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Adherence to behavior changes for COVID-19 prevention in community-dwelling older adults

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Background: Preventing coronavirus disease 2019 (COVID-19) in older people is an important public health issue. The purpose of this study was to investigate the relationship between the level of fear regarding COVID-19 and adherence to COVID-19 prevention measures among community-dwelling older adults.
Methods: This study was a cross-sectional survey conducted from July 15 to August 19, 2020, in 127 community-dwelling older adults ≥65 years old in Japan. A questionnaire including participants' basic attributes (age, sex, body mass index, and family structure), levels of fear regarding COVID-19, increasing adherence to four behaviors (restrictions on going out, maintaining physical distancing, wearing masks, and washing hands) for COVID-19 prevention, and its stress levels was used. We calculated the relationship between the level of fear of COVID-19 and the level of each behavioral change using Spearman's correlation coefficient (rs).
Results: About 95% of older adults displayed fear of COVID-19. Rates of adherence to all four COVID-19 prevention measures increased to approximately 80–95%. However, about 40–55% of older adults were stressed by all behavior modifications except washing hands. The increasing level of fear regarding COVID-19 correlated positively with decreasing frequency of going out (rs=0.280, p=0.001) and increasing frequency of washing hands (rs=0.336, p<0.001).
Conclusion: The behavioral changes of COVID-19 prevention measures in community-dwelling older people were excellent with increasing adherence rates. While such high adherence rates may increase the preventive effect in community-dwelling older people, the new lifestyle during the COVID-19 epidemic may cause frailty due to restrictions on going out and stress regarding behavior modifications.

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Key words: COVID-19, behavioral change, adherence, community-dwelling older people

Introduction

In Japan, the first case of infection with novel coronavirus disease 2019 (COVID-19) was confirmed on January 16, 2020.[1] The number of infected individuals subsequently increased exponentially in the early stage in urban areas.[2] By the end of February 2020, a total of 224 COVID-19 cases had been reported in Japan, resulting in 5 deaths.[2] In February 2020, the Japanese government considered COVID-19 infection control as an urgent issue, and the public was cautioned to avoid congregating to slow the spread of COVID-19.[3] In addition, the World Health Organization and the Japanese government urged citizens to maintain physical distance (about 2 m), wear masks when going out, and frequently wash hands to prevent COVID-19 transmission.[3,4] The Japanese government declared a state of emergency on April 16, 2020, in all 47 prefectures, and called for an 80% reduction in person-to-person contacts to bring COVID-19 under control.[3]

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Of the total 47 Japanese prefectures, 40 prefectures (regions where the epidemic was relatively calm) were released from the emergency declaration on May 6, 2020.[5]

In Japan, a frailty prevention project based on social participation has been promoted for community-dwelling older people.[6,7] However, COVID-19 is characterized by high transmissibility and a particularly high mortality rate for older people.[8,9] As such, attending voluntary circle activities for preventing frailty was suspended from around March 2020, and older people were required to adopt thorough measures against COVID-19. However, adherence to behavior modifications for the prevention of COVID-19 among community-dwelling older people has not been investigated in detail. In addition, the fear of COVID-19 and stress regarding the adoption of new behaviors are expected to be strong among older people during the COVID-19 pandemic.[10]

The purpose of this survey was therefore to research adherence to COVID-19 infectious control measures, and to clarify the relationship between the fear of COVID-19 and the adherence to COVID-19 prevention among community-dwelling older people.

Methods

Procedures and participants

We conducted a cross-sectional study in a local area in Sasebo City, Nagasaki Prefecture, Japan. In Sasebo City, an outbreak of COVID-19 started on April 1, 2020, followed by one to several other confirmed cases at intervals.[11] In Sasebo City, self-restrictions on the attendance of community-dwelling older adults to voluntary circle activities for preventing frailty went into effect on February 27, 2020 and were lifted on June 15, 2020.[11] The study period for this investigation was from July 15 to August 19, 2020. Fifteen cases of COVID-19 were confirmed in Sasebo City during the survey period, but no cluster had occurred at that stage. As of August 19, 2020, the survey end date, the cumulative number of COVID-19 cases was 21 in Sasebo City.[11]

Consecutive participants were recruited from among community-dwelling older adults ≥65 years old who participated in voluntary circle activities for preventing frailty at public halls. The inclusion criterion was an absence of confirmed or suspected COVID-19. The exclusion criterion was age <65 years.

