Three Month Trial of Networked System that Improves Quality of Life of the Elderly

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Introduction

Background

- It has become increasingly urgent to prevent elderly people from falling ill and eliminate the need for nursing care.
- However, we don't have enough preventative-care specialists.

Abstract

- In order to offset the shortage of these specialists, we have developed a support system that uses broadband and video-communication technologies.
- A care-prevention system aims to prevent a person from becoming bedridden due to "old-age syndrome", which frequently involves falls and broken bones, poor nutrition, incontinence, and home confinement.
- A three month trial of the system (focusing on the prevention of falls and broken bones) at a day-care center for elderly people is described.

System Structure

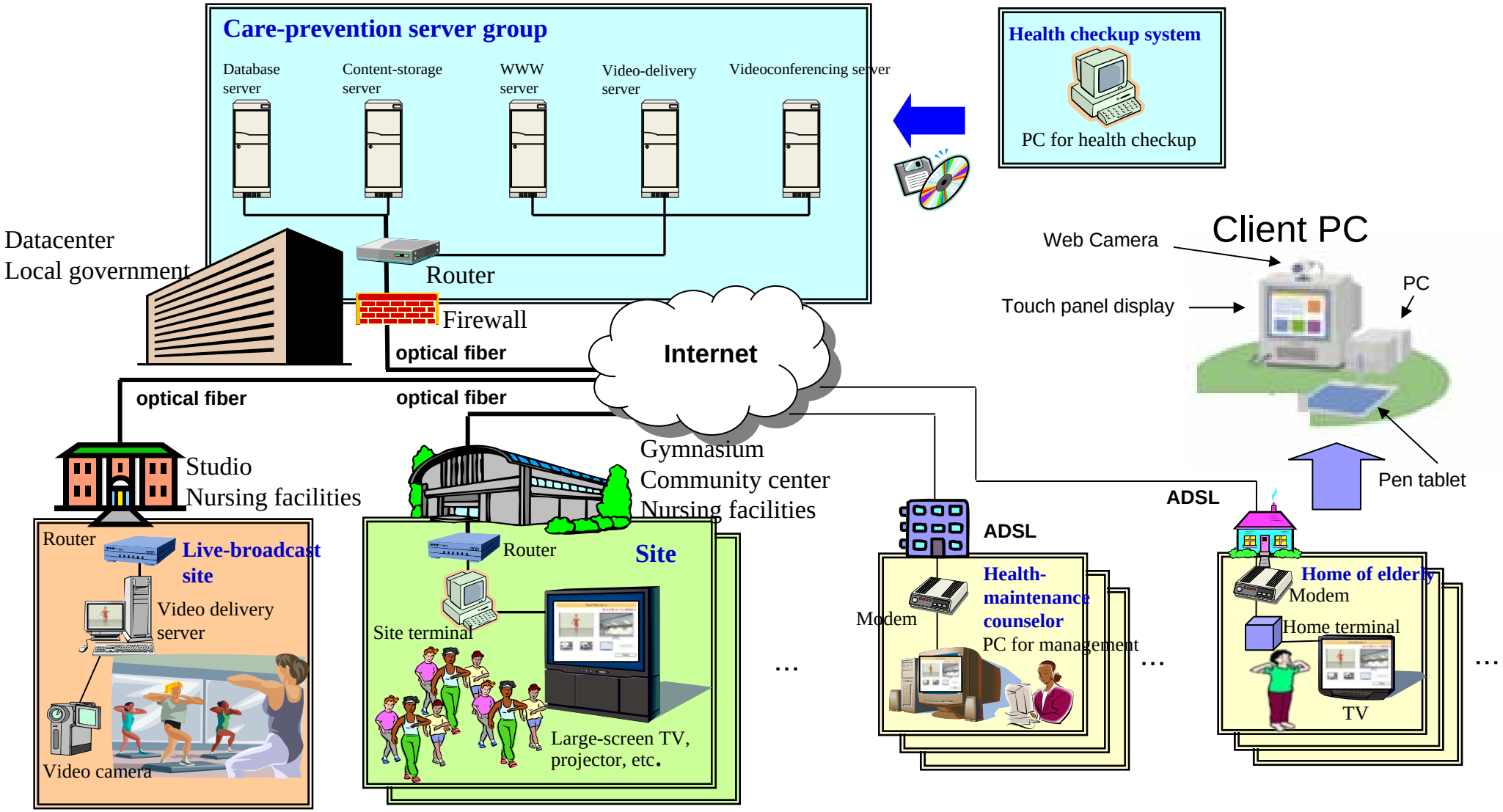
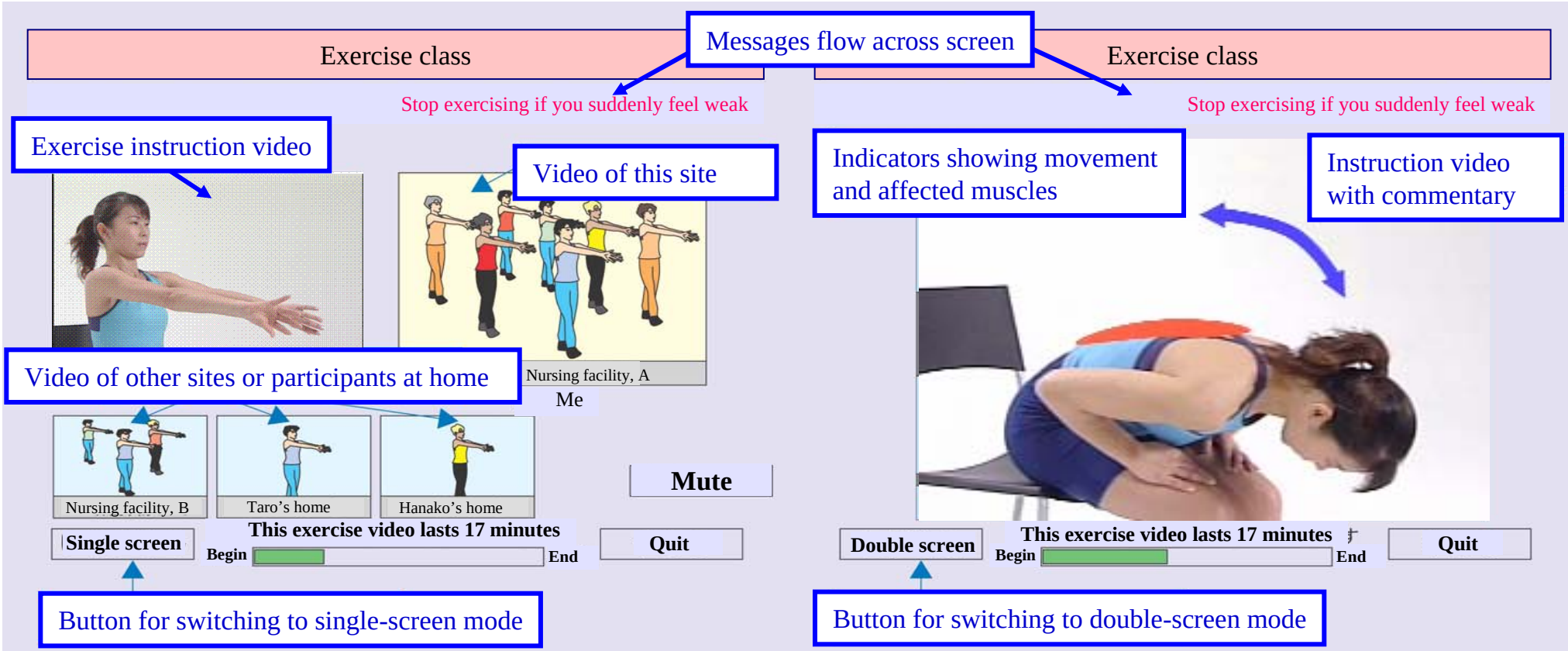


Fig. 1. Configuration of care-prevention system.

