A Qualitative Study of Lived Experiences of Witnessing Acute Cardiovascular and Cerebrovascular Events Among Older Adults in Mountainous Rural Areas (Postprint)

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Abstract

Background: Emergency care in mountainous areas represents a challenge in the construction of China's primary-level emergency rescue network. Rural elderly in mountainous regions, as the main resident population, exhibit high mortality and disability rates from cardiovascular and cerebrovascular emergencies. Understanding this group's authentic experiences in witnessing cardiovascular and cerebrovascular events constitutes an important supplement to research on emergency care literacy in mountainous areas.

Objective: To analyze the authentic experiences of rural elderly in mountainous areas within the context of witnessing acute cardiovascular and cerebrovascular events, with emphasis on deeply understanding their level of emergency care literacy, and to provide practical reference for primary-level public health service personnel in managing cardiovascular and cerebrovascular diseases in mountainous regions.

Methods: Using purposive sampling, rural elderly in the Zunyi mountainous area of Guizhou Province were selected as research subjects for face-to-face, semi-structured in-depth interviews conducted from January to February 2024. Directed content analysis was employed, utilizing the Knowledge-Attitude-Practice theory (KAP theory) as the analytical framework.

Results: A total of 3 themes and 8 sub-themes were identified: (1) Individual emergency knowledge and skills: severe deficiency in emergency knowledge, weak information discrimination ability, and existing need for information support. (2) Beliefs and attitudes toward rescue in emergency situations: passive response to life-saving emergencies, lack of confidence in rescue effectiveness, and numerous concerns about providing assistance. (3) Specific behaviors in

sudden situations: poor illness responsiveness and prominent problems in rescue behavior.

Conclusion: The issues of low emergency care literacy, poor treatment capability, and insufficient rescue initiative among rural elderly in mountainous areas when witnessing acute cardiovascular and cerebrovascular events are prominent. Primary-level health service organizations should prioritize efforts to enhance this group's capacity for treating acute cardiovascular and cerebrovascular diseases.

Full Text

The Real Experience of Elderly People in Rural Mountainous Areas Who Witnessed Acute Cardiovascular and Cerebrovascular Events: A Qualitative Study

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Abstract

Background: First aid in mountainous areas represents a critical challenge in constructing China's primary emergency rescue network. As the main resident population in these regions, elderly individuals in rural mountainous areas experience high mortality and disability rates from cardiovascular and cerebrovascular emergencies. Understanding this group's authentic experiences when witnessing acute cardiovascular and cerebrovascular events constitutes an important supplement to research on mountain first-aid literacy.

Objective: To analyze the real experiences of elderly rural residents when witnessing acute cardiovascular and cerebrovascular events, with particular emphasis on understanding their first-aid literacy level, thereby providing practical references for primary public health service personnel managing cardiovascular and cerebrovascular diseases in mountainous areas.

Methods: Using purposive sampling, rural elderly individuals from the Zunyi mountainous region of Guizhou Province were selected as study participants for face-to-face, semi-structured in-depth interviews conducted between January and February 2024. Directed content analysis was employed, with the Knowledge-Attitude-Practice (KAP) theory serving as the analytical framework.

Results: Three themes and eight sub-themes were identified: (1) Individual first aid knowledge and skills: serious lack of first aid knowledge, weak information screening ability, and existing need for information support. (2) Beliefs and attitudes toward rescue in emergency situations: negative response to life-saving first aid, lack of confidence in rescue effectiveness, and numerous concerns about providing aid. (3) Specific behaviors in emergent situations: poor illness responsiveness and prominent problems in rescue behavior.

Conclusion: Elderly individuals in rural mountainous areas demonstrate prominent issues of low first-aid literacy, poor treatment capabilities, and insufficient initiative in rescue efforts when witnessing acute cardiovascular and cerebrovascular events. Primary health service organizations should prioritize improving this group's capacity to respond to acute cardiovascular and cerebrovascular emergencies.

