

Understanding the health-seeking behaviours in primary care settings among cardiometabolic disease (CMD) patients in rural China: a mixed-method study protocol

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Abstract

Each year, more than 20 million people died from diabetes, stroke, and other cardiometabolic diseases (CMD). Today, three-fourths of these deaths occurred in low- and middle-income countries (LMICs). Although more than one-fourth of CMD patients live in China, this significant burden has disproportionately affected patients living in its rural areas. The past primary healthcare reforms in China, have failed to change rural CMD patient's health-seeking behaviours and health outcomes. Compared to a rich body of literature focusing on the barriers related to health delivery system and governance, the barriers related to patients' behavioural factors such as attitudes, beliefs, and mental models towards primary care have not been explored in depth. Therefore, this project aims to understand how complex social, institutional, and cultural factors can shape patients' mental models and influence their health-seeking behaviours with respect to CMD in rural China. We will conduct a mixed-method study in three counties in Eastern, Central, and Western China. For the quantitative component, we will collect variables on patients' mental models, socioeconomic/health status, clinical indicators, and health-seeking behaviours. For the qualitative component, we will explore patients' perceptions in their care-seeking journey previous health-seeking experiences, their personal life history, and the features of local primary care settings. Based on both qualitative and quantitative results, we will create a patient journey map. This map will describe how mental models affect different touchpoints while patients navigate through in their care journeys. In this way, we could identify the key barriers and facilitators in their decision-making process. Our findings will also help to improve CMD care practice for researchers, clinicians, and policy makers. Ultimately, our findings will lead to a better quality of life for patients who are living with CMDs in China and other LMICs.

Keywords:

Cardiometabolic disease, health-seeking behaviour, mental model, rural health, mixed-method study

Background

Cardiometabolic disease (CMD) is a group of complex metabolic dysfunctions, including hypertension, diabetes, stroke, and coronary heart disease^{1 2}. The burden of CMD has increased dramatically around the world in the past three decades³. This significant burden has disproportionately affected patients living in rural China: in 2019, more than one-fourth of CMD patients globally live in China. Compared to urban areas, the case fatality rates in rural China are much higher (323.3‰ vs 277.9‰)⁴⁻⁸. Given the significant challenges of CMD in China, there is a call to move away from the hospital-based system toward an integrated primary care-based health system⁹⁻¹³. Although China's new healthcare reform, initiated in 2009, has made massive efforts to strengthen its primary care system and promote CMD management, many empirical studies have demonstrated that underuse of primary care facilities are still common in rural China¹⁴⁻²⁰ and the awareness²¹, treatment^{22 23}, and control of CMDs^{24 25} remain poor. Compared to a rich body of literature focusing on the supply side-based barriers (e.g., health system design^{26 27} and governance^{28 29}), barriers related to patients' behavioural factors such as attitudes, beliefs, and mental models towards primary care have not been explored in depth³⁰⁻³³.

Mental models refer to common perspectives on making sense of the world shared by individuals in a given society, including categories, concepts, identities, stereotypes, and worldviews³⁴. The barriers related to mental models may affect individuals in different ways depending on their sex/gender, education, ethnicity, income, and geographical area, exacerbating existing inequities in health services and outcomes³⁵⁻³⁸. For example, rapid economic growth and urbanization in China has been accompanied by sharp rises in urban-rural inequality, which marginalized rural people in terms of healthcare access and altered their perception of the meaning of healthcare: healthcare needs are commonly seen as "burdensome" and passive attitudes have been growing towards medical services^{39 40}. However, until recently, there is little research on understanding how complex social, institutional, and cultural factors could shape patients' mental models and influence their health-seeking behaviours with respect to CMD in rural China. Uncovering these factors that can promote active health behaviours may significantly reduce health inequities in rural China as well as other rural areas in other developing countries⁴¹.

Research hypothesis

The mental models of Chinese rural CMD patients towards primary care are formed based on their social, institutional, and cultural contexts. These models lead to poor health-seeking behaviours and CMD health outcomes.

