# Effects of 12-month exercise training on physical performance and habitual physical activity in the very elderly

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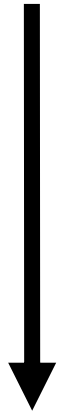
# Background

**2000** **The Long-term Care Insurance System started in Japan**



**Elderly people with light disabilities has increased steeply about 2.4 fold**

**2006** **The revised Long-term Care Insurance System (prevention-oriented)**

- **Improved physical fitness**
- **Improved nutrition**
- **Improved oral function**
- **Prevention or support of withdrawal**
- **Prevention of dementia and depression**

# Aim

**To determine the effects of multicomponent physical exercise training on physical performance and physical activity in the elderly with light disabilities**

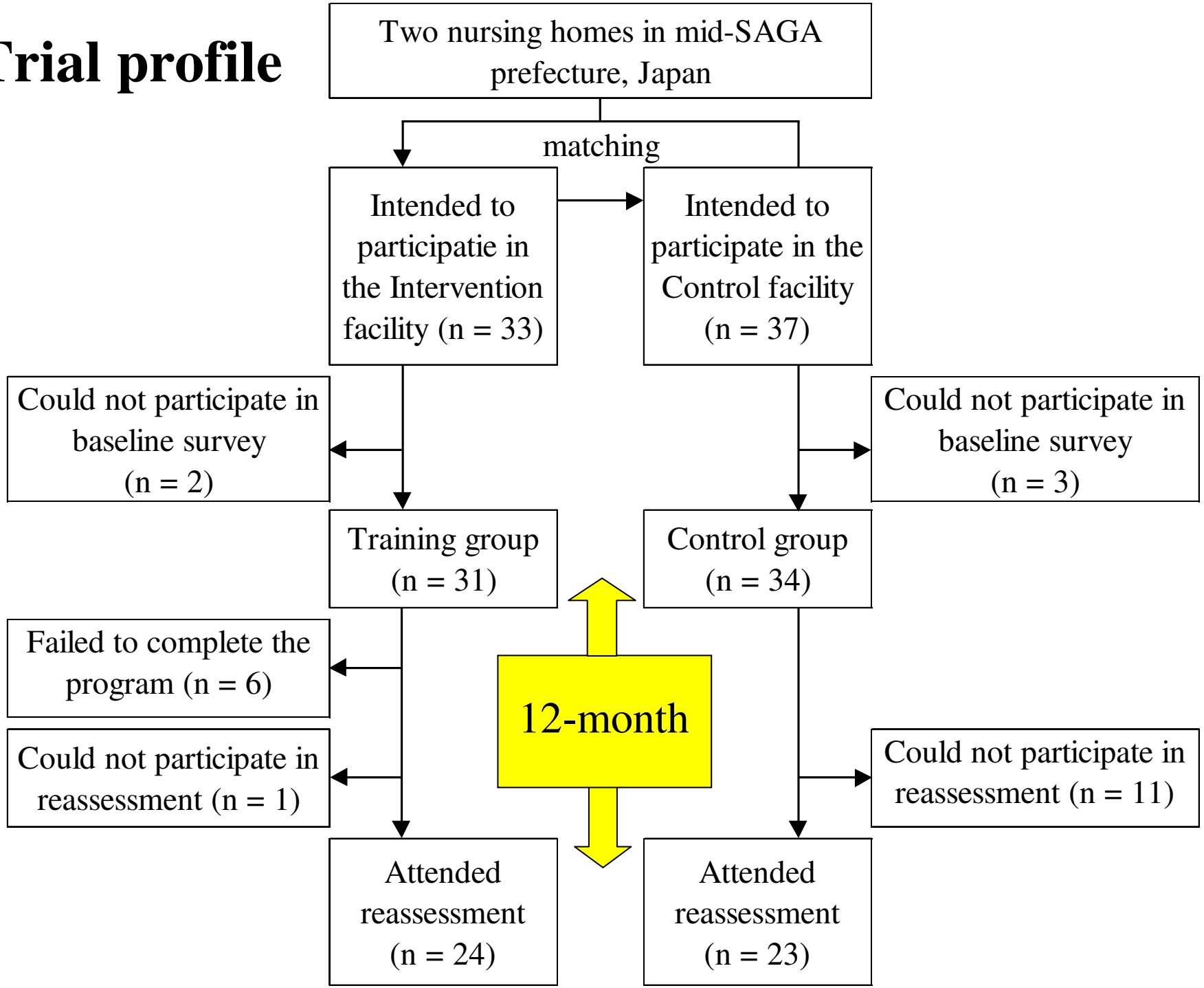
# Methods

- **Study design Non-randomized controlled trial**
  **Intervention group from one nursing home**
  **Control group from another nursing home**

- **Subjects 65 light disabled elderly, 74-96 years**
