

Preventive care for frail seniors living alone in the community -Special characteristics compared with seniors living with others-

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Abstract

The subjects were 125 eligible people out of 142 people considered as weak seniors (hereinafter, frail seniors) according to the basic checklist in S city. A self-administered questionnaire survey using a leaving method was conducted to investigate the frail senior's basic characteristics, Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC), Scale for the feeling that life is worth living among the aged (K-1 Scale), Social Support Scale, Geriatric Depression Scale, and General Self-Efficacy Scale. In the statistical analysis, seniors living alone (group A) and seniors living with others (group B) were compared. Group A had a significantly higher score in instrumental independence and significantly lower scores in emotional support, instrumental support, negative support, and positive support. The odds ratio of each characteristic factor between seniors living alone and seniors living with others was 4.44 in instrumental independence, 0.51 in emotional support, 0.72 in instrumental support, and 0.76 in negative support. It was found that frail seniors living alone are instrumentally independent. However, it was also suggested that they are less likely to utilize emotional, instrumental, and social support.

Key words: Community life, Seniors living alone, Frail, Preventive care, Characteristics

Introduction

Japan has become super aging society, and with declining birth rate and downsizing household, the number of seniors living alone is increasing¹⁾. According to the estimation by Ministry of Health, Labor and Welfare, one-person senior households account for 27% in 2016, and 45% of the 65 years and older population will live alone in 2030¹⁾. It is easy to presume that it is going to be more difficult for seniors to receive living support from their family. "Health", "Economy", and "Isolation" are the risk factors for long-term care needs in seniors living alone²⁾. The Japanese government has been promoting the 4th National Health Promotion Measures—Health Japan 21 (2nd), and one of the goals

is to extend healthy life expectancy. Healthy life expectancy is defined as the period living his or her everyday life without any support and without health problems³⁾. The task is finding out how to extend the period that seniors do not need special support. Therefore, it is critical to shorten the difference between life expectancy and healthy life expectancy, which are 9.1 years for male and 12.7 years for female.

Weakness is expressed as frailty in these days. Buchner and Wagner first defined the concept of frailty in 1990s as a preliminary step of ADL (activity of daily living) disorder, "the condition vulnerable to physical malfunction due to declined reserved capacity"⁴⁾. Fried et al. also defined frailty as a physical condition including weight loss, a sense of fatigue, declined amount of activity, slow-moving (slow walking speed), and declined grip strength⁵⁾. The number of seniors eligible for secondary prevention through the basic checklist assessment conducted in 2015 was approximately 10 % of the elderly population⁶⁾, but the proportion of potential frail seniors is likely to be higher.

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Suemori et al.⁷⁾ focused on depression as a mental problem of seniors living alone and pointed out that they need more appropriate support including prevention compared with seniors living with others. In terms of social support among the elderly, support networks become smaller as the range of activities and social interaction with friends becomes smaller⁸⁾. In this way, seniors gradually lose personal relationships and those who do not have companions or reliable friends are increasing⁹⁾. It has been reported that depression is associated with less social support¹⁰⁾¹¹⁾ and the association is especially higher in seniors¹²⁾. It is important to maintain social support for seniors living alone. Also, it has been reported that there is a gender difference in life satisfaction among seniors living alone¹³⁾. One of the reasons is that women anticipate living alone in the future due to earlier marriage and longer life span while men tend to feel more difficulty in living alone¹³⁾.

Establishing preventive care measures to support seniors to maintain independence in their house as long as possible is an important social task, but few companies have participated in preventive care business¹⁴⁾. Especially, preventive care for frail seniors with high care needs is not sufficiently carried out¹⁵⁾. In addition, relocation damage including mental, social, and physical damage caused by moving from one's old place to a new place is another obstacle¹⁶⁾. Frail seniors living alone are more likely to suffer from relocation damage by living together with their family who have separately lived for a long time or moving into the residential care facility. As these factors interact with one another, seniors may progress from a frail condition to a care needs condition. In this study, we clarified physical, mental, and social living conditions in frail seniors living alone and examined how to support for preventing long-term care needs.

Term Definition

Frail senior is defined as the person who is assessed as "weak" in the aspects including "losing weight", "declining muscle strength", "losing energy", "decreasing walking speed", and "declining physical activity" with the simple screening tool "preventive care checklist" developed by Shinkai et al.¹⁷⁾ to identify the seniors with a risk of care needs.

Study Methods

1. Subjects

The subjects were 142 weak seniors (hereinafter, frail seniors) according to the basic checklist in S city. The valid responses were obtained from 125 people (response rate: 88.0%).