Keywords: Cardiovascular diseases; Cerebrovascular diseases; Pre-hospital first aid; Rural area; Self-rescue and mutual rescue; Qualitative research

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China is a mountainous nation. Data from 2020 indicate that China's mountainous county population reached 522.97 million, accounting for approximately 40% of the national total, with an age structure resembling a dumbbell shape characterized by large proportions of elderly and left-behind children. Research on disease spectrum changes in rural China has revealed that elderly residents in mountainous rural areas, influenced by factors including long-term nutritional deficits, excessive labor, lifestyle transitions, and physical inertia, are experiencing rapidly increasing incidence of cardiovascular and cerebrovascular diseases. These conditions present with the "three highs" characteristics of high prevalence, high mortality, and high readmission rates. The Healthy China Strategy identifies improving residents' health literacy as a critical task, setting a target of 30% by 2030, with safety and first aid constituting important components. Since most acute cardiovascular and cerebrovascular events in China occur outside hospital settings, effective treatment within the critical time window is key to successful outcomes. However, due to underdeveloped emergency systems and transportation barriers in mountainous areas, hospital-based emergency care is often delayed. Moreover, victims and witnesses of acute cardiovascular and cerebrovascular events are predominantly elderly rural residents themselves. Therefore, enhancing this group's capacity to provide aid within the critical time window is crucial for reducing mortality from acute cardiovascular and cerebrovascular events in mountainous regions.

This qualitative study, framed by the Knowledge-Attitude-Practice (KAP) theory, aims to understand the authentic experiences of elderly rural residents when witnessing acute cardiovascular and cerebrovascular events. By identifying key factors influencing rescue efforts across the three KAP dimensions—knowledge, attitude/belief, and practice—this research provides a foundation for developing interventions to improve emergency response and treatment capabilities for

cardiovascular and cerebrovascular diseases among this population.

Methods

Study Participants Using purposive sampling, we selected rural elderly individuals from the Zunyi mountainous area of Guizhou Province between January and February 2024. Theoretical saturation guided sample size determination, with emphasis on representativeness and typicality. Inclusion criteria were: (1) age $\geq$ 60 years; (2) residence in mountainous rural areas for over ten years; (3) previous experience witnessing acute cardiovascular or cerebrovascular events; and (4) informed consent and voluntary participation. Exclusion criteria included: (1) terminal illness stage; and (2) inability to communicate normally. Sampling continued until data saturation was reached, ultimately including 13 elderly individuals who had witnessed acute cardiovascular or cerebrovascular events. General information about participants is presented in .

Interview Guide Development Through preliminary group discussions, research team members developed an initial interview outline centered on the three elements of KAP theory (knowledge, attitude, and practice). After refinement with assistance from local primary health workers, the final semi-structured interview guide included: (1) What is your first reaction when encountering acute cardiovascular or cerebrovascular situations (myocardial infarction/cerebral infarction/sudden fainting, etc.)? (2) What first aid knowledge (methods) do you know? (3) How and through what channels did you acquire first aid knowledge? (4) How likely do you think you are to successfully provide aid, and what are the main factors influencing rescue behavior? (5) What are your views on actively providing assistance?

Data Collection and Quality Control Face-to-face interviews were conducted through home visits. Final sample size was determined based on the information saturation principle. Research team members, accompanied by village doctors, visited participants' homes. Before interviews, they explained the purpose, assured privacy protection, obtained informed consent, and adjusted terminology according to participants' educational levels and comprehension abilities while avoiding subjective guidance. Content was supplemented and questioning strategies updated based on responses and reactions, while allowing participants to speak freely to uncover latent attitudes. Researchers simultaneously observed and documented participants' mental health status, facial expressions, tone, and gestures to supplement audio recordings and enhance depth of authentic experience exploration. Interviews were fully recorded, strictly following ethical principles of informed consent, privacy protection, and non-maleficence, with each session lasting 20-30 minutes.

Data Analysis Interview recordings were transcribed into detailed textual materials within 48 hours. Researchers transcribed recordings verbatim, repeatedly listened to audio, and retained interjections such as "um" and "ah" while

supplementing descriptions of participants' expressions when answering sensitive questions and documenting their home environments to facilitate research and analysis. Transcribed materials were coded using directed content analysis with the KAP theoretical framework: (1) The three elements of KAP theory—knowledge, attitude, and practice—served as initial coding themes; (2) Textual materials were read repeatedly, with content related to the theoretical framework marked and extracted to create new codes and categories; (3) Based on correspondence between new codes and initial theoretical themes, and similarities/differences within categories, sub-themes were identified and new themes added as needed.

Results

Three themes and eight sub-themes were identified:

Theme 1: Individual First Aid Knowledge and Skills Sub-theme 1.1: Serious Lack of First Aid Knowledge
Most participants' primary life task was crop cultivation. Limited by educational level, chronic overwork, lack of study time, and insufficient first aid education in primary healthcare, they possessed virtually no correct first aid knowledge. As P1 stated: "How would I know anything about saving people? Ask me about spraying pesticides when vegetables get bugs, and I'd know." P8 remarked: "I'm a farmer. Farmers just need to know when to plant crops. We can't even manage the lives of our crops." P9 recalled: "I saw him lying there but didn't know what to do. I thought not moving him would prevent him from dying."

