

Preplanned Studies

Survey of Residents' Satisfaction with the Environmental Sanitation of Key Public Places Under the Background of National Healthy City — China, 2021

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Summary

What is already known about this topic?

Sanitation of public places has been the focus of environmental sanitation construction in China for many years. It is critical to achieving the goal of building national healthy cities and counties.

What is added by this report?

The results showed that in all types of areas, residents' satisfaction with the sanitation of railway stations and other places of transportation ranked first, and farmers' markets ranked last.

What are the implications for public health practice?

This study provides a suitable reference for government decision-makers to effectively improve the sanitation situation of key public places and to further construct national healthy cities and counties.

National healthy city establishment is an urban construction activity with Chinese characteristics. As an essential part of establishing national healthy cities, environmental sanitation covers many environmental hygiene-related issues. Among them, public place sanitation has been the focus and difficulty in China for many years, especially in key public places (small restaurants, small “internet cafes,” small hairdressers, small dance halls, small hotels, and small bathrooms), which are ubiquitous. Public place sanitation has been a weak point in the efforts to achieve the goal of building national healthy cities (1). Residents are one of the stakeholders of the national healthy city construction policies and their subjective feelings can reflect the current situation to a certain extent. Moreover, the ultimate goal of the construction of national healthy cities is to improve health of residents, so knowing residents' ideas is essential. This study conducted a survey to evaluate residents' satisfaction with environmental sanitation in key places using a uniformly structured questionnaire to survey 32,243

residents of four provincial-level administrative divisions (PLADs). The results showed that in all types of areas, residents' satisfaction with the sanitation of railway stations and other places of transportation ranked first, and farmers' markets ranked last. It is recommended to strengthen research on the long-term management of the construction of national healthy cities and counties, formulate appropriate and effective policies, and provide more funds and personnel support for improving sanitation in key places.

In this study, the survey areas were determined by multistage sampling. Four PLADs that have a low ability to construct national healthy cities and counties — Hainan, Guizhou, Guangxi, and Sichuan — were selected for the survey area, with 10 districts, counties, and county-level cities chosen for each PLAD. Investigators did the survey from November 2021 to April 2022. The survey tool was the “Questionnaire on Residents' Satisfaction with Environmental Sanitation,” which mainly included the basic information of the respondents, general information of the survey area, satisfaction with environmental sanitation (city-appearance and environmental sanitation, environmental sanitation management, water sanitation, and sanitation of key public places), and the problems that the respondents think exist in environmental sanitation. The questionnaire items were scored with Likert's 5-level scoring method, with 1=very dissatisfied, 2=dissatisfied, 3=average, 4=satisfied, and 5=very satisfied. The overall satisfaction of residents with the sanitation of key public places is divided into two categories. “Satisfied, very satisfied” was classified as “satisfied”, and “very dissatisfied, dissatisfied, general” was classified as “dissatisfied”. Residents are selected by quota sampling. Based on the 2019 population data of each district and county sampled, the gender distribution and age distribution of the sampled population were consistent with the total population. The inclusion criteria of the

residents were: living in the survey area for 6 months or more, age ≥ 18 years, having clear cognitive and understanding ability, and being willing to participate in the questionnaire. The sample size of this study was calculated with the formula $N = \frac{\mu_{\alpha/2}^2 \times \pi \times (1 - \pi)}{\delta^2} \times deff$ and the sample size of each PLAD was 4,609. Considering the non-response rate of 10%, the sample size required by each PLAD is about 5,000.

Uniformly trained investigators conducted surveys in the form of central intercept investigations. The investigator introduced the purpose of the investigation to the respondents and obtained the informed consent of them, and the respondents filled in the survey themselves. Among them, elderly and less educated residents filled out questionnaires under the guidance of the investigator. Data were cleaned in Microsoft Office Excel (version 2016; Microsoft Corp., Washington, USA), and analyzed with SPSS Statistics (version 22.0, IBM Corporation, Armonk, USA). Counts were expressed as n (%) and chi-squared tests were used for comparisons. Statistical tests were two-tailed and $P < 0.05$ was considered significant.

