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Satisfaction with and factors influencing rural residents' government responses to COVID-19 in the post-pandemic era

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Abstract

Background China lifted its strict COVID-19 lockdown policies on December 8, 2022, transitioning to a series of milder preventive measures. Understanding the factors influencing rural residents' satisfaction with these policies is crucial for strengthening the government's ability to effectively respond to public health emergencies such as the COVID-19 pandemic.

Methods A cross-sectional survey on government policy satisfaction was conducted from January 28 to 31, 2023, and a convenience sampling method was used to recruit 1,276 rural residents across 27 provinces. Chi-square tests and logistic regression analysis were employed to identify the factors influencing rural residents' satisfaction with the government's pandemic response, with the significance level set at $\alpha = 0.05$.

Results A total of 59.87% of the participants reported being satisfied with the government's pandemic response. Logistic regression analysis revealed that migrant workers had lower levels of satisfaction with government pandemic policies (OR = 0.56, 95% CI: 0.40–0.80). The worse the government's ability to treat COVID-19 patients is, the lower their level of satisfaction (OR = 0.51, 95% CI: 0.38–0.70). Conversely, rural residents who exercised regularly presented higher levels of satisfaction (OR = 1.55, 95% CI: 1.19–2.01). Satisfaction was positively associated with key control measures, including health screenings (OR = 2.19, 95% CI: 1.48–3.22), pandemic control teams (OR = 2.21, 95% CI: 1.51–3.23), and restrictions on gatherings (OR = 1.57, 95% CI: 1.12–2.19). Inadequate health advocacy was negatively correlated with satisfaction (OR = 0.66, 95% CI: 0.44–0.99). Significant regional differences were observed, with residents in eastern China (OR = 1.57, 95% CI: 1.17–2.12) and western China (OR = 1.90, 95% CI: 1.37–2.63) reporting higher levels of satisfaction than those in central China did.

Conclusion More than half of rural residents are satisfied with the government's pandemic response, but significant room for improvement remains. Notably, the lower satisfaction levels among rural residents in central China warrant greater attention. This study identifies various factors influencing satisfaction with government pandemic policies, offering a scientific reference for enhancing responses to public health emergencies such as the COVID-19 pandemic.

Keywords COVID-19, Rural residents, Satisfaction, Influencing factor, Pandemic policy

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Introduction

A novel coronavirus outbreak erupted in Wuhan in late 2019, rapidly spreading across the entire country. Owing to the close connections among the global economy, population, and transportation, the new coronavirus extended its reach to various countries or regions worldwide. Identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), this novel coronavirus emerged as the primary cause of the disease known as COVID-19 [1]. As of January 1, 2023, the reported number of confirmed cases of COVID-19 worldwide had surpassed 656 million, with the number of deaths exceeding 6.6 million [2]. China is one of the countries to be significantly impacted by the COVID-19 pandemic. Since the reopening on December 8, 2022, and until January 12, 2023, Chinese medical institutions reported a cumulative total of 59,938 deaths related to COVID-19 infections within the hospital setting. Among them, 5,503 deaths were attributed to respiratory failure caused by COVID-19 infection, while 54,435 deaths resulted from a combination of underlying health conditions and COVID-19 infection [3].

The COVID-19 pandemic imposed significant economic and social burdens on countries and regions worldwide, including issues such as unemployment, poverty, and stigmatization [4]. With the COVID-19 pandemic presenting significant challenges to public health, the research community, and the health care sector, governments worldwide have implemented various measures [5]. These measures include imposing temporary travel restrictions, significantly reducing the number of travelers, isolating international travelers, maintaining social distancing, promoting self-isolation, advocating the use of masks, emphasizing regular handwashing, implementing lockdowns, and deploying other strategies aimed at curbing the spread of the virus across different countries [6–10]. Despite the gradual rollout of vaccines against the novel coronavirus, adhering to personal hygiene and preventive measures, in addition to actively identifying and isolating cases, remains an effective strategy for combating the pandemic. The Chinese government implemented different prevention and control strategies and measures at various stages of the COVID-19 pandemic. They include proactive containment strategies, tiered management, rational resource allocation, effective contact tracing, and the voluntary cooperation of Chinese citizens [11]. These measures are related to health care systems, the economy, and sociocultural factors [12]. The prevention and control policies implemented in response to the pandemic have also had economic implications for different countries. Research conducted by the United Nations (UN) and other international organizations indicates that the multiple negative impacts generated by this pandemic have exacerbated the economic developmental challenges faced by developing countries [13, 14].