Study objectives

The aims of this study are (1) quantifying the association of CMD patients' mental model on health-seeking behaviours and health outcomes in rural China primary care settings (Quantitative, QUAN), (2) describing CMD patients' perceptions during the care-seeking journey based on social, institutional, and cultural contexts (Qualitative, QUAL). (3) developing patient journey maps to identify how patients' mental models, health-seeking behaviours, and health outcomes are formed to inform policy and clinical decision-making (Mixed).

Scientific worldview & Justification

Since research questions related to health-seeking behaviours tend to be broad and complex⁴², either QUAN or QUAL evidence could provide complete answers to these

questions. In this sense, mixed methods approach will be the best way to obtain a corroborated result⁴³.

This protocol was informed by both critical theory⁴⁴ and postpositivist paradigm⁴⁵. This study is a perfect setting for incorporating the principles of critical theory and all analyses will be stratified by gender, ethnicity, education, and income to understand how the social structural factors intersect with individual mental models and influence diverse groups of people to behave differently in relation to their health. In addition, since many of our researchers, interviewers, and staff come from top universities in China and Canada and our participants are generally more disadvantaged, outdated stereotypes assumptions, and personal biases can be important issues in our study. All team members will be required to take training (e.g., online Gender-based Analysis+ courses of the Women and Gender Equality Canada⁴⁶) and be sensitive to research stakeholders' subjectivity during the whole study process.

Methods

I will conduct a convergent mixed-method study to create an in-depth assessment of the mental models and health-seeking behaviours⁴⁷ among Chinese rural residents living with CMD from three municipal

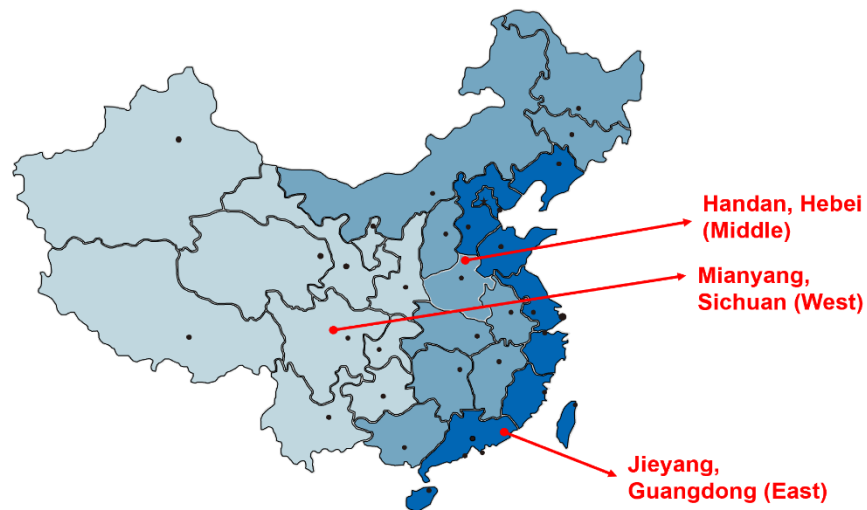


Figure 1, Field study sites selection

contrasted districts in China (Jieyang, Guangdong represents the most developed eastern coast, Handan, Hebei is in less developed central area, Mianyang, Sichuan is from the least developed western area, Figure 1). Ethics approval will be sought by both the McGill and the Peking University (PKU) Institutional Review Board.

Quantitative study (objective 1 QUAN)

I will conduct a **cross-sectional household survey & clinical assessment** among 600 participants aged 18+ with the diagnoses of CMD using stratified multistage sampling method to measure their mental models, socioeconomic/health status, and health-seeking behaviours.

Mental models will be measured by established physiological scales: (i) present bias, measured by *multiple price lists*⁴⁸; (ii) nonstandard beliefs: *contingency learning task experiments*^{49 50}; (iii) social preferences: *dictator game*^{51 52}.

