



Attitudes and behaviors on prevention and control of COVID-19 in a less developed village of Southwest China: a cross-sectional survey

Yuchen Zhang¹, Yonggao Huang², Li Zheng³, Dai Yan¹

¹Day Surgery Center/West China School of Nursing, West China Hospital, Sichuan University, Chengdu, China; ²Basic Geological Department, Sichuan Institute of Geological Survey/Guilin University of Technology, Chengdu, China; ³Sichuan Institute of Geological Survey, Chengdu, China
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Correspondence to: Dai Yan. West China Hospital, Sichuan University, No. 37 Guoxue Alley, Wuhou District, Chengdu, China.

Email: 1846703501@qq.com.

Background: At present new epidemic has entered a stage of normalized management, but there is still sporadic distribution, public already had certain protective knowledge of coronavirus disease 2019 (COVID-19). G County of Liangshan Yi Autonomous Prefecture is located in the mountainous area of southwest Sichuan Province, which also is ethnic minorities and as national-level poverty-stricken areas, residents in the region to the migrant workers as the main economic source of personnel with high mobility. In order to ensure the resumption of work and production, the effective implementation of epidemic prevention measures has certain guiding significance for epidemic prevention and control and economic recovery. This study investigated and analyzed the status quo of villagers' attitudes and behaviors toward COVID-19 prevention and control in Liangshan Yi Autonomous Prefecture, providing evidence for COVID-19 prevention and control measures in the resumption of rural work and agricultural production.

Methods: Snowball sampling was used to survey 117 villagers from an impoverished village in Liangshan Yi Autonomous Prefecture on February 10–19, 2020. A total of 120 questionnaires were collected, the recovery rate is 97.5%. Based on literature review, a self-designed questionnaire on attitudes and behaviors related to COVID-19 prevention and control was designed, the expert validity score was 0.912, and Cronbach α coefficient was 0.903.

Results: The overall score for respondents' attitude toward COVID-19 prevention and control was 29.65 ± 3.23 , which was considered a good level. The total score for prevention and control behavior was 114.74 ± 17.09 , which was medium level. A statistically significant difference was found for the attitudes and behaviors of different ethnic groups toward epidemic prevention and control.

Conclusions: The people in this village had a positive attitude toward epidemic prevention and control, but there was still room for improvement in prevention and control behavior. Training on hand hygiene and wearing masks outside should be strengthened, and relevant training for ethnic minorities should be further strengthened.

Keywords: Yi ethnicity; novel coronavirus; coronavirus disease 2019 prevention and control (COVID-19 prevention and control)

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Introduction

An unknown form of pneumonia developed in late 2019. The cases were later confirmed to be caused by a novel coronavirus (1) and named coronavirus disease 2019 (COVID-19) by the National Health Council (NHC) (2) and also the World Health Organization (WHO) (3). Along with treatment and research into COVID-19, it was vital that control measures among the healthy population be established (4), and with the unremitting efforts of the whole country, the epidemic has gradually been brought under effective control. While continuing to carry out infection prevention and control, the resumption of normal production is important to safeguard economic and social order (5). G County of Liangshan Yi Autonomous Prefecture is located in the mountainous area of southwest Sichuan Province. On February 23, 2020, NHC data (6) reported that the cumulative number of confirmed cases in Liangshan Yi Autonomous Prefecture was 13, among which 3 were in G County. At present, the COVID-19 prevention and control situation is improving on the whole, but we should not be complacent. There have been studies on COVID-19 related groups such as students and medical staffs (7,8), Wu's study on in-hospital patients, and the research shows that in-hospital patients' awareness of prevention and control is positively correlated with their

knowledge and attitude (9), Tang *et al.*'s survey of general practitioners suggests that effective knowledge training can improve the prevention and control of COVID-19 (10). However, people living in remote mountainous areas are less concerned. At the beginning of 2020, G County, an ethnic minority area, had just been removed from the national poverty county list. The local villagers rely on migrant work as their main source of income, and during the epidemic period, strengthening the awareness of villagers, especially migrant workers, would help reduce the negative impact of the epidemic on villagers' production and lives and play an important role in local prevention and control. This study conducted a survey and performed factor analysis of COVID-19 prevention and control attitudes and behaviors in M village, an impoverished community in G County, Liangshan Yi Autonomous Prefecture, in order to provide a reference for epidemic prevention and control in rural areas. We present the following article in accordance with the SURGE reporting checklist (available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-321/rc>).

