

Survey on the Status Quo of Emergency Response Capabilities of Public Health Emergencies in Grassroots Disease Control Institutions in a Certain Area

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Abstract: *Objective:* To survey and study the emergency response capabilities of grassroots disease control institutions in a certain area for public health emergencies, and to put forward suggestions for rectification. *Methods:* The study was carried out from March 2022 to March 2023. Field surveys, questionnaire surveys, and interviews were used to investigate and analyze the emergency response capabilities of public health emergencies in 5 county Centers for Disease Control and Prevention (CDCs) in the region. *Results:* Through the survey, it was found that the professional level of the existing emergency team personnel of the grassroots disease control institutions in this region needs to be improved. There was an overall lack of emergency plans, and the compliance rate of the equipment, inspection, and testing items was low. The health emergency system of the CDCs in the region and the ability of the talent team need to be further improved. *Conclusion:* The emergency response capacity of grassroots disease control institutions in this region needs to be improved. For this reason, government departments need to increase investment and strengthen the construction of talent teams and hardware settings, and grassroots disease control institutions need to strengthen the construction of the public health emergency system to improve the ability to respond to public health emergencies.

Keywords: Grassroots disease control institutions; Public health emergencies; Emergency response capabilities

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1. Introduction

Grassroots disease control institutions are an important part of China's public health security system, and they are also the main institutions that deal with various public health emergencies^[1]. The emergency response capabilities of grassroots disease control institutions for public health emergencies can have a greater impact on China's public health security. Therefore, it is necessary to strengthen the construction of systems, talent teams, and hardware facilities in combination with existing problems, and continuously summarize relevant experience in practice to promote comprehensive improvement of public health emergency response capabilities^[2,3].

This study surveys the grassroots disease control institutions in the region, analyzes their emergency response capabilities for public health emergencies, and puts forward targeted recommendations.

2. Materials and methods

2.1. General information

The research was carried out from March 2022 to March 2023, and the samples were 5 county Centers for Disease Control and Prevention (CDCs) in the region.

2.2. Methods

The staff collected relevant laws and regulations, consulted literature, and combined with expert opinions to prepare a questionnaire on the current situation of public health emergency response capabilities, including the general situation of the CDC, the current status of the capacity building of the health emergency system, interdepartmental communication and coordination, material security, laboratory capacity building, etc.

The survey was completed by combining an on-site survey, questionnaire survey, and interview. During the survey process, two CDCs were preferentially selected for pre-survey, the research results were analyzed, and the objectivity, operability, and completeness of the questionnaire content were evaluated. Feedback from the CDCs was collected and the content of the questionnaire was adjusted. During the formal survey, the staff conducted on-the-spot surveys at five CDCs, interviewed the heads of the CDCs, learned about the prevention and control of infectious diseases, laboratories, and emergency management, and arranged for special personnel to fill out the questionnaires.

To ensure the quality of the survey, each unit needs to review the content of the questionnaire before submitting it. The staff needs to review the questionnaire twice after returning it. After confirming that it is correct, the content of the questionnaire will be entered into the system and the data will be analyzed statistically.

2.3. Evaluation criteria

Statistics were collected on the personnel of the CDCs in the 5 counties and districts in the region, the capacity building of the health emergency system, laboratory construction, emergency drills and training, material security, and interdepartmental communication and coordination.

2.4. Statistical methods

SPSS 23.0 software was used to analyze the research data, measurement data were shown as mean \pm standard deviation (SD) and the *t*-test was used, count data were shown as % and χ^2 test was used, $P < 0.05$ indicated statistical difference.

3. Results

3.1. Personnel status of grassroots disease control institutions

The ratio of the actual number of personnel to the standard number of personnel in the 5 grassroots disease control institutions in the region is 42.15, and the number of personnel in only 1 county meets the standard number of personnel; among the composition of personnel titles in the 5 grassroots disease control institutions in the region, there are no senior professional titles, 10.58% of staff with deputy senior professional titles, 45.88% of intermediate professional titles, 34.12% of junior professional titles, and 9.42% of non-professional

titles. Among them, 3.25% of those with a master's degree, 62.58% of those with a bachelor's degree, 22.42% of those with a junior college degree, and 11.75% of those with a technical secondary school degree or below. In the age composition of personnel, the proportion of those under 30 years old is 10.96%, that of 30–50 years old accounts for 65.04%, and that of people over 50 years old accounts for 24.00%.

