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The prevalence of homebound individuals in the elderly population: a survey in a city area in Japan

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ABSTRACT

Being homebound has been reported to be associated with a number of conditions. In the current study, the incidence of homebound individuals was surveyed in an urban city area in Japan. The city office randomly enrolled 5,000 residents of Nagoya City aged 65 and over. A questionnaire was sent to their principal caregivers by mail, and 3,444 (68.9 %) subjects returned the survey. The investigators obtained the totally anonymous data from the city office. This study was approved by the Ethics Committee of Nagoya University Graduate School of Medicine. In the present study, the data of 3,053 (61.1 %) subjects for whom complete sets of data were available were employed for statistical analysis. The questionnaire included the following items: age, sex, the status of public long-term care insurance certification (none, support-level, care-level), self-rated health (good, fair, poor, very poor), states of living (single living, with only spouse, with other family members), and the frequency of outside excursions per a week (every day, once in a few day, one a week, rarely). An individual was defined as being homebound if his or her frequency of outside excursions was less than once per week. he incidence of the homebound elderly in the elderly population over 65 years old was 14.4 % in the current study. The status of certification in public long-term care insurance was associated with being homebound. Self-rated health was significantly worse in homebound individuals than in those non–homebound. The current survey found 14.4 % of the elderly was home-bound in a large city in Japan.

Key Words: long-term care insurance, homebound, self-rated health

INTRODUCTION

In Japan, the elderly population has been growing. With the increasing aging of society, the number of homebound elderly is growing.[1)] Homebound older adults are confined to their homes because of physical, psychiatric, and social limitations. Being homebound is associated with a number of conditions, including low basic and instrumental activities of daily living, psychiatric diseases, such as dementia, physical illness, and malnutrition.[2,3)] Moreover, several reports have indicated that being homebound is associated with a high mortality rate.[4,5)] The decrease in the number of opportunities to go out may itself be a consequence of poor health. Alternatively, the loss of the opportunity to leave the home may lead to both physical and mental disuse. Social

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relationships are known to be one of the core elements of quality of life for seniors.[6] Being homebound is also associated with social isolation.

The public long-term care insurance (LTCI) system was introduced in 2000 to meet the increasing need for elder care in the rapidly aging society of Japan.[7] LTCI provides services according to care levels 1–5 and support levels 1 and 2.[8,9] The individuals who need continuous care are classified into one of the care levels according to their mental or physical disabilities, whereas those who need support for daily activities but do not need care are classified as support level 1 or 2. The relationship between certification by LTCI and being homebound should be investigated.

Self-rated health has been reported to be associated with mortality[10-12] and functional declines.[13] Being homebound is associated with various factors, including health status.[2,3] The association between homebound status and self-rated health, however, has not been reported.

An epidemiological survey of the homebound elderly in Japan would provide useful information in terms of considering intervention and policy making. In the current study we aimed to clarify the incidence of homebound in the elderly in a city in Japan.

MATERIALS AND METHODS

This study was performed in Nagoya City, which is located in the central part of Japan. Nagoya City has a population of 2,261,377 (April 2010), of whom 21.4 % are 65 years of age or older. This study was developed and organised by Nagoya City and was supported by the Department of Community Healthcare & Geriatrics of the Nagoya University Graduate School of Medicine. The study was approved by the ethical committee in Nagoya University Graduate School of Medicine on March 26, 2014 (#4233). Written informed consent was obtained from all participants. The city office randomly enrolled 5,000 of all of the residents of Nagoya City aged 65 and over. A questionnaire was sent at September 1, 2010 by mail, and 3,444 (68.9 %) subjects returned the survey a by 15 October, 2010. The investigators obtained the totally anonymous data from the city office. In the present study, the data of 3,053 (61.6 %) subjects for whom complete sets of data were available were employed for statistical analysis. The questionnaire included the following items: age, sex, the status of public LTCI certification (none, support-level, care-level), self-rated health (good, fair, poor, very poor), states of living (single living, with only spouse, with other family members), and the frequency of excursions per week (every day, once in a few day, one a week, rarely) including day care service usage in LTCI.

Being homebound was defined in the current study as a frequency of excursions per a week that was less than once a week.

χ^2 analyses for the categorical variance were performed for the statistical analysis. Statistical significance was set below the p value of 0.05.

