

Depression: Improving Health Processes and Outcomes Through Implementation Science Research in China

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Keywords: Implementation science, major depression, mental health, China

Posted Date: October 26th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-96291/v1>

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Abstract

Despite widespread recognition of the importance of mental health, services for assessment and treatment, in the People's Republic of China, cannot currently meet the need. In this paper, we discuss the challenges associated with developing and validating evidence-based approaches to depression, including inertia and the need for culturally valued research. The potential role of implementation science is discussed in relation to the need for assessment and treatment of depression, and a recent initiative to fund and foster implementation research is detailed. The potential values of implementation research are highlighted, and several examples of projects are described to detail the scope of such work. We conclude with recommendations for further improvements of funding for mental health research in China. While we recognize several challenges to this initiative, we recommend further implementation science research to help meet the social need of mental health problems.

Introduction

Mental illnesses are one of the most prevalent global health conditions.[1,2] Depression, estimated to affect over 300 million people worldwide, is a mental disorder that is a leading cause of disability and .[2] Depression is a mental disorder with potentially severe impact on functionality.[3,4] As specified in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5),[7] major depressive disorder (MDD) is characterized by persistent low mood or loss of interest in usual activities more days than not, for a duration of at least two weeks, along with other symptoms. Depression affects one's social and interpersonal relationships, cognitive functioning as well as self-image[5,7] and is associated with increased mortality risk from suicide.[6,7] When expressed in terms of disability-adjusted life years (DALYS), a summary measure of health that includes the sum of years of life lost (YLL) and years of life lived with disability (YLD),[8] mental illness accounts for 13% of DALYs and 32.4% of YLDs with higher estimates in women.[1,9] MDD alone is estimated to account for 2.5% of global DALYs, with significant occupational and economic impact.[9,10] Worldwide, depression contributes significantly to the global economic burden of disease.[2,11,12]

A range of biological, psychological, social, cultural, and environmental factors explain the onset of depression.[6,7] Significant among the social determinants of mental illness are poverty and discrimination.[13] The adverse impact of social determinants of health is higher in low-and middle-income countries (LMICs) which accounts for an average of 80% of the people affected by mental disorders and addictions.[14] The degree and frequency of adverse social determinants account for most health inequities that exist amongst countries.[13] Although China is currently considered an upper-middle income country[15] due to significant recent economic growth, in past decades it was classified as a middle-income country.¹⁶ Further, disparities remain among different geographic regions in China.[17]

In this paper, we detail the burden of MDD in China, identify evidence-informed strategies and their role in reducing the burden of MDD, and discuss the clinical inertia that precludes China and many other countries from delivering optimal mental health care services. We examine the role of implementation

science research in accelerating the uptake of evidence-informed strategies to reduce the burden of MDD. We conclude by outlining the current state of implementation science research in China.

Major Depressive Disorders: China's Perspective

Mental disorders are prevalent in China, where the population exceeds 1.36 billion inhabitants.[18] In a sample of 63,004 adults selected from 96 urban and 267 rural primary sampling sites in four Chinese provinces – Shandong, Qingdao, Zhejiang, and Qinghai – 6% (n=1034) were diagnosed with MDD.[19] The prevalence of any mental disorder was 17.5% (95% CI 16.6–18.5) with mood disorders being more prevalent in women, adults 40-years and older, and rural residents.[19] An estimated 158 million Chinese people were in need of psychiatric services, which they never received¹⁹ due to a shortage of relevant staffing resources.[20] Staffing resources, however, are scarce in rural and densely populated areas; rural areas account for two thirds of China's overall population.[20] As depression is associated with mortality, suicide is a leading cause of death especially among those aged 15-34 in China, accounting for 19% of deaths in this age group.[21] Consistent with global data, the economic burden of mental illness and addictions in adults is high in China. The approximate annual cost of mental illness was 88.8 billion USD in 2013.[22] Addictions and medical co-morbidities further add to the economic burden.[22,23]

To be responsive to these mental health needs and challenges, the government and local Chinese authorities are working together to “optimize service systems, prioritize the treatment and management of patients, and safeguard social harmony”.[24 p.5] The 2015-2020 National Mental Health Work Health Plan aims to establish a universally integrated mental health care service and network.[24] This Mental Health Work Plan includes improving social context of mental health and illness in China.[24] Awareness of mental health issues in China is limited, though slowly changing.[25] The Mental Health Law bill, passed in 2012, supports efforts to increase awareness about mental health in multiple settings (schools, universities, and workplaces).[25] The lack of knowledge surrounding mental health is compounded by negative attitudes towards mental illness. Although the stigma towards mental illness has been associated with outcomes such as secrecy, isolation or withdrawal, and lost opportunity for work, not all individuals with mental illness experience discrimination.[26] A recent article in the *Economist* [27] reports an increase in outpatient visits among Chinese with mental illness and use of internet resources to tackle mental health issues among younger educated urbanites.