Public attitudes toward government policies or measures in response to the COVID-19 pandemic vary. Overall, the public was mostly negative regarding the government's response to the pandemic. Economic downturns, unemployment, threats to physical and mental health posed by the virus, and the circulation of virus-related misinformation online contributed to people's negative attitudes toward and perspectives on pandemic policies. In addition to the government directives and interventions implemented in each country, these differences can also be explained by cultural variances, societal norms, and disparities in the relative position on the trajectory of the pandemic curve [15]. The public's acceptance and level of trust in government policies vary significantly across different countries [16]. For example, a 2020 survey revealed that, owing to comparatively stringent pandemic control measures, the public in France and Italy showed higher levels of support for their respective governments. In contrast, public satisfaction was lower in the United Kingdom and Japan, where control policies were less strict [17]. In general, regions with strong economic development exhibited higher levels of governance in pandemic prevention and control, as governments had sufficient financial resources to provide economic support. In contrast, less developed areas often experienced less effective outcomes in pandemic prevention and control measures due to resource constraints. As the public's understanding of COVID-19 deepened and government capabilities in pandemic control improved, the incidence rate of COVID-19 could be effectively controlled, leading to increased public satisfaction with the government. In high-income countries, social distancing measures may save many lives, whereas in populous and economically disadvantaged nations vulnerable to the impact of COVID-19, the effectiveness of such measures was less pronounced [18].

In existing studies, research on public attitudes toward, perceptions of and satisfaction with pandemic policies often involves random sampling of the general population [19, 20], or it focuses on specific professions, such as employees in certain factories or health care workers in hospitals [21, 22]. The study periods are primarily concentrated in the early and middle stages of the pandemic. Overall, insufficient attention has been paid to the satisfaction of Chinese rural residents with government pandemic policies, and research on the satisfaction of rural residents with pandemic policies in the post-pandemic era is scarce.

China initiated a comprehensive reopening plan on December 8, 2022, discontinuing large-scale nucleic acid testing for the population, and individuals no longer needed to scan health QR codes for entry into

public places. Despite the government's adoption of a series of more lenient preventive measures while lifting strict lockdowns, the number of new COVID-19 cases has significantly increased over a short period. Medical resources and health care technological capabilities in rural areas are far less developed than in urban areas. This study conducted a cross-sectional survey on the satisfaction of rural residents with government pandemic policies after the policy relaxation in 2022. This study explores various factors influencing policy satisfaction, aiming to provide an effective reference for the government's response to similar public health events, such as the COVID-19 pandemic, and the implementation of corresponding measures.

Data and methods

Data

A cross-sectional survey was conducted from January 28 to January 31, 2023. A convenient sampling strategy was employed to recruit participants from villages in 27 provinces across China (excluding Qinghai, Taiwan, Macau, Hong Kong, Inner Mongolia, Xizang, and Xinjiang). The sampled population consisted of rural residents. A combination of online and onsite survey methods was employed in this study. The online survey distributed electronic questionnaires to community residents through the Survey Star app, whereas the onsite survey involved interviews conducted by student volunteers. This dual approach ensured that older respondents were aware of the content of the questionnaire, thus enhancing the quality of the survey. All the student volunteers underwent uniform training before the survey. The inclusion criteria for the participants were as follows: ① age ≥ 18 years; ② the ability to read and understand the questionnaire correctly (with the assistance of volunteers); and ③ informed consent and a willingness to participate in the survey. Each IP address could only respond only once, and incomplete or logically inconsistent entries were considered invalid and excluded. Ultimately, 1,276 qualified questionnaires were collected.

Variables

On the basis of epidemiological and disease prevention guidance documents related to the COVID-19 pandemic, and in conjunction with the theme of this study, a survey questionnaire was independently developed. The factors influencing rural residents' satisfaction with pandemic prevention and control policies were identified as a vector of explanatory variables **X**. **X** was divided into seven independent variables $\mathbf{X}_n$ ($n = 1,\ldots, 9$).

X1 represents the demographic and socioeconomic characteristics of the individual, including his or her gender, age, years of education, occupation, and party membership status. **X2** represents family characteristics, including the number of family members, and whether children reside in the same village or household. **X3** represents individual medical capability, including the primary payer for medical expenses and expenditures on related pandemic prevention materials and medicines in 2022. **X4** represents self-rated health conditions, including physical health, mental health, the presence of chronic diseases, and the habit of physical exercise. **X5** represents the status of COVID-19 infection, including whether the respondent has contracted COVID-19 and whether he or she has received the vaccine. **X6** represents the government's medical supply capability, including difficulties in purchasing medicine and seeking medical treatment, and the treatment capability for severe cases. **X7** represents government prevention and control measures, including health screenings for key populations, health advocacy, the establishment of prevention and control service teams, restrictions on gatherings, and assistance for elderly individuals living alone. **X8** represents the region, encompassing eastern China (Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan), western China (Sichuan, Chongqing, Guizhou, Yunnan, Xizang, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Guangxi, Inner Mongolia), and Central China (Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, Hunan). **X9** represents GDP, including the GDP of the province where rural residents live in 2022, as a control variable for studying regional differences in the satisfaction of rural residents. **Y** represents rural residents' satisfaction with government pandemic prevention and control policies, where $\mathbf{Y} = 1$ denotes satisfaction, and $\mathbf{Y} = 0$ otherwise.