2. Methods

The study method was a self-administered questionnaire survey using a leaving method. The basic characteristics, Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC)¹⁸⁾, Scale for the feeling that life is worth living among the aged (K-1 Scale)¹⁹⁾, Social Support Scale²⁰⁾, Geriatric Depression Scale (GDE)²¹⁾, and General Self-Efficacy Scale (GSES)²²⁾ were included in the survey.

TMIG-IC consists of 13 items with a higher score indicating higher competence in daily living. It has subscales including "instrumental independence", "intellectual activity", and "social role".

K-1 Scale for the feeling that life is worth living among the aged consists of 16 items with a higher score indicating higher sense of worth living. It has 4 subscales including "self-realization and will", "sense of life fulfillment", "will to live", and "sense of existence". With the total 32 points, 0-12 point (s) were considered "very low", 13-16 points were "relatively low", 17-23 points were "average", 24-27 points were "relatively high" and 28-32 points were "very high".

Social Support Scale consists of 12 items with the subscales including "emotional support", "instrumental support", and "negative support". In this study, "positive support" (emotional support + instrumental support) and "total support" (positive support - negative support) were also evaluated. For "emotional support", "instrumental support", "positive support", and "total support", a higher score indicates better social support. For "negative support", a higher score indicates poorer social support.

GDS consists of 15 items, and 0-4 point (s) indicate "no depression symptoms", 5-9 points indicate "mild depression", and 10-15 points indicate "depression".

GSES consists of 16 items and a higher score indicates higher self-efficacy. Using a standardized score conversion table, a degree of self-efficacy can be evaluated with the GSES 5-scale value table. 0-4 point (s) for male and 0-3 point (s) for female were evaluated as 1, which is "very low", 5-8 points for male and 4-7

points for female were 2 “relatively low”, 9-11 points for male and 8-10 points for female were 3 “normal”, 12-15 points for male and 11-14 points for female were 4 “relatively high”, and 16 points for male and 15-16 points for female were 5 “very high”.

3. Statistical analysis

For the statistical analysis, seniors living alone are classified as group A and seniors living with others are classified as group B. The basic characteristics were compared with Chi-square test and the scores of each scale were compared with t test. For the questions of each scale, Mann-Whitney U test was conducted. In addition, association between living alone and each factor was examined using logistic regression with living alone as a dependent variable. The explanatory variables included sex, age, lifestyle, subjective health status, TMIG-IC score, K-1 Scale score, Social Support Scale score, GDS score, and GSES score. Windows edition SPSS 24.0 was used for the statistical analysis, and the significance level was less than 5%.

4. Ethical consideration

This study was approved through the ethical review of S city and by the ethics committee of S university. The written and oral explanation about the purpose and contents of the study was provided to the subjects and the written consent was obtained from all participants. The data was anonymized. We paid close attention to information and data leakage to protect privacy. There is no conflict of interest to disclose in this study.

Results

1. Basic characteristics

Group A included 51 people (2 males, 49 females, the mean age: 78.6 years) and Group B included 74 people (13 males, 61 females, the mean age: 78.0 years). There was no significant difference in age between 2 groups. For the lifestyle, 90% of the subjects responded they are “able to buy things necessary for living” and “able to pay for food with no trouble” in both groups, showing no significant difference. For the subjective health status, approximately 70% responded “somewhat good”, and 20% responded “not so good” or “not good”, showing no significant difference between the groups (Table 1).

2. Comparison between 2 groups in each scale

The average score of TMIG-IC was approximately 12 points in both groups, but Group A had a significantly higher score in the subscale of instrumental independence. There was no significant difference between 2 groups in K-1 Scale. For Social Support Scale, Group A had a significantly lower score in the subscales of emotional support, instrumental support, negative support, and positive support. No significant difference was observed in the GDS and GSES scores (Table 2). In comparison of each question of K-1 Scale, significant differences were observed in “I still have roles inside and outside of the home.”, “I feel I am needed by others.”, “I think I’m doing things beneficial to our society and my family.”, and “I’m trusted and relied on by my family and others.”. In comparison of each question of So-

Table 1 Demographic characteristics

	Group A (n=51)	Group B (n=74)	p value
Average age (SD) ^a	78.0 (5.61)	78.6 (5.37)	0.55
Sex ^b			
Male	2 (3.9%)	13 (17.6%)	0.45
Female	49 (96.1%)	61 (82.4%)	
Subjective health status ^b			
Very good	1 (2.0%)	5 (6.8%)	0.79
Somewhat good	38 (74.5%)	49 (66.2%)	
Not so good	10 (19.6%)	18 (24.3%)	
Not good	6 (3.9%)	2 (2.7%)	
Lifestyle ^b			
Quite blessed life	3 (5.9%)	34.1 (4.1%)	0.63
Able to buy things necessary for living	16 (31.4%)	36 (48.7%)	
Able to pay for food with no trouble	28 (55.0%)	31 (41.9%)	
Difficult to pay for food	4 (7.7%)	4 (5.3%)	