Methods

General information

A questionnaire survey was conducted in M village, G County, Liangshan Yi Autonomous Prefecture on February 10–19, 2020. Snowball sampling method was adopted and questionnaires were distributed via Questionnaire Star (<https://www.wjx.cn>), investigators conducted on-site or telephone surveys of people around them, and then extrapolated from the survey objects in turn to obtain the survey objects. The inclusion criteria were: (I) local residents; (II) able to communicate in Mandarin; (III) ability to communicate, read and write; (IV) volunteer to participate in this survey. A total of 120 questionnaires were collected, a recovery rate of 97.5%, and after excluding the invalid ones, 117 questionnaires were included for analysis. The study was approved by West China Hospital ethics board (No. 2021-787). Informed consent was taken from all the patients. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

Sample size calculation

According to the multivariate statistical analysis, the sample size should be 5–10 times of the study factors (11). In this study, 4 variables were determined, and the sample size

Highlight box

Key findings

- The people in this village had a positive attitude toward epidemic prevention and control, but there was still room for improvement in prevention and control behavior.

What is known and what is new?

- There have been studies on COVID-19 related groups such as students and medical staffs. But Less attention has been paid to ethnic groups working in remote areas, however, there is a lot of mobility in these regions, so it's important to know what people think in these areas for epidemic prevention and control.
- This study focuses on rural and less developed areas, from a whole new perspective.

What is the implication, and what should change now?

- People in this village had a positive attitude toward epidemic prevention and control, but there was still room for improvement in prevention and control behavior. Focus should be on strengthening training in hand hygiene, using chopsticks when eating, and wearing masks when going out, with further relevant training for ethnic minorities.

should be 20–40 cases. Considering the invalid questionnaire and non-cooperation, the sample size was increased by 30%, that is, the sample size was between 26 and 52.

Research tools

Based on Knowledge, Attitude/belief, Practice (KAP) theory (12) and literature review about COVID-19, combined with expert consultation, we designed a questionnaire on villagers' attitudes, beliefs, and behaviors related to COVID-19 prevention and control. The questionnaire had an expert validity score of 0.912, and the Cronbach α coefficient of the presurvey was 0.903, indicating good reliability and validity. The questionnaire was divided into 3 parts. The first part collected demographic data, including gender, age, ethnicity, educational level, occupation, marital status, and economic level. The second part concerned attitudes toward COVID-19 prevention and control and included 8 items. A 4-level scoring method was adopted, ranging from "strongly agree" to "strongly disagree", with a total possible score of 32. The higher the score, the more positive the attitude was. The third part related to COVID-19 prevention and control behavior. This part included 27 items and used a 5-level scoring method, with "strongly agree" to "strongly disagree" and a total possible score of 135. The higher the score, the more standardized the prevention and control behavior was. Based on a literature review (13), scores were rated as good (>85% of the full score), poor (<60% of the full score), or medium (scores between 60–85% of the full score). Therefore, in this study, the attitude dimension score was considered good when it was >27.2, medium was 27.2–19.2, and poor was <19.2. Scores for the behavior component of the questionnaire were considered good when >114.75, medium for scores between 114.75–81, and poor when <81 points. The overall Cronbach α coefficient of the questionnaire was 0.912, indicating good reliability.

Statistical methods

Excel was used to create a database for all data, and a double-checking method was used for data verification. SPSS 22.0 statistical software was used for data analysis, and descriptive analysis was used to describe the scores of the attitudes and behaviors of villagers in M toward COVID-19 prevention and control. As the data was normal distribution, a *t*-test was used for comparison between 2 groups, ANOVA

(analysis of variance) was used for comparison between multiple groups, and generalized linear regression model were performed on the exported data. $P < 0.05$ (two sides) was considered a statistically significant difference.

