An Unstoppable Marathon: Community Prevention and Residents' Sense of Security in the Period of Low Transmission

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Research

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Abstract

Background: With more and more countries entering the phase of COVID-19 low transmission, there is an urgent need to study the implementation of community prevention in this stage. This study investigated the implementation of community prevention measures in China and whether residents consent they have adequate community protection during the Spring Festival of 2021, with exploring the differences in the sense of security caused by different measures.

Methods: A cross-sectional survey was conducted in China from 4 to 26 February 2021. Convenient sampling strategy was adopted to recruit participants. Participants were asked to filled out the questions that assessed questionnaire on the implementation of community protection and residents' perception. Descriptive statistics were used to assess the public's attitudes. A binary logistic regression analysis was performed to identify the risk factors affecting the residents' attitudes.

Results: A total of 2,361 residents filled out the questionnaire. The results showed 24.95% of community/village issued personal protective equipment, 62.98% implemented epidemic screening, and 46.59% implemented health propaganda and education of COVID-19. For people outside the community/village entering the community/village, 19.78% of community/village implemented that appointment of people are admitted, 4.57 implemented that only occupants are admitted. 1910 (80.90%) of residents agreed they acquire adequate community prevention during the Spring Festival. In addition, age of residents, “personal protective equipment will been issued by the community/village”, “resident epidemic screening is implemented by the community/village”, “health propaganda and education of COVID-19 is implemented by the community/village”, “appointment of people are admitted can enter the community/village”, “be satisfied with regularly cleaning and disinfecting by the community/village”, and “be satisfied with community service” were the mainly factors associated with residents’ attitudes.

Conclusions: This research is based on an innovative perspective to explore whether residents perceive themselves to be adequately protected after experiencing measures; at the same time, the differences in the sense of security brought to residents by various measures were discussed, which can provide a reference for Chinese and global public health policy makers.

Background

In late 2019, a novel coronavirus, now designated SARS-CoV-2, was identified as the cause of an outbreak of acute respiratory illness in Wuhan, a city in the Hubei province of China. The most common pathway of human-to-human transmission has been the contact of the mucosae with infectious respiratory droplets or fomites(1). As diseases transmitted by respiratory droplets require a certain proximity of people, social distancing of persons will reduce transmission. Social distancing is particularly useful to prevent further transmission(2). Social distancing is designed to reduce interactions between people in a broader community, in which individuals may be infectious but have not yet been identified hence not yet isolated(3). Compared with the SARS virus, the SARS-CoV-2 virus of the COVID-19 outbreak has the characteristics of a stronger infectivity and a longer incubation period(4). Additionally, as the COVID-19 outbreak occurred around the time of annual Chinese Lunar New Year holiday, billions of residents returned to their hometown to celebrate the
New Year with their families, as is traditional in the Chinese culture, which greatly increased the personnel mobility and traffic congestion in the short term (5).

Although there are cures for illnesses and developments made by leaps and bounds in our day, the strongest and most effective weapon that society has against this virus that is affecting not just health but also economics, politics, and social order, is the prevention of its spread. Preventive measures are the current strategy to limit the spread of cases. Early screening, diagnosis, isolation, and treatment are necessary to prevent further spread. Among these, the role of community was fundamental. Local communities were strictly managed by officials, with China implementing the firmest regime of community isolation, including: 1) Each community kept only one entrance and exit point open, and checkpoints were set up for community staff to perform the identification and temperature tests of each resident entering and leaving the community (6). 2) Anyone who went outside had to wear a mask (7). Entry and exit to communities was forbidden except for medical treatment and activities related to epidemic prevention. All the details about people entering a community as well as those being visited were registered, and the temperatures of people entering and leaving a community were taken at checkpoints. 3) Community workers also helped enforce these measures. For example, they monitored people passing through checkpoints to ensure that they wore face masks and observed the rules for physical distancing. They participated in dragnet screening of potential virus carriers and isolated those with positive results. They made sure every corner was disinfected (8). 4) Community workers took responsibility for providing daily supplies and monitoring health status, and also used social media to disseminate official information from different government agencies (9). In China's response to COVID-19, the community is the intersection and the bridge between government institutions, businesses, social organisations, volunteer groups, families and individuals (10).