We enrolled 157 study candidates at 19 voluntary circle activities for preventing frailty. Of these, 6 individuals who declined to participate in the study and 24 individuals with missing values were excluded from analysis. We, therefore, analyzed 127 participants (17 men, 110 women; mean age, 77 years) in this study.

This study was approved by the ethics committee of Nagasaki University Graduate School of Biomedical Sciences (Approval number:20111206). Informed consent was obtained from all participants included in the study.

Measures

We collected data on basic attributes (age, sex, height, weight, and family structure) and responses to our original COVID-19 questionnaire. Body mass index (BMI) was calculated as weight in kilograms divided by the height in meters squared.

COVID-19 original questionnaire

The original questionnaire included 4 items: Q1) sources of information about COVID-19; Q2) fear level regarding COVID-19; Q3) four behavioral changes against COVID-19 (i.e., restrictions on going out, maintaining physical distancing, wearing masks, and frequently washing hands); and Q4) stress levels associated with the four behavioral changes.

Questions Q2-Q4 used four Likert scales. For example, two questions about behavioral changes in response to COVID-19 and stress level were: "How has the frequency of going out changed in the last three and a half months?"; and "How strongly do you feel stressed about the preventive action?" We asked participants to choose a response from the following: "very reduced", "slightly reduced", "unchanged", or "increased"; and "very stressed", "somewhat stressed", "slightly stressed", or "not stressed at all", respectively.

Statistical analysis

The basic attributes of participants, including age, sex, BMI, family structure, and fear level regarding COVID-19, were reported as numbers and percentages. Similarly, levels of behavioral change for COVID-19 and stress levels associated with those behavioral changes were also expressed as numbers and percentages.

Spearman's correlation analysis was performed by calculating the correlation coefficient to examine the relationship between the fear level regarding COVID-19 and changes in adherence level to the four COVID-19 measures.

Statistical analysis was performed using SPSS for Windows version 23.0 software (IBM, Tokyo, Japan).

Results

As much as 95% of community-dwelling older adults reported fear regarding COVID-19; responses from 68% described "strong fear", and 27% felt "some fear" (Table 1). Television was the most popular source of information on COVID-19, reported by 125 individuals (98.4%), and the internet was the least popular source, reported by 12 individuals (9.4%).

Table 2 shows the four behavioral changes to prevent the spread of COVID-19. Regarding restrictions on going out, the total of those who "remarkably reduced" or "slightly reduced" this activity was 100 (78.8%). As for maintaining physical distance, the total of those who "always maintain a good distance" or "maintain a moderate distance" was 105 (82.6%). Adherence to wearing a mask when going out, as the total who "always wear a mask" and "almost always wear a mask", was 124 (97.6%). For frequency of washing hands, the total who "greatly increased hand-washing" or "slightly increased hand-washing" was 120 (94.5%).

Regarding the stress levels of restrictions on going out, maintaining physical distance, wearing masks, and washing hands, the combined values of "very stressed" and "somewhat stressed" were 52 (41.0%), 53 (41.7%), 71 (55.9%), and 26 (20.4%), respectively.

Figure 1 represents the relationship between fear level regarding COVID-19 and adherence to all four behavioral changes. The increasing fear level regarding COVID-19 correlated positively with decreasing frequency of going out ($rs=0.280$, $p=0.001$) and increasing frequency of washing hands ($rs=0.336$, $p<0.001$).

Discussion

We investigated adherence to COVID-19 infection control of 127 community-dwelling older adults ≥65 years old. Approximately 80–95% of community-dwelling older adults showed improved adherence to COVID-19 prevention in the behaviors of "restrictions on going out", "maintaining physical distance", "wearing masks", and "hand washing".

Our results showed that COVID-19 posed a major threat to almost all community-dwelling older adults. In parallel, all citizens, and older people, in particular, were required to change their behaviors to prevent COVID-19. The present study results suggest that these behavioral changes had a sufficiently high adherence rate among community-dwelling older adults.

