few older adults. The semistructure interview outline was developed by the research team, which included academics from both China and The USA. Interview questions focus on the basic information of the families, medical resources in rural areas, health-seeking behaviour before and during the epidemic. Interview outline is provided in table 1. The survey was pilot tested and relatively minor changes were made based on the feedback.

The first author has over 15 years of research experience in the field of qualitative research. ZO was trained by the first author in the process of conducting interviews in an ethical and professional manner. FS and DVO have more than 15 years research experience in the field of ageing. As noted above, all members of the author team have extensive experience conducting qualitative research.

Patient and public partnership

No patient and the public were involved.

Procedure

The screening criteria for participants are that there must be at least one older adult aged 60 years and above in the family (According to the definition of Chinese Ministry of Human Resources and Social Security, an older adult refers to individuals aged 60 and above). Initially, 22 interviewees families were reached out, and after screening, 20 interviewees families who met the requirements were selected. When we interviewed 16 families, we observed that little new information emerged, leading us to suspect that interviewing 20 families was sufficient to reach data saturation. If it was convenient to meet, one of the female authors, ZO, conducted a face-to-face interview at their home. If it was not convenient to meet, the author conducted an online interview through WeChat. Before the interview, the author sent the informed consent form to the interviewees and obtained their consent. Interviewees were informed of the study purpose and their rights as research participants. The author's interviews with each family lasted about an hour, including interviews with their children, grandchildren and older adults. The author conducted an interview only one time. We implemented the following measures to ensure the interviews were least influenced by any third party. We invited family members who were most familiar with the older adult's situation to participate in the interviews. During these interviews, we emphasised confidentiality to

Table 1 Questions in the interview outline

Items	Main questions
Basic information	1. Quantity, age, gender, educational status, income, marital status, place of residence and health status of older adults. 2. Quantity, educational status, income, place of residence of the older adults' children.
Medical resources in the rural area	1. May I ask about the number and distribution of health clinics in your village, whether there are qualified doctors or nurses, and what is the charging situation? 2. Do you have a family doctor in your rural area? What services did they provide during the COVID-19 epidemic?
Health-seeking behaviour before epidemic	1. What medication preparation did the family make in advance before the epidemic? Through what channels do you purchase medication? 2. When preparing medication, do you specifically prepare medication for the older adults at home?
Health-seeking behaviour in the epidemic	1. What are the symptoms of the older adults infected with COVID-19? What measures had been taken? How was the effect? 2. During the epidemic, have there been any situations that the medical resources in rural areas were unable to keep up? If so, how was it resolved? 3. What is the impact of the residential distribution of extended families between urban and rural areas on your health-seeking behaviour? Have you taken the older adults to the city for medical treatment? What other factors affect older adults seeking medical treatment in cities?

ensure their willingness to provide honest responses. If multiple members including the older adult were willing to participate, they were interviewed separately to prevent any potential interference from each other. The basic information of the interviewees' families is provided in tables 2 and 3. All the interviews were recorded in audio.

Table 2 Key characteristics of interviewees

Family ID	Interviewees, n	Relationship to the older adult
A 01	2	Older adult himself/son
A 02	2	Older adult himself/granddaughter
A 03	1	Granddaughter
A 04	1	Son
A 05	1	Daughter
A 06	1	Grandson
A 07	1	Son
A 08	1	Son
A 09	1	Daughter
A 10	1	Daughter
A 11	1	Son
A 12	1	Daughter
A 13	1	Son
A 14	1	Daughter
A 15	1	Daughter
A 16	1	Son
A 17	1	Son
A 18	1	Son
A 19	1	Son
A 20	1	Daughter

Analytic approaches

After the interviews, all the audio recordings were transcribed. The first author transcribed the interview into English. Transcripts were read and analysed by the research team, which comprises the primary investigator and another author. This study used thematic analysis method to analyse the collected data and extracted three themes based on the questions raised. Directed coding was used to drive themes related to health-seeking behaviour, social support network, migration and influence factors. Two authors coded the data. The initial analysis was conducted by the first author and the second author. The third author, fluent in Mandarin and English, resolved the conflict when a discrepancy between the two initial coders arose. Among three themes developed, there are two sub themes under the first theme and three sub themes under the third theme. SPSS (V.28) software was used to compute the descriptive statistics associated with participant demographics.