Engaging the community and having community-based approaches in addressing COVID-19 have been shown to play a significant role in addressing the issues brought about by the lockdown in the COVID-19 outbreak in China. Currently COVID-19 epidemic has been controlled and China has entered a period of low transmission (11). At this stage, China government still required community-level prevention, especially during the Spring Festival of 2021, keeping reducing concentration. 4 to 26 February, 2021 is considered as the China New Year. With large-scale interpersonal communication, whether primary communities and villages can fully implement epidemic prevention measures is worth to survey in China. As more and more countries enter the low-transmission phase, maintaining prevention awareness among the community-levels is critical to preventing a secondary outbreak. By investigating the implementation of community prevention in China during the Spring Festival, we can reflect the prevention awareness of the community-levels during the low transmission period of the COVID-19, which can provide a reference for Chinese and global public health policy makers.

In addition, the implementation of community prevention measures was not only to isolate the spread of COVID-19, but also to provided a sense of security for residents and build psychological protection (6, 12). Therefore, it should be noted that the full implementation of community prevention and control measures is not only reflected in the implementation of a single measure, but also depends on whether the residents have sufficient sense of security after the implementation of community protection measures. In fact, most of the current psychological research during the COVID-19 pandemic has focused on anxiety, depression, and other psychological problems. None has considered whether residents feel adequately protected by community
prevention measures, or which measures make residents feel more secure. Therefore, our research is based on an innovative perspective to explore whether residents perceive themselves to be adequately protected after experiencing measures; at the same time, the differences in the sense of security brought to residents by various measures were discussed. This study can reflect the potential impact of community prevention measures on the psychology of the population in the real world, and can also establish a link between prevention measures and psychological research, with reflecting the policy measures and the psychological status of the population in the COVID-19 pandemic.

Methods

Ethics statement

This study protocol was approved by the institutional review board of Tongji Medical College of Huazhong University of Science and Technology, Wuhan, China. All methods were performed in accordance with the relevant guidelines and regulations. Respondents were informed that their participation was voluntary, and consent was implied on the completion of the questionnaire.

Study participants and survey design

A cross-sectional survey was conducted in China from 4 to 26 February 2021. We stratify the respondents mainly according to the eastern, central and western region of China. We selected residents from eastern (Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong and Hainan), central (Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan) and western (Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, Xinjiang, Inner Mongolia, and Guangxi) China to complete the survey. Convenient sampling strategy was adopted to recruit participators; the research team used WeChat (the most popular social media platform in China) to advertise and circulate the survey link to their network members. Network members were requested to distribute the survey invitation to all their contacts. The participants were informed that their participation was voluntary, and consent was implied through their completion of the questionnaire. The inclusion criteria were that the respondents were Chinese citizens who were at least 18 years old, and able to comprehend and read Chinese.

Instruments

The questionnaire was developed based on the "Notice on Further Improving the Precision Level of Urban and Rural Community Prevention and Control" issued on January 30th, 2021 by the Ministry of Civil Affairs and the National Health and Construction Commission of China(13). The questionnaire consisted of two parts: 1) socio-demographic characteristics, with 7 items, including gender, age, marital status, highest educational level, place of residence, religion, and employment status; and 2) the implementation of community protection and residents' perception, with 7 items, including “agree they acquire adequate community protection”, “personal protective equipment will been issued by the community/village”, “resident epidemic screening is implemented by the community/village”, "health propaganda and education of COVID-19 is implemented by the community/village”, “people outside the community/village can enter the community/village”, “Satisfaction degree of regularly cleaning and disinfecting by the community/village”, and “Satisfaction degree
of community service by the community/village”. This part of the question has been developed through discussion and analysis by experts in public health, health policy and psychology.