Client System



(a) Double-screen mode

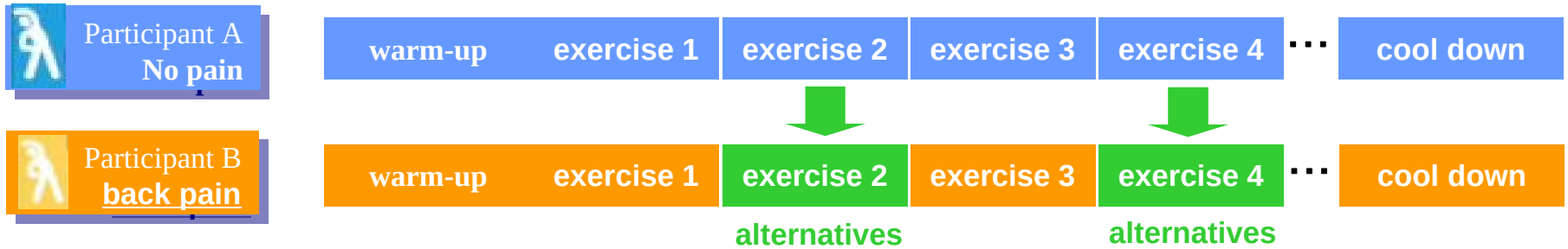
(b) Single-screen mode

Fig. 2. Screen modes for exercise classes.

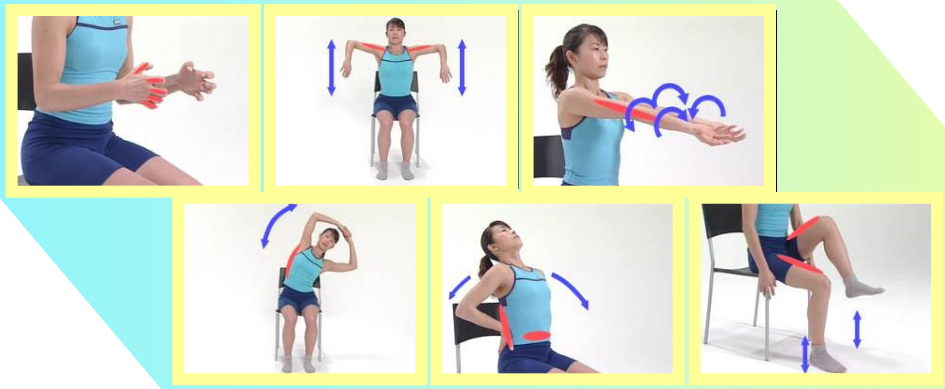
Features

- Networked System
  - Personalized program is available for people who have pain.
  - Data management is available. It makes it easy to give advice using exercise logs.
  - Having fun with exercising with people at other sites.
- Usability
  - Once client PC is powered up, the application starts automatically.
  - Most operations require only simple button pushing.

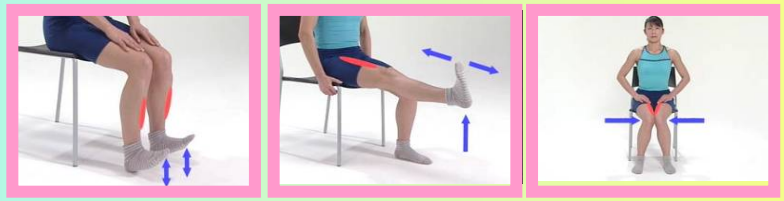
e.g.) Personalized program: Before the exercise, participants answer questions about their condition; the answer is reflected in the program.



Three Month Trial



warm-up exercises (5 min.)



strength training

cool-down (2 min.)

Trial term: 08/2005 to 11/2005 at Care-port Yahata, Telwel East Co.

Participants: 47 elderly people who need nursing care

Exercise class: 20 minutes consisting of exercises that were to be performed while sitting on a chair including exercises with rubber bands and balls

Check-up

Check-ups were held twice, before (a) and after (b) the trial.