A total of 32,243 residents participated in the survey, with a response rate of 100% and an average age of 39.19 ± 11.87 years. Among them, 11,573 (35.9%) were male, 19,646 (60.9%) had junior college and bachelor degrees, 19,024 (59.0%) resided in urban areas, and 18,209 (56.5%) had lived in the survey area for more than 10 years. The results of χ^2 test show that the overall satisfaction of residents with the sanitation of key public places had statistical significance in terms of gender ($\chi^2 = 437.659$, $P < 0.001$), education degree ($\chi^2 = 121.071$, $P < 0.001$), age ($\chi^2 = 519.803$, $P < 0.001$), occupation ($\chi^2 = 556.669$, $P < 0.001$), living area ($\chi^2 = 312.909$, $P < 0.001$), living time ($\chi^2 = 11.292$, $P < 0.001$), etc. (Table 1).

The survey areas selected in this study are 11 cities and 29 counties, including 9 national healthy cities and 16 national healthy counties. The overall satisfaction of residents with the environmental sanitation status of key public places in national healthy cities was 62.9% [95% confidence interval (CI): 61.6%–64.2%], which was higher than that of non-national healthy cities (47.4%, 95% CI: 45.4%–49.3%). Among them, in national healthy cities, residents' satisfaction with the sanitary conditions of recreation places (59.2%, 95% CI: 57.8%–60.5%) and farmers markets (57.1%, 95% CI: 55.7%–58.4%) was lower, but higher than that of

non-national healthy city residents with the sanitary conditions of recreation places (45.9%, 95% CI: 43.9%–47.9%) and farmers markets (36.8%, 95% CI: 34.9%–38.7%) (Table 2).

The overall satisfaction of residents with the environmental sanitation status of key public places in national healthy counties was 44.8% (95% CI: 44.0%–45.7%), which was lower than that of non-national healthy counties (62.3%, 95% CI: 61.4%–63.2%). Among them, in national healthy counties, residents' satisfaction with the sanitary conditions of beauty salon places (41.2%, 95% CI: 40.2%–42.1%) and farmers markets (38.6%, 95% CI: 37.8%–39.4%) was lower. And in non-national healthy counties, residents' satisfaction with the sanitary conditions of recreation places (59.8%, 95% CI: 58.9%–60.7%) and farmers markets (56.0%, 95% CI: 55.0%–56.9%) was lower (Table 3).

DISCUSSION

The results showed that among the four types of areas, the health satisfaction of farmers' markets was the lowest. It is speculated that the reasons for the above situation may be: the infrastructure of some farmers' markets is backward, the capital investment is insufficient, environmental health regulation is difficult, some citizens have poor awareness of environmental sanitation, which makes cleaning work hard, and the market is a public place with concentrated human flows and complex logistics. Due to the lack of cold chain logistics and storage facilities, rats breed easily and are difficult to control (2–3).

It is noteworthy that residents in national healthy cities are more satisfied with various public places than those in non-national healthy cities, while the opposite is true in national healthy counties. The reasons may be that some national healthy counties have experienced a decline in work and rebounding problems, so residents give an "unsatisfactory" evaluation compared with the health status during the establishment of national healthy cities and towns (4), which also indicates that exploring the establishment of a long-term management mechanism for national healthy cities and towns is necessary. In addition, the satisfaction rate reflects the gap between individual expectations and actual feelings. The smaller the gap, the higher the satisfaction rate. Low satisfaction does not mean an absolute decline of the work. It is likely that the improvement speed of the work level lags

TABLE 1. Basic information of residents' health satisfaction in key public places surveyed in four provincial-level administrative divisions ($n=32,243$, %).

Variable	Total	Satisfied		χ^2	P
		n	rate (95% CI)		
Gender				437.659	<0.001
Female	20,670	10,210	49.4 (48.7–50.1)		
Male	11,573	7,118	61.5 (60.6–62.4)		
Level of education				121.071	<0.001
Junior high school and below	6,049	2,923	48.3 (47.1–49.6)		
Technical secondary school/senior high school/technical school	6,221	3,226	51.9 (50.6–53.1)		
Junior college/bachelor degrees	19,646	10,988	55.9 (55.2–56.6)		
Postgraduate and above	327	191	58.4 (53.0–63.8)		
Age (years)				519.803	<0.001
18–44	22,360	11,165	49.9 (49.3–50.6)		
45–59	7,475	4,455	59.6 (58.5–60.7)		
≥ 60	2,408	1,708	70.9 (69.1–72.7)		
Occupation				556.669	<0.001
Students	452	219	48.5 (43.8–53.1)		
TAP*	12,934	6,858	53.0 (52.2–53.9)		
Business and service personnel	2,361	1,210	51.2 (49.2–53.3)		
Managers of government agencies, enterprises and institutions	5,977	3,822	63.9 (62.7–65.2)		
Retired	1,238	859	69.4 (66.8–72.0)		
Unemployed and others	9,281	4,360	47.0 (46.0–48.0)		
Living area				312.909	<0.001
Suburban (rural) and other	13,219	6,335	47.9 (47.1–48.8)		
Other densely populated urban areas (residential areas)	9,049	5,133	56.7 (55.7–57.7)		
Central urban area (where businesses gather or traffic is heavy)	9,975	5,860	58.7 (57.8–59.7)		
Living time				11.292	<0.001
6 months to 3 years	4,482	2,314	51.6 (50.2–53.1)		
3 to 10 years	9,552	5,221	54.7 (53.7–55.7)		
>10 years	18,209	9,793	53.8 (53.1–54.5)		
Areas type				79.684	<0.001
City (District)	7,715	4,466	57.9 (56.8–59.0)		
County	24,528	12,773	52.1 (51.4–52.7)		