We implemented several measures to ensure the rigour of our findings. First, the research team maintained an audit trail, documenting the detailed research process. This included analysing field notes alongside transcripts. The interviewer also provided her reflective thoughts, and the entire research team scrutinised the research process, coding and findings. Furthermore, when themes were established, we had the interviewer conduct member checking with five participants. All participants affirmed the major findings of the study, enhancing its credibility.

RESULTS

Participants

Among all 20 interviewee families, the old adults' age was between 64 and 90, they had 2–4 adult children. The education levels of the older adults were mostly primary school, some were middle school and only one was high

Table 3 Additional characteristics of interviewees and their older relatives

Interviewees' characteristics	Mean/SD	Frequency/%
Age (n=22)	46.5/13.28	
Sex		
Male		14/63.64%
Female		8/36.36%
Marital status		
Married		18/81.82%
Unmarried		3/13.63%
Widowed		1/4.55%
Education		
Primary school		8/36.37%
Middle school		7/31.82%
High school		0/0%
Associate degree		2/9.09%
College		5/22.72%
Residence of interviewees		
Rural area		9/40.90%
Town		10/45.45%
City		3/13.63%
Older relatives' characteristics		
Age (n=27)	72.1/8.10	
Sex		
Male		14/51.85%
Female		13/48.15%
Marital status		
Married		7/25.93%
Widowed		20/74.07%
Education		
Illiteracy		2/7.41%
Primary school		20/74.07%
Middle school		3/11.11%
High school		2/7.41%
Residence of older adults		
Rural area		27/100%
City		0/0%
Annual income (US$)		
0–2000		23/85.19%
2001–5000		4/14.89%
5001–10 000		0/0%

school. Older adults' annual income was not high, most were from US$0 to US$2000. There were 22 interviewees from 20 families. 18 families had 1 interviewee, and 2 families had 2 interviewees. The interviewees primarily consisted of adult children of older adults, alongside two grandchildren and two older adults themselves. The interviewees' education level and annual income are higher than older adults, mainly living in urban areas.

Theme 1: The health-seeking behaviour of families with older adults presents a characteristic that extended family members helped to access and complement medical resources between urban and rural areas

After the end of the zero-tolerance policy, large-scale infections with COVID-19 make medical resources scarce and unable to meet demands. The rapid development of the epidemic had left many families unable to prepare medication, coupled with a high demand for medication, resulting in a shortage or even paralysis of the entire medical system. According to the interview, it was found that in a large family, family members served as intermediaries for the distribution of medical resources between urban and rural areas. This approach facilitated the synergy between urban and rural medical resources and effectively meeting the medical needs of family members, especially older adults. The accessing to and complementarity of medical resources between urban and rural areas also showed different characteristics at distinctive stages of epidemic development. The representative statements of each subtheme are presented in table 4.

Subtheme 1: Accessing rural medical resources to meet urban needs

Interviews revealed that in the early stages of the outbreak of the epidemic after the end of zero-tolerance policy, due to the large urban population and the rapid spread of infection, urban pharmacies were out of stock soon. While information in rural areas was relatively closed and the population was relatively small, there were still some drug reserves in rural areas in the early stages. In this situation, many families met the medication needs of urban family members by purchasing and shipping medicine from village clinics and township pharmacies by their parents living in rural areas. For example, in the case of saturation in urban hospitals, some patients bring their medication back to the village health centre for injection and follow-up care after consultation in urban hospitals. Some patients with relatively less severe symptoms also choose to seek medical treatment at the village health centre or township hospital first. In this case, township hospitals and village health centres share some of the pressure for urban hospitals. Interviewees expressed:

> My sister-in-law lives in the city and didn't buy medicine. My grandparents bought medicine in the town and post it to them.

> Because there were too many patients in the city hospital at that time, the doctor suggested that we bring back the remaining two days of medication and ask the village doctor to help inject it.

