

Research Article

Examining the Shortcomings of Public Health Knowledge and Skills among Chinese Clinicians: A Deep Interview and Focus Group Study

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Abstract

Context: The recognition of the importance of public health knowledge and skills among clinicians has grown significantly in recent years, as they play a crucial role in identifying, preventing, and controlling infectious diseases, chronic illnesses, and health disparities within communities. However, the adequacy of public health training and experience among Chinese clinicians remains a topic of debate, with studies suggesting insufficiencies in their knowledge and skills. This study aims to explore the shortcomings of public health knowledge and skills among Chinese clinicians and provide insights to enhance their training and practice.

Objectives: This qualitative study seeks to identify gaps in public health knowledge and skills among Chinese clinicians, understand their perspectives on training and continuing education needs, and propose strategies to improve their practice.

Design and setting: Employing a qualitative research design, this study conducted deep interviews and focus group discussions with a purposive sample of 28 clinicians from diverse healthcare settings, including hospitals, community health centers, and the Chinese Centers for Disease Control and Prevention (CDC), in Beijing, Shanghai, and other regions.

Results: The study findings indicate significant gaps in public health knowledge and skills among Chinese clinicians, adversely affecting the delivery of high-quality healthcare services to the public. The research highlights the urgency for policymakers and healthcare institutions in China to take proactive measures to enhance public health education and training for clinicians. Additionally, the study emphasizes the importance of collaboration and knowledge sharing among healthcare professionals in China to address the existing challenges and gaps in public health knowledge and skills.

Conclusions: Through thematic analysis of the collected data, this study provides critical insights into the gaps in public health knowledge and skills among Chinese clinicians, as well as their training and continuing education needs. The study findings contribute to the development of policies and interventions aimed at enhancing public health education and training in China, ultimately leading to improved health outcomes for the population.

Keywords: Public health; Knowledge and skills; Chinese clinicians; Training; Qualitative study; Continuing education; COVID-19

Introduction

Background and rationale

In 1916, the Rockefeller Foundation established a School of Public Health outside of medical schools to raise awareness of diseases and social factors. However, one of the unintended consequences was the disconnection between clinical medicine and public health [1]. Nevertheless, with the development of time, people have become increasingly aware of the benefits of bridging this gap [2,3]. Individual

diagnosis and treatment require evidence-based guidance, and evidence acquisition also relies on research methods in public health. At the same time, clinical practice can reach out to more people for disease promotion, guidance, and control through the field of public health, and good public health practice can also promote the establishment of standardized methods and data improvement in the clinical medicine field, and widely expand the benefits of treatment [2]. The current traditional biomedical model is shifting towards a biopsychosocial medical model, which requires clinical physicians not only to treat diseases but also to have the ability to prevent diseases, maintain and promote health, and handle complex public health issues.

The outbreak and pandemic of COVID-19 in the 21st century undoubtedly constitute a major global public health emergency, which has far-reaching impacts on the global economy, society, and health [4,5]. In China, the 2003 SARS outbreak and the 2019 COVID-19 pandemic posed great challenges to China's medical and health system and life and property security [6]. In handling epidemic events, clinical medical workers, as front-line personnel in contact with public health emergencies such as epidemics, their correct measures are a crucial link in protecting their own safety and event prevention and control [7,8]. In this global pandemic, incomplete statistics showed that a total of 152,888 medical staff was infected,

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and 1413 people died [9]. Exploring the reasons behind this, medical staff infections are attributed to some extent to shortages of protective materials [10], high infection risks [11], overloaded work [12], and lack of public health and emergency protection capabilities [11]. According to research [13], medical staff who received prevention and control knowledge training had a significantly lower infection rate than those who did not. Therefore, it is crucial to improve the infectious disease prevention and control ability of clinical workers, the emergency public health capabilities, and to fill the gap in public health knowledge and skills of clinical physicians. This study aims to systematically analyze the gaps in public health knowledge and skills of Chinese clinical physicians through semi-structured interviews and focus group discussions with hospital clinical physicians and disease prevention and control institution personnel, to improve the public health level of Chinese clinical physicians and facilitate the development of policies and intervention measures.

