

木曽郡地域在住の中高年層における主観的地域環境と 予防的保健行動との関連

Associations of Perceived Neighborhood Environment Problems
with Preventive Health Behaviors for Functional Decline
in Middle-Aged in Kiso County Area

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ABSTRACT

OBJECTIVE: This study examined the association between neighborhood problems and preventive health behaviors for functional decline. **SUBJECTS:** A total of 1497 participants in the Kiso County who were aged 40-64 years functionally healthy were questioned in 2002. **METHODS:** Participants rated the severity of nine neighborhood problems. Preventive health behavior for functional decline was measured by self-report. Logistic regression models adjusted for demographic, socio-economic and health factors. **RESULTS:** The participants reported average of three neighborhood problems. The number of serious neighborhood problems was associated with an increased likelihood of having preventive health behaviors: getting information about health (odds ratio (OR) = 1.15, 95 percent confidence interval (CI) = 1.05, 1.27), taking a rest (OR=1.06, 95 percent CI = 1.01, 1.12), keeping on enough sleeping (OR = 1.06, 95 percent = 1.01, 1.12), and control of alcohol intake (OR=1.11, 95 percent CI = 1.04, 1.18). **CONCLUSION:** The result of these analyses suggests that poor-quality neighborhood environments are associated with increased likelihood of health behavior in middle-aged. Further research would be needed to identify other environmental characteristics that may influence preventive health behavior for functional decline.

INTRODUCTION

After the war the average life expectancy in Japan has been extended remarkably with the improved environment for living and the advancement of medicine. In 1997 the average life expectancy reached 77.19 years for men and 83.82 years for women, and Japan became a longest-lived society in the world. On the other hand, the rapid increase of elderly people who require long-term care for bedridden condition or dementia is projected along with the progress of aging society¹⁾.

Considering this situation, families providing long-term care are bearing heavy burden physically and psychologically, and that is causing the "care-worn" to the families and destroying the relationship among family members. The goal of health and welfare service measures for the elderly is leading not only the elderly in the condition to require care but all elderly people to live with the sense of security and fulfillment. In the scheme of long-

term care insurance system, it is also necessary to improve the measures for preventing the elderly becoming the condition from requiring care, so that the elderly feel fulfillment in life and promote health. Considering these needs, municipalities as the insurers of the long-term care insurance are going to establish the "Support program to promote health and welfare of the elderly at home" to enable the comprehensive implementation of health and welfare measures including the view of fulfillment, health promotion and preventive health measures according to the conditions of individual communities¹⁾.

Physically active lifestyles are regularly associated with improved health and quality of life. Regular physical activity in older adults can facilitate healthy aging, improve functional capacity, and prevent disease²⁻⁸⁾. Recently, increasing attention has been being paid to the impact of neighborhood residence on individual health status⁹⁻¹³⁾. Environmental factors may play an important role on influencing physical activity behaviors. It can be thought that identifying environmental factors that can influence physical activity is a public health priority. Several studies have found associations of perceived physical and social environmental attributes with physical activity behaviors, particularly about walking¹⁴⁻²⁴⁾. There are many studies have found associations of environmental attributes with physical activity behaviors²⁵⁻⁵⁵⁾. Recent research supports the hypothesis that physical and social environment affects health behaviors. However, few studies have examined association of neighborhood environment problem with preventive health behavior for functional decline in middle-aged in Japan. Physical and social environmental factors associated with physical inactivity in middle-aged population are poorly understood in Japan.

The purpose of the study was to examine associations of perceived social and physical neighborhood environment problems with preventive health behavior for functional decline in middle-aged in Kiso County in Nagano Prefecture.

MATERIAL AND METHODS

Study population

The study was conducted in Kiso County. Kiso County is located in the northwest corner of Nagano Prefecture. The county consisted of 11 municipalities: 3 towns and 8 villages. The county had a population of 42,159, according to the 2,000 census. The percentage of the population aged 65 years and older was 31.4 %. We conducted a cross-sectional survey. Respondents were asked about their views toward risk of functional decline, perceived environment problems, and health habit for preventing functional decline. We randomly selected 3,000 men and women aged 40-64 years living in the region by stratified sampling procedure. Male and female residents aged 40 to 64 years, 3,000 were selected from Basic Resident Registers of each of the 11 area in proportion to the population. Self-administered questionnaires were distributed through the Kiso wide area unification office to those of downtown district of Kiso County in October 2002, and completed questionnaires were collected. A total of 1,497 subjects in 11 areas responded to the questionnaires (response rate :

44.9%) in the survey.