Subtheme 2: Accessing urban medical resources to meet rural needs

In the accessing and complementation of urban and rural medical resources, the accessing of urban medical

Table 4 Accessing and complementarity of medical resources between urban and rural areas

Theme	Representative statements
Accessing rural medical resources to meet urban needs	1. "My sister-in-law lives in the city and didn't buy medicine. My grandparents bought medicine in the town and post it to them." (A06) 2. "Because there were too many patients in the city hospital at that time, the doctor suggested that we bring back the remaining two days of medication and ask the village doctor to help inject it." (A11) 3. "My dad's friend who works at a pharmaceutical company sent him some fever reducing medication, and my dad distributed some of the medication to his children living in the city." (A12)
Accessing urban medical resources to meet rural needs	1. "My brother, who works in Guangzhou, also mailed some antigen testing agents and fever reducing drugs to my mother." (A01) 2. "My sister-in-law took my grandmother to an old friend's community clinic in the county for getting injection." (A02) 3. "My grandparents didn't buy any medicine at the village clinic, but later my aunt who lived in the county sent them Brufen capsules." (A03) 4. "Medication was purchased by children through urban pharmacies and online channels, and then brought to older adults living in rural areas." (A08) 5. "The granddaughter of the old people purchased Brufen capsules, coldrine and other drugs from a pharmacy in Changsha city to send to the old people." (A10) 6. "My father had difficulty breathing and fainted. We quickly took him to the nearest township hospital for emergency treatment. The doctor suggested that my father be transferred, so we transferred him to the city hospital." (A20) 7. "My mother was very serious and there was no place in rural area can treat, I transferred my mother to the hospital where I live."

resources to meet rural needs played a major role, especially at the peak of the epidemic. During the peak of the epidemic, due to the scarcity of medical resources in rural areas, including reserve of medical resources, quality of medical equipment and level of medical staff, rural medical resources were far behind those in cities, resulting in rural medical resources being far from meeting the needs of rural residents. Through interviews, it can be found that if a family did not purchase medication in rural areas, they would seek relationships or other family members to buy medication in the city to meet their needs. For the older adults in the family, many of them had limited health information. Their medication was usually purchased by their children in urban pharmacies or hospitals. In seeking medical care, the older adults are vulnerable groups after the COVID-19 because of their fragile health status. Many of them had serious symptoms or even died after the infection of COVID-19. The lack of quality and supply of rural medical services makes the older adults go to urban areas for medical consultation with the help of their family members, which to a large extent makes up for the backwardness of rural medical care. For example, most interviewee expressed:

> I bought medicine for my parents.
>
> We transferred my father to city hospital.

Theme 2: Out-migrant adult children had a positive influence of facilitating the access of medical resources for older adults

The rapid development of China's economy has led to urbanisation, with many rural families experiencing the phenomenon of young children adults working in cities, older adults staying in rural areas and many grandchildren going to big cities to attend universities. Our study found that the residential distribution of extended family members in different urban and rural areas has a positive impact on the accessing of medical information, medical institutions and other medical resources.

This study found that many cold medicine, antipyretic medicine and other drugs in the COVID-19 that older adults in rural areas needed were brought back by their children or younger generation in the city pharmacy or hospital where they lived. Some interviewees said:

> My brother, who works in Guangzhou, also mailed some antigen testing agents and fever reducing drugs to my mother. Medication was purchased by children through urban pharmacies and online channels, and then brought to older adults living in rural areas.

At the same time, most older adults went to the hospital where their children lived under the leadership of their children for medical treatment. Therefore, the more family members, the greater the possibility of stepping into different places, the more access to medical resources. And the more developed the area where family members reside, the greater the possibility of obtaining high-quality medical resources. This study also found that if family members live in developed areas, older adults can also access higher-quality medical services. Children living in urban areas will take their parents to urban hospitals for medical treatment when choosing medical resources. Some interviewees said:

> My sister-in-law took my grandmother to an old friend's community clinic in the county for getting injection.

My sister-in-law took my grandmother to an old friend's community clinic in the county for getting injection.

My mother was very serious and there was no place in rural area can treat, I transferred my mother to the hospital where I live.

Theme 3: Structural and cultural factors affected the capacity of family members to assist older adults

The accessing of urban medical resources is related to the residential distribution of extended families. This study also found that this is also related to the social support network of the entire extended family for the older adults, such as the income of children, the network resources of family members in the city, the willingness of children to respect the older adults and the expectations of the older adults. The representative statements of each subtheme were presented in table 5.