  **31 in the intervention group**
  **34 in the control group**

- **Study period May 2004-May 2005, 12 months**
  **Exercise intervention during the whole period**

# Trial profile



# Exercise intervention

Vital check
20 minutes

15 minutes + 10 minutes

8 minutes

10 minutes

5 ~ 10 minutes

3 ~ 6 minutes

- Class-based exercise: 90 minutes once a week
- Home-based exercise: Recommended to do for 10 minutes everyday

- **Outcome measurements**

**1) Physical performance**

- knee extension strength, whole body flexibility, 6-minute walking distance, grip strength, timed one-legged standing with open eyes

**2) Daily physical activity**

- one-axis accelerometer (Suzuken Co. Ltd)

**3) Walking ability**

- walking speed, stride length, kinematics analysis

**4) Hospitalization**

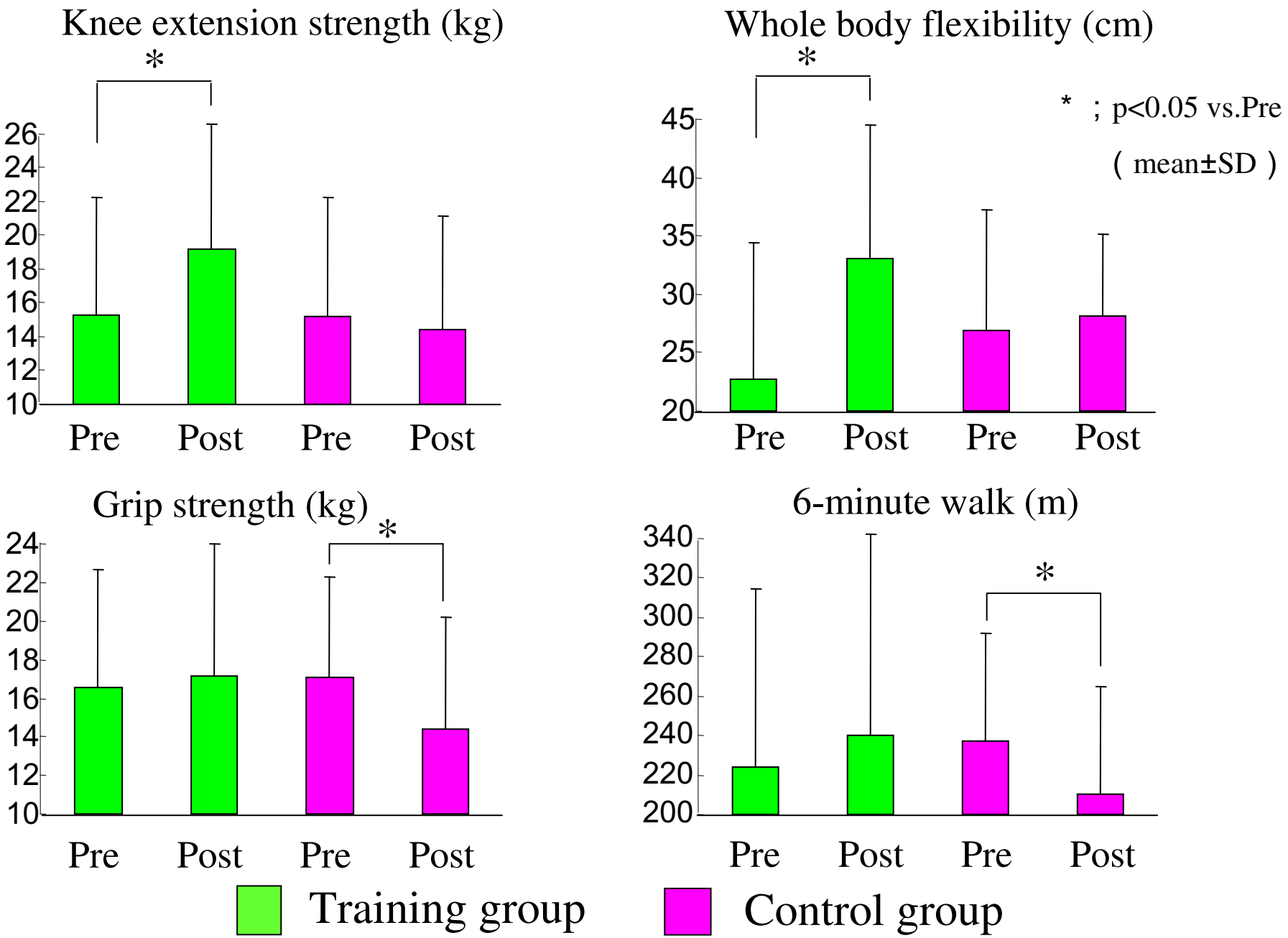
- **Statistical analysis** Two-way ANOVA, Paired t-test, Unpaired t-test