Sub-theme 1.2: Weak Information Screening Ability
When encountering acute cardiovascular or cerebrovascular situations with multiple suggestions from various sources, elderly rural residents often lacked information screening capacity, resulting in delayed golden rescue time and missed optimal treatment windows. P3 described: "When my neighbor had a myocardial infarction, some suggested calling 120, but most said he just collapsed from exhaustion and needed massage. I didn't know what the situation could be." P8 admitted: "I saw on TV that pinching the philtrum works, so I tried that first. When he responded, I thought he was fine. By the time others called 120, he was already gone."

Sub-theme 1.3: Existing Need for Information Support
Some participants expressed desire for guidance from health workers to improve emergency response capabilities. P7 noted: "Our village is basically all elderly people. If the village could provide support in this area, I'd definitely be willing to participate. Learning more knowledge is always good, but our village clinic doesn't have opportunities or conditions like in cities." P10 added: "If we old folks learn a bit more, our children working outside can worry less." P11 requested: "Do you have anything simple you can teach us? Complex things I

might not be able to learn, but simple ones should be okay. If I learn something, I'll know what to do when someone in the village has an emergency."

Theme 2: Beliefs and Attitudes Toward Rescue in Emergency Situations Sub-theme 2.1: Negative Response to Life-Saving First Aid
Most interviewed elderly individuals in mountainous rural areas exhibited negative attitudes toward life-saving first aid, particularly those living alone who faced more severe psychological crises involving loneliness and feelings of worthlessness. Many believed that prolonging others' or their own lives imposed enormous burdens on families, viewing death as a form of liberation. P1 stated: "Early death or late death, it's all death. Early death means early liberation." P9 explained: "We're not like cities where you save if you can. We have no money. What can you do even if you save him? With so many expenses later, treatment can't continue." P12 expressed: "We old things don't matter. Just don't cause trouble for the children." P13 added: "After decades of labor, my body is full of diseases. The pain keeps me awake at night. Dying suddenly would end the suffering."

Sub-theme 2.2: Lack of Confidence in Rescue Effectiveness
The vast majority of participants expressed insufficient confidence in their ability to master first aid knowledge and provide correct assistance, primarily attributing this to their low educational level and lifelong physical labor. P5 stated: "Doctors can definitely save successfully, but we can't. We're not professional." P7 doubted: "How much use is just moving him around a bit?" P8 questioned: "Can I really do this just by following your instructions?" P12 explained: "You young people don't understand our situation. I haven't recognized two characters my whole life. How can I do this? Plus, I have so much farm work."

Sub-theme 2.3: Numerous Concerns About Providing Aid
Most participants reported frequent worries about legal liability and neighborhood disputes resulting from their rescue actions when witnessing acute illness. P1 feared: "I'm afraid of killing someone and going to jail." P4 worried: "I'm a bit scared afterward. If I encounter someone unreasonable, I might have to pay compensation and create trouble for myself." P12 expressed concern: "If something goes wrong with a neighbor, how can we face each other in the future?"

Theme 3: Specific Behaviors in Emergent Situations Sub-theme 3.1: Poor Illness Responsiveness
Lack of disease perception ability and insufficient judgment of conditions were primary reasons for failing to take timely rescue measures. P2 recalled: "My mind went blank at that moment. I didn't know what I could do." P7 described: "I saw him lying in the field and thought he was just tired. Then I felt something was wrong—what farmer just lies in the field? When I went over and couldn't wake him, I thought it was heatstroke and went to call someone." P9 admitted: "I saw someone lying on a motorcycle and didn't pay attention, thinking he was just resting from riding. Later, when others called 120, the person was already

gone."

Sub-theme 3.2: Prominent Problems in Rescue Behavior
Most participants' first aid measures in emergency situations contained serious errors. Their first aid knowledge was often superficial and lacked practical training, resulting in pronounced behavioral mistakes. P4 stated: "I knew I needed to press the chest, but seeing him unresponsive, I didn't know how hard to press or how deep, fearing broken ribs. I could only press gently." P6 described: "We're in a mountainous area. The ambulance is slow. Several of us could only put the person on a flatbed cart and pull him to the hospital." P7 recalled: "At first, he said he was dizzy and had a headache. The village clinic gave him an IV. While hanging there, something felt wrong. The village doctor immediately called 120 to transfer him to the hospital. They found it was a cerebral hemorrhage. Fortunately, they discovered it early and saved his life."