Efficacious Interventions: Reducing The Burden Of Depression

MDD and its common comorbid conditions (e.g., anxiety) reduce interpersonal and occupational functionality and quality of life. Furthermore, MDD increases suicide risk especially when comorbid mental disorders and depression remain untreated.[28,29] Given these issues, there is a need for evidence-informed and cost-effective interventions, and in particular strategies that reduce symptoms and improve functional abilities. Such interventions benefit patients with MDD, patients' families, as well as diverse, key stakeholders whose priority remains service efficacy and cost-effectiveness.[30]

Various interventions exist for the treatment of depressive disorders. Common treatments include psychotherapy, medication, and their combination. First-line psychological treatments for acute MDD include Cognitive Behaviour Therapy (CBT), Interpersonal Therapy (IPT), and Behavioural Activation (BA). [31] CBT is efficacious in both acute depression [31-33] as well as severe depression MDD. [31,34-36] CBT is a practical problem-solving approach to treatment, which enables individuals to monitor and modify negative interpretations (e.g., thoughts, beliefs, and attitudes) and behaviors that perpetuate these negative interpretations. [37] The effectiveness of CBT in managing mild and moderate depression is well established and comparable to pharmacological treatment. [38] Mindfulness-based CBT (MBCBT) is a brief intervention that combines CBT and attentiveness to the present-moment without judgement. MBCBT has also been shown to yield a medium effect size in symptom reduction. [39] A common treatment strategy for severe and/or chronic depression is the combination of medication with a psychotherapeutic intervention. [2] Patient preferences, as well as clinician resource capacity are considered determining factors for treatment strategies for severe depression. [31] The cost of mental health treatment is significantly lower than the economic burden resulting from inadequate or no treatment. [40] Effective interventions represent a positive investment from both individual and societal perspectives. [40,41] A necessary requirement is for these interventions to be integrated within primary health care programmes using evidence-informed practices such as stepped care approach. [42,43] Moreover, program goals must aim to achieve mental health indicators within sustainable development goals such as ending poverty, protecting the planet, and ensuring health of all people. [44]

Challenges To Evidence-informed Practice: Clinical Inertia

Mental health services in China are typically hospital-based. There are, however, significant inequities in the allocation of resources and consequent capacity to provide specialized mental health care services among hospitals in cities and provinces. [45] Moreover, given the demand for mental health services, the approach to care and clinical decision-making is primarily influenced by the need to increase patient flow, rather than being evidence-informed. [45] The failure to utilize evidence-informed interventions, sometimes referred to as clinical inertia, [46] is influenced by both service providers [47] and patient related factors. [46,48-50] Provider-related factors include inadequate resources and lack of mental health knowledge. For example, stigma towards mental illness on the part of clinicians [51] and policy makers leads to inadequate funding of mental health services, [52] and contributes to clinical inertia which yield poor outcomes for affected individuals. [53] Patient-related factors such poor access, [52] negative help-seeking attitudes, [19,54] and low mental health literacy are well-documented as a significant contributor to poor mental health outcomes particularly in LMICs. [55,56] Furthermore, poor mental health literacy and stigma may be associated with to low mental illness recognition in China, [57-59] which both hinders early intervention [60,61] and contributes to the chronicity of the illness. [58-62]

Implementation Science Research

Implementation science is concerned with identification and uptake of evidence-informed strategies into routine health care, with the goals of improving the quality of health care services and effecting positive outcomes for patients, families, and communities.[63,64] Implementation science differs from quality improvement initiatives in that the explicit goal of implementation science is to promote the utilization of evidence-informed practices through the critical examination of behaviours and factors that affect the use of these practices.[63,64] Implementation science research examines the effectiveness of the evidence-informed strategies in context (i.e., real-world settings and population),[65] and provides an opportunity to systematically examine the organizational social context that promotes or hinders the integration of mental health services into primary care.[66] This examination is often complex, as organization contexts are affected by culture and climate,[67] structures and processes (e.g., policies, procedures, governance), extant knowledge, and technologies (e.g., built environment, equipment, tool kits, resources) that promote the integration of mental health services.[66] Overall, the emphasis of implementation science research is to remove barriers to services, and to adapt treatment protocols to local context, with the ultimate goals of maximizing patient treatment outcomes.[49]