Wenjuanxing (www.wjx.cn), a widely used platform for conducting surveys in China, was used to develop the electronic questionnaire. An online poster with an access code or the website link to the questionnaire was distributed via two ways: (1) posted on our WeChat; and (2) distributed via WeChat groups, with an average of one to two RMB each as compensation. Each individual could only participate once on each WeChat account to avoid repeated submissions.

Statistical methods

The data were analysed using SPSS™ for Windows, Version 22.0 (SPSS, Inc., Chicago, IL, USA). We dichotomized the answers to the “Agree they acquire adequate community protection” of residents’ attitudes as “Yes” and “No”. The descriptive statistics were presented as the number of observations with percentage (%), and we analyzed the difference in demographic statistics by Chi-square (χ2) test. Due to the disparities in socioeconomic status in different regions, the data have a typical hierarchical structure. We performed a mixed-effect logistic regression model with a random cluster effect (geographic regions) to investigate the adjusted OR (95% CI) of influencing factors of residents’ attitudes to agree they acquire adequate community protection. Further, we explored the factors influencing participants’ attitudes in Eastern, Central, and Western China, respectively, through multivariable logistic regression analysis. The significance level was accepted as $P<0.05$ (two-sided).

Results

Descriptive statistics

A total of 2,453 residents received the questionnaire, of which 21 participants did not respond and 71 questionnaires were not filled. The response rate was 96.24% and 2,361 complete questionnaires were employed for results analysis. Table 1 reports the social-demographic characteristics of 2,361 respondents. The mean age was 29.72 years (SD = 6.94) and majority of respondents were female (60.10%). Among the respondents, 421 (17.83%), 1470 (62.26%), and 470 (19.91%) were from eastern, central, and western China, respectively. Most respondents (89.24%) have the bachelor’s degree or higher. More than half of the participants (57.05%) were unemployed.
Table 1
Statistical description of study samples: univariate analysis of the differences of residents’ attitudes to agree they acquire adequate community protection during the Spring Festival

| Variables                                      | N (%)      | χ²   | P      |
|------------------------------------------------|------------|------|--------|
| Total                                          | 2361 (100) | NA   | NA     |
| Agree they acquire adequate community protection|            |      |        |
| Yes                                            | 1910 (80.90) | NA | NA     |
| No                                             | 451 (19.10) |      |        |
| Gender                                         |            |      |        |
| Male                                           | 942 (39.90) | 3.409 | 0.065  |
| Female                                         | 1419 (61.10)|      |        |
| Age group, y                                   |            |      |        |
| 18–44                                          | 1845 (78.14) | 2.607 | 0.272  |
| 45–59                                          | 369 (15.63)  |      |        |
| > 60                                           | 111 (4.70)   |      |        |
| Marital status                                 |            |      |        |
| Unmarried                                      | 1560 (66.07) | 2.191 | 0.139  |
| Married                                        | 801 (33.93)  |      |        |
| Place of residence                             |            |      |        |
| Urban                                          | 1372 (58.11) | 0.204 | 0.651  |
| Rural                                          | 989 (41.89)  |      |        |
| Highest educational level                      |            |      |        |
| Primary school or below                        | 68 (2.88)   | 5.688 | 0.058  |
| Middle school                                  | 186 (7.88)   |      |        |
| College degree or above                        | 2107 (89.24)|      |        |
| Region                                         |            |      |        |
| Eastern China                                  | 421 (17.83)  | 0.313 | 0.855  |
| Central China                                  | 1470 (62.26)|      |        |
| Western China                                  | 470 (19.91)  |      |        |
| Employment status                              |            |      |        |
| Employed                                       | 1014 (42.95)| 0.651 | 0.420  |
| Unemployed                                     | 1347 (57.05)|      |        |
| Variables                                                                 | N (%)       | $\chi^2$  | P     |
|-------------------------------------------------------------------------|-------------|-----------|-------|
| Personal protective equipment will been issued by the community/village |             |           |       |
| Yes                                                                     | 589 (24.95) | 0.073     | 0.786 |
| No                                                                      | 1772 (75.05)|           |       |
| Resident epidemic screening is implemented by the community/village     |             |           |       |
| Yes                                                                     | 1487 (62.98)| 828.630   | 0.000 |
| No                                                                      | 847 (37.02) |           |       |
| Health propaganda and education of COVID-19 is implemented by the community/village | |           |       |
| Yes                                                                     | 1100 (46.59)| 4.000     | 0.045 |
| No                                                                      | 1261 (53.41)|           |       |
| People outside the community/village can enter the community/village    |             |           |       |
| All people are admitted                                                 | 1786 (75.56)| 5.038     | 0.081 |
| Appointment of people are admitted                                      | 467 (19.78) |           |       |
| Only occupants are admitted                                             | 108 (4.57)  |           |       |
| Satisfaction degree of regularly cleaning and disinfecting by the community/village | |           |       |
| Strongly disagree                                                       | 112 (4.47)  | 5.935     | 0.204 |
| Disagree                                                                | 175 (7.41)  |           |       |
| Not sure                                                                | 529 (22.41) |           |       |
| Agree                                                                   | 935 (39.60) |           |       |
| Strongly agree                                                          | 610 (25.84) |           |       |
| Satisfaction degree of community service by the community/village       |             |           |       |
| Strongly disagree                                                       | 614 (26.01) | 1.979     | 0.740 |
| Disagree                                                                | 968 (41.00) |           |       |
| Not sure                                                                | 564 (23.89) |           |       |
| Agree                                                                   | 124 (5.25)  |           |       |
| Strongly agree                                                          | 91 (3.85)   |           |       |