Assessment of neighborhood environment, health behavior, and other covariate

Respondents were asked to consider their neighborhood as a whole and rate the seriousness of nine potential neighborhood problems associated with living: access to medical facilities, presence or absence of a shortage of social services by public sector, a shortage of social services by private sector, a shortage of Glossary store, supportive relative nearby, severe weather, severe geographic condition, limitation of way to go out, and delay in emergency. Each neighborhood item was counted as serious problem if the participants responded that the problem was serious. The number of serious neighborhood problems was summed.

Respondents were also asked whether they have preventive health behaviors for functional decline: health physical activity, trying to exercise, having a routine checkup, participation to health services by public sectors, getting information about health, continuous adherence, taking care of nutritional status, taking a rest, keeping enough sleeping, spending time with friend and family, no smoking habit, control of alcohol intake. Responses were coded into dichotomous categories: yes versus no. As other covariate, respondents were asked about socio-demographic items include sex, age, living arrangement, occupation, and so on.

Data analysis

Odds ratios were used to estimate likelihood of preventive health behaviors associated with neighborhood problems. A basic multiple logistic regression model adjusting for age (in years), sex, and self-assessed health status was used to assess the impact of neighborhood problems. All data analyses were conducted using HALBAU for Windows Version 5.34. Results were considered significant if they reached a p level of 0.05 or less in.

RESULTS

Characteristics of the study population are presented in table 1. The mean ages of the male (42.6percent) and female (57.6percent) subjects were 53.3 and 53.2 years, respectively. Neighborhood problems encountered most frequently in middle aged adults in Kiso County were severe weather (59.9percent), long distance to medical facilities (46.8percent), and a shortage of glossary stores(36.6percent),while no supportive relative nearby (21.4percent), delay in emergency (21.2percent), and a shortage of social services by public sectors (21.0percent) were reported less frequently(table 2). When the number of serious neighborhood problems was summed, approximately nine percent of the respondents reported that none of the nine problems were serious in their neighborhood. Most frequent category was the participants who reported two serious neighborhood problems (21.4percent) (table 3).

Health behaviors performed most frequently in middle aged adults in Kiso County were regular medical check (67.2percent), trying to exercise (52.2percent), and no smoking habit (50.8percent), while physical activity (16.4percent), getting information about health

(7.4percent), and participation to health services by public sectors (1.9percent) were reported less frequently (table 4).

Table 5 shows results of multivariate logistic regression analyses. In multivariate logistic regression adjusting for age, sex, and self-assessed health status, the number of neighborhood problems was associated with getting information about health (odds ratio (OR) = 1.15, 95 percent confidence interval (CI) = 1.05, 1.27), taking a rest (OR=1.06, 95 percent CI = 1.01, 1.12), sleeping (OR = 1.064, 95 percent =1.01, 1.12), and a little alcohol intake (OR=1.11, 95 percent CI = 1.04, 1.18).

Table1. Characteristics of the subjects (N=1497)

variable	N	(%)
Sex		
Male	631	(42.8)
Female	837	(56.7)
Mean age (years)		
Male	53.3	
Female	53.2	
Total	53.2	
Living arrangement		
One-person household	58	(3.9)
With spouse only	358	(24.3)
With parents	368	(24.9)
With children	346	(23.4)
Three-generation family household	345	(23.4)
NA	22	(1.5)

Table2. Perceived neighborhood environment problems

variable	N	(%)
Long distance to medical facilities	701	(46.8)
A shortage of social services by public sector	315	(21.0)
A shortage of social services by private sector	332	(22.2)
A shortage of glossary stores	548	(36.6)
No supportive relative nearby	321	(21.4)
Severe weather	897	(59.9)
Severe geographic condition	446	(29.8)
Limitation of way to go out	562	(37.5)
Delay in Emergency	318	(21.2)

N=1497 (multiple answer)

