



Featured Article

 Q1 Social interaction and cognitive decline: Results of a 7-year community
intervention

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Abstract

Introduction: There are few intervention studies that demonstrated linking social participation to lower risk of cognitive decline. We examined prospectively the protective effect of a community intervention program promoting social participation on the incidence of cognitive disability.

Methods: The baseline was established in a survey of community-dwelling older people aged 65 years old or more in July 2006 (2793 respondents, response rate 48.5%). The setting was Taketoyo town in Japan, where municipal authorities launched an intervention that was based on the establishment of community-based centers called “salons,” where the town’s senior residents could congregate and participate in social activities, ranging from arts and crafts, games, and interactive activities with preschool children. Three salons were established in May 2010, and a total of 10 salons were in operation by 2013. We recorded the frequency of salon participation among survey respondents till 2013 and conducted two follow-up surveys (in 2010 and 2013) to collect information about health status and behaviors. The onset of cognitive disability was followed from May 2007 to January 2014. We used the marginal structural models to evaluate the effect of program.

Results: The range of prevalence of cognitive disability was from 0.2% to 2.5% during the observation period. The proportion of respondents who participates to salons increased over time to about 11.7%. The frequency of salon participation was protectively associated with cognitive decline, even after adjusting for time-dependent covariates and attrition (odds ratio = 0.73, 95% confidence interval: 0.54–0.99).

Discussion: Our study suggests that operating community salons that encourage social interactions, light physical activity, and cognitive activities among older participants may be effective for preventing cognitive decline. In future studies, we need to understand what sorts of activities (e.g., those involving light physical activity vs. purely intellectual activities) are most effective in maintaining cognitive function.

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Keywords:

Prevention; Community intervention; Social participation; Japan; Marginal structural models

1. Background

Dementia is a major cause of disability and dependency among older people. Worldwide, an estimated 47.5 million people suffer from dementia while 7.7 million new cases are added each year [1]. The number of people living with dementia is projected to triple by 2050 [2].

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Japanese society is confronted with the fastest pace of population aging in the world, with a population prevalence of dementia that is nearly double the world average (Japan: 15.0% in 2012 [3] vs. world average: 5.2% in 2015 [4]). The population with dementia is forecast to reach 7 million by 2025 [5]. The prevention of dementia is therefore a top priority for Japanese public health policy [6]. One approach advocated by Japanese government to prevent cognitive decline in older adults has been to encourage more social participation [7]. Observational studies suggested that social participation is associated with lower risk of cognitive decline [8]. However, these studies are prone to confounding bias due to their observational nature; specifically, the selective participation of cognitively healthier individuals in community-based programs encouraging social participation.

Since 2007, the municipality of Taketoyo (population 41,000) in Aichi Prefecture, Japan, has been engaged in a community intervention program designed to facilitate social participation among older residents, with the aim of preventing cognitive and physical functional decline. The intervention program is based on opening 10 community-based centers (referred to as “salons”), where seniors can congregate to engage in a variety of social programs and activities [9,10].

In the present study, we report on the 7-year evaluation of this intervention program. Our design is quasi-experimental in the sense that the community salons were newly established by the Taketoyo municipality (where none previously existed), and we have information (from an ongoing cohort study) about the health status of individuals before and after the salons were opened. Because of the repeated assessments of salon participation and covariates over time, there is a possibility of time-varying confounding. For example, social participation could improve health status (covariates), which also may influence the probability of social participation in subsequent time periods. Therefore, we attempted to address time-varying confounding through marginal structural modeling with inverse probability weighting.

2. Methods

2.1. Study population

The study population consisted of participants in the Aichi Gerontological Evaluation Study (AGES), which was established in 1999 in Aichi prefecture. One of the field sites of the AGES cohort was in the town of Taketoyo (population 41,531 in 2006) [11]. We conducted a mail-in questionnaire survey of all community-dwelling older people who were physically and cognitively independent and aged 65 years or older ($n = 5759$) in July 2006.

The questionnaire survey inquired about personal characteristics, health status, and health habits of the respondents. As shown in Fig. 1, the response rate to the baseline survey was 48.5% ($n = 2793$). An additional 200 subjects were removed from the baseline of the present study because of

missing/invalid information, relocation out of the area, or death/incident disability.

Of the 2593 eligible participants from the baseline survey, we lost 326 subjects due to death/functional decline and relocation during the 3-year and 3-month follow-up period. In the second survey in August 2010, we recontacted 1769 individuals (participation rate: 78.0%). During an additional 3-year and 2-month follow-up term, 268 respondents dropped out of our cohort. We obtained 1352 responses from 1501 eligible subjects in the third survey conducted in October 2013 (participation rate: 90.1%). The cumulative follow-up rate during the total period was therefore 73.9%. We also collected information on their frequency of participating in salons until the end of March 2014. In addition, the onset of functional and cognitive disability was followed from May 1, 2007 to January 6, 2014. (The observation period was 2443 days.) Our study protocol was approved by the Ethics Committee at Nihon Fukushi University and Seijoh University.

2.2. The intervention

Taketoyo town is located approximately 35 km south of Nagoya in Aichi Prefecture, Japan. The community salon project was launched in May 2007 when the municipal authorities began to open community-based centers where the town's senior residents could congregate and participate in social activities. Initially, three salons were established, and by 2013, a total of 10 salons were in operation, staffed by community volunteers (Fig. 1).

In September 2013, we conducted a survey of a sample of 152 volunteers in the Taketoyo program. Of the 91 volunteers who responded to the survey (26 male and 65 female), the average age was 71 years, and the average duration of volunteering was 4.3 years. Almost all of them were recruited to volunteer by their friends who were participating in the salon activities. They were all required to take a training course conducted by two occupational therapists.

Although the salon programs were not standardized across locations, popular activities included dance classes, chatting with other participants, arts and crafts (calligraphy, origami, and poetry recitation), singing, playing musical instruments, quizzes and games (e.g., bingo, cards, Japanese chess), as well as interactive activities with preschool children. In each salon, 90–120 minutes of programming were scheduled between 1 to 3 times per month.

Any resident aged 65 years or older was eligible to participate for a nominal fee of 100 Japanese Yen (roughly 1 US dollar) per visit.

2.3. Outcome variable

Our primary outcome is the onset of cognitive disability assessed by a standardized in-home assessment. The Japanese government established a national long-term care insurance scheme in 2000 [12]. Under this system, a certification

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