Methods

We used a chi-square test to analyze the satisfaction of rural residents with government pandemic response policies under different characteristics. The Shapiro–Wilk test was used to assess the normality of the quantitative data. After the specific assumptions, including low multicollinearity, independence of errors, linearity in the logit for continuous variables, and a lack of strongly influential outliers, were verified, a logistic regression model was employed, and utilized a logistic regression model was used to analyze various factors influencing the satisfaction of rural residents with government pandemic response policies. All analyses were conducted using SPSS version 26 (IBM Corporation), with a two-tailed P value < 0.05 indicating statistical significance.

In the binary logistic regression, the forward stepwise likelihood ratio method was employed for variable entry, with 0 as the reference for Y, representing dissatisfaction. The model coefficients were collectively tested, where a p value < 0.05 indicated that at least one variable's OR value made the model meaningful, thus confirming the

successful establishment of the model. The Hosmer test was used to assess the goodness of fit of the model, and a p value > 0.05 demonstrated good fit, indicating that there was no significant difference between the predicted values and actual values. The final step included 8 indicators in the model, which were verified through significance tests.

Results

Characteristics of the participants

A total of 1,276 participants were involved in this study. Among them, 59.87% expressed satisfaction with government responses to the pandemic, whereas 40.13% indicated dissatisfaction. The sample sizes in eastern, central and western China accounted for 36.68%, 36.05% and 27.27%, respectively. Among them, 67.82% of rural residents in western China expressed satisfaction with the government's pandemic policy, while the proportion of rural residents in central China who were satisfied with the government's pandemic policy was the lowest, at 51.09%. The average age of the participants was 51.9 ± 15.5 years. During data collection, the majority of participants fell within the 45–59 age group, accounting for 39.34%, followed by those aged over 59, accounting for 31.66%. Consequently, the majority of participants were middle-aged to elderly (> 45 years), constituting 71% of the sample. More males than females participated in the survey, with males accounting for 51.65% and females accounting for 48.35%. Compared with females, rural males tended to exhibit slightly greater satisfaction with government policies. The participants generally had lower educational levels, with the majority (88.95%) having an educational attainment of below a bachelor's degree. Over half of the participants (58.23%) were employed as farmers or migrant workers. Table 1 presents the basic characteristics of the participants, along with the characteristics of the factors under investigation.

The results of the chi-square test (Table 1) revealed statistically significant differences in rural residents' satisfaction with pandemic policies across various factors. These factors included the participants' job type, party membership, family annual income, self-rated physical health, self-rated mental health, and exercise habits, as well as difficulty in purchasing medicine, difficulty in seeking medical treatment, the treatment capacity for severe cases, health screenings for key populations, health advocacy efforts, the establishment of health service teams, one-on-one assistance for elderly individuals living alone, restrictions on gatherings, and regions.

Factors associated with satisfaction with government policies

Table 2 shows that demographic characteristics, health conditions, government medical supply capability, health advocacy, government pandemic prevention and control measures, and region are related to farmers' satisfaction with government pandemic policies.

Regarding demographic and sociological characteristics, migrant workers expressed lower levels of satisfaction with government pandemic prevention and control policies (OR = 0.56, 95% CI: 0.40–0.80). With respect to health conditions, rural residents with a habit of regular physical exercise were more satisfied with government pandemic policies (OR = 1.55, 95% CI: 1.19–2.01). Concerning government medical supply capability, the poorer the government's treatment capability for COVID-19 patients is, the lower the satisfaction of individuals with government pandemic policies (OR = 0.51, 95% CI: 0.38–0.70). With respect to government prevention and control measures, actions such as health screenings for key populations (OR = 2.19, 95% CI: 1.48–3.22), the establishment of pandemic prevention and control service teams (OR = 2.21, 95% CI: 1.51–3.23), and restrictions on gatherings (OR = 1.57, 95% CI: 1.12–2.19) were positively correlated with rural residents' satisfaction with government pandemic policies. Inadequate health advocacy by the government regarding pandemic prevention and control measures (OR = 0.66, 95% CI: 0.44–0.99) was negatively correlated with rural residents' satisfaction. In terms of regional differences, rural residents in western China (OR = 1.90 95% CI: 1.37–2.63) and eastern China (OR = 1.57 95% CI: 1.17–2.12) expressed higher levels of satisfaction with the government's pandemic policies than did those in central China, at levels that were 1.90 and 1.57 times higher, respectively.