Results

General information

A total of 117 villagers participated in the study, including 67 males and 50 females. There were 65 respondents of Han ethnicity and 52 of Yi ethnicity. The average age was 35.27 ± 10.61 , and the education level of respondents was mainly junior high school, accounting for 52.14%. For occupation, 35.90% of respondents selected "farming", the highest proportion in this category. For marital status, the majority of respondents (66.67%) were "married/cohabiting". During the epidemic period, 100% of respondents had not been to the affected area (Wuhan or other parts of Hubei). The proportion of "uninfected" was also 100%, and more than 70% respondents selected "none" to the question asking whether anyone had been diagnosed with COVID-19 in their village or town. For family economic status at the local level, the majority of respondents (57.26%) selected "medium", and 40.17% selected "poor" (Table 1 for details).

Current situation of COVID-19 prevention and control attitudes

Among 117 villagers in this survey, the item with the highest score for attitude toward prevention and control was "confidence in their own response to the epidemic", with a score of 3.79 ± 0.43 . The total score for attitude toward prevention and control was 29.65 ± 3.23 , which was considered a good level (Table 2).

Prevention and control of COVID-19

The 3 items with the highest scores in the survey were: minimizing going out, not touching public facilities directly, and paying attention to reports about the epidemic from the government and rural areas, with scores of 4.75 ± 0.49 , 4.68 ± 0.62 , and 4.65 ± 0.62 , respectively. The lowest scores were 3.79 ± 1.30 for filling the u-shaped pipe in the sewer, 3.79 ± 1.33 for eating with chopsticks, 3.76 ± 1.30 for eating separately, and 3.38 ± 1.44 for paying attention to a balanced diet (Table 3 for specific scores).

Table 1 General data (n=117)

Demographic characteristic/question	Item	Number of persons	Percentage (%)
Gender	Male	67	57.26
	Female	50	42.74
Ethnicity	Han	65	55.56
	Yi	52	44.44
Education level	Primary and below	30	25.64
	Junior high school	61	52.14
	High school and above	26	22.22
Occupation	Migrant worker	92	78.63
	Self-employed	4	3.42
	Clerk	5	4.27
	Student	14	11.97
	Unemployed	2	1.71
Marital status	Unmarried	34	29.06
	Married/Cohabiting	78	66.67
	Divorced/widowed	5	4.27
Have you been to the affected area (Wuhan or other parts of Hubei) during the epidemic?	Yes	0	0
	No	117	100
Have you had a novel coronavirus infection?	Uninfected	117	100
	Confirmed	0	0
Your family's financial situation at the local level	Good	6	2.56
	Medium	67	57.26
	Poor	47	40.17
Has anyone in your village or town been confirmed with COVID-19?	Yes	1	0.85
	No	93	78.63
	I don't know	24	20.51

COVID-19, coronavirus disease 2019.

Factor analysis of COVID-19 prevention and control attitudes and behaviors

Single-factor analysis was conducted using the general demographic data and total scores for prevention and control attitudes and behavior. The results showed that the scores for prevention and control attitudes and behavior of respondents of Han ethnicity were significantly higher than that of Yi ethnicity, while occupational and marital status had no significant difference on scores for prevention and control attitudes, as shown in *Table 4*.

Discussion

Strengthen the management of prevention and control attitudes and behaviors of villagers in poor rural areas and steadily resume work while preventing and controlling the epidemic

The subjects of this survey were villagers in M Village, G County, Liangshan Yi Autonomous Prefecture, which was removed from the poverty-stricken county list in early 2020 (14). A total of 117 villagers were included, among which there were almost equal numbers of male and

Table 2 Villagers' attitudes toward COVID-19 prevention and control (n=117)