3.2. The status of capacity building of the health emergency system of grassroots disease control institutions

The five grassroots disease institutions in the region have established emergency management teams for public health emergencies, with the director or deputy director of the CDC as the team leader, and leadership on duty and 24-hour on-duty systems are implemented.

The five grassroots disease control institutions in the region have all set up emergency response teams for public health emergencies with infectious disease emergency response teams as the main members, but none of them have established emergency response teams for biological anti-terrorism, nuclear radiation, and natural disasters. Professionals accounted for 13.66%, and public health professionals accounted for 12.94%.

The five grassroots disease control institutions in the region have also not established a complete evaluation mechanism for biological anti-terrorism, nuclear radiation, and natural disasters, and lack dynamic adjustments and scientific management plans for biological anti-terrorism, nuclear radiation, and natural disasters. Publicity and training on the relevant content of biological anti-terrorism, nuclear radiation, and natural disasters are not in place. The integrity and operability of biological anti-terrorism, nuclear radiation, and natural disasters are insufficient.

3.3. Construction status of laboratories in grassroots disease control institutions

There are currently 68 inspectors in the 5 grassroots disease control institutions in the region, including 4 with senior titles, accounting for 5.9%, 18 with intermediate titles, accounting for 26.5%, and 46 with junior titles, accounting for 67.6%. As affected by the COVID-19 pandemic, there is a common phenomenon of centralized recruitment of inspection personnel in the five grassroots disease control institutions. However, the recruits only accounted for 39.7% of total appointments, and their professional skills and work experience are insufficient.

According to the requirements of the “Construction Standards for Centers for Disease Control and Prevention” formulated by relevant national agencies, the staff checked the equipment configuration of the laboratories of five grassroots disease control institutions in the region. The results showed that the standard rate of equipment required for routine inspections was 75.44 %. The compliance rate of basic instruments and equipment that must be configured is 68.19 %.

Only 1 of the 5 grassroots disease control institutions in the region have obtained the relevant qualification certificates for inspection and testing institutions. The lack of a laboratory quality management system is prominent. As affected by national policy adjustments, the actual implementation rate of inspection and testing items in the five grassroots disease control institution was only 39.75%, which lack of parasitic disease detection capabilities, rapid investigation and on-site detection capabilities for emerging infectious diseases, and food hygiene detection capabilities.

3.4. Emergency drills and training status of grassroots disease control institutions

During the period from March 2022 to March 2023, five grassroots disease control agencies in the region organized several infectious disease prevention and control drills as well as plague prevention and control drills, and did not organize food poisoning and natural disaster biosafety drills. The relevant drills were relatively complete. However, there is a lack of exercise effect evaluation, and no exercise improvement plan has been

formulated. The five grassroots disease control centers in the region all adopted centralized training methods to publicize knowledge about emergency response to public health events. The content and form of the training were relatively single, and no evaluation was made on the training effect.

3.5. Material security status of grassroots disease control institutions

None of the 5 grassroots disease control institutions in the region have set up full-time material management personnel, and 2 grassroots disease control institutions have not set up emergency material storage places. The five grassroots disease control institutions in this region all have the problem of insufficient public health emergency funds. The existing emergency equipment and materials are outdated. The existing vehicles need to complete the work of biosafety sample transportation, emergency command, and on-site flow adjustment. Disinfection vehicles, field survival, communication, rapid detection, and rescue equipment are outdated, and the personnel's self-protection ability is insufficient to meet the emergency response needs of major disasters.

3.6. Interdepartmental communication and coordination status of grassroots disease control institutions

The five grassroots disease control institutions in the region have established an interdepartmental coordination mechanism, but they lack a multi-departmental coordination mechanism, a public health emergency notification and risk communication system, lack of scientific research cooperation and exchanges between different institutions, and public health emergency response, without collaborative research on public health emergency projects not organized.

4. Discussion

The emergency response capabilities of grassroots disease control institutions to various public emergencies can affect public health security. Therefore, it is necessary to analyze and study existing problems and formulate effective improvement measures to promote the improvement of emergency response capabilities and ensure public health security^[4].