Subtheme 1: The income of children

This study found that many older adults went to urban hospitals for medical treatment when they had serious symptoms after COVID-19 infection, and many of them were in the intensive care unit for treatment. This was a huge medical expenditure; few rural older adults can afford this expenditure without the support of their children. In fact, not all children have sufficient income. When their income is low, the older adults may choose to take medicine at home to save money and heal themselves. However, children may also neglect to send the older adults to the hospital in a timely manner due to their low income. After COVID-19 infection, many older adults were so serious that they needed to be hospitalised. At this time, their children's meagre income will hinder the older adults' speed of medical treatment, and even lose their lives by missing the best treatment time.

Subtheme 2: Family members' social network resources

According to the author's interview, family members' social relationship networks, including the older adults themselves and their children, have a significant impact on the quality and efficiency of medical resource acquisition in urban areas for the older adults. During COVID-19, due to the large number of infected people, many patients went to hospitals for treatment, which led to extreme strain of medical resources. During special periods with many patients and a shortage of hospital beds, not all patients can receive immediate treatment, especially hospitalisation. In this case, many families will use their family members' social network resources, usually seeking help from acquaintances in the hospital to obtain medical opportunities and hospitalisation beds.

Subtheme 3: The willingness of children's filial piety to older adults

In most families, older parents and children live separately from each other, but children still take care of parents and actively care for their physical condition and health needs. According to the interview, when the rural older adults suffer from severe symptoms of COVID-19 infection, their children almost took them to urban hospitals for treatment and care, and a large part of the medical expenses were also borne by their children. The stronger the willingness of children to show filial piety to their parents, the more emphasis they place on their parents' health-seeking behaviour. They were also more willing to use their income and network resources in the city to help parents obtain more advantageous medical resources. However, not all children could be filial and take care of their parents. Some children did not go home to visit their parents all year round due to their indifferent emotions or past conflicts and arguments with parents, nor did they care about their parents' living conditions and physical and mental health. Therefore, in this case, the older adults lacked the help of their children after they were infected with COVID-19. They could do nothing when they were seriously ill, and even no one finds and helps them for the first time after the accident of living alone.

Subtheme 4: Expectations of older adults

Participants shared that older adults had a low awareness of self-care. Many older adults always followed the principle of 'treating diseases' rather than 'preventing diseases'. Most older adults did not undergo regular physical examinations, and they only went to the hospital for physical examinations when they were uncomfortable or had other conditions. However, those older adults seeking help from their children after being infected with COVID-19 were also related to their expectations of their families, the older adults' assessment of their children's economic status, the relationship with their children, and how much trouble their illness will bring to their children. Some older adults felt that their children's financial situation was acceptable, and their children would also spend money on their disease, so they would seek help from their children. However, some older adults might have low expectations of their children due to children's meagre income, weak filial piety or maintaining family harmony. After being infected with COVID-19, they would choose to hide their diseases from their children in order not to cause trouble to their children, but also to save money and reduce internal conflicts in the family. These older adults relied more on themselves than their children economically and emotionally, and they would face more limitations and difficulties in the choice of medical resources.

DISCUSSION

This study confirmed the urban–rural dual structure of China, as addressed by previous scholars, and investigated how people access medical resources for rural older adults through private relationship networks. In the case of China's rural medical resources lagging far behind the cities, the rural older adults, as the most vulnerable group in the COVID-19 epidemic, seek health through social support networks. This social support

Table 5 Structural and cultural factors that affected the capacity of family members to assist older adults