Research questions

1. What are the public health knowledge and skills of Chinese clinicians, and how do they compare to international standards?
2. What are the gaps in the public health knowledge and skills of Chinese clinicians, and how do they affect their practice?
3. What are the perceptions of Chinese clinicians about their public health training and continuing education needs?
4. What are the strategies that can improve the public health knowledge and skills of Chinese clinicians?

Aims and objectives

The importance of public health knowledge and skills among clinicians is increasingly recognized, as it enables them to identify, prevent, and control infectious diseases, chronic illnesses, and health disparities in their communities. However, the degree of public health training and experience of Chinese clinicians has been a subject of debate, with some studies indicating that their knowledge and skills are insufficient. This study aims to explore the shortcomings of public health knowledge and skills of Chinese clinicians and provide insights to improve their training and practice. This study provides insights into the shortcomings of public health knowledge and skills of Chinese clinicians and their perspectives on training and continuing education needs. The findings contribute to the development of strategies to improve the quality of public health education and training in China, which can lead to better health outcomes for the population.

Materials and Methods

This study employs a qualitative research design, using deep interview and focus group methods. A purposive sample of 28 clinicians from different healthcare settings (e.g., hospitals, community health centers, CDC) in Beijing, Shanghai, and other regions were recruited. The inclusion criteria are clinicians who have completed their medical education and are currently practicing in China. The sample diverse in terms of age, gender, specialty, and years of practice.

Data collection

The study consists of two phases. The first phase involves semi-structured in-depth interviews with 6 persons in charge of education departments in disease prevention and control institutions, hospitals, emergency centers and other institutions to explore their perspectives on public health knowledge and skills, their training and continuing

education needs, and the challenges they face in their practice (Table 1). The interviews were conducted in Mandarin Chinese and last approximately 60 minutes. The interviews were recorded and transcribed verbatim for analysis.

The second phase involves three focus group discussions with 22 clinicians: the first was held in a level A tertiary hospital in Beijing, which is both a standardized training base for resident physicians and a training base for medical and health integration in Beijing and involved seven individuals including the heads of the education management department, as well as teaching staff from departments such as general internal medicine, emergency medicine, and hospital infection control. The discussion topics included the hospital's medical and health integration scenario, the current pain points of integration, and the knowledge and skills training needs for cross-disciplinary medical and health training. The second interview was held at another tertiary hospital in Beijing, a training base for medical and health integration, with 10 participants from various institutions such as emergency centers and district-level disease control centers who attended medical and health integration training (Table 2). The discussion topics included medical and health integration scenarios and training needs, cross-disciplinary training programs, participants' feedback, and improvement suggestions. The third interview involved five public health physicians from a district-level CDC who were engaged in chronic disease prevention and control, sexually transmitted disease and HIV prevention, immunization, food hygiene, and environmental health. They had completed six months of cross-disciplinary medical and health integration training at different training bases. The discussions will focus on the research questions and will last approximately 90 minutes each. The participants were encouraged to share their experiences, opinions, and suggestions. The discussion topics included the need for medical and health integration and collaboration in their respective work scenarios, the knowledge and skill gaps that needed to be filled in each scenario, and the key areas that needed improvement. The focus groups were audio-recorded and transcribed verbatim.

Data analysis

The data was analyzed using a thematic analysis approach. The transcripts of the interviews and focus groups was read and re-read by two independent researchers, who identified and code the themes and sub-themes. The researchers compared and discussed their findings

Table 1: Participant Demographics in Semi-structured in-depth interview: Occupation and Institutional Affiliation.

Semi-structured in-depth interview			
Institution	Director	Staff	Total
CDC	1	1	2
"AAA" hospital	1	1	2
emergency center	1	1	2
Total	3	3	6

Table 2: Participant Demographics in Focus Group Discussions: Occupation and Institutional Affiliation.

Focus group discussions				
Institution	Chief physician	Clinician	Public Health Physicians	Total
CDC in Daxing district			1	1
CDC in Changping district			3	3
CDC in Shunyi district			1	1
"AAA" hospital	7	10		17
Total	7	10	5	22

to ensure agreement. The identified themes and sub-themes were presented in a narrative report.