Explanatory models of illness differ in various cultures, and are an important aspect of cross-cultural psychiatry.[68-71] Health is often socially constructed,[72] and so different ethnic groups may vary in their understanding of mental health symptoms, perceived causes, severity and treatment.[73] Depression is typically viewed in the Chinese culture as a physical health disorder, rather than a mental health problem. [57-59,74] This conceptualization influences the understanding,[75] presentation[76] and disclosure[77] of depressive symptoms and behavior.[78] These considerations demand a culturally sensitive interpretation of research findings and contextual understanding of the patient, and their role in the treatment journey. For example, in pediatric primary care settings, culture influences the uptake of mental health services more so than context.[66] Implementation science research enables us to understand how to better adapt interventions for depressive disorders based on these considerations, to determine “what works, how and why,”[65 p.2] as well as to examine the efficacy of these approaches in promoting research uptake.[65]

Both patients and health care providers can influence the implementation of evidence-informed practices in predictable and unpredictable ways.[79] Behavioral expectations in primary care are guided by values and norms shared by health care practitioners.[66,67] These expectations determine how work is done and the organizational culture which in turn influences both experiences and general well-being of the health care practitioner.[66,67,80] Implementation science research enables an understanding of the complex systems that can contribute to the effective delivery of direct mental health services, and can guide multi-level interventions to organize effective mental health services within primary care and specialized care settings. ‘Fit’, which is the basis of implementation science research “addresses the application of interventions in ‘real world’ settings with the view to understanding what works, how and why, in specific context, and testing approaches to improve their implementation and effective uptake [2].”[65 p.1] Implementation science concerns itself with the goal of “‘intention to reach’, rather than ‘intention to treat’”,[65 p. 2] to maximize the impact of evidence-informed practices on population health.⁶⁵ Mixed-methods research designs (e.g., integrating quantitative and qualitative data, methods,

and/or methodologies) provide an opportunity to expose convergent and divergent findings related to organizational social context (e.g., cultural diversity, distrust, and affect) within the health care system thus has been recommended for implementation science research.[67] Implementation science research is further guided by methodological approaches that are participatory or involve co-creating implementation strategies, as these approaches permit adaptations to the changing context, involve patients, health care providers and policy makers, and promote continuous improvement implementation strategies to ensure sustainability.[65]

Implementation Science Research In China

Implementation science research is a relatively new field in China. The Global Alliance for Chronic Diseases (GACD) held the first GACD Implementation Science Workshop in Xi-an, China in 2014.[81] In 2016, the National Natural Science Foundation of China (NSFC) proposed the application of an implementation science framework to address mental illness. A call for proposals was issued jointly by the Canadian Institutes of Health Research (CIHR) and NSFC as part of the GACD research program to encourage scientists from Canada and China to collaborate on implementation research projects related to mental health and dementia.[82] The GACD mental health program, supported by both CIHR and NSFC, aims to enhance international cooperation through the inclusion of multi-dimensional and interdisciplinary research, ranging from the basic sciences to public health to policy. The program further aims to encourage growth of implementation research, the development of interventions and management of mental health and dementia, as well as to promote academic exchange and knowledge sharing.

Seven projects were funded by the GACD mental health program. The current authors are conducting one of the GACD projects in Anhui province, China. The two co-PIs of the “Screening and management of perinatal depression within the primary care system” project are Professor Fangbiao Tao of Anhui Medical University and Professor Shahirose Premji of York University, Canada, and they are supported by large teams of other health professionals and researchers. This project involves the development and deployment of a screening protocol for perinatal depression in women, and a stepped care program based on cognitive-behavioral therapy principles and methods. Ethics approval has been attained in three Canadian universities where major collaborators work (York University, the University of Calgary, the University of Alberta), as well as Anhui Medical University in China. The project has used models developed in the West but these have been significantly adapted to the cultural issues and health care system in China. As such, the suggestions in Table 1 reflect the combined suggestions of that team, with respect to the process of international implementation science projects. Although these comments no doubt reflect the exigencies and details of the current project, and they must be considered as iterative, in that they the issues need to be continually visited and revisited, are offered here as they are likely generalizable to other projects. The results of this study, coupled with research from other countries, strongly suggests that a quality improvement approach that incorporates PDSA cycles can help local health authorities make context-specific, evidence-informed decisions to improve uptake of health services.