Table 1. Participants attributes

Characteristics		n	%
Age, years			
	65–74 years (young-old)	50	39.4
	≥ 75 years (old-old)	77	60.6
Sex			
	Men	17	13.4
	Women	110	86.6
BMI, kg/m^2			
	≥ 18.5	117	92.1
	< 18.5	10	7.9
Family structure			
	Living together	83	65.4
	Living alone	44	34.6
Fear levels of COVID-19			
	Strong fear	87	68.5
	Some fear	34	26.8
	Slight fear	2	1.6
	No fear	4	3.1

Table 2. COVID-19 infection control adherence and its stress levels

Infection control	n	%	n	%	n	%	n	%
Going out restrictions	remarkably reduced		slightly reduced		no change		increased	
	27	21.3%	73	57.5%	25	19.7%	2	1.6%
Stress level	very stressed		somewhat stressed		slightly stressed		no stress at all	
	11	8.7%	41	32.3%	75	59.1%	0	0%
Physical distancing	always maintain a good distance		almost all maintain a distance		no change		shorter distance	
	20	15.7%	85	66.9%	21	16.5%	1	0.8%
Stress level	very stressed		somewhat stressed		slightly stressed		no stress at all	
	6	4.7%	47	37.0%	74	58.3%	0	0%
Wearing masks	always		almost always		not very often		not at all often	
	104	81.9%	20	15.7%	2	1.6%	1	0.8%
Stress level	very stressed		somewhat stressed		slightly stressed		no stress at all	
	12	9.4%	59	46.5%	55	43.3%	1	0.8%
Washing hands	remarkably increased		slightly increased		no change		reduced	
	77	60.6%	43	33.9%	7	5.5%	0	0%
Stress level	very stressed		somewhat stressed		slightly stressed		no stress at all	
	5	3.9%	21	16.5%	98	77.2%	3	2.4%

Notably, our findings showed that among the infection prevention measures, the increase in washing hands was relatively high (94.5%) with low stress (20.4%), implying a positive correlation with the fear level. A previous study reported that people tend to adopt excessive hygiene behaviors when pandemics arise and cause strong fear.[10] At times, this may result in maladaptive health behaviors, such as the excessive purchase of hygiene products.[10] Although the present study did not investigate maladaptive health behaviors, in this case, such a response was considered likely to be beneficial, because increasing the frequency of washing hands with a relatively low cost in terms of stress is an effective and relatively easy approach for preventing COVID-19.

Among the COVID-19 measures for community-dwelling older people, restrictions on going out are reportedly not only stressful but also associated with fear levels. Such restrictions on going out are considered an excellent measure when aiming for the control of COVID-19 under epidemic conditions,[12] but the policy conflicts with the prevention or improvement of frailty based on social participation for community-dwelling older people. Long-term restrictions on going out or limiting social participation may thus lead to decreased activity time and subsequent progression of frailty for community-dwelling older people.[13]

Although these statistical figures do not represent the current prevalence of adherence, the rate of increase in adherence was high, and the rate of fear for COVID-19 was serious in the short term. This may be perceived stress from all COVID-19 infection control measures (about 40–55%) other than the stress of washing hands (about 20%). We should promote appropriate modification of health behaviors among community-dwelling older people, especially in COVID-19 resurgences. Therefore, it should be necessary to provide a program that can mitigate the stress caused by COVID-19 infection control measures of participants and provide new evidence-based information about COVID-19.

This study was not designed using random sampling and had a small sample size. A continuous survey was conducted after voluntary circle participation restrictions were lifted, but selection bias may have been present. However, the characteristics of participants in the present study were similar to those of Japanese voluntary circle participants,[14] so we considered the results as representative to some extent for Japanese voluntary circle participants. In the future, a longitudinal study with a large sample size should be planned. Moreover, the participant's cognitive function or mental