RESULTS

Approximately 54.0 % of the responders went out every day, 31.6 % went out once every few days, 9.0 % went out once in a week, and 5.4 % went out rarely. The frequency of going-out distributed differently in men and women ($p<0.001$) (Fig. 1). In the current study, being homebound was defied as going out less than once per week. The proportion of the homebound elderly in the elderly population over 65 years-old was 14.4 % in this setting. As the age of the population increase, the proportion of homebound elderly increased ($p<0.001$). With respect

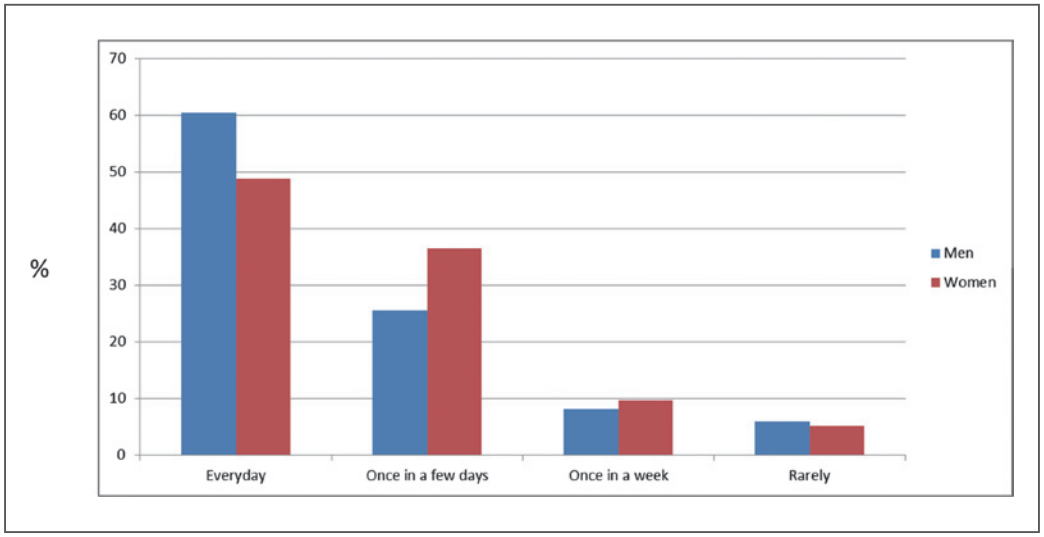

Fig. 1 The distribution of the frequency of excursions in the elderly over 65 years old. Approximately 14.4% of the elderly over 65 years old went out once a week or less.

Table 1 Rate of the homebound according to age and sex

	Male		Female		
Age	Total	Homebound	Total	Homebound	p value
65-69	436	32 (7.3%)	517	39 (7.5%)	0.503
70-74	380	40 (10.5%)	418	39 (9.3%)	0.327
75-79	288	44 (15.7%)	306	44 (12.7%)	0.192
80-84	164	34 (20.7%)	233	61 (26.2%)	0.128
85-	73	28 (38.4%)	119	40 (33.6%)	0.304
Total	1,364	192 (14.1%)	1,689	248 (14.7%)	

to the male population 7.3 % of men 65–69 years old, 10.5 % of men 70–74 years old, 15.7 % of men 75–79 years old, 20.7 % of men 80 84 years-old, and 38.4 % of men over 85 years old were homebound. With respect to the female population, 7.5 % of women 65–69 years old, 9.3 % of women 70–74 years old, 12.7 % of women 75–79 years old, 26.2 % of women 80–84 years old, and 33.6 % of women over 85 years old were homebound (Table 1). The trend of being homebound significantly increase with age ($p<0.001$).

The χ^2 analysis did not identify any significant differences between males and females with respect to the frequency of homebound individuals in each age category.

Approximately 11.3 % (4.8 % for support levels, and 6.5 % for care levels) of the subjects involved in the study was certified by public LTCI. A 11.2% (311/2708) of the non-certified elderly, 33.8% (50/148) of the elderly with support levels, and 40.1% (79/197) of the ones with care levels was homebound. As the level of certification increased (support levels and care-need levels), the proportion of homebound individuals increased significantly in both men and women (Table 2). When stratified by age, more homebound individuals were observed among the non-

Table 2 Rate of homebund by the certified levels of public LTCI

	Total	Homebound	Men	Homebound in men	Woman	Homebound in woman
Non-certified	2708	311 (11.5%)	1246	145(11.6%)	1462	166 (11.4%)
Support levels	148	50 (33.8%)	38	14 (36.8%)	110	36 (32.7%)
Care levels	197	79 (40.1%)	80	33(41.3%)	117	46 (39.3%)