Limited work has been published on implementation science research in China.[83] For example, the Liangshan Yi Autonomous Prefecture in Sichuan Province has one of the highest prevalence rates of HIV in China, and the prevention of HIV transmission from mothers to children is a critical health care concern. This study tested a model that enabled clans and health providers to increase antenatal care attendance in rural minority areas of China with high HIV prevalence. Formative research determined barriers and facilitators to antenatal care use. Implementation of the new strategy was done through three plan-do-study-act (PDSA) cycles. After the intervention, the proportion of post-partum women who used any antenatal care increased from 21.3% to 64.5% ($p < 0.001$), and the proportion who knew about the necessity of antenatal care increased from 77.8% to 89.8% ($p < 0.001$).[83] Involving clans in rural minority areas of China had a significant positive impact on antenatal care use.

The results of this study, coupled with research from other countries, strongly suggests that a quality improvement approach that incorporates PDSA cycles can help local health authorities make context-specific, evidence-informed decisions to improve uptake of health services. As the seven projects identified above are implemented and evaluated across China, this will yield further insight regarding implementation science research. While not all projects will necessarily be as successful as that in Liangshan Prefecture, findings will promote better understanding of implementation research theories and methods in China, and potentially generate significant improvements in health care and health outcomes.

Implementation science research will likely face some challenges in China. These challenges include the system factors such as insufficient mental health workers compared to the magnitude of population needs and the availability and quality of non-hospital-based community health services. As noted above, however, implementation science research has the potential to identify effective interventions through an iterative research and knowledge exchange process. This approach will also help identify and strengthen implementation platforms for these interventions at multiple levels, such as communities, primary health centers, and medical institutions. These developments can significantly improve the scope and quality of health care throughout China and contribute to the science of global mental health more broadly.

Declarations

Ethics Approval

Ethics approval has been attained in three Canadian universities where major collaborators work (York University, the University of Calgary, the University of Alberta), as well as Anhui Medical University in China. All participants provide free and informed consent for their involvement in the project.

Consent for publication

Not applicable.

Availability of data and materials

Not applicable.

Competing interests

None.

Funding

Canadian Institutes of Health Research

National Natural Science Foundation of China

Authors' contributions

Shahirose Premji, Project co PI and study design

Fangbiao Tao, Project co PI and study design

Laura Loli-Dano, Arun Ravindran, Beibei Zhu, Xiaoyan Wu, Mengjuan Lu, Shanshan Shao, Shelby Yamamoto- All are project collaborators and helped developed Table 1, and reviewed the manuscript.

Keith S. Dobson- Project collaborators, coauthor, corresponding author

All authors reviewed and approved the final manuscript.

Acknowledgements

We express our sincere appreciation to the following members of the Global Alliance for Chronic Diseases Canada-China Depression Research Teams Kenneth Fung, Jill Murphy, Raymond W. Lam, Jun Chen, and Erin Michalak.

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Tables

Table 1.

Summary of issues and recommendations for international implementation science projects.

Issue	Recommendations
Team experience and knowledge	Ensure team members understand key elements of implementation science; educate if needed
	Encourage regular team meetings with broad attendance; keep minutes of meetings and circulate broadly
	Ensure presence of language and cultural brokers in all countries that participate in the project
	Have face to face meetings early in program development to build research team engagement; supplement with regular distance meetings as required
Project logistics	Consider different funding models for research in the funding countries, and what program aspects can be funded
	Be prepared for differences in institutional policies and practices regarding ethical approvals, consents, data management, etc. and build in requisite time to meet these issues
	Anticipate and be prepared for logistical and practical delays and set-backs; address concerns promptly
Community engagement	Increase the awareness of the health issue in the society, to increase the interest and enthusiasm for both participants and health providers
	Develop both policy and funding support from all possible levels of authority to enhance project sustainability
	Recognize that priorities in the health system may not match program goals or may shift over time. Educate and engage local leaders to support the program
Implementation	Develop a “champion” within the health care system, ideally in an administrative leadership position
	Permit flexibility in program implementation; modify the program as needed after group discussion and agreement, but avoid excessive change from original program
	Engage the local health participants, to maximize program ownership and the likelihood of program uptake and continuation
	Assess long term outcomes, to promote integration of program into health system and services