Among all the factors, the preventive and control measures implemented by the government have the greatest impact on rural residents' satisfaction with government pandemic prevention and control policies. Among the various prevention and control measures, the establishment of prevention and control service teams and the health screenings of key groups have the most significant impacts on the satisfaction of rural residents. In other words, the impacts of the establishment of prevention and control service teams and the implementation of key population health screenings on the satisfaction of rural residents were 2.21 and 2.19 times greater, respectively, than those of the nonimplementation of the measure. The prevention and control service team is the basis for the government to conduct health screenings for key populations. Health screenings for key rural populations involve understanding the basic health conditions of vulnerable groups, such as elderly individuals, women, children, impoverished households, disabled individuals, and patients. Free health kits are distributed as part of this initiative. If an individual is infected with the novel coronavirus, the government will transport him or her to nearby isolation centers or hospitals for treatment on

Table 1 Characteristics of the participants in the study ($N=1276$)

Variable	Total	Satisfaction		*P* value
		YES	NO	
Sociodemographic characteristics				
Gender				0.695
Female	48.35%	59.32%	40.68%	
Male	51.65%	60.39%	39.61%	
Age				0.318
<45	29.00%	60.00%	40.00%	
45–59	39.34%	61.55%	38.45%	
>59	31.66%	55.20%	44.80%	
Educational level				0.456
0–6	39.66%	58.70%	41.30%	
7 ~ 12	49.29%	59.78%	40.22%	
>12	11.05%	64.54%	35.46%	
Job type				<0.001
Farmer	38.40%	61.43%	38.57%	
Rural migrant worker	19.83%	52.17%	47.83%	
Teacher and doctor	13.24%	66.27%	33.73%	
Self-employed laborer	3.06%	87.18%	12.82%	
Village cadre	6.66%	62.35%	37.65%	
Others	18.81%	55.00%	45.00%	
Party member				<0.001
No	89.03%	57.92%	42.08%	
Yes	10.97%	75.71%	24.29%	
Family characteristics				
Family members				0.889
<5 = 0	54.31%	59.31%	40.69%	
5 ~ 6	37.38%	60.38%	39.62%	
>6 = 2	8.31%	61.32%	38.68%	
Living with their parents				0.682
No	58.31%	59.21%	40.79%	
Yes	41.69%	60.35%	39.65%	
Annual household income				0.024
<10,000	5.56%	47.89%	52.11%	
10,000–50,000	40.83%	62.57%	37.43%	
50,000–100,000	31.35%	62.00%	38.00%	
>100,000	22.26%	54.93%	45.07%	
Health condition				
Physical health				<0.001
Unhealthy/not good	7.37%	43.62%	56.38%	
General	21.87%	55.20%	44.80%	
Healthy/good	70.77%	63.01%	36.99%	
Chronic disease				0.995
No	75.31%	61.39%	38.61%	
Yes	24.69%	55.24%	44.76%	
Mental health				0.006
Unhealthy/not good	2.98%	44.74%	55.26%	
General	13.56%	51.45%	48.55%	
Healthy/good	83.46%	61.78%	38.22%	
Habit of exercise				<0.001
No	58.23%	54.24%	45.76%	
Yes	41.77%	67.73%	32.27%	
Individual medical payment				
Who mainly pays for medical expenses				0.296

Table 1 (continued)

Variable	Total	Satisfaction		*P* value
		YES	NO	
Free medical care	10.34%	66.67%	33.33%	
Cooperative medical care	40.83%	58.93%	41.07%	
State and collective subsidies	2.59%	51.52%	48.48%	
Self-paying	46.24%	59.66%	40.34%	
Cost of purchasing pandemic prevention materials in 2022				0.468
0-200	35.42%	57.52%	42.48%	
200–500	32.13%	59.51%	40.49%	
500–1000	19.12%	62.70%	37.30%	
>1000	13.32%	62.94%	37.06%	
COVID-19 related factors				
Infected with COVID-19				0.987
No	18.34%	59.83%	40.17%	
Yes	81.66%	59.88%	40.12%	
Vaccination				0.193
No	1.96%	44.00%	56.00%	
First shot	1.10%	50.00%	50.00%	
Two shots or above	96.94%	60.31%	39.69%	
Government's medical supply capacity				
Difficulty in purchasing medicine				0.031
Decreased	68.89%	59.16%	40.84%	
Steady	14.50%	68.11%	31.89%	
Increased	16.61%	55.66%	44.34%	
Difficulty in receiving medical services				0.011
Decreased	62.23%	60.83%	39.17%	
Steady	13.87%	66.67%	33.33%	
Increased	23.90%	53.44%	46.56%	
Government's prevention and control measures against COVID-19				
Ability to treat severe patients of COVID-19				<0.001
Good	38.79%	72.32%	27.68%	
General	29.08%	53.37%	46.63%	
Not good	32.13%	50.73%	49.27%	
Health screening for key populations				<0.001
No	19.67%	40.64%	59.36%	
Yes	43.65%	76.48%	23.52%	
Not clear	36.68%	50.43%	49.57%	
Health advocacy				<0.001
No	18.42%	47.23%	52.77%	
Yes	53.53%	71.30%	28.70%	
Not clear	28.06%	46.37%	53.63%	
Establishment of a prevention and control service team				<0.001
No	30.41%	48.97%	51.03%	
Yes	31.58%	79.65%	20.35%	
Not clear	38.01%	52.16%	47.84%	
Provision of one-on-one assistance to elderly people living alone				<0.001
No	24.53%	50.16%	49.84%	
Yes	30.88%	75.13%	24.87%	
Not clear	44.59%	54.66%	45.34%	
Restrictions on gatherings				<0.001
No	49.53%	52.06%	47.94%	
Yes	29.15%	77.42%	22.58%	
Not clear	21.32%	54.04%	45.96%	
Region				<0.001