Check-up Items:

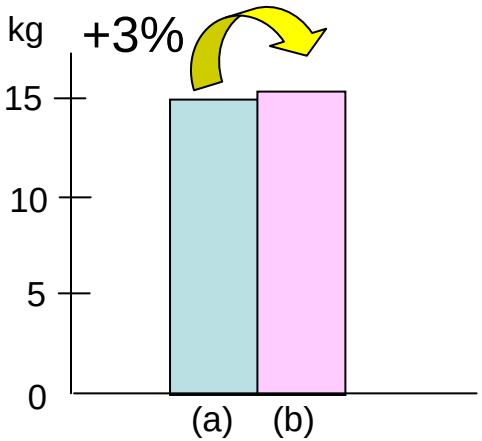
- Measurement of physical fitness
  - grip strength
  - balance on one foot (with eyes open)
  - walking speed
  - knee extension power
  - functional reach
- Interview
  - iADL (Instrumental Activities of Daily Living)

Results of Physical Fitness

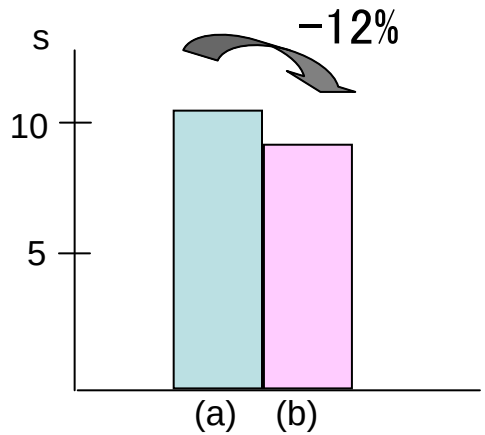
Check-up items		Mean	SD	Number	improvement rate（%）	significance probability
grip strength（kg）	(a)	14.9	6.96	47	+3	0.442
	(b)	15.3	6.56	47		
balance on one foot with eyes open (s)	(a)	10.7	10.69	29	−12	0.204
	(b)	9.4	11.43	29		
walking speed (m/s)	(a)	0.42	0.37	39	+2	0.708
	(b)	0.43	0.34	39		
knee extension power (N)	(a)	125.3	90.57	35	+30	0.010
	(b)	163.1	98.50	35		
functional reach (cm)	(a)	22.6	7.87	37	+10	0.067
	(b)	24.8	8.95	37		

Items whose average values were improved.