# Characteristics of study subjects at baseline

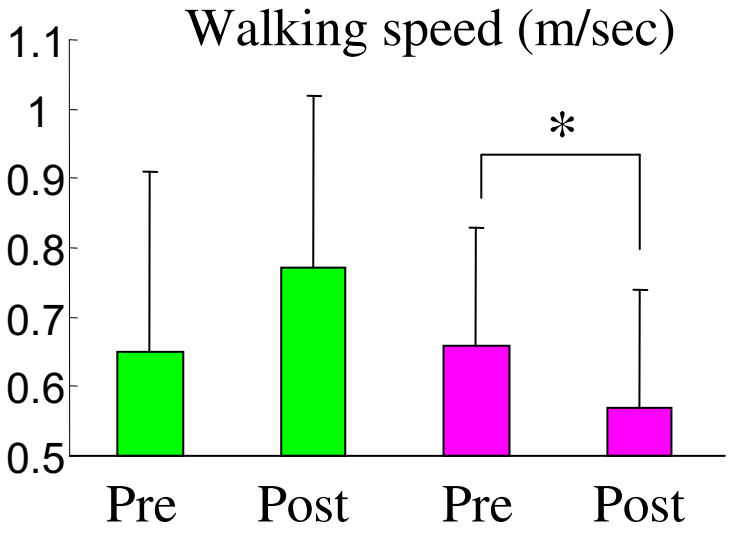
| | Training group (facility A) | Control group (facility B) |
|---|---|---|
| n | 31 | 34 |
| male/female | 6 / 25 | 6 / 28 |
| Age (years) | 84.5±5.7 (74-96) | 85.6±5.3 (77-96) |
| Height (cm) | 147.8±10.1 (130-172) | 146.8±8.7 (134-175) |
| Weight (kg) | 49.5±10.0 (32.8-73.5) | 48.4±8.4 (35.0-65.5) |
| BMI ($kg/m^2$) | 22.6±3.6 (16.5-32.7) | 22.5±3.4 (15.8-29.2) |