Theme	Representative statements
The income of children	1. "After my mother's infection, she had difficulty breathing and swallowing. Then I sent my mother to the People's Hospital of Yizhang County. The doctor made a lung CT and found a small area of lung infection. The next day, the condition deteriorated rapidly. The doctor sent her directly to the ICU for rescue. The cost of hospital was shared by me and several brothers and sisters." (A17) 2. "My two younger brothers and I both have low income and can barely support our small family. My elder sister is generally responsible for the living expenses of my parents. This time, my elder sister paid most of the expenses after my mother was hospitalized with COVID-19 infection, and my younger brother and I borrowed money from friends to pay a small part of the expenses. Fortunately, the medical insurance for the hospitalization expenses was reimbursed, otherwise I don't know what to do." (A09) 3. "My brother doesn't have a fixed job. He makes a living by doing part time jobs every month. My parents usually live on subsistence allowance. A few days after COVID-19 infection, my father was in a bad situation. My brother didn't have any extra money. My father didn't go to the hospital to save money. On the fourth day, my father's condition worsened rapidly, and he was not conscious. My brother just took my father to the hospital, and after going there, I found that he had extensive white lung. Because he missed the best treatment time, my father left us forever." (A19)
Family members' social network resources	1. "My father's condition was quite serious. The doctor said he needed to be hospitalized for treatment, but initially due to limited medical resources, the hospital did not have a bed. Later, I contacted my cousin who works at the People's Hospital of Yizhang County to get a bed located in the hospital corridor for my father." (A04) 2. "After the large-scale outbreak of the epidemic, my wife entrusted a friend who worked at the county pharmacy to purchase the drugs". (A01) 3. "My mother has regular physical examinations because my younger sister works at the county traditional Chinese medicine hospital, so she values her physical health very much. During this epidemic, my father and my family only bought the necessary drugs thanks to my younger sister." (A11)
The willingness of children's filial piety to older adults	1. "My grandpa and grandma always tell their children about their physical conditions, and my sister-in-law and my mother also care about my grandpa and grandma's physical conditions. This time, my sister-in-law took them to the hospital for the first time after my grandpa and grandma were infected with COVID-19." (A02) 2. "My dad had a high fever and difficulty breathing after being infected, so I called an ambulance. When he arrived in the city, the doctor diagnosed him with a severe lung infection and a small area of white lung. That day, my dad went directly to the ICU, and we took turns taking care of him afterwards." (A13) 3. "My younger brother works in city, his wife had many conflicts and quarrels with my parents. The younger brother's family has not returned to their hometown for a long time. I am married, so I don't usually live with my father. My father fell down the night he was infected with COVID-19. At that time, my father was the only one at home. The next day, the neighbours found out and called the ambulance, at that time my father was almost exhausted. After two days of rescue at hospital, my father died." (A15)
Expectations of older adults	1. "My father had lung cancer surgery before, so his lungs were very fragile. After experiencing a low fever on the first day, my father told us about the situation. I quickly asked my sister to send my father to the First People's Hospital of Chenzhou City where I work for treatment. After two days of continuous treatment, my father still passed away." (A16) 2. "In recent years, my brother and I have been in a bad economic situation. When my mother got infected with COVID-19, she was afraid of troubling us and spending money, so she was reluctant to tell us about the high fever for two days. " (A10) 3. "Because my uncle's business has not been good in recent years, my aunt alone supports the family expenditure, and they have quarreled many times because of business and income problems. So, my grandmother seldom troubles my uncle and aunt, afraid they will quarrel again. After infection with COVID-19, she also went to the hospital to see the doctor herself." (A03)

network is a network of interpersonal relationships established by their adult children and relatives. The differences of medical resources led people to seek better medical resources outside of their residential area, but this pursuit was based on private relationship networks, rather than through public policies. Out-migration of adult children in developing countries can affect the older adult's health status in both positive and negative ways. Some studies indicated that migrant adult children had negative influence on older adults with chronic

diseases. This study explored the impact of migrant children on health-seeking behaviour for older adults with acute illnesses through COVID-19. The study found that migrant adult children use the medical resources in the urban area where they live to treat the older adults, which has a positive impact on older adults' health.