Table 1 (continued)

Variable	Total	Satisfaction		*P* value
		YES	NO	
Central China	36.68%	51.09%	48.91%	
Western China	36.05%	67.82%	32.18%	
Eastern China	27.27%	62.61%	37.39%	
Provincial GDP				0.008
<200	9.87%	53.17%	46.83%	
200–600	57.76%	63.50%	36.50%	
>600	32.37%	55.45%	44.55%	
Satisfaction				
No	40.13%			
Yes	59.87%			

Note: Values in bold indicate statistical significance at $P < 0.05$.

Table 2 Logistic regression analysis of rural residents' satisfaction with government pandemic policies

Independent variable	Coefficient	S.E,	Wals	df	*P* value	OR(95% CI)
Job type(0 = Farmer)					Ref.	
Job type(1 = Migrant workers)	-0.58	0.18	10.54	1	**0.001**	0.56(0.40–0.80)
Job type(2 = Teacher and doctor)	-0.13	0.21	0.41	1	0.52	0.87(0.58–1.32)
Job type(3 = Self-employed laborer)	0.36	0.51	0.49	1	0.48	1.43(0.52–3.92)
Job type(4 = Village cadre)	-0.29	0.27	1.14	1	0.29	0.75(0.45–1.27)
Job type(5 = Others)	-0.32	0.18	3.27	1	0.07	0.73(0.51–1.03)
Have a habit of exercising(0 = No)					Ref.	
Have a habit of exercising(1 = Yes)	0.44	0.13	10.79	1	**0.001**	1.55(1.19–2.01)
Government's ability to treat COVID-19 patients (0 = Good)					Ref.	
Government's ability to treat COVID-19 patients (1 = Average)	-0.67	0.16	17.41	1	**<0.001**	0.51(0.38–0.70)
Government's ability to treat COVID-19 patients (2 = Not good)	-0.68	0.16	19.18	1	**<0.001**	0.51(0.37–0.69)
Health screenings for key populations(0 = No)					Ref.	
Health screenings for key populations(1 = Yes)	0.78	0.20	15.60	1	**<0.001**	2.19(1.48–3.22)
Health screenings for key populations(2 = Not clear)	0.20	0.19	1.05	1	0.31	1.22(0.84–1.77)
Health advocacy(0 = No)					Ref.	
Health advocacy(1 = Yes)	0.10	0.19	0.27	1	0.60	1.11(0.76–1.62)
Health advocacy(2 = Not clear)	-0.42	0.21	3.93	1	**0.047**	0.66(0.44–0.99)
Establishment of a pandemic prevention and control service team(0 = No)					Ref.	
Establishment of a pandemic prevention and control service team(1 = Yes)	0.79	0.19	16.66	1	**<0.001**	2.21(1.51–3.23)
Establishment of a pandemic prevention and control service team(2 = Not clear)	0.19	0.17	1.28	1	0.26	1.21(0.87–1.69)
Restriction on gatherings(0 = No)					Ref.	
Restriction on gatherings(1 = Yes)	0.45	0.17	6.93	1	**0.008**	1.57(1.12–2.19)
Restriction on gatherings(2 = Not clear)	0.11	0.17	0.40	1	0.53	1.11(0.80–1.56)
Central China					Ref.	
Eastern China	0.45	0.15	8.89	1	**0.003**	1.57(1.17–2.12)
Western China	0.64	0.17	14.94	1	**<0.001**	1.90(1.37–2.63)

the basis of the severity of him or her symptoms. This health survey initiative has broad coverage, and the public perceives it profoundly. The measure reflects a sense of humanity and governmental responsibility, leading to greater satisfaction among rural residents with government pandemic policies.

Regional differences in satisfaction with government policies

As previously mentioned, rural residents in eastern and western China reported higher levels of satisfaction with government policies than did those in central China. As shown in Table 3, the effectiveness of pandemic control measures implemented by governments in the western and eastern regions was greater than that in the central region. These measures primarily include health screenings for key populations, health advocacy, the establishment of prevention and control service teams, one-on-one assistance for elderly individuals living alone, and the regulation of public gatherings. Among them, health advocacy had the highest reach. In the western region, 60.06% of the respondents believed that

Table 3 Regional disparities in the factors influencing rural residents' satisfaction with government COVID-19 policies

