

# Study on the Cognitive Status of Foodborne Parasitic Diseases and its Influencing Factors

Ning Li, Meiling Qi, Yuhong Zhao, Baiqun Wu, Biao Zhang, Zhimei Wang, Juan Li\*

Nanjing Jiangning District Center for Disease Control and Prevention, Nanjing 211100, China

\*Corresponding author: Juan Li, 781560962@qq.com

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**Abstract:** *Objective:* To explore the cognitive status and influencing factors of foodborne parasitic diseases. *Methods:* 2301 residents were selected as samples, and CDC staff conducted questionnaire surveys on them and statistically analyzed the survey results. *Results:* 2285 valid questionnaires were collected, and the awareness rate of residents' knowledge about foodborne parasitic diseases ranged from 21.3% to 59.4%. The results of the multi-factor regression analysis showed that factors influencing the awareness of foodborne parasitic diseases include education level, relatives working in medical institutions, attention to news related to food safety, history of food poisoning, satisfaction with food hygiene, degree of concern about one's health, whether received health education on parasitic diseases and whether they actively searched for knowledge on parasitic diseases ( $P < 0.05$ ). *Conclusion:* The residents surveyed in this study have poor awareness of foodborne parasitic diseases. Health education needs to be carried out based on the influence of relevant factors, and prevention and control work should be strengthened.

**Keywords:** Foodborne parasitic diseases; Cognitive status; Influencing factors

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## 1. Introduction

Foodborne parasitic diseases have high morbidity and mortality. The main cause of the disease is semi-raw or raw food containing parasites in the infective stage. Common pathogenic foods include meat, freshwater fish, shrimp, crabs, marine fish, marine mollusks, and so on, and disease types include taeniasis, clonorchiasis, fascioliasis, angiostrongyliasis, and so on.<sup>[1-2]</sup> Many regions in China have temperate and subtropical climates, rich species of animals and plants, and geographical and natural conditions for the prevalence of parasitic diseases. Therefore, prevention and control work must be strengthened to ensure public health safety<sup>[3]</sup>. This study included 2285 residents as samples to analyze the cognitive status and influencing factors of foodborne parasitic diseases.

## 2. Materials and methods

### 2.1. General information

The research was carried out in 2022. The survey plan is multi-stage cluster sampling. There are 2301 resident samples, including 1291 males and 1010 females. The age range is 22–61, and the average age is  $41.59 \pm 2.63$ . All surveyed samples gave informed consent to the survey content and related processes.

### 2.2. Method

CDC staff distributed questionnaires to the residents under investigation and informed them of the items and precautions to be filled in. Residents were not prompted while filling in the questionnaire. If residents have dyslexia, CDC staff will assist them in filling in each item. After the residents completed filling in the questionnaire, CDC staff promptly collected it and conducted a summary and analysis of the filling.

### 2.3. Evaluation criteria

CDC staff statistically analyzed the questionnaires, eliminated invalid questionnaires, counted the awareness rate of foodborne parasitic diseases, collected basic information about residents, and determined factors influencing awareness of foodborne parasitic diseases using univariate and multivariate regression analysis protocols.

### 2.4. Statistical methods

SPSS 20.0 software analyzed the research data. The measurement data (mean  $\pm$  SD) were used as the *t*-test, and the count data % were used as  $\chi^2$  test.  $P < 0.05$  indicated that there was a statistical difference.

## 3. Result

### 3.1. Awareness rate of foodborne parasitic diseases

2301 questionnaires were distributed in this study, and 2285 valid questionnaires were recovered. The awareness rate of residents' knowledge about food-borne parasitic diseases was 21.3%–59.4%. After a comprehensive assessment, 725 residents knew about food-borne parasitic diseases, and the awareness rate is 31.7%, as shown in Table 1.

**Table 1.** Awareness rate of foodborne parasitic diseases

| Questionnaire content                                   | Number of people who know | Awareness rate (%) |
|---|---------------------------|--------------------|
| What are foodborne parasitic diseases                   | 1358                      | 59.4%              |
| Causes of foodborne parasitic diseases                  | 894                       | 39.1%              |
| Sources of infection for foodborne parasitic diseases   | 772                       | 33.8%              |
| Transmission routes of foodborne parasitic diseases     | 769                       | 33.7%              |
| Susceptible populations to foodborne parasitic diseases | 658                       | 22.8%              |
| Drugs to treat foodborne parasitic diseases             | 486                       | 21.3%              |
| Parasitic organs of foodborne parasitic diseases        | 704                       | 30.8%              |
| The dangers of foodborne parasitic diseases             | 1208                      | 52.9%              |
| Symptoms of foodborne parasitic diseases                | 681                       | 29.8%              |
| Preventive measures for foodborne parasitic diseases    | 1211                      | 53.0%              |

### 3.2. Single factor analysis of factors influencing the cognitive status of foodborne parasitic diseases

The results of single factor analysis of cognitive status factors of foodborne parasitic diseases were summarized and analyzed, as shown in **Table 2**.