Of them, 1910 (80.90%) agreed they acquire adequate community protection during the Spring Festival. Results of the univariate analysis suggested the “resident epidemic screening is implemented by the community/village” and “health propaganda and education of COVID-19 is implemented by the
community/village” were statistically significant influencing factors for “agreeing they acquire adequate community protection” ($P < 0.05$). (Table 1)

Considering the significant differences different geographic regions in the sampling, we conducted univariate analyses with participants from Eastern, Central, and Western China, respectively. (Table 2)
| Variables                          | Eastern China | Central China | Western China |
|-----------------------------------|---------------|---------------|---------------|
|                                   | N (%)         | χ²            | P             | N (%)         | χ²            | P             | N (%)         | χ²            | P             |
| Total                             | 421 (100)     | NA            | NA            | 1470 (100)    | NA            | NA            | 470 (100)     | NA            | NA            |
| Agree they acquire adequate       |               |               |               |               |               |               |               |               |               |
| community protection              |               |               |               |               |               |               |               |               |               |
| Yes                               | 322 (76.48)   | NA            | NA            | 1231 (83.74)  | NA            | NA            | 357 (75.96)   | NA            | NA            |
| No                                | 99 (23.52)    | 239 (16.26)   | 113 (24.04)   |               |               |               |               |               |               |
| Gender                            |               |               |               |               |               |               |               |               |               |
| Male                              | 181 (42.99)   | 558 (37.96)   | 203 (43.19)   |               |               |               |               |               |               |
| Female                            | 240 (57.10)   | 912 (62.04)   | 267 (56.81)   |               |               |               |               |               |               |
| Age group, y                      |               |               |               |               |               |               |               |               |               |
| 18–44                             | 323 (76.72)   | 1175 (79.93)  | 347 (73.83)   |               |               |               |               |               |               |
| 45–59                             | 61 (14.49)    | 232 (15.78)   | 76 (16.17)    |               |               |               |               |               |               |
| >60                               | 37 (8.79)     | 63 (4.29)     | 47 (10.00)    |               |               |               |               |               |               |
| Marital status                    |               |               |               |               |               |               |               |               |               |
| Unmarried                         | 222 (52.73)   | 1061 (72.18)  | 277 (58.94)   |               |               |               |               |               |               |
| Married                           | 199 (47.27)   | 409 (27.82)   | 193 (41.06)   |               |               |               |               |               |               |
| Place of residence                |               |               |               |               |               |               |               |               |               |
| Urban                             | 288 (68.41)   | 754 (51.29)   | 330 (70.21)   |               |               |               |               |               |               |
| Rural                             | 133 (31.59)   | 716 (48.71)   | 140 (29.79)   |               |               |               |               |               |               |
| Highest educational level         |               |               |               |               |               |               |               |               |               |
