Postprint of a Qualitative Study on Training Needs for Enhancing Community General Practitioners' Decision-Making Capacity in Pharmacotherapy for Chronic Multimorbidity

Authors: Zhou Xinmei, Han Liyan, Xia Yu, Li Haixin, Luo Yuan, Qian Yi, Zhao Yang, Xu Zhijie, Zhao Yang, Xu Zhijie

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Abstract

Background Community general practitioners face numerous challenges when making pharmacotherapeutic decisions for patients with chronic multimorbidity, and enhancing their decision-making capacity through training represents an important approach to addressing these challenges. However, current research on the training needs of community general practitioners regarding pharmacotherapeutic decision-making for chronic multimorbidity remains inadequate. Objective To understand the difficulties encountered by community general practitioners in making pharmacotherapeutic decisions for chronic multimorbidity and their training needs for improving pharmacotherapeutic decision-making capabilities, thereby providing a reference basis for designing relevant training curricula. Methods From 2023-10-05 to 2023-12-21, using purposive sampling and maximum variation principle, general practitioners from community health service centers in Hangzhou, Ningbo, Jiaxing, Shenzhen, and Shanghai were recruited for in-depth interviews. The interview topics focused on the content and format needs of community general practitioners regarding training in pharmacotherapeutic decision-making for chronic multimorbidity. Interview content was independently transcribed and coded by two researchers, and content analysis was performed on the interview data. Results A total of 20 community general practitioners completed the interviews, including 15 females, with a mean age of (38.5$±$3.0) years. Based on the current problems in pharmacotherapeutic decision-making for multimorbidity faced by community general practitioners, training content should encompass four aspects: pharmacotherapeutic assessment, rational drug selection, physician-patient communication and shared decision-making, and medication education and follow-up. Regarding training format, community general practitioners were receptive to flexible

and diverse teaching approaches and showed greater appreciation for case-based training methods that integrate community healthcare needs. Conclusion Community general practitioners have explicit training needs regarding pharmacotherapeutic decision-making capabilities for chronic multimorbidity. The findings of this study can provide a theoretical reference for curriculum development and help ensure that training better aligns with the work environment and practical needs of community general practitioners.

Full Text

Training Needs of Primary Care Physicians in Medication Decision-Making for Multimorbidity: A Qualitative Research

ZHOU Xinmei[1], HAN Liyan[2], XIA Yu[3], LI Haixin[4], LUO Yuan[5], QIAN Yi[6], ZHAO Yang[7],[8], *XU Zhijie*[1]

[1]Department of General Practice, the Second Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou 310009, China
[2]Zhangqi Branch of the Longshan Hospital, Medical Health Group of Ningbo First Hospital, Cixi 315313, China
[3]Department of General Practice, Peking University Shenzhen Hospital, Shenzhen 518036, China
[4]Department of Pharmacy, the First Affiliated Hospital of Xi'an Jiaotong University, Xi'an 710061, China
[5]Hangzhou Shangcheng District Xiaoying Street Community Health Services Center, Hangzhou 310009, China
[6]School of Public Health, Hangzhou Normal University, Hangzhou 311121, China
[7]The George Institute for Global Health, University of New South Wales, Sydney 2050, Australia
[8]School of Population and Global Health, University of Melbourne, Melbourne 3010, Australia

Corresponding authors: ZHAO Yang, Researcher/Doctoral supervisor; E-mail: zhao@georgeinstitute.org.cn
XU Zhijie, Physician; E-mail: zhijiexu@zju.edu.cn

Abstract

Background: Primary care physicians in community settings face numerous challenges when making medication decisions for patients with multimorbidity. Enhancing their decision-making capabilities through training is an important way to address these challenges. However, there is a dearth of in-depth research on the training needs of primary care physicians in the context of medication decision-making for multimorbidity.

Objective: This study aims to explore the challenges physicians encounter in medication decision-making for patients with multimorbidity and their needs for training content and modalities, providing a reference for designing training courses for ability enhancement.

Methods: From October 5th to December 21st, 2023, physicians from community health care centers in Hangzhou, Ningbo, Jiaxing, Shenzhen, and Shanghai were recruited for in-depth interviews following the principle of purposive sampling and maximum variation, focusing on the content and formats of training to enhance medication decision-making abilities. Two researchers transcribed and coded the interviews independently, and content analysis was performed on the interview data.