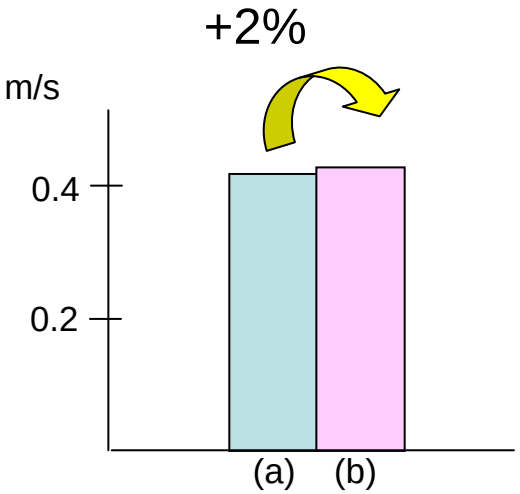
Results of Physical Fitness



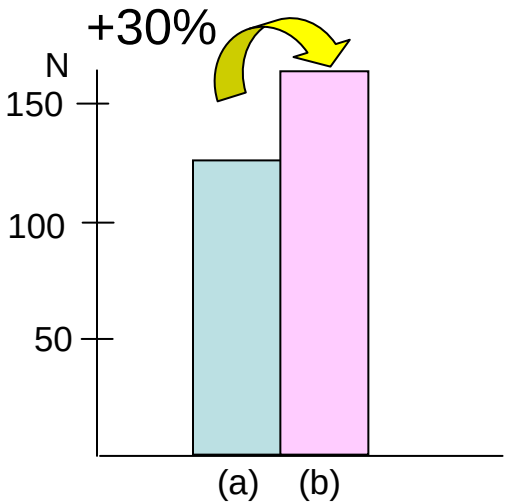
A. grip strength



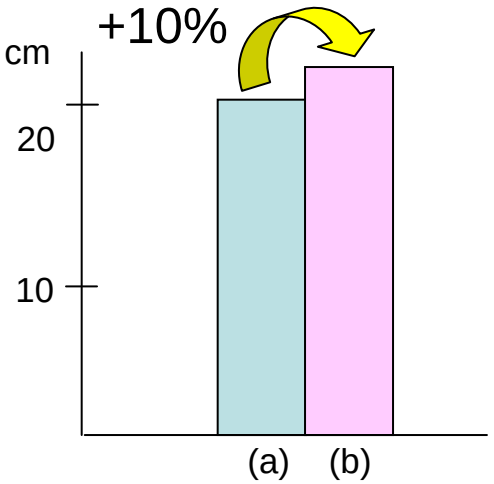
B. balance on one foot



C. walking speed

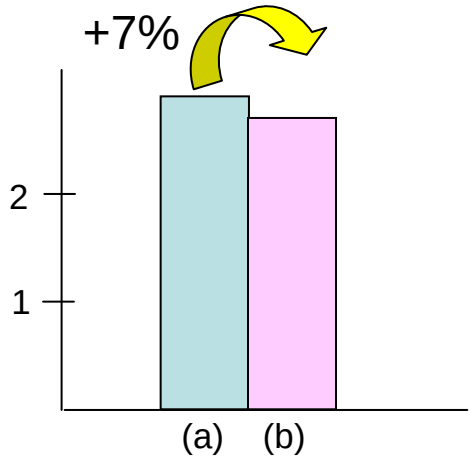


D. knee extension power

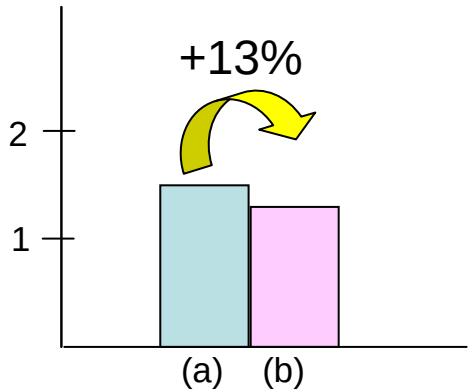


E. functional reach

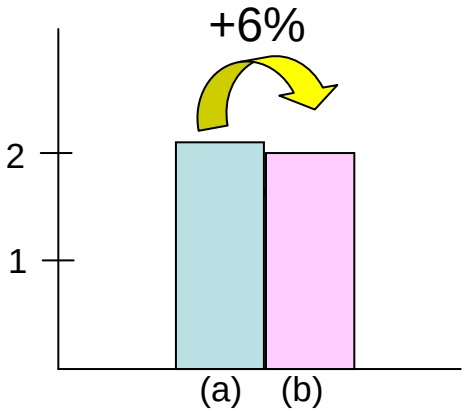
Interview Results:



A. Basic self-sufficiency



B. Intellectual Activities



C. Social Role

	A. Basic self-sufficiency		B. Intellectual Activities		C. Social Role		Total	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
mean	2.9	2.7	1.5	1.3	2.1	2.0	6.5	6.0
SD	1.9	2.0	1.1	1.1	1.3	1.4	3.5	3.9

Conclusion

While it is hard for elderly who need nursing care to maintain own strength, the results show a significant improvement in leg strength and iADL after the three month exercise.

The proposed support system has been proven to be effective for those who need nursing care. It can be expected to not only offset the shortage of preventative-care specialists, but also reduce the need for and costs of nursing care.

- References
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  - S. Murata, T. Tsuboi, T. Ito, K. Fujimura, and H. Sato, ” Development of System for Reducing the Need for Nursing Care,” NTT Technical Review, Vol. 4, No. 2, p.60, 2006
  - Koyano W, Shibata H, Nakazato K, Haga H, Suyama Y, ”Measurement of competence: reliability and validity of the TMIG Index of Competence.” Archives of Gerontology and Geriatrics, 13: 103-116,1991

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