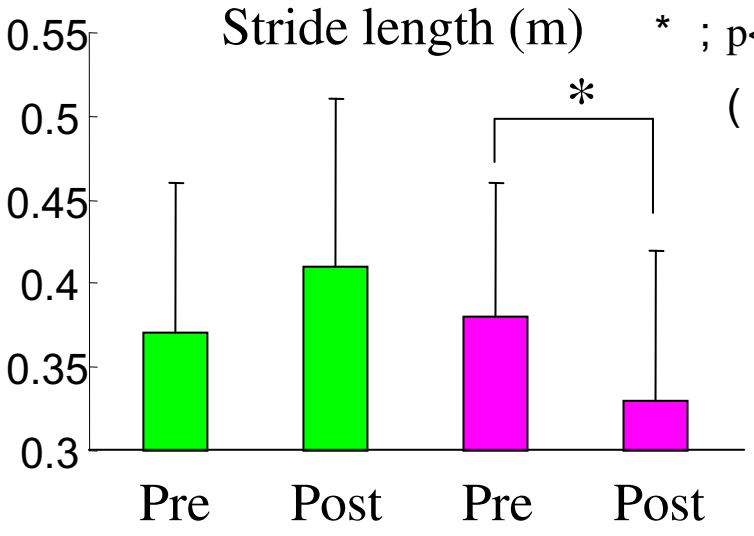
Values in parentheses are min-max.

# Physical performance



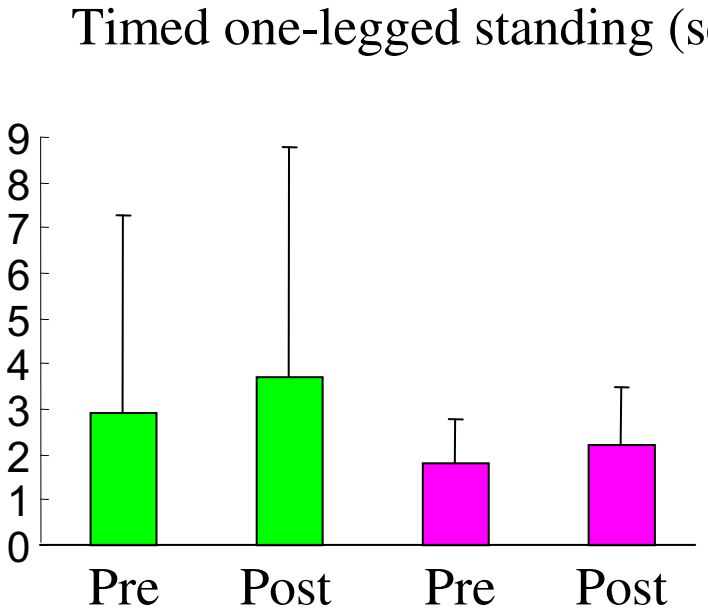
# Walking ability, Physical performance, Physical activity

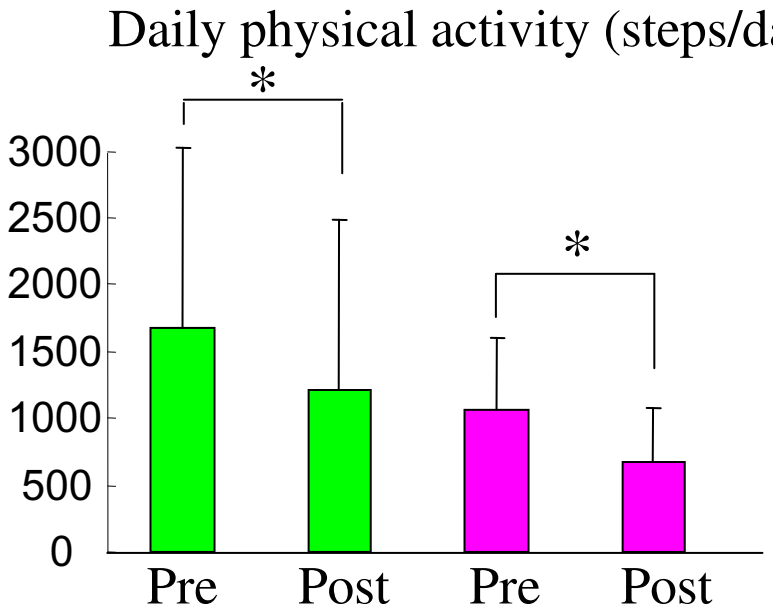



* ; p<0.05 vs.Pre

( mean±SD )