Results: A total of 20 physicians completed the interviews, 15 were female, and the mean age was (38.5$±$3.0) years. Based on the challenges faced by primary care physicians in medication decision-making for multimorbidity, the training should cover four aspects: evaluation of medication therapy, rational selection of medication, doctor-patient communication and shared decision-making, and medication education and follow-up. In terms of training form, primary care physicians are willing to accept flexible and multiple teaching approaches and prefer case-based training that aligns with community health needs.

Conclusion: Primary care physicians have clear training needs for medication decision-making for patients with multimorbidity. The results of this study provide a theoretical reference for the development of training courses that adapt to the working environment and actual requirements of primary care physicians.

Keywords: Multimorbidity; Medication decision-making; General practitioners; Training need; Qualitative research

1. Object and Methods

This study employed a descriptive qualitative research method, which aligns with the research objective of exploring the current status and training needs of community general practitioners in medication decision-making for multimorbidity. This approach facilitates a detailed and in-depth understanding of participants' experiences and training needs regarding medication decision-making for multimorbidity, enabling exploration of the authentic circumstances of phenomena and fostering interpretive understanding through researcher-participant interaction. Prior to the study, the research protocol was approved by the Medical Ethics Committee of the Second Affiliated Hospital of Zhejiang University [Approval No.: (2023) Ethics Review Research No. (0732)]. The research report adheres to the Consolidated Criteria for Reporting Qualitative Research (COREQ): a 32-item checklist for interviews and focus groups.

1.1 Study Subjects

This study employed purposive sampling to select research participants, as this method recruits targeted potential subjects suitable for providing insights relevant to the research topic. Researchers invited general practitioners from 12 community health service centers across five regions—Hangzhou, Ningbo, Jiaxing, Shanghai, and Shenzhen—from October 5th to December 21st, 2023, to participate as interviewees. Inclusion criteria were: (1) clinical medical staff working in community health service centers or community health centers; (2) registered practice scope in general practice with attending physician rank or above; (3) cumulative working time at the current unit of no less than 3 years; (4) currently engaged in frontline clinical work; and (5) having at least 1 year of experience in family doctor contract services. Exclusion criteria were: (1) refusal to sign informed consent or inability to participate for other reasons; and (2) inability to communicate in Mandarin, which might affect transcription. Three community general practitioners declined to participate, citing "inconvenient timing" as the reason.

1.2 Development of Interview Outline

Based on previous literature, researchers initially developed an interview outline. After conducting pilot interviews with four community general practitioners and multiple discussions among team members, the formal interview outline was finalized. The questions primarily addressed the current status and training needs of community general practitioners in medication decision-making for multimorbidity patients, with key questions including: (1) How do you make medication decisions when seeing community multimorbidity patients? (2) What difficulties have you encountered in medication decision-making for multimorbidity patients, and how did you resolve them? (3) What abilities do you hope to improve in medication decision-making for multimorbidity patients? (4) What format do you prefer for training to enhance medication decision-making abilities for multimorbidity? To gain deeper and more accurate understanding of participants' views, exploratory questions were designed for each key issue. In addition to prepared questions, researchers encouraged participants to share any other relevant perspectives.

1.4 Data Analysis

Within 24 hours after each interview, the interviewer transcribed the recordings verbatim and organized notes, which were then verified by another team member. All transcripts were de-identified while noting interview time and participant codes. Transcripts were not returned to participants for revision or feedback. This study used MAXQDA 22.2.0 software for data management and analysis, employing content analysis for text analysis. The specific steps were: (1) repeatedly listening to recordings and carefully reading interview data to understand context and meaning; (2) conducting line-by-line analysis, performing initial coding on each line's statements potentially relevant to the research

questions while recording memos to facilitate in-depth thinking; (3) classifying codes according to their meanings and attributes, constructing code categories and forming themes through constant comparative method; (4) having two researchers jointly create a codebook containing code names, definitions, and typical original participant statements; and (5) continuously comparing concepts, codes, and themes during coding until no new themes or codes emerged, with codebook content finalized through multiple team discussions.

