Surveillance Report of the Prevalence and Risk Factors of Chronic Non-Communicable Diseases in Tinghu District, Yancheng City, 2021

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Abstract: *Objective:* To comprehensively understand the changes and prevalence of major chronic diseases among residents of Tinghu District, Yancheng City, in 2021, and to analyze the trends of the major risk factors for the onset of chronic diseases in the region. *Methods:* Chronic diseases and their risk factors in Tinghu District in 2021 were monitored among the resident population who had lived in the district for five years or more and were aged 18 years or older. The survey was conducted using random cluster sampling, with 7,130 questionnaires collected. After data processing, 7,012 valid questionnaires were obtained, resulting in a qualification rate of 98.35%. *Results:* Among the chronic diseases reported in the survey population, hypertension had the highest prevalence at 37.61%, followed by dyslipidemia at 37.19%. Other chronic diseases were ranked in order of prevalence from highest to lowest. Regardless of gender, the top three chronic diseases were hypertension, diabetes, and hyperlipidemia. Multifactorial regression analysis identified both non-preventable risk factors (such as family history, gender, and age) and preventable risk factors (such as smoking, sedentary behavior, overweight, and obesity) as significant contributors to the major chronic diseases in Tinghu District. *Conclusion:* Analyzing the trends in the main risk factors for chronic disease incidence in Tinghu District, Yancheng City, provides a basis for developing a new comprehensive chronic disease prevention and control plan to address chronic disease prevention and management.

Keywords: Chronic diseases; Non-communicable; Social factors; Monitoring report

1. Introduction

With socio-economic development and accelerating urbanization, people are increasingly choosing refined foods and leading sedentary lifestyles, while psychological stress levels are rising [1]. Along with an aging population, China is facing a high burden of chronic diseases, posing significant challenges to healthcare services [2,3]. Currently, chronic non-communicable diseases (chronic diseases), primarily cardiovascular and cerebrovascular diseases, cancers, diabetes mellitus, and chronic respiratory diseases, are major health threats and leading causes of death [4]. Tinghu District, Yancheng City, conducted surveys on four chronic diseases

and their risk factors in 2011, 2012, 2016, and 2021, respectively, to understand the epidemiological status and trends of major chronic diseases and their risk factors. These surveys aimed to identify key intervention targets and priority health issues and to provide a scientific basis for developing chronic disease prevention and control plans across the district. With ongoing socio-economic advancements, improved living standards, and an aging population, new challenges continue to emerge in the prevention and control of chronic diseases in Tinghu District. To comprehensively assess the effectiveness of chronic disease prevention and control measures in the district and identify priority health issues, a new round of surveys on chronic diseases and their social factors was conducted from September 2021 to May 2022.

2. Purpose of the survey

The survey aimed to gain a comprehensive understanding of the changes and prevalence of major chronic diseases among residents of Tinghu District since 2017. It sought to assess the status of community environmental support, health services, and resources, the changes in residents' knowledge and skills related to chronic diseases, and the actual effectiveness of chronic disease prevention and control efforts. Furthermore, the survey aimed to analyze trends in major risk factors for chronic diseases in the district and identify priority health issues for residents. Additionally, it evaluated the current status of the support system for chronic disease prevention and treatment policies and assessed the effectiveness of comprehensive chronic disease prevention and control measures. This information will provide a basis for developing a new comprehensive chronic disease prevention and treatment plan for the region.

3. Materials and methods

3.1. Survey subjects

In 2021, the monitoring targets for chronic diseases and their risk factors in Tinghu District were permanent residents who had lived in the district for 5 years or more and were 18 years old or older (defined as those who had lived in the survey area for a total of 6 months or more).

3.2. Sampling method

To ensure that the monitoring samples were representative of the entire region, aligned with the socio-economic development of the area, and consistent with the age and sex ratio of the population, random whole-cluster sampling was used. This method also considered geographic distribution balance, cost-effectiveness, and the feasibility of the sampling scheme.

3.3. Content of the survey

The survey comprised two parts: a questionnaire and a physical examination.

(1) Questionnaire content and method: (a) Family questionnaire on chronic diseases and their risk factors: This included basic family information, living environment, and family salt intake status; (b) Individual questionnaire on chronic diseases and their risk factors: This included basic personal information, history of major chronic diseases, family history, tobacco and alcohol use, dietary habits, physical activity, and residents' knowledge, behaviors, and attitudes related to chronic diseases.

(2) Physical examination content and method: (a) Measurements included: height, weight, waist circumference, blood pressure, fasting blood glucose, and nutritional tests; (b) Blood pressure: Measurement was conducted according to the Chinese Guidelines for the Prevention and Control of

Hypertension (2018), with the average taken from three measurements; (c) Blood glucose monitoring: Fasting peripheral blood was used, with uniform specifications for blood glucose meters from the same manufacturer; (d) Nutritional monitoring: Nutritional status was assessed by drawing venous blood, testing blood lipid levels, and evaluating overall nutritional status.