Table3. Distribution of No. of serious neighborhood problems

category	N	(%)
0	241	(16.1)
1	241	(16.1)
2	317	(21.2)
3	278	(18.6)
4	212	(14.2)
5	137	(9.2)
6	75	(5.0)
7	51	(3.4)
8	23	(1.5)
9	23	(1.5)
Average No.of problems	3	

N=1497

Table4. Distribution of preventive health behaviors for functional decline

variable	N	(%)
Physical activity habit	246	(16.4)
Trying to exercise	782	(52.2)
Having a routine checkup	1,006	(67.2)
Participation to health services by public sectors	28	(1.9)
Getting information about health	111	(7.4)
Continuous adherence	469	(31.3)
Taking care of nutritiononal status	750	(50.1)
Taking a rest	614	(41.0)
Keeping on enough sleeping	732	(48.9)
Spending time with friend and family	499	(33.3)
No smoking habit	760	(50.8)
Control of alcohol consumption	300	(20.0)

N=1497 (multiple answer)

Table5. Odds ratio for preventive health behaviors and No.of neighborhood problems by multiple logistic regression model

variable	No.of serious neighborhood problems		p value
	OR	95%CI	
Physical activity habit	1.01	0.94, 1.08	
Trying to exercise	1.04	0.99, 1.10	
Having a routine checkup	1.03	0.98, 1.09	
Participation to health services by public sectors	1.00	0.83, 1.21	
Getting information about health	1.15	1.05, 1.27	<0.05
Continuous adherence	1.03	0.97, 1.09	
Taking care of nutritional status	1.04	0.99, 1.10	
Taking a rest	1.06	1.01, 1.12	<0.05
Keeping on enough sleeping	1.06	1.01, 1.12	<0.05
Spending time with friend and family	1.05	0.99, 1.11	
No smoking habit	1.05	0.99, 1.10	
Control of alcohol consumption	1.11	1.04, 1.18	<0.05

Basic model adjusted for age, sex, and health status

OR, odds ratio; CI, confidence interval

Odds ratios are estimated by 1score up

Table6. Associations between perceived environment problems and preventive health behaviors for functional decline

	Perceived neighborhood problems								
	1	2	3	4	5	6	7	8	9
	Long distance to medical facilities	A shortage of social services by public sector	A shortage of social services by private sector	A shortage of glossary of stores	No supportive relative nearby	Severe weather	Severe geographic condition	Limitation of way to go out	Delay in Emergency
Physical activity habit									
Trying to exercise									
Having a routine checkup									
Participation to health services by public sectors									
Getting information about health									
Continuous adherence									
Taking care of nutritional status									
Taking a rest								1.37 (1.10,1.70)	
Keeping on enough sleeping	1.30 (1.06,1.60)			1.35 (1.09,1.68)					
Spending time with friend and family									
No smoking habit									
Control of alcohol consumption									

Odds ratios (95% CI), blanks are not significant

To explore the impact of the different neighborhood problems on health behavior, I evaluated separate models comparing people who reported the presence of each single neighborhood problem with those who did not report that problem (table 6). After adjustment basic covariate including age, sex, and health status, it was founded that three serious neighborhood problems were associated with health behaviors, respectively. First, people who reported the presence of limitation of way to go out were significantly more likely than those who did not report that problem to try to take a rest (OR=1.37, 95 percent CI = 1.10, 1.70). Second, people who reported the presence of a shortage of glossary store were significantly more likely than those who did not report that problem to keep on enough sleeping (OR=1.35, 95 percent CI = 1.09, 1.68). Third, people who reported the presence of long distance to medical facilities were significantly more likely than those who did not report that problem to keep on enough sleeping (OR=1.30, 95 percent CI = 1.06, 1.60).

DISCUSSION

The purpose of the study was to examine associations of perceived social and physical neighborhood environment problems with preventive health behavior for functional decline in middle-aged in Kiso County in Nagano prefecture. The results of these analyses suggest that poorer-quality neighborhood environments are associated with increased likelihood of health behavior in middle-aged. After adjustment for many individual demographic and health characteristics, the associations are founded. Residence in a neighborhood with multiple problems has an association with health behaviors.