The health-seeking behaviours of adult children also influenced by other structural and cultural factors, such as income of children, family members' social network resources, the willingness of children's filial piety to older adults and expectations of older adults. The theory of health service demand believes that economic factors (including income, price of health services, etc) are important factors that affect people's health demand and access to health services. Therefore, the income of children greatly affects the affordability of medical resources for older adults in their health-seeking process. When older adults encounter major diseases and emergencies, such as hospitalisation for COVID-19 infection, they cannot afford medical expenses alone, which depends primarily on the income of their children. China is a human relationship society, and the accessing of many social resources relies on personal relationship networks. Human network resources play a more significant role in the health-seeking process of rural older adults, especially in obtaining medical resources. The values of filial piety to parents are deeply rooted in China's family cultural value system. With the changes in family structure, most older adults no longer live with their children and live a more independent life. However, many children still fulfil their responsibilities of taking care of their parents, visiting them regularly and extending a helping hand when they need it. Health-seeking behaviour of children for older adults largely depends on their filial piety. Older adults' expectations also influence their health-seeking behaviour and their children's health-seeking behaviour for them, older adults will assess children's income, finial piety to determine if they ask for help from children. This study brought a novel perspective that investigated social and cultural factors influencing social support networks that access medical resources for older adults.

The findings highlight that medical security for the older adults in rural China is seriously insufficient. The lack of medical resources in rural areas, the low income of the older adults and the insufficient medical security provided by public resources and policies to meet their needs. They largely rely on their own private social support network to obtain medical resources. Those older adults who have adult children in urban areas can help them to access medical resources, but there are also many older adults who have no child or their children cannot help them due to the structural and cultural factors. Therefore, enhancing the construction of medical resources in rural areas of China and providing better public health security for rural older adults is a very urgent and challenging task in China's medical construction. Of course, this process takes time. So, we think that managing interpersonal networks and expanding family relationships can help the older adults to access better medical resources in current rural China. For example, adult children can get to know people working in hospitals through the relationship of relatives and friends and strengthen relationships with them.

There are several limitations of the study. First, the perspectives of older adults were not systematically included. Only two families had an older adult as the interviewee, primarily due to challenges related to difficulties in hearing and language expression among this demographic. Although adult children orchestrated health-seeking for their older relatives, the inclusion of older adults' perspectives would have contributed to a more holistic view of this issue. Additionally, we adopted a purposive sampling approach, which restricted the sample's representativeness.

We believe that this study can provide a perspective for research on the health of older adults in rural China, on how to strengthen public medical resources and use existing networks to provide health services for the older adults in rural China.

CONCLUSION

This study researched the characteristics of health-seeking behaviour of families with older adults in rural areas after China ended the zero-tolerance policy for the COVID-19. The gap in medical resources between urban and rural areas make rural older adults have difficulties in accessing medical resources. The out-migrant adult children and relatives of older adults helped older adults to access better medical resources in urban areas. Families with older adults used their social support network to access better medical resources. Social support networks of families with older adults are also influenced by other structural and cultural factors. Health-seeking behaviour of families with older adults relies on private relationship resources, which make necessary task to build public health resources in rural China.

Contributors HY led research design, guided data collection, conducted data analysis and drafted the manuscript. Specifically, she guided ZO in data collection, including designing interview protocol. She co-coded the data, developed the themes with other authors and addressed the comments from the editor and reviewers. ZO conducted interviews with older adults in her hometown village through her personal network. She co-coded the data and conducted the initial analysis with HY. ZO contributed to the initial draft of the manuscript. FS was involved in data analysis, theme development, discussion writing and editing this manuscript and addressing the comments from the editor and reviewers. DVO was involved in theme development and proofreading the manuscript. HY is the guarantor and accepts full responsibility for the finished work, the conduct of the study, had access to the data and controlled the decision to publish.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Ethics approval This study involves human participants. The IRB Approval number is: FZXY2023003, IRB approval was reviewed and granted by the ethical review committee of School of Law & Public Affairs Nanjing University of Information,

Science, and Technology. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study.

ORCID iDs
Huiyu Yang http://orcid.org/0000-0003-2184-0386
Zixi Ouyang http://orcid.org/0009-0000-8851-9613
Fei Sun http://orcid.org/0000-0001-6291-1879
Daniel Velez Ortiz http://orcid.org/0000-0002-6284-1660