3.4. Quality control

The specific quality control measures for this monitoring were as follows:

(1) The District Health Committee organized supervisors to oversee the entire survey process.

(2) The CDC sent staff for periodic or on-site supervision.

(3) Strict implementation of operational procedures and norms was enforced, with all physical examination and monitoring equipment calibrated or debugged before and during use to ensure accurate measurements.

(4) The survey response rate was required to be above 95%, with efforts to minimize the non-response rate.

(5) The survey information was compiled into a database according to a unified standard, with data management services provided by a third-party software company.

The survey collected 7,130 questionnaires, of which 7,012 were valid after data processing, resulting in a response rate of 98.35%, meeting the sample size requirements.

3.5. Statistical analysis

In this report on the monitoring of chronic diseases and their risk factors, data were primarily analyzed using descriptive statistics, with a focus on stratification by gender and age. All monitoring questionnaires were double-entered using EpiData 3.1 software, which was uniformly prepared and distributed. After data cleaning, checking, and organization, statistical analysis was conducted using SPSS 26.0 and Excel 2010.

4. Survey results

4.1. Basic information of survey respondents

The survey collected 7,130 questionnaires, of which 7,012 were valid after data processing, resulting in a qualification rate of 98.35%. The sample size meets the required criteria. Among the respondents, 3,796 (54.14%) were male and 3,216 (45.86%) were female, with a male-to-female ratio of 1.18:1. In terms of age distribution, different age groups accounted for 7.94%, 46.79%, and 45.27% of the total valid questionnaires, respectively (**Table 1**).

Table 1. Age and gender distribution of the population with chronic diseases and their risk factors in Tinghu District in 2021

Age groups	Male		Female		Total	
	Number of people surveyed	Composition ratio (%)	Number of people surveyed	Composition ratio (%)	Number of people surveyed	Composition ratio (%)
18–34	295	7.77	262	8.15	557	7.94
35–59	1,768	46.58	1,513	47.05	3,281	46.79
≥ 60	1,733	45.65	1,441	44.80	3,174	45.27
Total	3,796	100.00	3,216	100.00	7,012	100.00

4.2. Prevalence of major chronic diseases

Among the chronic diseases reported in this survey population, hypertension had the highest prevalence at

37.61%, followed by dyslipidemia at 37.19%. The prevalence of other chronic diseases, in descending order, included diabetes mellitus (15.57%), malignant neoplasms (4.14%), chronic obstructive pulmonary disease (COPD; 2.21%), stroke (2.10%), coronary heart disease (1.11%), and osteoporosis (0.27%). Across all genders, the top three chronic diseases were hypertension, diabetes, and hyperlipidemia (**Table 2**).

Table 2. Prevalence of major chronic diseases among the population monitored for chronic diseases and their risk factors in Tinghu District, 2021

Chronic disease	Male		Female		Total	
	n	Rate (%)	*n*	Rate (%)	*n*	Rate (%)
Hypertension	1,461	38.49	1,172	36.44	2,633	37.55
Dyslipidemia	1,411	37.17	1,197	37.22	2,608	37.19
Diabetes	601	15.83	491	15.27	1,092	15.57
Stroke	77	2.03	70	4.57	147	2.10
Malignant neoplasms	175	4.61	115	3.58	290	4.14
Coronary heart disease	40	1.50	37	1.15	77	1.11
Chronic obstructive pulmonary disease	89	2.35	66	2.05	155	2.21
Osteoporosis	5	0.13	14	0.44	19	0.27

4.3. Monitoring and analysis of social factors

Using multifactorial unconditional logistic regression analysis, the study identified the following independent risk factors:

(1) Hypertension: Family history of hypertension, advanced age, overweight/obesity, and smoking, with particularly prominent risks associated with overweight/obesity, advanced age, and smoking (**Table 3**).

(2) Diabetes: Family history of diabetes, advanced age, dyslipidemia, and overweight/obesity, with particularly prominent risks associated with family history and dyslipidemia (**Table 4**).

(3) COPD: Smoking was identified as an independent risk factor (**Table 5**).

(4) Stroke: Advanced age, male gender, smoking, and family history of stroke were independent risk factors, with family history being particularly prominent (**Table 6**).

(5) Coronary heart disease: Advanced age and smoking were identified as independent risk factors, with smoking being particularly prominent (**Table 7**).

(6) Malignant neoplasms: Smoking, low literacy, and family history of malignant neoplasms were identified as independent risk factors, with family history being particularly prominent (**Table 8**).