Discussion

3.1 Focus on Family Burden: Negative Coping with Life-Saving Among Mountain Elderly This study reveals that most elderly rural residents in mountainous areas exhibit negative psychology toward life status when witnessing others' acute cardiovascular and cerebrovascular events or considering their own potential illness. They demonstrate reluctance to increase family and children's economic and caregiving burdens due to personal illness, manifesting disease views such as "death is liberation" and "don't cause trouble for children." These elderly individuals typically position themselves within the family structure, emphasizing that personal wishes and needs are subordinate to overall family interests. In acute life-threatening situations, they exhibit extreme misinterpretation of personal obligations, with individual life willingness subordinated to family-structured duties. The left-behind status of mountainous rural elderly is an objective cause of negative life psychology. Research by Wang Xinru et al. indicates that patients may conceal their true needs and expectations out of consideration for relatives, and when effective communication is lacking, this affects expression of personal autonomy and fulfillment of needs. Johnson's research suggests that communication with others and effective self-expression are effective ways to alleviate individual psychological crises, with social support being an influencing factor of self-expression. Combined with this study, personal connection with family and society is an important factor affecting disease coping styles. The long-term left-behind status of mountainous rural elderly easily leads to psychological characteristics such as loneliness and poor sense of security, while negative psychology is also a risk factor for cardiovascular and cerebrovascular diseases. Relevant scholars have noted that this group's mental health problems are serious and deserve attention regarding their spiritual elderly care dilemmas.

Additionally, this study found that mountainous elderly have no practical concept of medical expenses, believing that cardiovascular and cerebrovascular emergency costs are extremely high and unaffordable for ordinary families—an

important subjective factor causing negative attitudes toward life-saving first aid.

3.2 Limited by Individual Literacy: Low Cardiovascular and Cerebrovascular Disease Treatment Capacity Among Mountain Elderly Elderly individuals in China's mountainous rural areas generally have low education levels, poor economic conditions, and weak health management awareness. They lack the ability to correctly screen information and provide timely assistance for cardiovascular and cerebrovascular disease prevention and treatment. Influenced by religious beliefs, geographical location, and cultural traditions, they face serious problems in scientific treatment of cardiovascular and cerebrovascular diseases. This study found that elderly rural residents in mountainous areas don't know how to handle acute cardiovascular and cerebrovascular events or handle them incorrectly. The investigation revealed that this group has poor disease perception ability, and disease perception influences individual health behaviors. In this study, the inability to associate symptoms such as sudden fainting, headache, and chest pain with acute cardiovascular and cerebrovascular diseases was the most important cause of delayed rescue. Additionally, the survey of first aid knowledge among mountainous rural elderly found that some acquired first aid knowledge from village "folk remedies" such as bloodletting or fingertip acupuncture, which lack scientific basis, or from first aid scenes in TV dramas, which lack accuracy. In summary, elderly rural residents in mountainous areas exhibit characteristics of low treatment capacity and low first aid literacy in cardiovascular and cerebrovascular emergencies. Li Jianan et al. found that rural elderly have low first aid literacy levels, related to factors including advanced age, long-term homebound status, low education level, high chronic disease prevalence, and psychological problems. Among first aid knowledge items, the correct rate for emergency call numbers was highest, while other first aid knowledge was at extremely low levels. They proposed that health behavior interventions and knowledge transmission should be implemented from multiple dimensions to improve rural elderly first aid literacy and reduce or prevent health damage from emergencies.

3.3 Constrained by Delayed Emergency Response: Mountain Elderly Rely on Internal Motivation for Time-Window First Aid Affected by underdeveloped emergency systems and transportation barriers in mountainous areas, hospital-based emergency care is often delayed. This study found that most first witnesses of rural cardiovascular and cerebrovascular emergencies are fellow villagers, and first witnesses' attitudes and beliefs are key factors affecting the timeliness and accuracy of rescue behavior. This study shows that rural elderly demonstrate poor subjective initiative when facing acute cardiovascular and cerebrovascular events, with slow response speed and low accuracy in identifying conditions. Although some elderly can relatively accurately identify emergencies, they hesitate in specific rescue behaviors due to concerns about responsibility attribution after patient death or paralysis caused by personal rescue