Variable	Central China	Western China	Eastern China
Migrant worker	14.78%	15.52%	27.99%
Exercise habit	55.43%	41.09%	39.53%
Good ability to treat severe COVID-19 patients	41.09%	36.21%	38.46%
Health screenings for key populations	33.70%	**49.71%**	48.93%
Health advocacy	46.96%	**60.06%**	55.13%
Establishment of a prevention and control service team	29.57%	31.61%	33.55%
Provision of one-on-one assistance to elderly people living alone	24.57%	33.91%	34.83%
Restrictions on gatherings	20.87%	**35.34%**	32.69%
Satisfaction	51.09%	67.82%	62.61%

the government had conducted pandemic-related public health campaigns, whereas in the central region, this proportion was less than half (46.96%). The second most notable measure was health screenings, with 49.71% of respondents in the western region acknowledging government efforts in conducting health assessments for rural elderly individuals, compared with only 33.70% in the central region. Additionally, restrictions on public gatherings were more stringent in the western (35.34%) and eastern (32.69%) China than in the central China.

Discussion

The survey results indicate that 59.87% of rural residents are satisfied with the government's response to the pandemic. While this percentage exceeds half, it is not particularly high. One possible explanation is that, during the early phase of the lifting of COVID-19 restrictions, the high infection rate led to widespread public dissatisfaction. This suggests that in future responses to similar public health crises, particularly in the initial stages of the easing of control measures, there is considerable room for improving rural residents' satisfaction with government policies. Some studies argue that Chinese citizens were discontent with the government's stringent containment measures, which were widely criticized for allegedly "infringing on human rights" in the early stages. For example, Wuhan's large-scale lockdowns resulted in significant social and economic costs, raising concerns among other governments about potential repercussions [23, 24]. However, other studies suggest that when the Chinese government ensured transparency, allocated resources effectively, and responded promptly, public satisfaction with lockdown measures was relatively high [25]. This study focuses on rural residents' satisfaction with the government's pandemic response. The results show that more than half of the rural residents surveyed expressed satisfaction with the government's COVID-19 control policies, despite the spread of negative news in rural areas at the time. Previous research has shown that, in countries with relatively stringent COVID-19 measures (with the exception of France and Italy), public satisfaction with and trust in the government tended to be lower [17, 26]. In this regard, however, China appears to differ, which may be attributed to its traditional Confucian culture. Confucianism emphasizes hierarchical order, collectivism, and respect for authority. In Chinese society, Confucian principles have historically provided a foundational order for governance. The Confucian concept of "ritual order" integrates everyday social order with national governance, reinforcing public acceptance and compliance [27]. Influenced by Confucian values, Chinese citizens generally express satisfaction with the government's approach, demonstrating a willingness to sacrifice certain individual interests for the sake of social harmony. Even when government actions occasionally infringe on personal interests, citizens tend to tolerate them as long as they are perceived as serving the collective good [19, 28]. Thus, rural residents' satisfaction with COVID-19 policies may stem from a sense of compliance, an acceptance-based mindset, or an understanding of the broader context. In other words, although individuals recognize that some policies may come at a personal cost, such as affecting individuals' life satisfaction, they trust that policy-makers have good intentions in considering the greater public interest. Therefore, rural residents' satisfaction with government policies is significantly influenced by local sociocultural and ideological factors.

Oleribe et al. reported that women perceive the government's ability to respond to the pandemic as being lower [29]. We observed that rural women expressed lower levels of satisfaction with government policies in response to the pandemic than men did, although this difference did not reach statistical significance. The lower satisfaction among rural women may be attributed to the heavier household and caregiving responsibilities that they often bear compared to men. Moreover, when facing unexpected public health events such as COVID-19, women tend to experience a stronger sense of insecurity, leading to lower satisfaction with pandemic policies compared to men. Research has shown that during the COVID-19 pandemic, fear predominantly prevailed among women [30]. Women are more likely than men to experience anxiety during the coronavirus pandemic [31]. This result implies that when similar public health events such as COVID-19 occur, in addition to addressing the challenges that women face in their daily lives and work during the pandemic, attention should be paid to their mental health conditions. Women should develop the ability to discern accurate information about the pandemic, avoiding the influence of misinformation. At the

same time, they are encouraged to seek support from local mental health counseling centers or the psychological assistance hotline 12,356 to access professional counseling and psychological support when they need psychological counseling assistance.

We found that, among demographic characteristics, only the participants' occupation was correlated with satisfaction with government pandemic policies. Rural residents employed as migrant workers expressed lower levels of satisfaction with the government's pandemic policies. This finding indicates that individuals who are highly dependent on the external environment are less satisfied with the government's pandemic policies. Compared with farmers, who rely on the land for their livelihoods, migrant workers have more flexible job content, working hours, and locations. However, during the pandemic, this flexibility became a significant factor limiting the livelihoods of migrant workers, as restricting population movement and implementing isolation were crucial measures for preventing the spread of COVID-19. Pandemic-related control measures have profoundly altered the working environment of migrant workers [32]. Job instability or a significant reduction in income leads to lower levels of satisfaction among migrant workers with government pandemic policies. Research indicates that the negative effects of the pandemic included economic downturns, income reductions, and a sharp increases in unemployment rates [33]. Therefore, the government should pay special attention to the livelihoods of migrant workers and unemployed individuals by providing or increasing financial assistance for low-income groups. For instance, the Ministry of Civil Affairs, Central Agricultural Office, Ministry of Finance, and National Rural Revitalization Administration jointly issued the "Notice on Further Enhancing the Social Assistance System for Basic Livelihood Protection" [34]. This notice stipulates that migrant workers unable to return to work due to the pandemic can apply for a one-time temporary relief fund from either their workplace location or their habitual residence, helping them overcome short-term financial difficulties.