1.5 Quality Control

The research team comprised general practitioners from community health centers and general hospitals, all with experience in medication management for multimorbidity patients and previous participation in qualitative research theory training and in-depth interview practice. Two interviewers, both female general practitioners, participated throughout the interview outline design—one from a general hospital with a master's degree in general practice, and the other from a primary care institution as a current general practice master's student. Only one participant was a colleague of an interviewer; others were unfamiliar with interviewers beforehand. Interviewers emphasized reasonable use of interview techniques to promote in-depth communication. Memos and reflective journals were recorded promptly during transcription to adjust interview strategies based on progress, enhancing data accuracy and depth. Other team members verified transcription information and participated in finalizing the thematic framework. One participant from each region was randomly selected to receive the main research results via email for validation; none raised objections.

2. Results

2.1 Basic Information of Respondents

This study included 20 participants, 15 female, aged 30-46 years with a mean age of (38.5$±$3.0) years. Participant basic information is shown in , with codes GP1-20 used to protect participant identities. Interviews lasted 30-45 minutes, and no repeat interviews were conducted. Data collection ceased when information saturation was reached—that is, when participant narratives no longer added to researchers' understanding of the research topic and data analysis no longer generated new themes.

2.2.1 Theme 1: Medication Therapy Evaluation

Accurately assessing the rationality of medication regimens for multimorbidity patients constitutes the primary basis for community general practitioners' decision-making. Participants universally expressed confusion and concerns about complex interactions among multiple diseases and medications, with insufficient understanding of interactions being a significant factor causing decision-making difficulties. Some community general practitioners identified insufficient

clinical pharmacology knowledge and lack of intelligent pharmaceutical information tools as major barriers to evaluating medication rationality for multimorbidity. Consequently, most participants emphasized the importance of receiving further training to gain deeper understanding of interaction mechanisms between different diseases and medications.

"Although we're relatively familiar with common medications for hypertension and diabetes, I think we still need to learn more about adverse drug reactions and interactions. Because many patients have multiple coexisting diseases—like kidney, blood, tumor, or nervous system conditions—I'm not always clear about potential interactions between their existing medications and new ones." (GP3, female, 46 years)

"Patients use many medications, but often they're prescribed by various specialists. When they reach primary care, we don't fully understand these drugs' usage and pharmacology… Our system lacks intelligent prescription tools that would allow me to quickly assess a medication's suitability and potential interactions with other diseases or drugs during consultations." (GP12, female, 32 years)

A few participants emphasized the need to learn about identifying potentially inappropriate medications and high-risk drugs, noting that inability to accurately identify irrational prescribing relates not only to insufficient pharmacological knowledge but also to workplace constraints. For example, one doctor stated that during outpatient consultations, time pressure might lead to overlooking potential inappropriate medications among patients' numerous drugs, tending to continue existing regimens. Therefore, mastering efficient methods to identify irrational prescribing in multimorbidity patients holds important practical value for community general practitioners.

"With so many diseases and medications together, you might miss potential inappropriate prescribing. For elderly patients taking estazolam for two or three years, sometimes I don't notice I should evaluate it until they return for follow-up. Because seeing a hundred patients daily, you get accustomed to long-term patients' medications." (GP7, female, 32 years)

2.2.2 Theme 2: Rational Drug Selection

Most participants recognized that treatment evidence for single diseases might not apply to multimorbidity patients, yet acknowledged insufficient evidence-based medicine awareness in their prescribing decisions. This deficiency could lead to prescribing unnecessary medications, increasing healthcare costs and adverse drug event risks. Therefore, participants universally expressed training needs for strengthening evidence-based drug selection to master how to obtain, evaluate, and apply appropriate medications for multimorbidity patients.

"Basically, we consider single diseases when prescribing. Regarding what to note for multiple chronic diseases and polypharmacy, we haven't systematically

learned this. I feel helpless—I think we're not doing well enough in standardization, not just in primary care but also in many secondary and tertiary hospitals. For example, using aspirin for primary prevention of coronary heart disease—analyzing published community prescribing data over many years shows that users don't actually benefit much more than non-users." (GP8, female, 38 years)

Some participants mentioned limitations in providing personalized medication for multimorbidity patients. One noted that community general practitioners should not overly rely on single-disease clinical guidelines when making prescribing decisions but should combine patient conditions and personal preferences to develop individualized treatment plans.