Health-seeking variables will include participation in annual physical examinations, the average number of follow-up visits⁵³, the selection of health facilities, and medication adherence (measured by 8-item Morisky Medication Adherence Scale⁵⁴ and adherence to 5 healthy lifestyles: ≥ 5 fruits and vegetables/day, regular exercise >12 times/month, maintaining healthy weight, moderate alcohol consumption, and not smoking⁵⁵).

Health outcomes will include sitting blood pressure, fasting blood glucose, activities of

daily living & instrumental activities of daily living, and quality of life (measured by EuroQol- 5 Dimension⁵⁶).

According to previous literature³², other covariates will include participants' age (continuous variable), sex/gender, province of residency, marriage (married/single), occupation (agriculture/non-agriculture), education (illiterate/elementary school/middle school/high school and above), annual income (continuous variable), and other non-CMD chronic conditions.

Multivariable logistic regression (adjusted for the community clusters and potential confounders, e.g., patient sociodemographic characteristics, other chronic conditions) will also be conducted to identify the association of mental models with health-seeking behaviours and health outcomes among CMD patients in rural China. The quantitative data were analysed using Stata 14.0 (StataCorp, College Station, TX, USA).

Qualitative study (objective 2 QUAL)

I will conduct a **phenomenological study** for the qualitative part of this study. I will conduct semi-structured interviews with a purposive sample of 30 participants (including 3-5 key informant interviews and 2-3 focus group discussions, FGDs) in each province, focusing on the patients' perceptions in their care-seeking journey, their personal life history, the features of local primary care settings (social, institutional, and cultural contexts) including barriers and facilitators in accessing healthcare services.

A purposive sampling method was applied to cover different types of participants, based on their age, gender, ethnicity, education, and income. The participants were recruited by coordinators from county-level, township hospitals, and village doctors. The interviews and FGDs were conducted in a quiet meeting room or office room. A senior researcher conducted the interviews and FGDs as interviewer or facilitator, with a junior researcher as observer and notetaker. There was no other person present during the interview/FGD. All interviews and FGDs were tape-recorded with informed consent. We will transcribe the QUAL data and use a hybrid thematic analysis⁵⁷. The analytical framework will be developed based on the topic guides and emerging issues from the interviews and FGDs. The qualitative data were analysed in MAXQDA 2018 (VERBI GmbH, Berlin, German).

Integration (objective 3 Mixed)

I will integrate both QUAN & QUAL results using a joint display **mixed matrix**⁴³. Based on the matrix, I will develop patient journey maps to describe how patients' mental models, health-seeking behaviours, and health outcomes are formed as well as how to encourage patients to make autonomous decisions. All analyses will be stratified by gender, ethnicity, education, income, and province to understand how mental models influence diverse groups. When QUAN & QUAL findings contradict each other, I will consider gathering additional data, re-analyzing existing databases to resolve differences, seeking explanations from theory, or challenging the validity of the constructs⁴³.

Timeline

Our plan of action for the different project components is indicated in Figure 2.

Contribution to the advancement of knowledge

This multi-centre study will be the first to examine the impact of mental models of CMD patients' health-seeking behaviours in a rural setting of a developing country

and to explore how mental models will interact with features of primary care systems. Findings will be disseminated to national-level policy makers, clinicians, and patient/caregiver groups through the help from experienced knowledge translation specialists and knowledge brokers at the McGill translation platform as well as international conferences. The result will also have important implications for China's provincial and national health system reform by integrating patient preference and voice. The results will also help us to: 1) lay the groundwork for future cohort studies to assess the longitudinal association between social/behavioural factors and CMDs. 2) design model mental-based interventions in CMD prevention and control, which offer a realistic and transferable alternative to conventional CMD prevention approaches for other developing countries. 3) examine the role of mental models in other chronic diseases and multimorbidity.

Activities	Year 1				Year 2				Year 3			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Finalise the proposal	■	■										
Literature review	■	■										
Pilot study			■	■								
Main field study					■	■						
Data analysis							■	■	■			
Knowledge translation									■	■	■	■
Thesis writing										■	■	
Submit the final report												■

Figure 2. Project timeline