Particularly, the results indicate that people who reported the presence of limitation of way to go out were significantly more likely than those who did not report that problem to try to take a rest. People who reported the presence of a shortage of glossary store were significantly more likely than those who did not report that problem to keep on enough sleeping. People who reported the presence of long distance to medical facilities were significantly more likely than those who did not report that problem to keep on enough sleeping. Thus, long distance to medical facilities, a shortage of glossary stores, and limitation of way to go out were particularly important contributors to the preventive health behaviors in neighborhoods with multiple problems.

However, previous studies reported that poor-quality neighborhood environments are associated with decreased likelihood of health behavior. For instance, Forde DR found that perceived crime in the city and in Canada was not associated with fear of crime and walking alone at night; perceived crime in respondents' neighborhoods showed a weak association⁵⁵⁾.

Moreover, a large of number of studies reported that richer-quality neighborhood environments are associated with increased likelihood of health behavior. Carnegie et al. concluded that the health promotion implications of these findings are that environments perceived as attractive and as providing convenient access to services and facilities may influence motivational readiness for physical activity and time spent walking²²⁾. Patterson PK and Chapman

NJ showed that traditional urban neighborhoods with mixed services and good pedestrian access were associated with increased walking among older residents²⁷⁾. Humpel N et al. found that men with the most positive perceptions of neighborhood "aesthetics" were significantly more likely to be in the highest category of neighborhood walking. Men who perceived the weather as not inhibiting their walking were much more likely to be high exercise walkers. Women who perceived the weather as not inhibiting their walking were significantly more likely to be high neighborhood walkers and those with moderate perceptions of "accessibility" were much more likely to do more walking for pleasure¹⁸⁾. Patterson JM et al. reported that both higher area level social cohesion and higher individual social cohesion were associated with lower likelihoods of smoking²⁹⁾.

Spanier PA and Allison KR. showed that general social support was significantly associated with higher levels of physical activity. The finding suggests that social supportive neighborhood environments are associated with increased likelihood of health behavior. Conversely, support in the form of Familial Structure (marital/cohabitation and parental status) was significantly associated with lower levels of physical activity. The findings indicate the types of general social support that facilitate or hinder participation in physical activity⁵³⁾.

In addition, there are reports that social participations are associated with increased likelihood of health behavior. Bertrais S et al. revealed that participation in some vigorous activity may be viewed as a "facilitator" to attain physical activity recommendations²⁶⁾. Evenson KR et al. found that social environmental factors, such as knowing people who exercise or seeing people exercise in the neighborhood, were more likely among women who reported any activity or who met recommendations for activity. Physical environmental factors, such as vehicular traffic and street lighting, were not strongly associated with physical activity. Living in a community where places to exercise were available was associated with any activity⁴⁰⁾.

Contrary to previous studies mentioned above, the number of serious neighborhood problems was associated with an increased likelihood of having preventive health behaviors in this study. One explanation for the association between neighborhood and health behavior is that risk perception toward serious environments may influence preventive health behaviors. Different environmental attributes were associated with different types of walking and these differed between men and women. Approaches to increasing physical activity might usefully focus on those attributes of the local environment that might influence particular subsets of walking behavior¹⁸⁾. It is also possible that there is a gap between subjective environment and objective environment. Future research should focus on the relation between objective measures rather than perceptions of the environment and physical activity.

In this study, there are several limitations that should be considered. First, the low response rate may have caused selection bias. In such case, the author should compare the sample with the target population in terms of characteristics. However, in this study, it was impossible to make this comparison because I didn't have data on non-respondents. Second,

Limitations of the study include self-reported data and cross-sectional design. Third, Measurement of neighborhood was limited to nine negative characteristics of rural environments. While these characteristics appear to be important factors for the health behaviors of middle-aged, they may not be the only vital components of neighborhood. There are many other negative characteristics of neighborhood environment and this analysis included no positive neighborhood characteristics. There could be also positive neighborhood characteristics which may help health behaviors of middle-aged. In the future, it will be important to measure such factors as neighborhood social group and other supportive characteristics. Also, further research would be needed to identify other environmental characteristics that may influence preventive health behavior for functional decline.

The study highlights the need for future studies: to examine behavior-specific environmental attributes, to collect objectively-measured environmental data and to include both objective and perceived environmental data in the same studies, and to adopt prospective study designs to allow causal relationships to be established.

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