"Our general drug usage should be fine, but we're still very insufficient in personalized medication for multimorbidity. Usually, we take a 'package' approach—if a drug seems suitable for elderly patients, we prescribe it to younger patients too, without 细分 or specifically asking about their risks. This can't be achieved by just reading guidelines, so training could strengthen this aspect." (GP18, female, 38 years)

Rapid updates in specialized medication knowledge pose challenges for community general practitioners' drug selection. One participant expressed the lifelong learning pressure faced by community general practitioners and hoped for regular training on the latest drug research findings and treatment methods to provide optimal medication regimens for patients.

"Working in primary care for a long time has a downside—knowledge keeps updating. Some treatment regimens that worked well during our internships may have been updated after many years in primary care, but without being in specialized wards, we might not know comprehensively. For example, in diabetes management, some drugs can improve cardiac and renal function and prognosis, but quite a few patients aren't using them. So I think this is indeed a challenge for general practitioners, and we hope to try optimizing medications from the perspective of achieving better prognosis." (GP12, female, 32 years)

2.2.3 Theme 3: Doctor-Patient Communication and Shared Decision-Making

When making medication decisions for multimorbidity patients, community general practitioners face challenges of inconsistent understanding with patients. Participants noted that decision-making conflicts often stem from cognitive biases regarding treatment risks and benefits. Specifically, some patients focus on immediate symptom relief or short-term clinical indicator improvement while neglecting the importance of long-term complication risk reduction; others may oppose new treatment proposals due to excessive concerns about potential negative impacts on clinical indicators. Participants believed doctors must master communication skills in shared decision-making, particularly accurately conveying long-term medication benefits and effectively addressing patient concerns.

"Just yesterday in clinic, I encountered a ninety-something grandmother who was very clear-minded despite her age. But she firmly believed in a traditional Chinese medicine she'd taken for many years, feeling it made her feel great and that she'd have insomnia and dizziness without it. When I tried to stop it, she thought I was wrong." (GP2, female, 46 years)

"If the patient's condition isn't urgent, I prioritize patient preferences. I value patient preferences but can't completely follow them if the demand isn't very reasonable. For example, some people worry excessively about medication effects on liver and kidney function, so we try to explain and guide them toward the correct treatment direction." (GP7, female, 32 years)

Due to increased treatment burden, multimorbidity patients often experience anxiety and confusion about treatment, creating difficulties for shared decision-making. One community general practitioner emphasized that when multimorbidity patients show anxiety, hesitation, and confusion, doctors should fully understand their concerns through communication and listening, provide necessary support and comfort, and build a trusting, harmonious relationship. However, participants acknowledged that mastering such communication skills is not easy and requires professional training and practice.

"Compared with single diseases, managing these patients involves more anxiety. There's also a phenomenon: the more diseases and medications patients have, the more impatient they become—they want to get better quickly, so they seek more doctors and take more medications, creating a vicious cycle." (GP6, female, 30 years)

"Some patients who previously refused to change medications suddenly become willing one day, perhaps because you happened to address their specific concerns in communication. They feel the doctor noticed their thoughts and made sense, so they're willing to try the new plan. So the doctor's communication and patient trust are quite crucial. Doctors also need to improve their communication skills—without specialized training and practice, it's hard to achieve this in outpatient settings." (GP7, female, 32 years)

2.2.4 Theme 4: Medication Education and Follow-Up

Medication education constitutes a key link in communication between community general practitioners and patients after prescribing decisions. Some participants reported that medication education often cannot be fully implemented in daily work. After prescribing medications, community general practitioners typically provide brief usage instructions without ensuring patients fully understand specific usage methods or detailed precautions. Participants believed this phenomenon might stem from insufficient awareness of medication education's importance and that community doctors need training to improve their knowledge and skills to provide comprehensive, accurate medication guidance to multimorbidity patients.

"In terms of medication education, I feel we often don't do enough. When prescribing, I'm used to telling patients how to take it—once or twice daily, before or after meals. But I think we don't explain in more detail, like what side effects the medication has or what precautions to take. Indeed, there have been cases where patients misunderstood medications or didn't take them correctly." (GP17, male, 42 years)

"We definitely do medication education, but whether we truly value it—I doubt it. Patients might use medications incorrectly or not follow prescriptions because we haven't given them sufficient, correct information. This actually requires practice. I think we need training to improve these skills." (GP18, female, 38 years)

Developing and implementing follow-up plans for multimorbidity patients before concluding consultations is important for medication decision-making, a point universally recognized by participants. However, some noted that doctors often lack initiative in following up multimorbidity patients' medication situations, relying more on patients' regular return visits. Participants proposed various methods for following up multimorbidity patients but expressed confusion about how to develop reasonable follow-up plans.