Item	Mean \pm standard deviation
Your willingness to protect yourself may affect your daily life and work	3.67 \pm 0.53
Whether you are willing to cooperate with the government and rural areas in epidemic prevention and control will affect your daily life and work	3.71 \pm 0.46
If you have contact history of confirmed cases or travel history in Wuhan, are you willing to report and isolate yourself	3.69 \pm 0.48
If you have suspected symptoms such as fever and cough, are you willing to take the initiative to isolate and see a doctor in time	3.68 \pm 0.47
If your family members have contact history of confirmed cases or travel history in Wuhan, will you persuade them to report and isolate them	3.65 \pm 0.50
If your family members have suspected symptoms such as fever and cough, are you willing to persuade them to take the initiative to isolate and see a doctor in time	3.69 \pm 0.48
Confidence in the response of relevant epidemic prevention and control departments	3.78 \pm 0.48
Confidence in their response to the outbreak	3.79 \pm 0.43
Total score	29.65 \pm 3.23

COVID-19, coronavirus disease 2019.

female respondents, and the education level was mainly junior high school and senior high school, accounting for 62.40%. Migrant workers were the main occupation, accounting for 78.63%.

At a meeting of the Standing Committee of the Political Bureau of the Central Committee of the Chinese Communist Party, chaired by General Secretary Xi Jinping on 19 February 2020, it was pointed out that the task of poverty alleviation should be completed as scheduled, priority should be given to returning rural migrant workers to work in poor areas, and assistance should be given to rural households who have been impoverished or returned to poverty due to the epidemic (15). As agricultural production and gradual return to work and production commenced throughout the country with the approach of spring, it was crucial that villagers in poor areas had relevant knowledge and training in COVID-19 epidemic prevention and control in order to strengthen attitude and behavior management and thereby minimize COVID-19 infections and adverse impacts on livelihoods in poverty-stricken areas, further worsening the effects of poverty.

Positive attitudes toward COVID-19 prevention and control can be further strengthened

WHO guidelines recommend that increased awareness and community involvement are critical for effective control

of COVID-19 (16), and a good attitude toward prevention and control is the premise of active prevention and control behavior (17).

According to the survey results, among the attitudes of villagers in M village toward prevention and control of COVID-19, the item with the highest score was their confidence in dealing with the epidemic, which was 3.79 \pm 0.43, and the total score for prevention and control attitude was 29.65 \pm 3.23, which was considered a good level. The above data indicated that the preliminary work of the epidemic prevention and control team of the village Committee had achieved certain results, and the information related to the epidemic had been conveyed relatively well. Although the villagers were located in remote rural areas, they had a positive attitude toward epidemic prevention and control work.

Among the COVID-19 prevention and control behaviors of villagers in M village, the top 5 items with the highest scores were: minimize going out (4.75 \pm 0.49), not touching public facilities directly (4.68 \pm 0.62), paying attention to epidemic reports (4.65 \pm 0.62), ensuring adequate sleep (4.62 \pm 0.55), and disinfecting indoors (4.58 \pm 0.58). However, hand hygiene and wearing masks, which are most important for epidemic prevention and control, scored 4.26 \pm 1.15 and 4.15 \pm 1.21, respectively. NHC's new Guidelines on the Diagnosis and Treatment of Novel Coronavirus Pneumonia (Trial Version 6) (18), clearly state that strengthening hand

Table 3 Scores for villagers' COVID-19 prevention and control behavior (n=117)

Item	Mean ± standard
Go out as little as possible	4.75±0.49
Use paper towels or gloves when in direct contact with public facilities, such as elevator buttons and door handles	4.68±0.62
Pay attention to government and rural reports on the epidemic	4.65±0.62
Get enough sleep every day	4.62±0.55
Use disinfectants (such as alcohol, 84, etc.) for indoor disinfection	4.58±0.58
Take supplements	4.56±0.58
Exercise indoors	4.53±0.64
Cover the toilet before flushing it	4.50±0.65
Monitor your body temperature and that of your family	4.48±0.82
Monitor yourself and your family for symptoms	4.48±0.82
Disinfect clothing and shoes that are worn outside	4.45±0.73
Open windows regularly for ventilation	4.44±1.01
Good hand hygiene	4.26±1.15
Seal floor drain	4.23±1.18
Keep your spirits up	4.23±0.99
Avoid places where people gather	4.16±1.07
Wear a mask outside	4.15±1.21
Hang clothes worn outside separately	4.15±1.03
Avoid live poultry markets	4.02±1.11
Water more	4.02±1.03
Cover your coughing and sneezing	3.97±1.40
Avoid public transportation	3.96±1.45
Do not attend or invite friends and relatives to gatherings	3.93±1.45
Don't eat game	3.92±1.31
Fill the u-pipe of the drain with water	3.79±1.33
Use serving chopsticks and separate meals when eating	3.76±1.30
Pay attention to a balanced diet	3.38±1.44
Total score	114.74±17.09