Ethical considerations

This study obtained ethical clearance from the institutional review board of Institute of Medical Information, Chinese Academy of Medical Sciences. The participants are provided with informed consent forms and have the right to withdraw from the study at any time. Their identities are kept confidential, and pseudonyms will be used in the report.

Results

Insufficient knowledge and skills in the prevention and control of infectious diseases

In semi-structured interviews and focus group discussions, most clinicians believed that there was insufficient understanding of the diagnostic criteria and treatment principles for common infectious diseases, the classification of infectious diseases, the reporting deadlines for infectious diseases, epidemic areas, isolation and medical observation of infectious diseases, and measures that can be taken legally after the discovery of infectious diseases.

In the face of the COVID-19 pandemic, all clinicians need to strengthen their training in public health emergency management, including knowledge and skills in isolation clothing, hand washing, disinfection, and infectious disease prevention. These are not usually involved in our daily work, but they are important in emergency situations (interview 3, clinician).

In the interviews with clinical and public health practitioners, the following deficiencies were found in their knowledge and skills in the prevention and control of infectious diseases: 1) Lack of knowledge and skills in the prevention and control process of infectious diseases, such as etiological diagnosis, isolation observation, environmental disinfection, and protection of susceptible populations. 2) Weak awareness of risk prevention and control, crisis intervention, and self-protection regarding infectious diseases. 3) Obvious deficiencies in emergency treatment and rescue techniques for major infectious diseases, as well as the wearing of protective equipment for acute and severe infectious diseases, bacterial disinfection, and sterilization techniques. 4) Insufficient capability to isolate suspected cases and effectively cut off the transmission.

We need to identify the knowledge and skills that clinical doctors need to have regarding public health, and arrange some small lectures or training sessions to integrate these contents. We should tell them how to prevent, detect, and set targets for detection, and also give them a basic understanding and recognition of infectious diseases (interview 2, medical expert).

Insufficient knowledge and skills in the prevention and control of public health emergencies

Clinical doctors bear responsibilities such as medical rescue, testing and reporting, and assisting epidemiological investigations in the face of public health emergencies. However, many clinicians lack the ability to adapt to emergencies and have relatively insufficient skills in preventing and controlling infectious disease epidemics and emergency responses. Clinical doctors usually focus on disease diagnosis and treatment, but they often neglect prevention of sudden events. Although they have received training and education on public health emergencies, they gradually forget this part of knowledge and skills in daily practice due to the reason that they rarely use it.

Moreover, most of their learning is based on video courses, which often produce poor learning results.

Clinical doctors' knowledge and skills in public health are also learned during peacetime, but they have been forgotten since they are not used frequently. Sudden events catch us off guard, which is a wake-up call for us (interview 4, a professor from a tertiary hospital).

The lack of knowledge and skills of clinicians in the prevention and treatment of public health emergencies, but in what way should be learned still needs to be studied. There are many questions that need to be discussed about whether clinicians devote their time to training and learning alone or simply watch video courses.

Insufficient knowledge and skills in health education and health promotion

With the rapid rise of non-communicable diseases, they have become a significant burden on the general population in terms of health expenditure and disease management. The reduction of chronic diseases can be achieved through prevention and health promotion interventions, which aim to modify unhealthy lifestyles, enhance health literacy and effectively prevent the occurrence and prevalence of chronic diseases. In treating diseases, clinicians should prioritize disease prevention by educating patients on disease prevention, evaluating relevant physical indicators, and devising tailored treatment and prevention plans to prevent disease progression. For chronic diseases such as hypertension and diabetes, clinicians should establish health records and diagnosis and treatment plans, provide health education to patients, and guide them in adopting healthy eating habits and regular exercise. Improving medication compliance and adherence to prescribed treatments are also crucial in managing these diseases. Increasing clinicians' knowledge of the etiology and epidemic characteristics of diseases is crucial to early prevention, timely screening, and accurate disease management. However, most clinicians focus primarily on disease treatment, and health education and promotion of patients remain a weak link in disease management.

We pay attention to both medicine and prevention. On the one hand, we should pay attention to the diagnosis and treatment of diseases. On the other hand, we also pay attention to the prevention and treatment of diseases. On the one hand, the control of chronic diseases, such as hypertension and diabetes, on the other hand, is conducive to the early detection and reporting of infectious diseases, which plays a very important role in controlling the spread of the epidemic, eliminating the panic of the masses and stabilizing the society (interview 1, clinician).

