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## Functional disability among partners and community activity in elderly Japanese: The Ohsaki Cohort 2006 Study



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## ABSTRACT

**Introduction:** This cross-sectional study aimed to determine association between partners' functional disability and community activity in an elderly Japanese population.

**Methods:** A baseline survey was conducted between December 1st and December 15th, 2006 and included 6600 participants from whom we collected data regarding their participation in community activity and functional disability among their partners. We defined functional disability as receiving certification for long-term care insurance in Japan, and frequent community activity as engaging in community activity more than once a month. Multiple logistic regression analysis was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) for frequent community activity based on functional disability among partners. We also conducted additional analyses using three types of community activities (neighborhood associations; sports, exercise, or a hobby; and volunteering for nonprofit organizations) as outcomes.

**Results:** Multivariate adjusted analysis showed that the OR (95% CI) for frequent community activity was 0.70 (0.54–0.89,  $P < 0.01$ ) among those whose partners had functional disabilities, compared with those whose partners did not have functional disabilities. This finding remained true even for different types of community activities such as neighborhood activities, sports, exercises, hobbies, and volunteering for nonprofit organizations.

**Conclusion:** In this cross-sectional study of an elderly Japanese population, participants whose partners had functional disabilities were less likely to participate in community activity. We conclude that enhancement of support systems is important to promote participation in community activity, not only for patients with disability but their partners as well.

### 1. Introduction

Elderly people participate in various community activities to maintain their health. Community activities such as neighborhood activities, exercises, hobbies, or volunteer activities provide opportunities for communicating and collaborating with others, helping others (Levasseur, Richard, Gauvin, & Raymond, 2010), and supporting health of the elderly. Some studies have reported that participation in community activities was more likely to reduce health decline (Choi, Park, Cho, Chun, & Park, 2016; Dodge et al., 2008; Isaac, Stewart, Artero, Ancelin, & Ritchie, 2009; McGue & Christensen, 2007; Shah, Lin, Yu, & McMahon, 2017) and was associated with decreased risk of disability and mortality (Agahi, Lennartsson, Kareholt, & Shaw, 2013; Ashida, Kondo, & Kondo, 2016; Han, Tavares, Evans, Saczynski, & Burr, 2017;

James, Boyle, Buchman, & Bennett, 2011; Pynnonen, Tormakangas, Heikkinen, Rantanen, & Lyyra, 2012).

Participation in community activity among elderly people may be associated not only with sociodemographic factors and their own health (Aoki et al., 1996; Choi et al., 2016; Dodge et al., 2008; Isaac et al., 2009; McGue & Christensen, 2007; Shah et al., 2017), but also their partners' health conditions. Because stroke and dementia have been identified as major causes of functional disability in the elderly (Cabinet Office, 2016; Vos et al., 2012), these patients may therefore experience some issues with activities of daily living (ADL) and require assistance. Caregivers of the disabled experience high burden (Brodaty et al., 2014; Rigby, Gubitz, & Phillips, 2009) and may not be able to secure sufficient personal time. In addition, the main caregiver among these patients is known to be a spouse (Cabinet Office, 2016). Therefore, partners of

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patients with functional disabilities might not be able to participate in community activities.

Earlier studies have shown that level of community activity decreased significantly among those with functional disabilities relative to those who were not similarly disabled (Agahi et al., 2013; James et al., 2011). However, association between partners' functional disability and community activity has not been previously investigated. In addition, spouses' illnesses have been shown to increase the risk of psychological problems (Nakaya et al., 2017) and death among partners (Christakis & Allison, 2006). Therefore, enhancement of support systems among spouses is important to maintain their health.

This study aimed to determine association between community activity in elderly Japanese and functional disability among their partners. We hypothesized that partner's functional disability results in limited participation in community activity. We also sought to determine whether participation in community activities including neighborhood activities, sports, exercise, hobbies, or volunteering was consistently lower in those whose partners had functional disabilities.

## 2. Methods

### 2.1. Study design, setting, and participants

The design of the Ohsaki Cohort 2006 Study has been described elsewhere in detail (Kuriyama et al., 2010). Although we initiated a large population-based prospective cohort study, whose main objective was to examine the association between psychosocial factors and both physical and mental disability statuses, we have begun to research about the burden of the care of disabled partners in our new research project since 2016. In brief, the source population for a baseline survey comprised all 77,235 men and women living in Ohsaki City, north-eastern Japan, on December 1, 2006.