This study reveals that rural residents who habitually engage in physical exercise are more satisfied with the government's pandemic policies. On the one hand, regular physical exercise contributes to increasing people's physical fitness, and individuals who exercise regularly generally have better health conditions. On the other hand, rural residents with exercise habits also have greater health awareness. During pandemic prevention and control, they are more likely to pay attention to personal protective measures such as washing their hands, wearing masks, and ensuring ventilation. These positive habits and optimistic attitudes toward preventive measures contribute to increased satisfaction among rural residents with government pandemic policies. Research indicates that moderate exercise can effectively alleviate anxiety and depressive emotions related to the COVID-19 pandemic through its regulatory effects on the regulation of neurotransmitters, neurogenesis, neurotrophic factors, and cerebral blood flow [35]. Therefore, the government should encourage rural residents to participate in various forms of exercise, promote healthy living concepts and exercise methods, and enhance the health literacy of local residents.

Our study revealed that the lower the government's capacity to treat COVID-19 patients is, the lower the satisfaction of people with the government's pandemic prevention and control policies. In both urban and rural areas, the Chinese government has attached great importance to pandemic prevention and control, promptly implementing a series of public health measures to address the situation [36]. Taking rural areas as an example, once a person is diagnosed with COVID-19, the information is reported layer by layer to the prevention and control center. The village government promptly transports the individual to an isolation area and provides the necessary medication. If the symptoms are severe, the patient will be swiftly transferred to a hospital for treatment. The treatment of COVID-19 patients is a phenomenon that rural residents can personally experience and perceive. The government's commitment to treating COVID-19 patients reflects its emphasis on individuals' lives and the intensity of its efforts in controlling the pandemic. The higher the level of government treatment for COVID-19 patients is, the greater the satisfaction of the people with the government's pandemic policies. This finding indicates that during the prevalence of infectious diseases, enhancing patient treatment and human care contributes to increased satisfaction among the public with the government's work. Given the high proportion of elderly residents in rural areas, strengthening health monitoring and assessments for senior citizens during infectious disease outbreaks is essential.

This study reveals a strong correlation between various pandemic prevention and control policies implemented by the government and a high level of satisfaction of rural residents with government policies. Cathy et al. indicated that people pay greater attention to the results of their governments' battle against COVID-19 (number of confirmed cases and deaths per million population) than to what policies they initiate [37]. Although we included information about COVID-19 infections in our questionnaire, the correlation of this question with rural residents' satisfaction was not significant. In contrast, we found a significant positive correlation between rural residents' satisfaction with government pandemic policies and specific preventive measures initiated by the government, such as conducting health screenings

for key populations, launching health advocacy campaigns, establishing pandemic prevention and control service teams, and restricting gatherings. The reason may be that, in the later stages of the pandemic, the majority of rural residents had already been vaccinated against COVID-19, increasing their understanding of virus prevention measures. The established facts about the continued prevalence of the pandemic no longer evoke the same level of panic and fear as in the earlier stages of the pandemic. Moreover, government policies and preventive measures were implemented around the time of our survey, and people may have had higher expectations regarding the outcomes of policy implementation, leading to increased satisfaction with government pandemic policies.