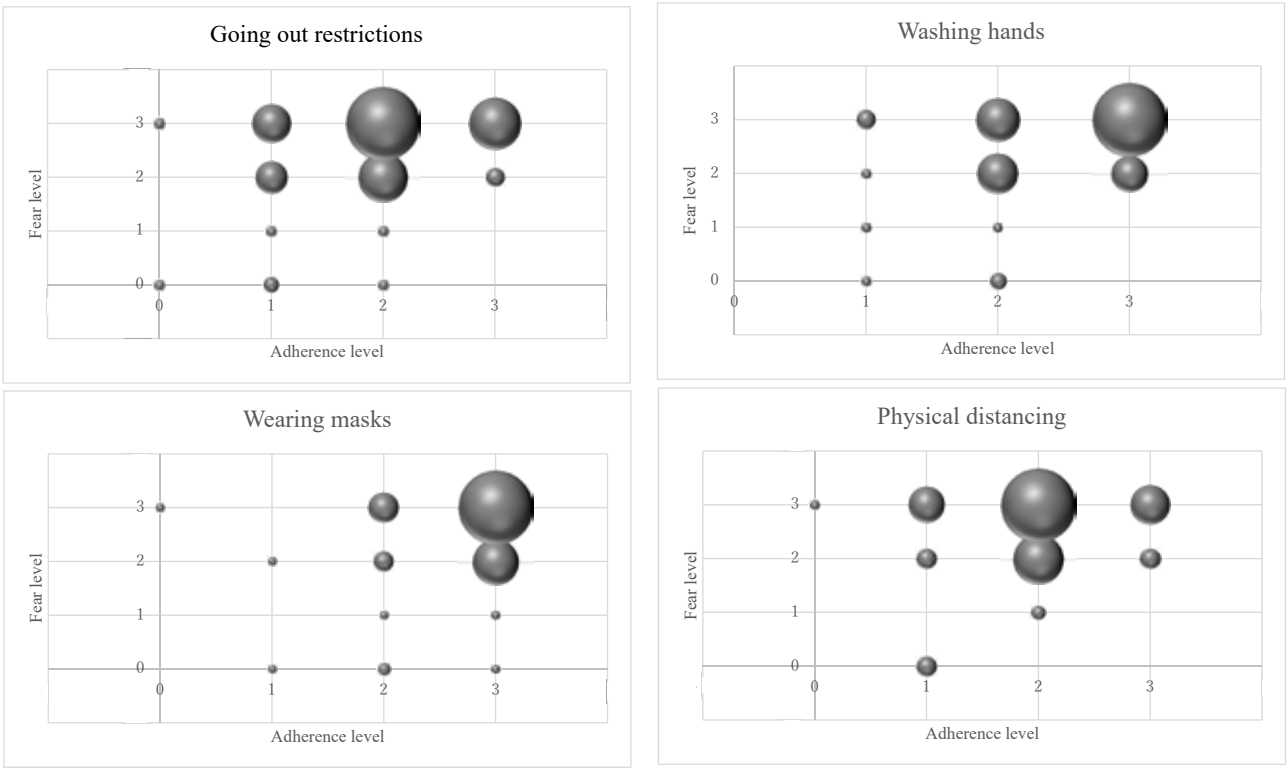

Figure 1. Relationship between the level of fear regarding COVID-19 and level of adherence to behavioral change among community-dwelling older people. Increasing fear of COVID-19 correlated significantly with decreasing frequency of going out (rs=0.280, p=0.001) and increasing frequency of washing hands (rs=0.336, p<0.001). Correlations between increasing levels of fear regarding COVID-19 and physical distancing (rs=0.129, p=0.149) and wearing masks (rs=0.161, p=0.071) were not significant.
The vertical axis of the graph represents a fear level and the horizontal axis represents an adherence level. The vertical axis of the graph: "strong fear"=3, "some fear"=2, "slight fear"=1, and "no fear"=0, respectively. The horizontal axis of the graph: Going out of restrictions; "very reduced"=3, "slightly reduced"=2, "unchanged"=1, and "increased"=0, respectively. Physical distancing; "always maintain a good distance"=3, "almost all maintain a distance"=2, "no change"=1, and "shorter distance"=0, respectively. Wearing masks; "always"=3, "almost always"=2, "not very often"=1, and "not at all often"=0, respectively. Washing hands; "remarkably increased"=3, "slightly increased"=2, "no change"=1, and "reduced"=0, respectively.

illness may affect the results of the relationship among fear level, stress level, and behavioral change as confounding factors. Furthermore, those confounding factors may also cause differences in the knowledge level of participants regarding medical literacy. The present study did not investigate the participants' cognitive function or knowledge level, so the results of the study should be interpreted with caution. Future studies should adjust for these confounding factors.

Despite the limitation, our study provides novel and important evidence that adherence to measures aimed at preventing COVID-19, which is extremely dangerous for older people, is sufficiently high. Furthermore, our study indicates that the more fear is felt, the more thoroughly restrictions on going out will be adopted among community-dwelling older adults, and may in turn affect frail older adults more adversely.

Conclusions

In conclusion, among community-dwelling older adults ≥65 years old, the increase in adherence rate to all four behaviors against COVID-19 was sufficiently high (approximately 80–95% increased), suggesting a contribution to preventing COVID-19. However, 40–55% of older adults were stressed by each behavioral change except for washing hands. In particular, the higher the perceived level of fear for COVID-19, the more restrictions on going out were kept for older adults. These findings indicate that older people living in the community need continuous behavior changes to prevent COVID-19 infection, and also require balanced measures to prevent frailty from decreased activity caused by restrictions on going out and associated stress. Specifically, shortly, measures such as stress palliative care and increased exercise at home are desired.

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Declaration

The authors have no conflicts of interest to declare.

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