| Primary school or below           | 17 (4.04)     | 27 (1.84)     | 24 (5.11)     |               |               |               |               |               |               |
|                                   | 2.692          | 7.716         | 0.525          |               |               |               |               |               |               |
|                                   | 0.260          | 0.021         | 0.769          |               |               |               |               |               |               |
| Variables                                           | Eastern China | Central China | Western China |
|-----------------------------------------------------|---------------|---------------|---------------|
|                                                     | N (%)         | χ²            | P             | N (%)         | χ²            | P             |
| Middle school                                       | 24 (5.70)     | 123 (8.37)    | 39 (8.30)     |
| College degree or above                             | 38 (90.26)    | 1320 (89.80)  | 407 (86.60)   |
| Employment status                                   |               |               |               |
| Employed                                            | 270 (64.13)   | 508 (34.56)   | 236 (50.21)   | 1.105         | 0.293         | 3.397         | 0.065         |
| Unemployed                                          | 151 (35.87)   | 962 (65.44)   | 234 (49.79)   |
| Personal protective equipment will been issued by the community/village |               |               |               |
| Yes                                                 | 96 (22.80)    | 386 (26.26)   | 107 (22.77)   | 0.124         | 0.724         | 1.147         | 0.284         |
| No                                                  | 325 (77.20)   | 1084 (73.74)  | 363 (77.23)   |
| Resident epidemic screening is implemented by the community/village |               |               |               |
| Yes                                                 | 266 (63.18)   | 921 (62.65)   | 300 (63.83)   | 151.593       | <0.001        | 165.193       | <0.001        |
| No                                                  | 155 (36.82)   | 549 (37.35)   | 170 (36.17)   |
| Health propaganda and education of COVID-19 is implemented by the community/village |               |               |               |
| Yes                                                 | 199 (47.27)   | 666 (45.31)   | 212 (45.11)   | 2.188         | 0.139         | 2.664         | 0.103         |
| No                                                  | 222 (52.73)   | 804 (54.69)   | 258 (54.89)   |
| People outside the community/village can enter the community/village |               |               |               |
| All people are admitted                              | 318 (75.53)   | 1087 (73.95)  | 381 (81.06)   | 1.256         | 0.534         | 2.342         | 0.310         |
| Appointment of people are admitted                   | 92 (21.85)    | 306 (20.82)   | 69 (14.68)    |
| Only occupants are admitted                          | 11 (2.61)     | 77 (5.24)     | 20 (4.26)     |
| Satisfaction degree of regularly cleaning and disinfecting by the community/village |               |               |               |
| Strongly disagree                                    | 25 (5.94)     | 64 (4.35)     | 23 (4.89)     | 13.402        | 0.009         | 3.197         | 0.525         |
| Variables                  | Eastern China | Central China | Western China |
|---------------------------|---------------|---------------|---------------|
|                           | N (%)         | χ²            | P             | N (%)         | χ²            | P             | N (%)         | χ²            | P             |
| Disagree                  | 41 (9.74)     |               |               | 91 (6.19)     |               |               | 43 (9.15)     |               |               |
| Not sure                  | 97 (23.04)    |               |               | 333 (22.65)   |               |               | 99 (21.06)    |               |               |
| Agree                     | 154 (36.58)   |               |               | 590 (40.14)   |               |               | 191 (40.64)   |               |               |
| Strongly agree            | 104 (24.70)   |               |               | 392 (26.67)   |               |               | 114 (24.26)   |               |               |