"We rarely do medication follow-up because for hypertension and diabetes, there's a follow-up list where names appear daily in an interface, allowing us to check their blood pressure and glucose. But for other diseases, there's no good patient inquiry pathway or reminder function, and I haven't established such a roster, so there's little active follow-up—basically none." (GP7, female, 32 years)

"I have about 1,100 to 1,200 contracted patients. I've made medication adjustments through outpatient visits, community health education sessions (half a day weekly), home visits, and family bed visits… These are done regularly, but during outpatient visits, I generally don't clearly explain the follow-up plan to patients—what to do next isn't particularly well-planned." (GP8, female, 38 years)

2.2.5 Theme 5: Various Forms of Training Based on Community Needs

Participants suggested that when designing multimorbidity medication decision-making courses, special attention should be paid to common decision-making challenges in community outpatient settings. The disease spectrum faced by community health institutions differs from secondary and tertiary hospitals, and resources for medications and examinations are relatively limited. Therefore, community general practitioners prefer training content that closely integrates with community outpatient work environments and actual medical conditions while providing practical solutions.

"I focus on treatment plans adaptable to primary care. Actually, have you

noticed that even our industry guidelines don't explain medication usage thoroughly enough? You can't just tell me about the latest achievements from big hospitals or the latest treatment plans for special diseases—that's unrealistic and meaningless for primary care." (GP17, male, 42 years)

Regarding deficiencies in rational medication knowledge, some participants proposed using expert lectures to organize and supplement background knowledge needed for medication decision-making, helping them quickly grasp key medical information. However, most participants favored case-based training methods, believing case teaching not only provides actual clinical contexts for deeper understanding of how theoretical knowledge applies to real decisions but also promotes reflective learning.

"Case workshops are good—addressing specific problems with specific solutions. I think this might be better because empty talk can't capture attention. With an actual case, everyone can think about how they'd handle it, then see how experts handle it, fill knowledge gaps, and notice details they missed for future reference." (GP3, female, 46 years)

A few participants suggested online teaching as an effective and flexible training method, allowing community general practitioners to learn according to their own schedules without traditional face-to-training time and location constraints, thereby improving learning participation and effectiveness.

"If there's continuous communication, I think this online teaching format is more needed. Otherwise, taking special leave to attend training, you forget what was taught afterward, and you can't draw experience from the course when problems arise later." (GP6, female, 30 years)

Discussion

This study reveals that community general practitioners face challenges in both internal capability limitations and external environments when making medication decisions for multimorbidity patients. Their training needs encompass multiple aspects including medication therapy evaluation, rational drug selection, doctor-patient communication and shared decision-making, and medication education and follow-up—key content areas for future training course development. For training formats, case-based teaching and online instruction are recommended as flexible, diverse approaches to suit community general practitioners' work environments and practical needs.

This study first reveals challenges community general practitioners face in evaluating medication therapy for multimorbidity patients, including insufficient understanding of complex drug-disease interactions and clinical pharmacology knowledge, particularly lacking intelligent pharmaceutical information tools. Under adverse working conditions like time pressure, their decision-making quality is negatively affected. These findings align with Anthierens et al.'s study, which similarly found general practitioners' widespread knowledge gaps in un-

derstanding multiple medication interactions. Tsiga et al. noted that in time-pressured clinical environments, clinicians tend to reduce symptom assessment, decrease completeness of clinical examinations, and reduce medical recommendations, adversely affecting medication decision-making for multimorbidity patients.

Second, this study also found that rationally applying evidence-based medicine to personalized medication for multimorbidity patients represents a capability "shortage" for community general practitioners. Currently, community practice lacks standardization in medication use, and deeper consideration of individualized treatment principles is needed when applying evidence-based medicine to community clinical practice. Given this, future training programs should focus on enhancing community general practitioners' awareness of evidence-based medicine, guiding them on how to effectively obtain and apply new guidelines and drug research findings to optimize medication regimens for multimorbidity patients.