Discussion

This discussion will briefly recap the findings set out above, situate the findings within the wider body of evidence, and examine links and conflicts. After the findings have been thoroughly considered, the strengths and weaknesses of this study will be examined. In addition, the implications and recommendations will be made for researchers and policy-makers.

Strengthening capacity for infectious disease prevention and control and public health emergency response

Globalization and population mobility have made infectious disease prevention and treatment a significant part of public health. Clinicians are at the forefront of defense against infectious diseases, but deficiencies still exist in their prevention and treatment knowledge and skills, indicating a need to strengthen relevant training and

education. Clinicians must understand various infectious diseases and the characteristics of pathogens, transmission routes, clinical manifestations, diagnosis, and treatment, as well as the knowledge of infectious disease prevention and control. They also need to master emergency treatment knowledge and skills and actively participate in emergency rescue work while ensuring their own safety. Thus, it is necessary to strengthen clinicians' knowledge and skills training to improve their ability to handle public health emergencies.

Strengthening clinicians' health education and prevention and treatment knowledge and skills of health promotion

Clinicians are responsible for treating diseases and promoting patient health and disease prevention. Thus, strengthening their health education and prevention knowledge and skills of health promotion is of great significance. Health lectures and publicity materials can enhance doctors' health awareness and prevention awareness and provide health guidance to patients. Physicians can focus on mental health and nutritional health issues to ensure their physical health. Moreover, physicians can learn health promotion knowledge and skills to provide patients with comprehensive and scientific health consultation and guidance. The training can include nutrition and health, sports and health, mental health, and other aspects to improve physicians' health promotion ability through practical operation.

Regular public health knowledge and skills training

Medical institutions can conduct regular public health knowledge and skills training, such as classroom instruction, simulation exercises, and case studies, to ensure physicians have updated prevention and control skills and improve their response and emergency response capacity. Public health experts and scholars can provide the latest epidemic information and prevention and control strategies, while experienced clinicians can share practical experience and personal insights. Through regular training, medical institutions can ensure that physicians are aware of the latest disease prevention and control strategies, master the response and management methods of public health emergencies, and improve their crisis awareness and resilience. The training content can be customized according to physicians' actual needs to ensure the training's effectiveness and sustainability. Government departments can provide support by setting relevant policies and standards to encourage medical institutions to strengthen training in public health knowledge and skills.

Strengthening the collaboration and cooperation between clinical institutions and public health institutions

Coordination and cooperation between clinical institutions and public health institutions are crucial to improving public health work and safeguarding people's health. In the prevention and treatment of infectious and chronic diseases, clinical institutions and public health institutions should form a coordinated battle pattern, jointly coping with disease threats, improving the level of epidemic prevention, treatment, and health care, and realizing the health of the whole population. Coordination and cooperation should be strengthened through communication channels, regular coordination meetings, joint work plans and measures, and joint responses to disease prevention and treatment, particularly in public health emergencies. Clinical institutions and public health institutions should also leverage and support each other, share medical resources and expertise, and establish an information-sharing platform to report the situation and other aspects to each other. Strengthening personnel training and exchanges is also necessary.

Conclusions

In conclusion, the deep interview and focus group method used to examine the shortages of public health knowledge and skills among Chinese clinicians have provided valuable insights into the current state of public health education and training in China. The findings reveal that there are significant gaps in public health knowledge and skills among Chinese clinicians, which are affecting the delivery of quality healthcare services to the public.

The study highlights the need for policymakers and healthcare institutions in China to take proactive measures to improve the public health education and training of clinicians. This can be achieved through the development of structured training programs, continuing education courses, and mentorship programs for clinicians. In addition, the study underscores the importance of collaboration and knowledge sharing among healthcare professionals in China to address the challenges and gaps in public health knowledge and skills. It is essential to establish a platform for healthcare professionals to exchange information and ideas, thereby promoting continuous learning and improvement in the delivery of public health services.

Overall, the study provides critical insights into the state of public health education and training among Chinese clinicians and offers practical recommendations to address the identified gaps. By implementing these recommendations, China can improve the quality of public health services and enhance the well-being of its citizens.

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