Satisfaction degree of community service by the community/village

| Strongly disagree | 97 (23.04) | 7.273 | 0.122 | 405 (27.55) | 0.489 | 0.975 | 112 (23.83) | 4.736 | 0.315 |
| Disagree          | 181 (42.99) |       |       | 583 (39.66) |       |       | 204 (43.40) |       |       |
| Not sure          | 98 (23.28)  |       |       | 354 (24.08) |       |       | 112 (23.83) |       |       |
| Agree             | 26 (6.18)   |       |       | 74 (5.03)   |       |       | 24 (5.11)   |       |       |
| Strongly agree    | 19 (4.51)   |       |       | 54 (3.67)   |       |       | 18 (3.83)   |       |       |

In the mixed-effect logistic regression analysis, Chinese residents who agreed “personal protective equipment will be issued by the community/village” (OR = 1.373, 95%CI = 1.075 ~ 1.754), “resident epidemic screening is implemented by the community/village” (OR = 21.09, 95%CI = 16.671 ~ 26.681), “health propaganda and education of COVID-19 is implemented by the community/village” (OR = 1.302, 95%CI = 1.060 ~ 1.599), “appointment of people are admitted can enter the community/village” (OR = 1.322, 95%CI = 1.021 ~ 1.724), “be satisfied with regularly cleaning and disinfecting by the community/village” (OR = 3.143, 95%CI = 1.692 ~ 5.838) and “be satisfied with community service” (OR = 2.465, 95%CI = 1.247 ~ 4.875) were more likely to agree they acquire adequate community protection; while people who older than 60 (OR = 0.643, 95%CI = 0.426 ~ 0.973) were more likely not to agree. (Table 3)
Table 3
Mixed-Effect Logistic Regression Analysis on the Influencing Factors of Residents’ attitudes to agree they acquire adequate community protection during the Spring Festival

| Variables | Coefficient | S.E. | P    | OR    | 95% CI            |
|-----------|-------------|------|------|-------|------------------|
| Gender (Ref: Female) |             |      |      |       |                  |
| Male      | -0.229      | 0.107| 0.031| 0.795 | 0.645 ~ 0.980    |
| Age group, y (Ref: 18–44) |             |      |      |       |                  |
| 45–59     | -0.106      | 0.144| 0.461| 0.900 | 0.679 ~ 1.192    |
| > 60      | **-0.441**  | 0.211| **0.037** | **0.643** | **0.426 ~ 0.973** |
| Marital status (Ref: Unmarried) |             |      |      |       |                  |
| Married   | -0.146      | 0.152| 0.339| 0.865 | 0.642 ~ 1.165    |
| Place of residence (Ref: Urban) |             |      |      |       |                  |
| Rural     | 0.043       | 0.118| 0.719| 1.044 | 0.827 ~ 1.316    |
| Highest educational level (Ref: Primary school or below) |             |      |      |       |                  |
| Middle school | -0.673      | 0.377| 0.074| 0.51  | 0.244 ~ 1.069    |
| College degree or above | -0.313      | 0.334| 0.348| 0.731 | 0.380 ~ 1.407    |
| Region (Ref: Eastern China) |             |      |      |       |                  |
| Central China | 0.016       | 0.143| 0.912| 1.016 | 0.767 ~ 1.346    |
| Western China | 0.128       | 0.171| 0.455| 1.136 | 0.813 ~ 1.588    |
| Employment status (Ref: Unemployed) |             |      |      |       |                  |
| Employed  | 0.011       | 0.149| 0.941| 1.011 | 0.755 ~ 1.355    |
| Personal protective equipment will been issued by the community/village (Ref: No) |             |      |      |       |                  |
| Yes       | **0.317**   | 0.125| **0.011** | **1.373** | **1.075 ~ 1.754** |
| Resident epidemic screening is implemented by the community/village (Ref: No) |             |      |      |       |                  |
| Yes       | **3.049**   | 0.12 | < 0.001 | 21.09 | 16.671 ~ 26.681 |
| Health propaganda and education of COVID-19 is implemented by the community/village (Ref: No) |             |      |      |       |                  |
| Yes       | **0.264**   | 0.105| **0.012** | **1.302** | **1.060 ~ 1.599** |
| People outside the community/village can enter the community/village (Ref: All people are admitted) |             |      |      |       |                  |
| Appointment of people are admitted | **0.283**   | 0.134| **0.034** | **1.327** | **1.021 ~ 1.724** |
| Only occupants are admitted | 0.409       | 0.254| 0.107| 1.506 | 0.916 ~ 2.476    |
| Satisfaction degree of regularly cleaning and disinfecting by the community/village (Ref: Strongly disagree) |             |      |      |       |                  |
In addition, we stratified the study sample by regions and conducted multivariate logistic regression analyses. The results showed that “age”, “resident epidemic screening is implemented by the community/village”, “satisfaction degree of regularly cleaning and disinfecting by the community/village”, and “satisfaction degree of community service by the community/village” were the mainly factors associated with attitudes to agree they acquire adequate community protection during the Spring Festival. (Table 4)
Table 4
Stepwise Multivariate Logistic Regression Analysis on the Influencing Factors of Residents’ attitudes to agree they acquire adequate community protection during the Spring Festival