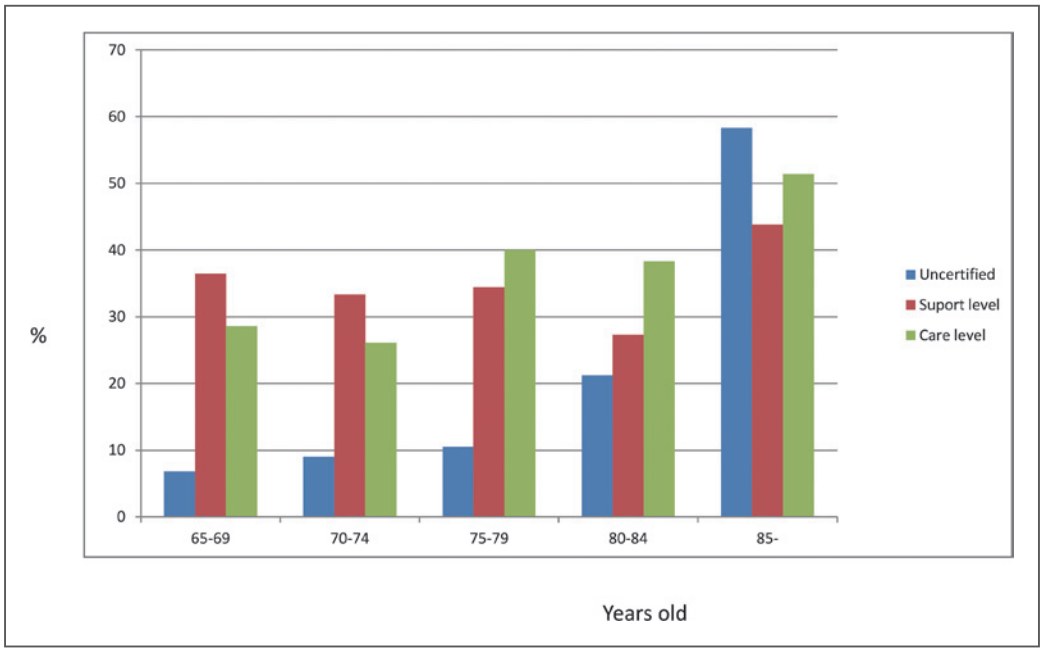

Fig. 2 The frequency of being homebound stratified by age and certified levels.
As the age increased, the proportion of homebound individuals increased among the non-certified subjects.

certified subjects as age increased (Fig. 2).

The status of the living situation (living alone, with spouse, with other family members, or, other) was not associated with being homebound (p=0.355). In men the distribution was not associated with the status of the living situation, while in women the distribution was significantly different according to the status of the living situation (Table 3).

Self -rated health was significantly worse among the homebound than among the non–homebound. Approximately 32.1 % of the non-homebound rated their health as good, 59.8 % as fair, 5.3 % as poor, and 2.8 % as very poor. Among the homebound, 12.3 % rated their health as good, 52.8 % as fair, 15.7% as poor, and 19.2 % as very poor (Fig. 3). Overall, the homebound rated their health as significantly worse ($p<0.001$).

Multiple logistic analysis with sex (male–1, female=0), age (5 year category), status of certification of LTCI (non-certified=0, support level=1, care level=2) showed that age (odds ratio 1.517; 95% confidential interval 1.402–1.642, $p<0.001$) and certification level (odds ratio 1.746; 95% confidential interval 1.484–2.054, $p<0.001$) were positively associated with homebound.

Table 3 Rate of the homebopund by the living status

	Total	Homebound	Men	Homebound in men	Woman	Homebound in woman
Living alone	543	73 (13.4%)	159	19 (11.9%)	384	54 (14.1%)
With spouse only	1274	173(13.6%)	692	102 (14.7%)	582	71(12.2%)
With other menbers of family	1118	173 (15.5%)	460	65 (14.1%)	658	108 (16.4%)
Others	118	21 (17.8%)	53	6 (11.3%)	65	15 (23.1%)