This study emphasizes the importance of community general practitioners effectively using communication skills in multimorbidity medication decision-making. Multimorbidity patients' insufficient understanding of long-term treatment benefits and potential risks may cause disagreements with general practitioners, consistent with literature on patients' varying understanding and acceptance of medical information. Specifically, patients may overemphasize immediate symptom relief while failing to fully recognize the importance of long-term complication risk reduction. In this context, doctors need to effectively guide patients to understand treatment plan scientificity while respecting personal preferences. Numerous studies show that clinical doctors' effective communication skills can build doctor-patient trust, alleviate patient anxiety, and promote shared decision-making, crucial for improving treatment adherence and experience. Future training programs should emphasize improving community general practitioners' communication abilities, including: how to guide patients in making wise medication choices by combining personal preferences with medical evidence; how to identify and manage patient anxiety and confusion; and how to achieve "patient-centered" care through establishing solid doctor-patient trust relationships.

Regarding medication education and follow-up, results suggest community general practitioners' medication instructions are often too brief, failing to provide adequate guidance, potentially causing patient misunderstanding or poor adherence. Meanwhile, although participants recognized the importance of developing follow-up plans for multimorbidity medication management, they lacked initiative in practice, relying on patient return visits rather than planned follow-up. These issues may relate to insufficient awareness of medication therapy monitoring and lack of effective follow-up management tools. Future training courses should emphasize improving community general practitioners' quality and frequency of medication education and developing and executing effective follow-up plans, including how to use existing technologies and resources such

as mobile apps to track patient medication use or how to write and publish popular science articles on rational medication use through online channels to improve education and follow-up efficiency.

This study's results emphasize community general practitioners' specific training needs for multimorbidity medication decision-making, showing preference for practical, targeted training content and flexible, diverse formats like case-based teaching and online instruction. Case-based teaching is favored by clinicians for integrating theoretical knowledge with clinical practice, providing actual clinical contexts, and promoting reflective learning. This study shows that workshops based on multimorbidity patient medication cases may capture community general practitioners' attention, helping them identify knowledge gaps and learn from experience. Previous research indicates that students using problem-based learning demonstrate better actual prescribing abilities than traditional methods like lectures and written exams. Additionally, online teaching is advocated as a flexible training method unconstrained by time and location, facilitating community general practitioners' active participation and continuous training. Therefore, when constructing training courses, appropriate formats should be selected based on different teaching content, fully considering community general practitioners' clinical work characteristics to ensure training acceptability, feasibility, and effectiveness.

This study has limitations requiring attention in future research. First, community general practitioners' training needs for multimorbidity medication decision-making may vary by work environment and region. Although this study followed maximum variation sampling across multiple regions, the sample concentrated in economically developed coastal areas, potentially limiting generalizability. Second, this study limited participants to community general practitioners with over 5 years of practice. This experienced group may have more mature and in-depth understanding of multimorbidity medication decision-making, meaning results may not fully reflect training needs differences among less experienced practitioners. Future research will use cross-sectional surveys to obtain broader, more representative data to more accurately validate community general practitioners' training needs.

Conclusion

Community general practitioners face challenges of insufficient capabilities and external environments when making medication decisions for multimorbidity patients. Their training needs cover medication therapy evaluation, rational drug selection, doctor-patient communication and shared decision-making, and medication education and follow-up—key content for future training course development. Training formats should prioritize case-based teaching and online instruction to adapt to community general practitioners' work environments and practical needs.

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search objectives and were responsible for study conception and design; ZHOU Xinmei, HAN Liyan, and LUO Yuan were responsible for interview outline design and overall implementation; ZHOU Xinmei and XIA Yu were responsible for data analysis and manuscript writing; LI Haixin and QIAN Yi participated in interview outline and coding results discussions and revised the manuscript; ZHAO Yang and XU Zhijie conducted manuscript revision and quality control review, bearing overall responsibility for the article.

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ORCID IDs:
ZHOU Xinmei: https://orcid.org/0009-0009-1364-3316
HAN Liyan: https://orcid.org/0009-0008-1052-105X
XIA Yu: https://orcid.org/0009-0003-8837-1139
LI Haixin: https://orcid.org/0009-0008-1052-105X
LUO Yuan: https://orcid.org/0009-0009-6971-5497
QIAN Yi: https://orcid.org/0000-0002-1898-2458
ZHAO Yang: https://orcid.org/0000-0002-6011-5948
XU Zhijie: https://orcid.org/0000-0003-4824-6176

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