* T refers to professional technicians; A refers to agriculture, forestry, animal husbandry, fishery and water conservancy production personnel; P refers to production and transportation equipment operators.

behind the improvement speed of the masses' expectations (5), it is also possible that different residents have different standards for evaluating satisfaction.

Previous studies on sanitation of public places mainly focused on evaluating whether the sanitation of each was qualified by sampling and monitoring the public goods or air quality of each place (6–7). These studies focused on discussing the current problems and corresponding remediation plans from the perspective

of health supervision and management (8), but rarely evaluated the sanitation of the public place and collected ideas from the perspective of residents. This study investigated the environmental sanitation conditions of key public places by knowing the satisfaction of residents. Lessons learned will inform the subsequent construction of national healthy cities and counties.

This study has some limitations. Firstly, central intercept investigation was adopted to select residents.

TABLE 2. Comparative analysis of residents' satisfaction with the environmental sanitation of key public places in different types of cities (n=7,715, %).

City type	Total		Farmers market		Beauty salon places		Recreation places		Accommodation places		Food and beverage places		Railway stations and other transportation places	
	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)
Non-national healthy cities	1,175	47.4 (45.4-49.3)	913	36.8 (34.9-38.7)	1,190	48.0 (46.0-49.9)	1,139	45.9 (43.9-47.9)	1,174	47.3 (45.4-49.3)	1,171	47.2 (45.2-49.2)	1,252	50.5 (48.5-52.4)
National healthy cities	3,291	62.9 (61.6-64.2)	2,986	57.1 (55.7-58.4)	3,268	62.4 (61.1-63.8)	3,097	59.2 (57.8-60.5)	3,211	61.3 (60.0-62.7)	3,184	60.8 (59.5-62.2)	3,523	67.3 (66.0-68.6)
χ^2	166.252		276.122		144.537		119.563		135.036		127.273		202.530	
P	0.001		0.001		0.001		0.001		0.001		0.001		0.001	

Abbreviation: CI=confidence interval.

TABLE 3. Comparative analysis of residents' satisfaction with the environmental sanitation of key public places in different types of counties (n=24,528, %).

County type	Total		Farmers market		Beauty salon places		Recreation places		Accommodation places		Food and beverage places		Railway stations and other transportation places	
	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)	n	Rate (95% CI)
Non-national healthy counties	6,651	62.3 (61.4-63.2)	5,976	56.0 (55.0-56.9)	6,583	61.7 (60.8-62.6)	6,382	59.8 (58.9-60.7)	6,580	61.6 (60.7-62.6)	6,547	61.3 (60.4-62.3)	7,085	66.4 (65.5-67.3)
National healthy counties	6,211	44.8 (44.0-45.7)	5,346	38.6 (37.8-39.4)	4,459	41.2 (40.2-42.1)	5,776	41.7 (40.9-42.5)	6,125	44.2 (43.4-45.0)	6,052	43.7 (42.9-44.5)	7,029	50.7 (49.9-51.6)
χ^2	738.484		734.324		673.103		789.958		733.938		751.975		603.629	
P	0.001		0.001		0.001		0.001		0.001		0.001		0.001	

Abbreviation: CI=confidence interval.

Although the study had broad geographic coverage and a large sample size in four PLADs, the representation of the participants may have been limited. Secondly, this survey only described the residents' satisfaction with the sanitation of key public places, and failed to consider the residents' awareness of environmental sanitation and other factors that may affect residents' satisfaction. This study provides a suitable reference for government decision-makers to effectively improve the sanitation situation of key public places and further construct national healthy cities and counties.

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