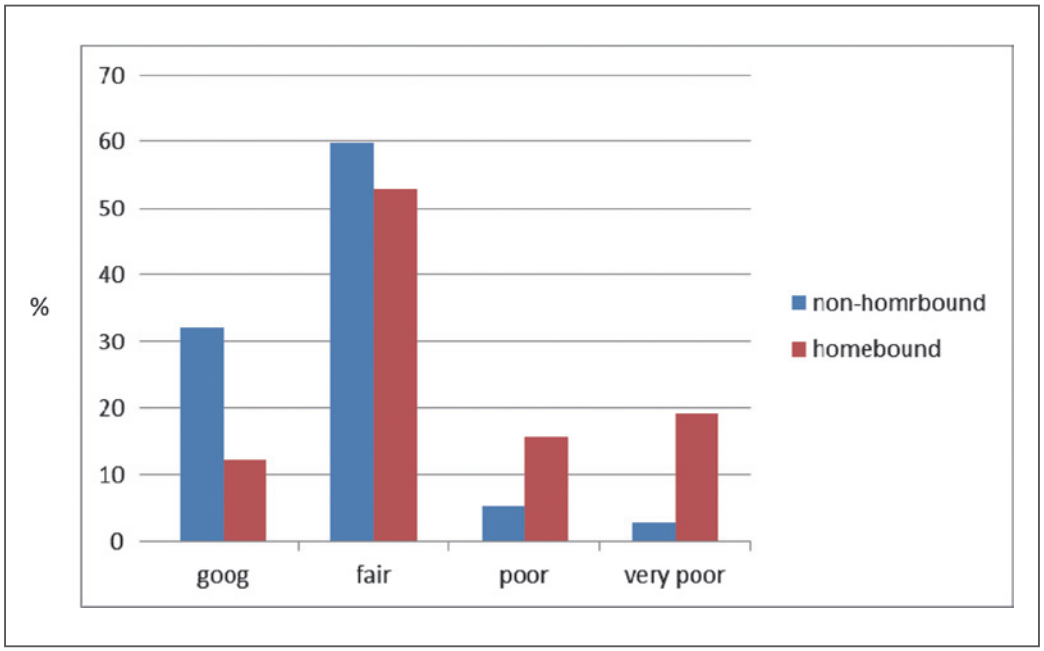

Fig. 3 Self-rated health of the elderly over 65 years old.
The homebound rated their health significantly worse ($p<0.001$).

DISCUSSION

In the current survey performed in a city area in Japan, approximately 14.4 % of the population over 65 years old was homebound. The rate increased with aging and increased certified levels in LTCI.

Estimates of how many elderly persons are homebound range from 10.3 % to more than 30.0 %.[14,15] A rate of 10.6 % was reported by a study in a rural area in Japan.[16] A study from Israel reported a prevalence of 17.7–19.5 %.[17]

Several studies in United States[14,17] and in UK[18] reported that women are more prone to being homebound, and several Japanese studies also showed the same trend.[19,20] However, in the current survey, we did not observe any sex differences among the prevalence of the homebound. The analysis divided by thecertified levels of public LTCI and the living status did not show the difference of homebound prevalence between men and women in the current study. Lower

education and income may be speculated to explain the female dominance in the previous studies; social and cultural backgrounds should be further studied.

Ganguli *et al.* reported that being widowed was a risk for being homebound.[14] In the current survey, single living status was not associated with being homebound. The ability to live alone may be associated with better health status, cognitive function, and activities of daily livings. LTCI provides services according to support levels 1 and 2 and care levels of 1–5.[8,9]

People certified as care level require more assistance. In the current survey, the prevalence of the homebound increased according to the increase in the LTCI certification levels.

Japanese public LTCI provides day-care services.[7-9] The homebound individuals with LTCI certification might not fully use these services. Taking advantage of day-care service may create opportunities for the homebound beneficiaries. Our previous study demonstrated that the introduction of services provided by public LTCI significantly reduced care-giver burden.[21] Among the older subjects, more non-certified subjects tended to be homebound. The reasons for this association remain to be elucidated. The LTCI certification is largely based on functional ability and cognitive dysfunction. The older subjects may have other reasons for be homebound. Depressive mood may be speculated to be one of the associated factors.[4,22]

Self-rated health is reportedly associated with decreased survival or function.[13] In the current survey, we observed significantly lower self-rated health in the homebound. Nearly 90 % of the homebound rated their health as fair, poor, or very poor. Lower health status secondary to disease effects may cause homebound status. A study found that lower self-rated health was associated with depressive mood.[23] As stated previously, depressive mood is also a risk for homebound.[4,22] Elderly individuals with depression are likely included in the homebound found in the current study. Further investigation and intervention is warranted. A study reported that being homebound was not necessarily due to an impairment in mobility or IADL.[16] Approximately 11.7 % of the homebound evaluated their health status as good. The reasons why this group did not go out should be further investigated.

The current survey was performed in a metropolitan area in Japan. Compared to rural areas, urban areas tend to have better transportation systems, which may protect against becoming homebound, but fewer social relationships in the community, which may contribute to becoming homebound. A study reported that the neighbourhood environments affect the walking of the elderly.[24] Another study from Japan reported that feasibility of access in the neighbourhoods was associated with homebound status.[25]

The housing environment including public transplantation system and shopping services also differs in rural and urban areas. The current rate of the homebound elderly should be compared with some rural areas.

The survey was based on a self-report, which is a major limitation in the current study. Depressive mood may be a factor associated with being homebound; however, in the current study, we did not assess depressive mood, which is another limitation. Further, we were only able to analyse 63.4 % of the initial 5,000 subjects who were invited to participate in the survey by mail. The non-responders could include more homebound subjects. The interpretation of the results requires some caution.

CONCLUSIONS

We observed that 14.7 % of the population over 65 years old in a city area in Japan were homebound. The prevalence of being homebound increased according to age. The relatively high rate of homebound status in the elderly population requires increased medical and political

attention.

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Conflict of interest: None declared.

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