A baseline survey was conducted between December 1st and December 15<sup>th</sup>, 2006 via questionnaires distributed by the heads of individual administrative districts to individual households and collected by mail. Of the eligible 77,235 respondents, 49,855 who provided valid responses formed the study cohort. We defined partners as follows, using information regarding participants' relationship to the householder: head of household-wife, head of household-husband, mother of head of household-father of head of household, and mother of spouse-father of spouse. Through this matching process, we identified 29,410 potential participants (14,705 pairs). We also excluded 15,103 participants who were < 65 years of age, 5601 participants who did not provide written consent for review of their long-term care insurance (LTCI) information, 659 participants who had already been certified as having a disability by the LTCI at the time of the baseline survey, and 1447 participants who did not complete the community activity questions (three types). Finally, 6600 participants were analyzed in this study.

### 2.2. Measurements

The questionnaire administered to participants aged  $\geq 65$  years requested the following information: frailty checklist (Japanese-language Kihon Checklist) (Suzuki, Makigami, Goto, Yokokawa, & Yasumura, 2007), history of disease, health status during the previous year, smoking status, alcohol consumption status, dietary habits, body weight and height, general health status, pain, daily activities, sports and exercise, psychological distress (Furukawa, Kessler, Slade, & Andrews, 2003; Kessler et al., 2002), educational background, social support (Muraoka, Ikichi, & Ihara, 1996), participation in community activities, and dental status. The Kihon checklist is a simple self-reporting yes/no survey comprising 25 questions regarding instrumental ADL, physical function, nutrition, eating, social interactions, memory, and depression. It was developed by the Japanese Ministry of Health, Labour, and Welfare to screen for frailty and was designed to measure

actual task performance (Suzuki et al., 2007). A higher score indicates a more frail condition. Psychological distress was assessed using the K6 (Kessler 6) (Furukawa et al., 2003; Kessler et al., 2002) in which six questions inquire about how often an individual has experienced the following emotions during the previous month: [1] nervous, [2] hopeless, [3] restless or fidgety, [4] so sad that nothing could cheer you up, [5] everything is an effort, or [6] worthless. We classified respondents with scores of  $\geq 10$  as experiencing increased psychological distress. Social support was assessed by asking the following question: Do you have someone who can help you with your daily housework? This questionnaire was a simple self-reporting yes/no survey (Muraoka et al., 1996).

### 2.3. Partners' functional disability (the LTCI system in Japan)

In this study, we defined functional disability as receiving certification for the LTCI, a form of mandatory social insurance in Japan intended to assist the frail and elderly in their daily activities (Ministry of Health, Labour & Welfare, 2002). When a person applies to the municipal government for benefits, a care manager assesses the degree of functional disability using a questionnaire developed by the Ministry of Health, Labour, and Welfare. Next, the municipal government calculates standardized scores for physical and mental functions based on the questionnaire and classifies the applicant as eligible or ineligible for LTCI benefits (certification). The Municipal Certification Committee applies one of seven levels of support, including Support Levels 1 and 2 and Care Levels 1–5. LTCI certification has previously been used as a measure of functional disability in the elderly (Hozawa et al., 2010; Sone, Nakaya, Tomata, & Tsuji, 2018).

### 2.4. Community activities

We assessed participation in community activities and asked how often respondents participated in the following activities: [1] neighborhood associations (including residents', neighborhood, men's, women's, senior, or children's); [2] sports, exercise, or a hobby, including sports such as Gateball (Gateball is a game played between two teams, each with five players. The players strike balls using mallets for 30 min. The winner is decided based on the total score of passing through three gates or hitting a goal-pole), hobbies such as Karaoke (Karaoke is a form of entertainment. People sing popular songs using a microphone over recorded backing tracks), Haiku (Haiku is the shortest poem including a season word. It consists of only three lines, and the lines have five, seven, and five syllables, respectively), or lifelong learning; and [3] volunteering for nonprofit organizations (town development, disabled, elderly or parental care, sports instruction, beautification, security and disaster prevention, or environmental activity). Frequency of these activities was assessed as never, a few times each year, once a month, two to three times/month, once a week, two to three times/week, and more than times/week. We defined frequent community activity as engaging in community activity more than once a month.

### 2.5. Ethical issues

We considered the return of completed questionnaires as implying consent to participate in the study, which involved baseline survey data and subsequent follow-up of death and emigration. We also confirmed information regarding LTCI certification status after obtaining written consent from the subjects. The Ethics Committee of Tohoku University Graduate School of Medicine (Sendai, Japan) reviewed and approved the study protocol.

### 2.6. Statistical analysis

The primary outcome was a combination of three types of community activities (whether subjects participated in any of the three

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