**Table 2.** Single factor analysis of factors influencing the cognitive status of foodborne parasitic diseases (n/%)

| Variable   |   | Number of people who know | $\chi^2$ value | P value |
|--|---|---------------------------|----------------|---------|
| Education level  | Junior high school and below (n = 1084) | 161                       | 338.478        | 0.000   |
|  | High school and above (n = 1201)        | 564                       |                |         |
| Relatives work in medical facilities                           | Yes (n = 726)                           | 422                       | 342.318        | 0.000   |
|  | None (n = 1559)                         | 303                       |                |         |
| Have you received health education on parasitic diseases?      | Yes (n = 684)                           | 391                       | 291.559        | 0.000   |
|  | No (n = 1601)                           | 334                       |                |         |
| Are you concerned about news about food safety?                | Yes (n = 720)                           | 401                       | 278.738        | 0.000   |
|  | No (n = 1565)                           | 324                       |                |         |
| History of food poisoning                                      | Yes (n = 189)                           | 124                       | 109.070        | 0.000   |
|  | None (n = 2095)                         | 601                       |                |         |
| Food hygiene satisfaction                                      | Satisfied (n = 784)                     | 309                       | 32.536         | 0.000   |
|  | Not satisfied (n = 1501)                | 416                       |                |         |
| Concern about one's health                                     | Follow (n = 1044)                       | 389                       | 27.156         | 0.000   |
|  | Don't follow (n = 1241)                 | 336                       |                |         |
| Do you actively search for knowledge about parasitic diseases? | Yes (n = 892)                           | 411                       | 139.048        | 0.000   |
|  | No (n = 1393)                           | 314                       |                |         |

### 3.3. Multi-factor analysis of factors influencing the cognitive status of foodborne parasitic diseases

Logistic regression analysis was used to determine the factors influencing the cognitive status of foodborne parasitic diseases. The results of the multi-factor analysis are shown in Table 3.

**Table 3.** Multifactor analysis of factors influencing the cognitive status of foodborne parasitic diseases

| Variable   | $\beta$ | OR     | Wald   | 95% CI      | P     |
|--|---------|--------|--------|-------------|-------|
| Education level  | 0.175   | 1.182  | 29.774 | 1.112–1.275 | 0.001 |
| Relatives work in medical facilities                           | 0.366   | 1.445  | 23.875 | 1.248–1.664 | 0.000 |
| Relatives work in medical facilities                           | 1.284   | 3.552  | 87.124 | 1.745–2.338 | 0.000 |
| Are you concerned about news about food safety?                | 0.322   | 1.159  | 29.427 | 1.224–1.589 | 0.002 |
| Have you received health education on parasitic diseases?      | 0.152   | 20.638 | 10.094 | 1.052–1.228 | 0.003 |
| Food hygiene satisfaction                                      | 0.285   | 1.331  | 20.613 | 1.175–1.524 | 0.001 |
| Are you concerned about news about food safety?                | 0.145   | 1.157  | 5.954  | 1.021–1.302 | 0.001 |
| Do you actively search for knowledge about parasitic diseases? | 0.702   | 2.011  | 81.245 | 1.744–2.358 | 0.000 |

## 4. Discussion

Foods such as aquatic products and meat can carry parasitic pathogens. For example, eating semi-raw or raw foods can cause the body to be infected with parasites, thereby inducing food-borne parasitic diseases<sup>[4]</sup>. Relevant survey data show that due to unhealthy eating habits and other factors, the incidence of food-borne parasitic diseases in China is on the rise. This disease has become a parasitic disease that seriously threatens public health safety. For this reason, effective prevention and control measures must be taken<sup>[5-6]</sup>.

The survey data of this study show that the awareness rate of residents' knowledge about food-borne parasitic diseases is 21.3%–59.4%. After a comprehensive assessment, 725 residents know about food-borne parasitic diseases, and the awareness rate is 31.7%. The analysis of this result shows that the 2285 residents surveyed have a low level of knowledge about food-borne parasitic diseases and a lack of knowledge about susceptible groups, symptoms, and treatment drugs for food-borne parasitic diseases. Poor cognitive status can increase residents' risk of contracting foodborne parasitic diseases. Therefore, the Centers for Disease Control and Prevention needs to organize a survey and study on the cognitive status of foodborne parasitic diseases by the relevant requirements of "Healthy China" and conduct online publicity and education on media platforms such as TV, radio, and so on, and organize various publicity activities within the jurisdiction to introduce knowledge about foodborne parasitic diseases to residents comprehensively, guide residents to stay away from disease-causing factors and be able to seek treatment as soon as possible after the occurrence of disease-related symptoms, thereby achieving effective prevention and control of the disease<sup>[7-8]</sup>.