| Variables                                                                 | Coefficient | S.E.  | P       | OR     | 95% CI           |
|--------------------------------------------------------------------------|-------------|-------|---------|--------|------------------|
| **Eastern China**                                                        |             |       |         |        |                  |
| Resident epidemic screening is implemented by the community/village (Ref: No) |             |       |         |        |                  |
| Yes                                                                      | 3.333       | 0.317 | <0.001  | 28.011 | 15.062 ~ 52.091  |
| **Central China**                                                        |             |       |         |        |                  |
| Age group, y (Ref: 18–44)                                                |             |       |         |        |                  |
| >60                                                                      | -0.707      | 0.320 | 0.027   | 0.493  | 0.263 ~ 0.924    |
| Resident epidemic screening is implemented by the community/village (Ref: No) |             |       |         |        |                  |
| Yes                                                                      | 3.040       | 0.152 | <0.001  | 20.895 | 15.509 ~ 28.151  |
| Satisfaction degree of regularly cleaning and disinfecting by the community/village (Ref: Strongly disagree) |             |       |         |        |                  |
| Disagree                                                                 | 1.284       | 0.442 | 0.004   | 3.609  | 1.518 ~ 8.583    |
| Not sure                                                                 | 1.791       | 0.400 | <0.001  | 5.997  | 2.736 ~ 13.145   |
| Agree                                                                    | 1.756       | 0.398 | <0.001  | 5.792  | 2.655 ~ 12.634   |
| Strongly agree                                                           | 1.595       | 0.422 | <0.001  | 4.929  | 2.154 ~ 11.277   |
| Satisfaction degree of community service by the community/village (Ref: Strongly disagree) |             |       |         |        |                  |
| Strongly agree                                                           | 0.985       | 0.452 | 0.029   | 2.678  | 1.104 ~ 6.498    |
| **Western China**                                                        |             |       |         |        |                  |
| Resident epidemic screening is implemented by the community/village (Ref: No) |             |       |         |        |                  |
| Yes                                                                      | 3.315       | 0.295 | 0.000   | 27.525 | 15.432 ~ 49.096  |

**Discussion**

Our study is based on a cross-sectional survey, determined the implementation of community prevention measures and attitudes to agree they acquire adequate community protection during the Spring Festival and influencing factors during the Spring Festival among Chinese residents. We found that 24.95% of community/village issued personal protective equipment, 62.98% of community/village implemented epidemic screening, and 46.59% implemented health propaganda and education of COVID-19. For people outside the community/village entering the community/village, 19.78% of community/village implemented that appointment of people are admitted, 4.57 of community/village implemented that only occupants are admitted. After the outbreak of COVID-19 is basically controlled, many communities have opened in order to prevent isolation from impeding the population, with most communities are still insisting on screening to avoid
potential community transmission. Such measures can make people's lives as convenient as possible while protecting their health.

