

significantly reduce locomotorium pain. In this study, in addition to lifestyle and exercise instructions, aquatic exercise using spas and spa bathing were always incorporated, which are presumed to contribute to both the maintenance of the activity of daily life (ADL) and quality of life (QOL).

Iwai et al. reported that physical activity was influenced by socio-environmental factors, and that it was accompanied by other healthy behaviors. In the present study, no information on education levels, lifestyles, BMI, or presence or absence of smoking habits was available, and the great limitation was that discussion was virtually impossible, given the confounding factors. Previous studies have reported that the elderly with low body weight (BMI < 20) showed high all-cause mortality even after adjusted for smoking habits in both genders. Anzai et al. suggested that the relationship between healthy practices and education levels was weaker in Japan than in Europe or the USA. In the present study, however, the education levels in the two groups were unknown, leaving of unclear whether or not they were confounding factors.

Several methodological limitations affect the interpretation of our findings. First, we could obtain only age and sex data for our baseline, while other possible confounding factors as BMI, medical histories, morbidity, smoking status, etc. could not be put into Cox's proportional hazards regression model. This makes it difficult to determine the effects of the repetition of comprehensive health education. Second, this study probably had a selection bias because of the population in a particular village. Third, the change in national criterion for care need makes it impossible to expect our data to figure the same health status. Fourth, since no class attendance records were kept. We could not conduct subgroup analysis. More rigorous cohort studies and randomized controlled trials seem warranted.

In conclusion, repeated comprehensive health education classes including lifestyles, exercise, diets, and spa bathing, although available only biweekly, may be effective in the care prevention of middle-aged and elderly people.

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ACKNOWLEDGMENTS

This study was supported by a Health and Labor Sciences Research Grant from the Ministry of Health, Labor and Welfare of Japan and a Grant from the Research Institute of the Tokyo University of Agriculture.

Table 1. Study schedule

10:00	Arrival at facility (by shuttle bus) Chat and Tea
10:30	Main program
12:00	Lunch & Break
13:30	Free time (aquatic exercise) Bathing (alkaline simple hot spa)
15:00	Departure from facility (by shuttle bus)

Table 2. Age of participants at baseline †

	N	Age
Total	1013	68.8±8.5
Participants of Silver College	190	
Non-participants	823	
Male	456	65.5±5.6
Participants of Silver College	42	73.3±5.2**
Non-participants	414	64.7±5.0
Female	557	71.5±9.5
Participants of Silver College	148	76.9±6.4**
Non-participants	409	69.5±9.7

† May 1994

** p<0.001

Table 3. Age composition of participants* at baseline

Age group	Male		Female	
	Participants	Non-participants	Participants	Non-participants
<65	1 (2.4)	187 (45.2)	41 (27.7)	162 (39.6)
65-74	25 (59.5)	146 (35.3)	79 (53.4)	123 (30.1)
75-84	15 (35.7)	60 (14.4)	28 (18.9)	81 (19.8)
85≤	1 (2.4)	21 (5.1)	0	43 (10.5)
Total	42 (100)	414 (100)	148 (100)	409 (100)

number (%)

*participants of Silver College

Table 4. Results by Cox's proportional hazards regression model

Total	Variables	Hazard ratio	95% Confidence interval
	Age	1.125	1.111-1.139
	Participation	0.270	0.172-0.423
Male	Age	1.115	1.095-1.136
	Participation	0.423	0.228-0.787
Female	Age	1.138	1.117-1.158
	Participation	0.215	0.112-0.412

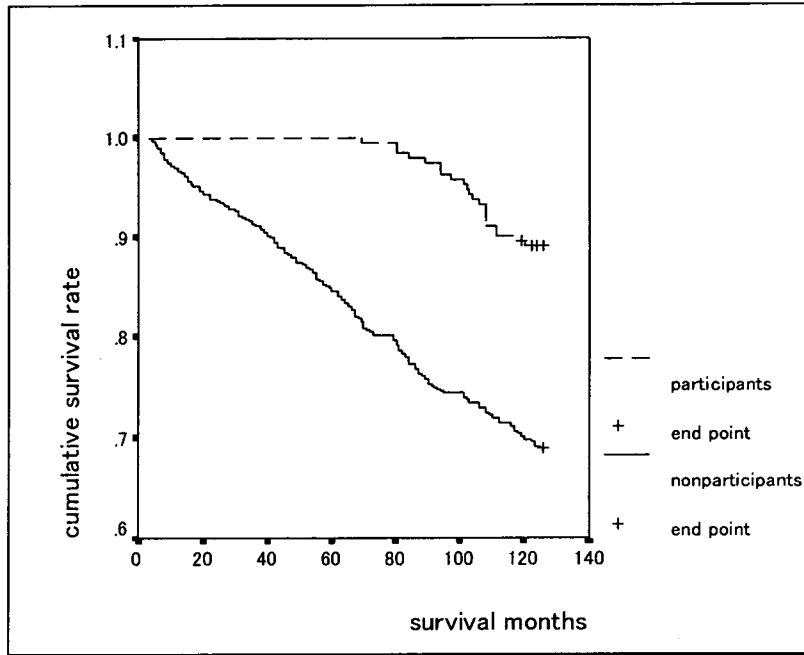


Figure 1. Time to first event (total)
Ordinate shows rate of those not recognized as dead or having grade 2 care needs or more.