REFERENCES

1 Chakraborty I, Maity P. COVID-19 outbreak: Migration, effects on society, global environment and prevention. *Sci Total Environ* 2020;728:138882.
2 Singh J, Singh J. COVID-19 and its impact on society. *Electron Res J Soc Sci Human* 2020;2:5. Available: https://ssrn.com/abstract=3567837
3 China Center for Disease Control and Prevention. Pre planned research: effectiveness of COVID-19 vaccine on COVID-19 Omicron variant infection and symptoms - China, December 2022 to February 2023. 2023.
4 National Bureau of Statistics of China. *Official report of the seventh national population census*. 2021.
5 Chen Y, Yin Z, Xie Q. Suggestions to ameliorate the inequity in urban/rural allocation of healthcare resources in China. *Int J Equity Health* 2014;13:34.
6 Wang T, Zeng R. Addressing inequalities in China's health service. *Lancet* 2015;386:1441.
7 Li D, Zhou Z, Si Y, *et al*. Unequal distribution of health human resource in mainland China: what are the determinants from a comprehensive perspective? *Int J Equity Health* 2018;17:29.
8 Meng Lei, Zhao MQiang. Permanent and temporary rural–urban migration in China: evidence from field surveys. *China Econ Rev* 2018;51:228–39.
9 Hussain A, Wang Y. Rural—urban migration in China: scale, composition, pattern and deprivation. In: Wu F, Webster C, eds. *Marginalization in urban China. International political economy series*. London: Palgrave Macmillan, 2010.
10 Zhang X, Dupre ME, Qiu L, *et al*. Urban-rural differences in the association between access to healthcare and health outcomes among older adults in China. *BMC Geriatr* 2017;17:151.
11 Zhou Z, Wang C, Yang H, *et al*. Health-related quality of life and preferred health-seeking institutions among rural elderly individuals with and without chronic conditions: a population-based study in Guangdong Province, China. *Biomed Res Int* 2014;2014:192376.
12 Adhikari R, Jampaklay A, Chamratrithirong A. Impact of children's migration on health and health care-seeking behavior of elderly left behind. *BMC Public Health* 2011;11:143.
13 Liu Y, Wang J, Yan Z, *et al*. Impact of child's migration on health status and health care utilization of older parents with chronic diseases left behind in China. *BMC Public Health* 2021;21:1892.
14 Bhandari P, Ray S, Nagarajan R. Implication of adult out-migration on the health and healthcare seeking of the older parents in Indian households: an exploration. *Ageing Int* 2022;47:180–205.
15 Song Q. Aging and separation from children: The health implications of adult migration for elderly parents in rural China. *Demogr Res* 2017;37:1761–92.
16 Lu H, Wang W, Xu L, *et al*. Healthcare seeking behaviour among Chinese elderly. *Int J Health Care Qual Assur* 2017;30:248–59.
17 Wong IOL, Chan W-S, Choi S, *et al*. Moral hazard or realised access to care? Empirical observations in Hong Kong. *Health Policy* 2006;75:251–61.
18 Shi L, Zhang D. China's new rural cooperative medical scheme and underutilization of medical care among adults over 45: evidence from CHARLS pilot data. *J Rural Health* 2013;29 Suppl 1:s51–61.
19 Dong X, Chang E-S, Wong E, *et al*. Assessing the Health Needs of Chinese Older Adults: Findings from a Community-Based Participatory Research Study in Chicago's Chinatown. *J Aging Res* 2011;2010:124246.
20 Li M, Wang C. The Association Between the New Rural Cooperative Medical System and Health Care Seeking Behavior Among Middle-Aged and Older Chinese. *J Aging Soc Policy* 2017;29:168–81.
21 Cheng M, Tao L, Lian Y, *et al*. Measuring Spatial Accessibility of Urban Medical Facilities: A Case Study in Changning District of Shanghai in China. *Int J Environ Res Public Health* 2021;18:9598.
22 Pang EC, Jordan-Marsh M, Silverstein M, *et al*. Health-seeking behaviors of elderly Chinese Americans: shifts in expectations. *Gerontologist* 2003;43:864–74.
23 Liu M, Yang Y, Sun Y. Exploring Health Information Sharing Behavior Among Chinese Older Adults: A Social Support Perspective. *Health Commun* 2019;34:1824–32.
24 Todd L, Hoffman-Goetz L. A qualitative study of cancer information seeking among English-as-a-second-Language older Chinese immigrant women to canada: sources, barriers, and strategies. *J Cancer Educ* 2011;26:333–40.
25 Wu D, Li Y. Online health information seeking behaviors among Chinese elderly. *Libr Inf Sci Res* 2016;38:272–9.