In addition, this study found that 1910 (80.90%) of residents agreed they acquire adequate community prevention during the Spring Festival, indicated that the community prevention measures have been accepted and satisfied by the majority of residents. Furthermore, age of residents, “personal protective equipment will been issued by the community/village”, “resident epidemic screening is implemented by the community/village”, “health propaganda and education of COVID-19 is implemented by the community/village”, “appointment of people are admitted can enter the community/village”, “be satisfied with regularly cleaning and disinfecting by the community/village”, and “be satisfied with community service” were the mainly factors associated with residents’ attitudes.

The more community protection is implemented, the more residents will feel a sense of security, especially for epidemic screening. Epidemic screening can early detect of COVID-19 cases in community transmission and support timely control measures. In fact, most of the sporadic cases in China currently come from community transmission, so adequate outbreak detection is the most effective strategy for early containment of large-scale transmission(14, 15). Therefore, this measure can also give residents a full sense of security. In addition, the provision of protective equipment, the control of access to the community, health promotion and education by the community can also effectively enhance the safety of the residents. Therefore, communities and villages are supposed to implement sound community prevention policies on the premise of not impeding the normal life of residents, for protecting the health and mentality of residents.

Satisfaction with the implementation of measures also affects residents' sense of security. Residents have a greater sense of security when they are satisfied with the implementation of measures such as community services, cleaning and disinfecting in their communities. Therefore, the community should force on improving residents' satisfaction with the implementation of the measures. The study also found that residents older than 60 felt less sense of secure. Therefore, community prevention should pay attention to the protection of vulnerable groups, especially the elderly.

**Strengths and limitations**

The study reported implementation of community prevention measures and attitudes of residents to agree they acquire adequate community protection during the Spring Festival can reflect awareness of prevention COVID-19 during the low transmission period. This is the first study to investigate implementation of community prevention measures. We used a nationwide sample of the Chinese population. The results provide evidence on how the public sense of security and influenced factors, which are of importance to China and other countries.

However, this study has some limitations. First, this study used social media as the main method to disseminate the survey. Participants without access to the internet were probably not included. Second, the distribution of the study participants was imbalanced across regions (421: 1470: 470); therefore, the subgroups of variables might not be representative of the population. Third, this study could not determine how many participants reviewed the online poster or survey but decided not to complete the survey; thus, the
presence of non-response bias could not be assessed. Finally, as the behaviors were self-reported, reporting bias was possible. Overall, generalization of the results should be regarded with caution.

Conclusions

24.95% of community/village issued personal protective equipment, 62.98% of community/village implemented epidemic screening, and 46.59% implemented health propaganda and education of COVID-19. For people outside the community/village entering the community/village, 19.78% of community/village implemented that appointment of people are admitted, 4.57 of community/village implemented that only occupants are admitted. 1910 (80.90%) of residents agreed they acquire adequate community prevention during the Spring Festival. In addition, age of residents, “personal protective equipment will been issued by the community/village”, “resident epidemic screening is implemented by the community/village”, “health propaganda and education of COVID-19 is implemented by the community/village”, “appointment of people are admitted can enter the community/village”, “be satisfied with regularly cleaning and disinfecting by the community/village”, and “be satisfied with community service” were the mainly factors associated with residents’ attitudes.

The study reported implementation of community prevention measures and attitudes of residents to agree they acquire adequate community protection during the Spring Festival can reflect awareness of prevention COVID-19 during the low transmission period, which are of importance to China and other countries.

Declarations

Ethics approval and consent to participate

This study protocol was approved by the institutional review board of Tongji Medical College of Huazhong University of Science and Technology, Wuhan, China.

Consent for publication

Not applicable.

Availability of data and material

Data may be made available by contacting the corresponding author.

Competing interests

We declare that we have no conflict of interests.

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Authors’ contributions
X.S. and Y.G. conceived and designed the study. J.F. and Z.L. participated in the acquisition of data. X.S. and J.F. analyzed the data. H.C. and Y.Z. gave advice on methodology. X.S. drafted the manuscript. Y.G. revised the manuscript. All authors read and approved the final manuscript. Y.G. is the guarantor of this work and had full access to all the data in the study and takes responsibility for its integrity and the accuracy of the data analysis.

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