This study comprehensively analyzes the factors that influence awareness of foodborne parasitic diseases. The results show that education level is an important influencing factor. Residents with high school education and above have better cognitive status. The reason is that residents with higher education levels read large amounts of food-borne parasitic diseases, and strong cognitive understanding ability can be obtained through various channels. The relevant knowledge can be accurately understood. Therefore, the Centers for Disease Control and Prevention needs to focus on food-borne parasitic diseases for residents with low education levels. Parasitic disease health education uses easy-to-understand language to explain relevant knowledge. The CDC patiently answers various questions to help them understand the relevant knowledge more accurately and enable them to avoid the transmission routes of food-borne parasitic diseases, thereby achieving effective prevention and control of the disease<sup>[9]</sup>. This study confirms that relatives working in medical institutions influence the awareness of foodborne parasites. The reason is that residents can obtain relevant knowledge about foodborne parasitic diseases through relatives. Therefore, it is recommended that staff in medical institutions actively promote foodborne parasitic diseases to relatives to improve their awareness of disease knowledge<sup>[10-11]</sup>. The results of this study show that residents who pay attention to news related to food safety, have received health education on parasitic diseases, and actively search for knowledge about parasitic diseases have a higher awareness of foodborne parasitic diseases. The reason is that such residents have health awareness. They can take the initiative to learn about food safety and parasitic diseases. They can also take the initiative to receive health education, so they have a higher level of knowledge about disease-related knowledge<sup>[12]</sup>. This study also confirmed that residents with a history of food poisoning are more aware of foodborne parasitic diseases. The reason is that residents pay more attention to foodborne diseases after experiencing food poisoning and can take the initiative to understand relevant information, consciously establish healthy living habits, avoid the transmission routes of food-borne parasitic diseases, and achieve effective prevention and control of related diseases<sup>[13]</sup>. In this study, satisfaction with food hygiene is also an important factor influencing awareness

of foodborne parasitic diseases. Food hygiene satisfaction is the overall perception formed by residents after learning about food safety-related knowledge. During this period, residents can be exposed to relevant knowledge about food-borne parasitic diseases, which helps to improve their awareness of the disease.

The above analysis shows that the 2285 residents surveyed lacked knowledge about foodborne diseases, and the factors affecting their awareness are relatively complex. Based on this, CDC staff need to organize and carry out publicity and education on food-borne parasitic diseases and publicize the dangers, transmission routes, symptoms, treatment options, and other knowledge of food-borne parasitic diseases through new media platforms and traditional media platforms. They should carry out publicity activities in various streets and communities within the jurisdiction, distribute publicity materials to residents, set up publicity boards, publicize knowledge about foodborne parasitic diseases from different angles, and guide residents to stay away from the transmission routes of the disease, be able to respond after the occurrence of relevant symptoms and seek medical treatment early <sup>[14]</sup>. At the same time, the Centers for Disease Control and Prevention should regularly summarize and analyze the incidence of foodborne parasitic diseases within its jurisdiction, issue early warning information promptly, actively strengthen cooperation with other departments, regularly organize and carry out food safety publicity activities, and strengthen food safety management in key industries to achieve effective prevention and control of foodborne diseases. In addition, the Centers for Disease Control and Prevention needs to strengthen the health management of patients with foodborne parasitic diseases, understand their daily diet and living habits in detail, investigate the contact groups, determine the source of disease induction, take effective prevention and control measures, and evaluate and analyze the disease control effect, provide patients with professional health guidance, inform them of the key points of preventing and treating foodborne parasitic diseases, and patiently answer various questions raised by them to avoid expanding the scope of the spread of foodborne parasitic diseases <sup>[15]</sup>.

Based on the above analysis, the residents surveyed in this study have poor awareness of foodborne parasitic diseases. Health education needs to be carried out based on the influence of relevant factors, knowledge of foodborne parasitic diseases should be disseminated through different channels, and work strategies should be continuously adjusted to strengthen prevention and control work. During the study, the number of residents who received questionnaires was small, the analysis and research process was not complete and systematic, and no horizontal comparative analysis of the same data type was conducted. Hence, the cognitive status of foodborne parasitic diseases and related influencing factors must be studied in depth.

## Disclosure statement

The authors declare no conflict of interest.

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