COVID-19, coronavirus disease 2019.

hygiene and standardizing mask wearing can effectively prevent the spread of the epidemic. The above data suggested that messaging on epidemic prevention and control in the village had achieved certain effects, but the most important and basic measures, such as strengthening hand hygiene and wearing masks, still needed to be strengthened.

Analysis of influencing factors of COVID-19 prevention and control attitudes and behaviors

Factor analysis of the general information data was performed to investigate potential influences on prevention and control attitudes and behavior. The results showed that the total score for respondents of

Table 4 Factor analysis of villagers' COVID-19 prevention and control attitudes and behaviors (n=117)

Variable	Number of cases	Total score for prevention and control attitudes			Total score for prevention and control behavior		
		Score	Statistic	P value	Score	Statistic	P value
Gender			0.357	0.407		1.937	0.167
Male	67	29.55±3.32			113.17±18.09		
Female	52	29.77±3.15			116.69±15.69		
Ethnicity			6.522	0.012		8.326	0.005
Han	65	30.42±2.99			111.17±18.51		
Yi	52	29.03±3.31			119.19±14.05		
Record of formal schooling			0.657	0.521		0.928	0.398
Primary and below	21	29.95±3.46			112.86±16.33		
Junior high school	49	29.24±3.28			113.02±17.69		
High school and above	47	29.94±3.11			117.36±16.79		
Occupation			3.061	0.52		1.261	0.29
Migrant worker	92	29.56±3.21			114.24±16.99		
Self-employed	4	27.00±3.56			107.75±25.51		
Student	5	27.80±4.55			107.00±20.83		
Clerk	14	31.86±0.36			122.93±12.88		
Unemployed	2	28.00±5.66			113.50±21.92		
Marital status			3.217	0.544		1.475	0.233
Unmarried/cohabiting	34	28.50±3.711			110.71±19.06		
Married	5	30.15±2.89			116.63±16.25		
Divorced/widowed	78	29.60±3.58			112.60±13.11		
Economic status			0.571	0.566		1.262	0.287
Poor	47	29.81±3.18			111.68±18.46		
Medium	67	29.46±3.33			116.76±16.20		
Good	3	31.33±1.155			117.33±8.08		

Data are presented as mean ± standard deviation. COVID-19, coronavirus disease 2019.

Han ethnicity in prevention and control attitudes and behavior was significantly higher than that of respondents of Yi ethnicity. This may have been due to differences between ethnic groups and national norms in attitudes and behavior regarding COVID-19 epidemic prevention and control. The study results suggested that in M village, epidemic prevention and control work should continue to strengthen the training of the community to optimize attitudes and improve prevention and control of COVID-19, thereby steadily laying a solid foundation for a return to work.

Conclusions

To sum up, the people in this village had a positive attitude toward epidemic prevention and control, but there was still room for improvement in prevention and control behavior. Focus should be on strengthening training in hand hygiene, using chopsticks when eating, and wearing masks when going out, with further relevant training for ethnic minorities. However, as this study only investigated the population of one village and only analyzed the general demographic data, the research results have certain limitations.

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Footnote

Reporting Checklist: The authors have completed the SURGE reporting checklist. Available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-321/rc>

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-321/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was approved by West China hospital ethics board (No. 2021-787). Informed consent was taken from all the patients. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

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