a: t-test b: chi-square test

Table 2 Comparison between two groups in each scale

	Group A		Group B		p value
	Average	SD	Average	SD	
Tokyo Metropolitan Institute of Gerontology Index of Competence (TMIG-IC)					
Total	12.1	1.5	11.8	1.9	0.04
Instrumental independence	5.0	0.2	4.6	0.9	p<0.01
Intellectual activity	3.7	0.7	3.7	0.7	0.80
Social role	3.0	1.0	3.4	0.9	0.04
K-1 Scale Sense of worth living	21.8	7.2	23.7	6.7	0.03
Social support scale					
Emotional support	3.5	0.9	3.8	0.7	0.04
Instrumental support	2.4	1.3	3.1	1.1	p<0.01
Negative support	0.8	1.2	1.4	1.3	0.02
Positive support	5.8	1.9	6.8	1.5	p<0.01
Total support	5.0	2.2	5.4	1.9	0.03
GDS ¹⁾ total	4.8	3.5	4.5	2.9	0.67
GSES ²⁾ total	7.3	4.6	7.7	3.8	0.55

1) Geriatric Depression Scale

2) General Self-Efficacy Scale

Table 3 Logistic regression analysis comparing seniors living alone with seniors living with others

	p value	Odds ratio	95% Confidence interval
Instrumental independence	p<0.01	4.44	1.40 - 8.75
Social role	0.04	0.51	0.36 - 3.79
Emotional support	0.02	0.69	0.17 - 1.64
Instrumental support	0.03	0.72	0.38 - 1.11
Negative support	0.35	0.63	0.66 - 1.52

cial Support Scale, significant differences were observed in “Is there anyone who can take care of you if you become sick and stay in bed for several days?”, “Is there anyone whom you can ask some work when you are away from home?”, “Is there anyone who makes you irritated or angry?”, and “Is there anyone who puts you in trouble?”.

3. Characteristic factors in seniors living alone and seniors living with others

Table 3 shows the results of logistic regression with seniors living alone and seniors living with others as dependent variables. In the explanatory variables, the odds ratio of instrumental independence in TMIG-IC was 4.44 (95% confidence interval [CI] 0.49-1.06), the odds ratio of emotional support was 0.51 (95%CI 0.24-1.11), the odds ratio of instrumental support was 0.72 (95%CI 0.49-1.06), and the odds ratio of negative support was 0.76 (95%CI 0.56-1.06). Also, in the Wald test, seniors living alone had a significantly higher

score in instrumental independence but significantly lower scores in social role, emotional support, and instrumental support, compared with senior living with others.

❖ Discussion

In this study, we used the basic checklist in Long-term Care Insurance to identify frail seniors at Community General Support Center and compared the characteristics of seniors living alone and seniors living with others. Based on the results, we clarified their physical, mental, and social living conditions and examined how to maintain and improve physical functions of frail seniors living alone and provide support for preventive care.

1. Factors that contribute to frailty development

There are many previous studies examining predic-

tive factors that contribute to long-term care needs in the elderly in Japan and other countries²³⁾²⁴⁾. However, there are a few studies examining predictive factors that contribute to frailty. Currently, the cutoff value of the basic checklist for Long-term Care Insurance is mostly 3 points/4 points out of 15 items, and seniors with 4 or more points are considered comprehensively frail²⁵⁾. It has been reported that comprehensive frailty is associated with grip strength²⁵⁾. The previous studies also indicated that high blood pressure, heart disease, diabetes, and muscle weakness due to undernutrition are predictive factors of frailty²³⁾²⁶⁾. Frailty is more likely to be caused by various factors including physical, mental, and social factors²⁷⁾, and physical functions can be significantly improved by exercise and nutrition²⁶⁾. Moreover, psychological stress, unhealthy behavior, and physiological factors complicatedly affect health maintenance in seniors living in the community²⁸⁾. On the other hand, social participation such as hobbies can contribute to health related QOL even in frail seniors²⁹⁾. Therefore, social relationships, physical functions, cognitive functions, and social isolation due to someone's death are factors associated with frailty development³⁰⁾. Although focusing on social isolation in frail seniors living alone is important, seeking for how to build social relationships may be more important as a preventive measure. In general, social role functions start declining earlier than instrumental activities of daily living (IADL)³¹⁾. In other words, seniors lose social relationships including social roles before they lose physical or mental functions and IADL. However, frailty is reversible and can be returned to a healthy condition with appropriate intervention. The most important thing is to identify frail seniors in the early stage and properly intervene to maintain and improve their living functions.