The survey results of this study show that the grassroots disease control institutions in this region lack emergency management departments and full-time emergency management personnel, the quality of the existing emergency team personnel is not comprehensive, and inter-departmental communication and coordination are not in place, the number of laboratory staff in grassroots disease control institutions in this region is small, the area of laboratory space is not up to standard, and the rate of equipment and inspection and testing items is low. Thus, the health emergency system of the CDC in this region and the ability of the talent team need to be further improved. The causes of the aforementioned problems are relatively complex. The grassroots disease control institutions in the region do not pay enough attention to the construction of emergency response capabilities for public health emergencies. Coupled with the heavy daily tasks, they cannot analyze and study the relevant content of public health services from a strategic perspective, resulting in conflicts. The emergency response system for public health incidents has not yet been fully established. At the same time, the income level of grassroots disease control institutions in this region is relatively low, and they are not attractive to high-level personnel, it is also difficult to retain outstanding talents, which leads to a low level of emergency response capabilities of grassroots disease control institutions for public health emergencies^[5,6].

Through the analysis of the aforementioned problems, it can be known that improving the emergency response capabilities of grassroots disease control institutions in the region needs to start with the construction of talent teams and system construction, and constantly adjust and improve the work plan in practice.

- (1) There are problems such as an insufficient number of professionals, weak technical ability, and high work intensity in grassroots disease control institutions in this region. Therefore, it is necessary to vigorously strengthen the construction of the personnel team. The grassroots disease control institutions in this region are subject to many restrictions in the process of introducing outstanding talents. Therefore, they need to establish a thorough talent training system based on their own talent needs and long-term development plans, and vigorously cultivate compound talents with the ability of prevention, control, and treatment, improve their technical ability and comprehensive quality, so that they can be competent for various jobs ^[7,8]. In the process of talent team building, grassroots disease control institutions also need to continuously innovate and improve talent training and recruitment models, establish a completed promotion path for professional titles, strengthen the construction of incentive mechanisms, create a good development environment for talents, and take effective measures to retain excellent talents and improve their enthusiasm for work ^[9].
- (2) Government departments need to pay more attention to the construction of grassroots disease control institutions, increase capital investment, carry out the establishment of disease control centers in strict accordance with relevant national standards, scientifically and rationally allocate professional and technical personnel, and ensure that the number of CDCs is sufficient and reasonable. Remuneration and treatment are required to set up to ensure the stability of the talent team, and the establishment of a guarantee funding mechanism is essential for laboratory construction, emergency supplies, talent team building, supplement testing and disinfection vehicles, field survival, communication, rapid testing, and rescue equipment. The grassroots disease control institutions should have sufficient personnel and hardware facilities to promote the overall improvement of public health emergency response capabilities ^[10,11].
- (3) Grassroots disease control institutions need to strengthen internal management, formulate a thorough management system, establish emergency response plans for infectious diseases, nuclear radiation, radioactivity, chemical, and natural disasters, and establish a reliable plan evaluation mechanism, dynamic adjustment, and scientific management plans, regularly organize infectious disease prevention and control drills, plague prevention and control drills, field survival drills, food poisoning, natural disasters, and biological safety drills, and scientifically evaluate the drill effects ^[12]. Grassroots disease control institutions also need to strengthen the construction of the public health system, establish a collaborative working mechanism for various departments, and constantly summarize experience in practice to ensure that they can respond quickly when public health emergencies occur, and control the spread of the situation in a timely and effective manner, and then guarantee public health security ^[13]. Moreover, grassroots disease control institutions need to actively learn advanced public health emergency response plans, analyze and study their own shortcomings, constantly adjust and improve the application strategies of relevant plans in the process of practice, and strengthen the management of personnel and materials to promote their own improvement of working ability ^[14,15].

To sum up, the emergency response capabilities of grassroots disease control institutions in this region need to be improved for public health emergencies. For this reason, government departments need to increase investment and strengthen the construction of talent teams and hardware settings, and grassroots disease control institutions need to strengthen the construction of public health emergency systems, in order to enhance the ability to respond to public health emergencies.

Disclosure statement

The author declares no conflicts of interest.

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