Table 3. Multifactorial unconditional logistic regression analysis for hypertension

Variable	β-value	*OR*	95% CI	*P*
Age	0.030	1.031	1.026–1.035	0.000
Degree of education	0.407	1.502	1.129–1.996	0.005
Smoking	0.232	1.261	1.093–1.455	0.001
Alcohol consumption	0.052	1.054	0.909–1.222	0.489
Overweight and obesity	0.402	1.494	1.353–1.651	0.000
Dyslipidemia	0.114	1.121	1.011–1.244	0.031
Family history	0.158	1.171	1.053–1.302	0.004

Table 4. Multifactorial unconditional logistic regression analysis for diabetes mellitus

Variable	β-value	OR	95% CI	P
Age	0.014	1.014	1.009–1.020	0.000
Degree of education	-1.083	0.339	0.102–1.125	0.077
Smoking	0.153	1.165	0.989–1.372	0.068
Dyslipidemia	0.427	1.533	1.348–1.743	0.000
Overweight and obesity	0.360	1.434	1.258–1.633	0.000
family history	0.511	1.668	1.355–2.053	0.000

Table 5. Multifactorial unconditional logistic regression analysis for COPD

Variable	β-value	OR	95% CI	P
Age	0.000	1.000	0.983–1.018	0.961
Degree of education	16.898	0.750	0.636–0.885	0.999
Overweight and obesity	0.219	1.245	0.826–1.876	0.296
Dyslipidemia	-0.450	0.956	0.625–1.460	0.833
Smoking	0.895	2.447	1.599–3.745	0.000

Table 6. Multifactorial unconditional logistic regression analysis for stroke

Variable	β-value	OR	95% CI	P
Age	0.030	1.031	1.015–1.047	0.000
Dyslipidemia	0.265	1.303	0.917–1.852	0.139
Family history	0.835	2.306	1.252–4.247	0.000
Smoking	0.703	0.019	1.314–3.102	0.001

Table 7. Multifactorial unconditional logistic regression analysis for coronary heart disease

Variable	β-value	OR	95% CI	P
Age	0.082	1.085	1.063–1.108	0.000
Smoking	0.654	1.923	1.142–3.239	0.004
Family history	0.045	1.047	0.325–3.374	0939

Table 8. Multifactorial unconditional logistic regression analysis for malignant neoplasms

Variable	β-value	OR	95% CI	P
Age	0.013	1.013	1.001–1.026	0.039
Degree of education	-2.007	0.134	—	0.001
Family history	0.651	1.918	1.295–2.839	0.001
Smoking	0.383	1.466	1.183–2.186	0.002

5. Main findings

(1) The prevalence of chronic diseases is high, with an overall increase in the crude incidence rate compared to the 2016 survey. Among the chronic diseases reported by the survey population, hypertension had the highest prevalence at 37.55%, followed by dyslipidemia at 37.19%, diabetes mellitus at 15.57%, malignant tumors at 4.14%, chronic obstructive pulmonary disease at 2.21%, stroke at 2.10%, coronary heart disease at 1.10%, and osteoporosis at 0.27%. Except for osteoporosis, the prevalence rates for these conditions are all greater than 1%.

(2) A significant number of cases of hypertension, diabetes mellitus, and dyslipidemia remain undiagnosed, with poor overall control rates for blood pressure, blood glucose, and lipids. The comprehensive dyslipidemia rate in this survey was 37.19%, the awareness rate of dyslipidemia among those affected was 19.56%, and the treatment rate was 13.08%.

(3) Multifactorial regression analysis identified the following risk factors for major chronic diseases in Tinghu District: non-preventable factors such as family history, gender, and age; and preventable factors such as smoking, sedentary lifestyle, overweight, obesity, and abdominal obesity.

6. Recommendations

(1) In light of the aging population, it is recommended that the government further promote policies that integrate elderly care with medical services to achieve comprehensive coverage [5,6].

(2) Continually promote knowledge of tumor prevention and treatment, encourage tumor screening, and other early diagnosis and treatment techniques, and gradually meet the public's needs for regular physical examinations [7,8].

(3) Enhance the screening of chronic patients and high-risk groups, such as those with hypertension, diabetes, and hyperlipidemia, to achieve integrated management of these conditions [9].

(4) Enrich the scope of healthy living initiatives in Tinghu District to reduce and control the prevalence of chronic disease risk factors [10].

7. Summary

The 2021 survey of chronic non-communicable diseases and social factors in Tinghu District, Yancheng City, employed a standardized design, strict organization, rigorous quality control, and scientific analysis. The survey effectively captured changes in major chronic disease prevalence and knowledge and skills related to chronic diseases among residents from 2017 to 2021. The findings reflect some success in the prevention and treatment of chronic diseases. The understanding and analysis of the main risk factor trends in chronic diseases in Tinghu District provide a basis for developing a new comprehensive chronic disease prevention and treatment plan.

Disclosure statement

The authors declare no conflict of interest.

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