1. Characteristics of frail seniors living alone

In the study by Yoshida et al.²³⁾, the subjective health status was not a predictive factor of frailty. Similarly, there was no significant difference in the subjective health status between 2 groups in this study. While lower subjective health status is not associated with frailty, individual sense of values for daily living or lifestyle are more likely to affect frailty. However, it is known that seniors living alone lose functions more rapidly than seniors living with others if they developed a disease or disorder³²⁾.

Since seniors living alone have a higher level of

activities of daily living (ADL) compared to seniors living with others³³⁾, they do not always need support because of just living alone. In this study, Group A had a higher score in instrumental independence, which equals to IADL. Living alone inevitably requires playing various roles to maintain daily living, which may contribute to prevent frailty. Therefore, living alone does not always lead to social isolation and frailty. The situation differs from person to person.

It has been reported that frail seniors living alone have less social interaction and less conversation with others³⁴⁾, which are risk factors of the psychological unhealthy state. Improvement of social networks for seniors living alone can reduce the development of geriatric syndrome³⁵⁾. Since leisure activities and work-related activities are both related to social networks, senior's good mental health is associated with hobbies and volunteer activities with a sense of purpose in daily living³⁶⁾. In frail seniors living alone, social participation such as active lifestyle, social roles, and social networks is closely associated with their health status. A sense of worth living was significantly lower in frail seniors living alone in this study. Therefore, frail seniors living alone can increase a sense of worth living and maintain physical and mental health through active social participation and frequent conversation with others.

It is indicated that frail seniors living alone are less likely to receive social support from private networks and more likely to develop depression³⁷⁾. In terms of social support examined in this study, Group A had a significantly lower score in emotional support, instrumental support, positive support, and total support, compared with Group B. Also, in the logistic regression analysis after adjusting the confounding relationships between each item, the odds ratios in social roles, emotional support, and instrumental support were significant. It has revealed that seniors living alone do not receive sufficient emotional support and instrumental support as shown in the questions including "Is there anyone who can take care of you if you become sick and stay in bed for several days?", "Is there anyone whom you can ask some work when you are away from home?", and "Is there anyone whom you can talk about worries and concerns?". Informal and formal support from children not living together or neighbors can provide a sense of security and hope of living in frail seniors living alone.

2. To prevent the progress from frailty to care need conditions

This study showed that frail seniors living alone are weak but independent, and even superior in instrumental independence compared with seniors living with others. However, this study also showed that frail seniors living alone do not receive sufficient social support. As physical functions gradually decline with aging, early social support is important to maintain independence as long as possible. Especially, interaction with others is critical in frail seniors living alone from the viewpoint of dementia prevention.

It has been reported that frequent social interaction with friends and neighbors is strongly associated with mental well-being³⁸⁾ and can prevent the progress from frailty to care need conditions. Social interaction among seniors are relationships chosen mutually and voluntarily, so fun time of leisure activities can bring a sense of worth living and improve QOL. These relationships can affect the multi-aspects of frailty including physical, mental, and social aspects.

For frail seniors living alone, maintaining instrumental independence may also lead to a sense of self-efficacy. In addition, maintaining social roles puts seniors in a higher activity level, which is a better situation. However, it must be kept in mind that frail seniors tend to lose various functions more easily with small impact, even without any disease.

3. Study limitations and future tasks

This study is significant because it has clarified that frail seniors living alone live independently with good subjective health status, but they do not receive sufficient social support. However, this study is a cross-sectional study analyzing the characteristics of frail seniors living alone only at the time of investigation. The subject's background such as the reason and the period of living alone was not examined. In addition, the subjects were only those who live in a small city and the sample size was relatively small.

In the future, we need to increase the number of subjects and conduct a further study for seniors living alone in a large city or a rural area. Our next task is to generalize these results and examine long-term care prevention measures based on the characteristics of frail senior living alone.

❖ Conclusion

This study showed that frail seniors living alone are instrumentally independent, but it also suggested that they are not utilizing emotional, instrumental, and social support. In recent years, "oral frailty" occurring as a preliminary step of "physical frailty" as well as "cognitive frailty", "mental frailty", and "social frailty" caused by "physical frailty" have been newly proposed²⁹⁾. Seniors living alone are more likely to fall into these types of frailty. To prevent that, it is important for those seniors to recognize that they can continue to live independently in their community by utilizing social support effectively. Also, it is necessary for seniors living alone to have a sense of worth living, maintain mental health even in physically frail conditions, play some social roles, and have a connection to social networks. Promoting the connection to the neighborhood and the participation in local activities and keeping relationships with others are essential.

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