errors, and worry about neighborhood disputes from improper rescue actions—findings similar to multiple scholars' research results showing that mountainous rural elderly exhibit poor subjective rescue initiative when witnessing emergency situations. Additionally, this study found that mountainous rural elderly have low trust in the effectiveness of common first aid measures such as CPR, low recognition of how personal first aid actions affect disease prognosis, and most have poor confidence in their ability to master first aid knowledge and provide correct assistance. Therefore, this study suggests that first aid attitudes and beliefs among mountainous rural elderly are key supports for internal motivation. Improving this group's cardiovascular and cerebrovascular emergency treatment capacity is the foundation for correcting rescue attitudes and beliefs. During first aid education and training, besides scientific, simple, and practical knowledge dissemination, legal education on liability exemption rules for good Samaritans should be emphasized. Legal aspects of exemption from liability after failed rescue attempts should be publicized, along with intervention in villagers' life values to establish correct views on survival, death, and unexpected events. Through these actions, the psychological burden of rescue among mountainous rural elderly can be reduced, thereby promoting positive behaviors.

3.4 Limited by Regional Medical Level: Urgent Need for Primary Emergency Resource Integration and Extension Although China's mountainous areas have successfully implemented the "village connectivity" project, problems persist including wide emergency medical service jurisdictions, poor ambulance accessibility, and lack of basic first aid conditions. The primary emergency chain shows obvious disconnection between township hospitals and village clinics, with insufficient effective 下沉 (sink/downward extension) of primary emergency resources, resulting in poor cardiovascular and cerebrovascular disease control and extreme difficulty in time-window emergency rescue. The current rural emergency system still has a large gap from national health deployment requirements. Village clinics, as the fastest first aid support for mountainous elderly, are crucial for linking and extending primary emergency resources. Regarding solutions, Huang Siyu et al. proposed constructing and strengthening the "villager-village doctor" self-rescue and mutual rescue link in rural pre-hospital emergency extension research, including equipping villages with emergency supplies according to needs and improving medical regulation service institutions. Xiong Xiaofei et al. suggested introducing medical emergency volunteers to improve the out-of-hospital emergency chain. In the villager self-rescue link, improving individual first aid knowledge and skills is crucial. Fu Yaxi et al. proposed constructing resident self-rescue networks through first aid training, lectures, and other activities in research on community medical emergency system construction. This study's follow-up investigation found that some village clinics and township health centers used incentives such as free over-the-counter medications to increase participation in existing first aid education activities, but most mountainous rural elderly refused to participate due to daily farm work and certain educational require-

ments for training. Li Mingye et al. found that residents' willingness to receive first aid training is influenced by multiple factors, with perceived usefulness and perceived ease of use being most significant—meaning residents are more willing to accept training when they believe it is effective and easy to master. Therefore, this study suggests that primary health service organizations should fully utilize existing conditions such as village cultural stations, employing pictures, videos, and other forms to conduct first aid education activities based on principles of simplicity, feasibility, and easy mastery. This would promote effective 下沉 (sink/downward extension) of first aid resources, improve mountainous elderly cardiovascular and cerebrovascular treatment capacity, facilitate positive emergency responses and correct rescue within the golden time window, promote favorable disease outcomes, and reduce mortality and disability rates.

Conclusion

Mountainous areas are easily overlooked and difficult points in China's emergency medical rescue network construction. This study deeply explored the authentic experiences of elderly rural residents in mountainous areas when witnessing acute cardiovascular and cerebrovascular events, examined factors influencing rescue behavior across three dimensions—knowledge, attitude, and practice—and summarized existing problems in cardiovascular and cerebrovascular emergency treatment among this population. The findings suggest that primary health workers should focus on improving emergency disease treatment capacity among mountainous rural elderly, enhancing their internal motivation for rescue, and promoting effective 下沉 (sink/downward extension) of medical resources such as education and equipment to link and extend the primary emergency chain. These measures would protect the life rescue rights of mountainous rural elderly and improve primary emergency efficiency.

Author Contributions: KONG Xiaoqian proposed the research topic and objectives, designed the study, conducted the research, and wrote the manuscript; WANG Jingyi and WANG Li conducted interviews and organized data; MAO Ting and XIA Wenjing assisted with interviews and supervised research rigor; SHI YAN provided research conditions and conducted quality control and review of the article.

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Note: Figure translations are in progress. See original paper for figures.