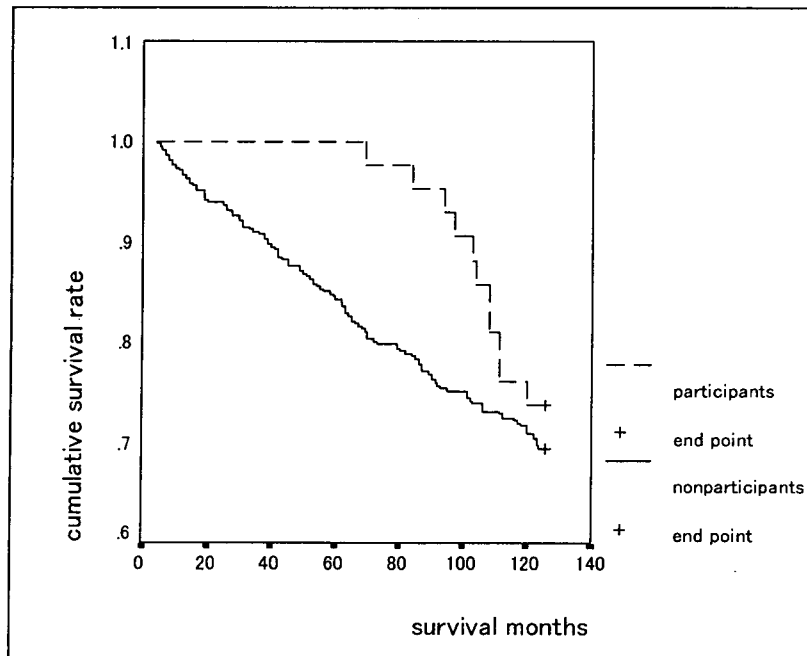


Figure 2. Time to first event (males)
 Ordinate shows rate of those not recognized as dead or
 having grade 2 care needs or more.

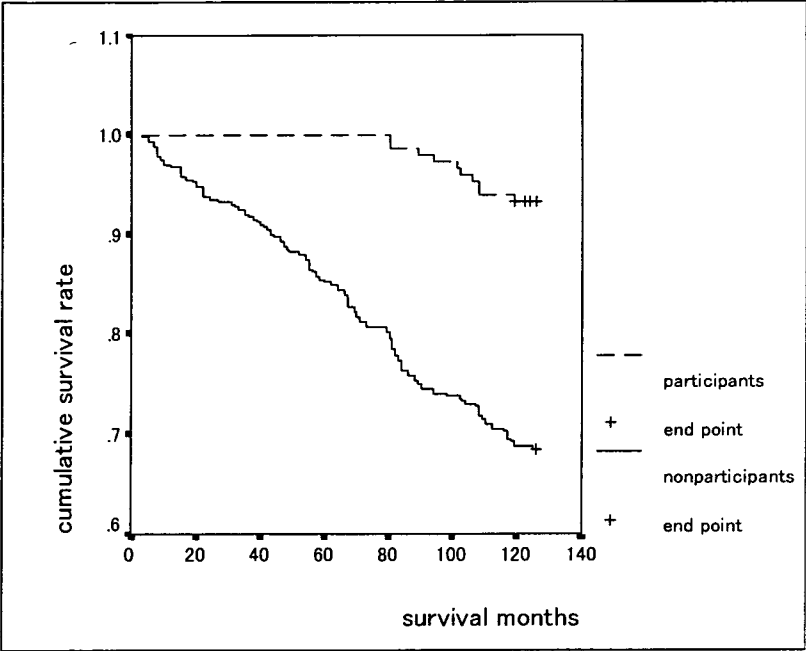


Figure 3. Time to first event (females)
Ordinate shows rate of those not recognized as dead or having grade 2 care needs or more.

研究責任者の連絡先

〒156-8502 東京都世田谷区桜丘1-1-1
東京農業大学地域環境科学部教養分野

上岡 洋晴

TEL/FAX 03-5477-2587
E-mail h1kamiok@nodai.ac.jp