Physical and sociocultural environments exhibit distinct characteristics in different regions. Consequently, people's satisfaction with government policies varies by region [17]. Within the same region, residents in different areas also differ in their satisfaction with policies. This study indicates that rural residents in eastern and western China were more satisfied with the pandemic prevention policies than were those in central China. The reason is the more effective pandemic prevention and control policies implemented by governments in the western and eastern China. Cary et al. indicated that authoritarian control, political culture, and awareness of government performance all contribute to citizen satisfaction, thus increasing public support for the Chinese government [19]. We observed that this phenomenon is more pronounced in western China. This finding indicates that in public health emergencies, rural residents in less developed western areas demonstrate stronger collective consciousness. They are willing to sacrifice some of their personal interests, such as quarantining at home and limiting social gatherings (which may impact residents' normal lives and livelihoods), to maintain a relatively stable situation for society as a whole. In other words, rural residents in western China show greater obedience to authority. Since individuals cannot combat the COVID-19 pandemic alone and must rely on a series of government control measures, their personal preferences become relatively less significant in the decision-making process [25]. As mentioned above, migrant workers' satisfaction with the government's pandemic policy is lower. However, we found that although migrant workers in eastern China constitute the highest proportion (27.99%), the satisfaction of rural residents in eastern China (62.61%) is still higher than that in central China (51.09%) (Table 3). The reason may be that the economy in the eastern region is relatively developed [38], meaning that it had a certain degree of economic resilience to the COVID-19 pandemic. Therefore, rural residents in eastern China are more satisfied with government policies than those in central China are. Peng et al. reported that during the COVID-19 pandemic, an increase in the total number of community pandemic prevention and control measures had the greatest impact on citizen satisfaction in the central region [39]. Considering the insufficient effectiveness of pandemic prevention and control policies in the central region, as indicated in our study, central China needs to increase the effectiveness of government pandemic policies, for example, by strengthening efforts in policy publicity and establishing a prevention and control service team. This study revealed that the highest proportion of respondents who believed that the government had conducted health campaigns related to the pandemic was in western China (60.6%), followed by eastern China (55.13%). This finding suggests that the central region needs to enhance the effectiveness of government pandemic policies by, for example, by strengthening public awareness campaigns, ensuring timely updates on pandemic information and control measures, and establishing dedicated prevention and control service teams. In western China, it is necessary to integrate individuals' personal rights with societal needs, seeking a balance between the two. While pursuing sustained economic growth, the eastern region should strategically integrate health promotion initiatives with equitable medical resource allocation to enhance the economy's ability to prevent sudden risks such as pandemics.

The present study has some limitations. First, this survey is a cross-sectional study that does not account for changes in rural residents' satisfaction with policies over different time periods. Thus, this study cannot prove a clear causal relationship. Obtaining panel survey data at various time points in the future would provide a better understanding of the changes in rural residents' satisfaction. Second, due to limitations in the surveyed sample, the western region in this study lacks survey data from Xinjiang, Xizang, Inner Mongolia and Qinghai. If survey data on the satisfaction of rural residents in these four western provinces were available, we could gain a deeper understanding of the regional differences in satisfaction among rural residents. Future research will continue to track public satisfaction with government policies, expanding the sample size in western China to provide scientifically grounded data for analyzing the regional differences in rural residents' satisfaction with pandemic policies. Third, this study provides only a preliminary exploration of the factors influencing rural residents' satisfaction with government pandemic policies. The identified factors are not exhaustive, and some variables may have been overlooked, such as the channels through which respondents accessed pandemic-related information and whether media coverage influenced their perceptions of government policies. Given that health communication is closely tied to the media and its

dissemination channels, factors such as the credibility of information sources, the mix of true and false information, and individuals' value judgments shape public satisfaction with government responses. Furthermore, this study's sample primarily comprised middle-aged and elderly individuals, with insufficient research on young people's views regarding the government's pandemic policy. Future research should integrate theoretical and cultural frameworks to explore the underlying mechanisms affecting rural residents' satisfaction across different age groups.

Conclusion

This study summarizes the satisfaction of rural residents in China with the government's response to the pandemic in the later stages and its influencing factors. Approximately 59.87% of rural residents express satisfaction with the government's pandemic response policies. However, migrant workers are less satisfied with the government's pandemic prevention and control policies. Rural residents who regularly engage in physical exercise tend to be more satisfied with the government's pandemic policies. Factors such as the government's robust treatment capacity for COVID-19 patients, health screenings for key populations, the establishment of pandemic prevention and control service teams, and restrictions on gatherings are positively associated with increased policy satisfaction. Inadequate government health advocacy for pandemic prevention measures is negatively correlated with the satisfaction of rural residents. Noticeable regional differences in farmers' satisfaction with the government's pandemic policies exist, with higher satisfaction in western China and eastern China than in central China. Additionally, local social and cultural factors play a role in shaping the satisfaction of rural residents with government response policies. These findings can assist the Chinese government in enhancing policy satisfaction when dealing with similar public health emergencies such as COVID-19. This can be achieved by promoting scientifically sound health knowledge, encouraging healthy exercise habits, focusing on vulnerable populations, and reinforcing the dissemination and implementation of prevention and control policies. The results can also serve as an effective reference for other countries' governments to respond to public health emergencies.

Abbreviations

S.E	Standard Error
Wals	Wald Statistic
df	Degrees of Freedom
OR	Odds Ratio
CI	Confidence Interval

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Author contributions

Wuwei Wang, Xiaokang Li, and Dacai Deng participated in the design of the study. Wuwei Wang, Xiaokang Li, Hao Li, and Dacai Deng contributed to the analyses of the data and prepared the tables. Wuwei Wang, Hao Li, and Liming Zhang drafted the manuscript. Xiaokang Li and Liming Zhang reviewed the relevant literature. All authors read and approved the final manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

This study has been approved by the Ethics Committee of the Institute of China Rural Studies at Central China Normal University. All methods were conducted in compliance with the Chinese Statistical Law to ensure the confidentiality of participants' personal information. Written informed consent was obtained from all study participants. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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