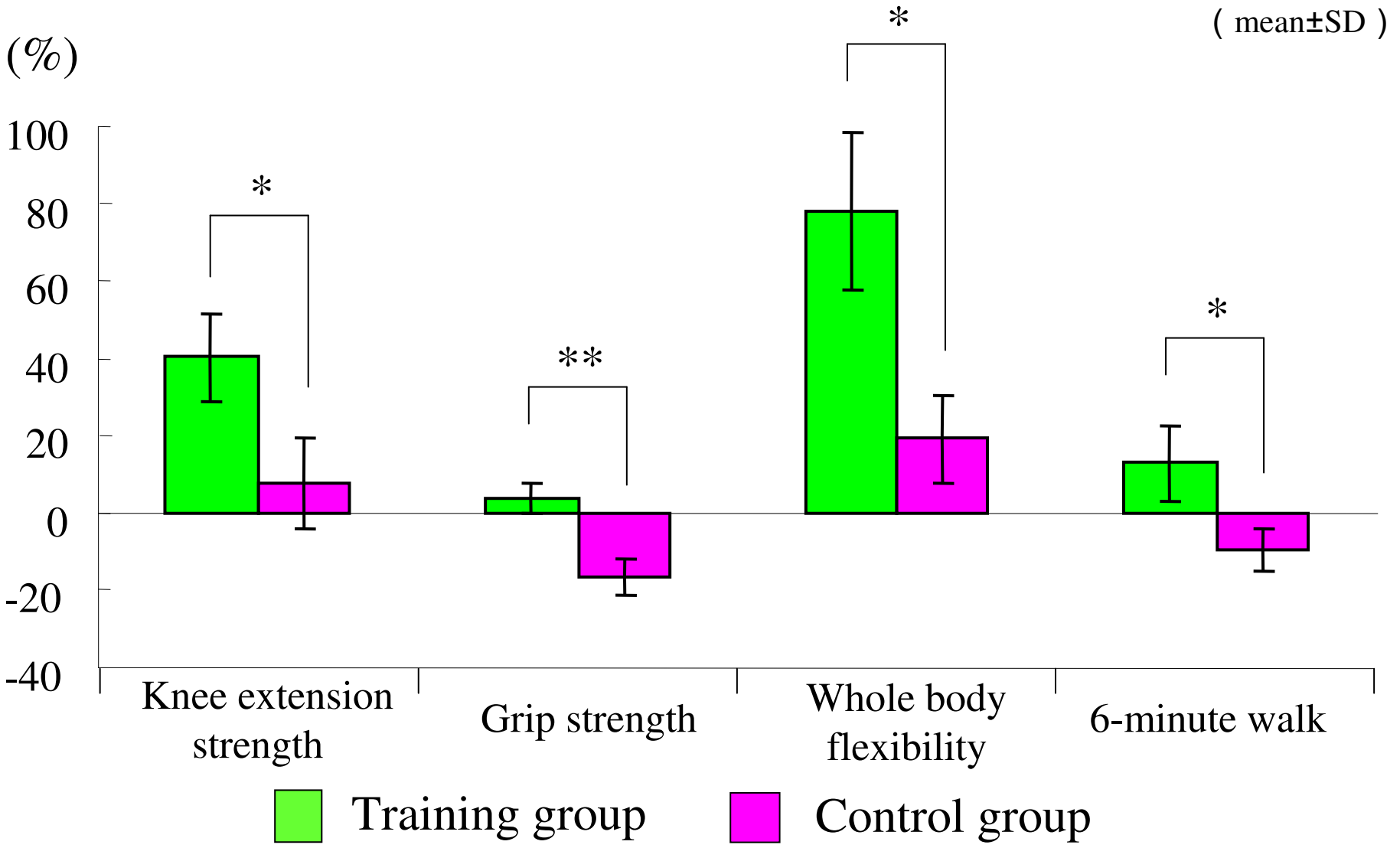




Training group

Control group

# Rate of improvement in physical performance (Pre ⇒ Post)

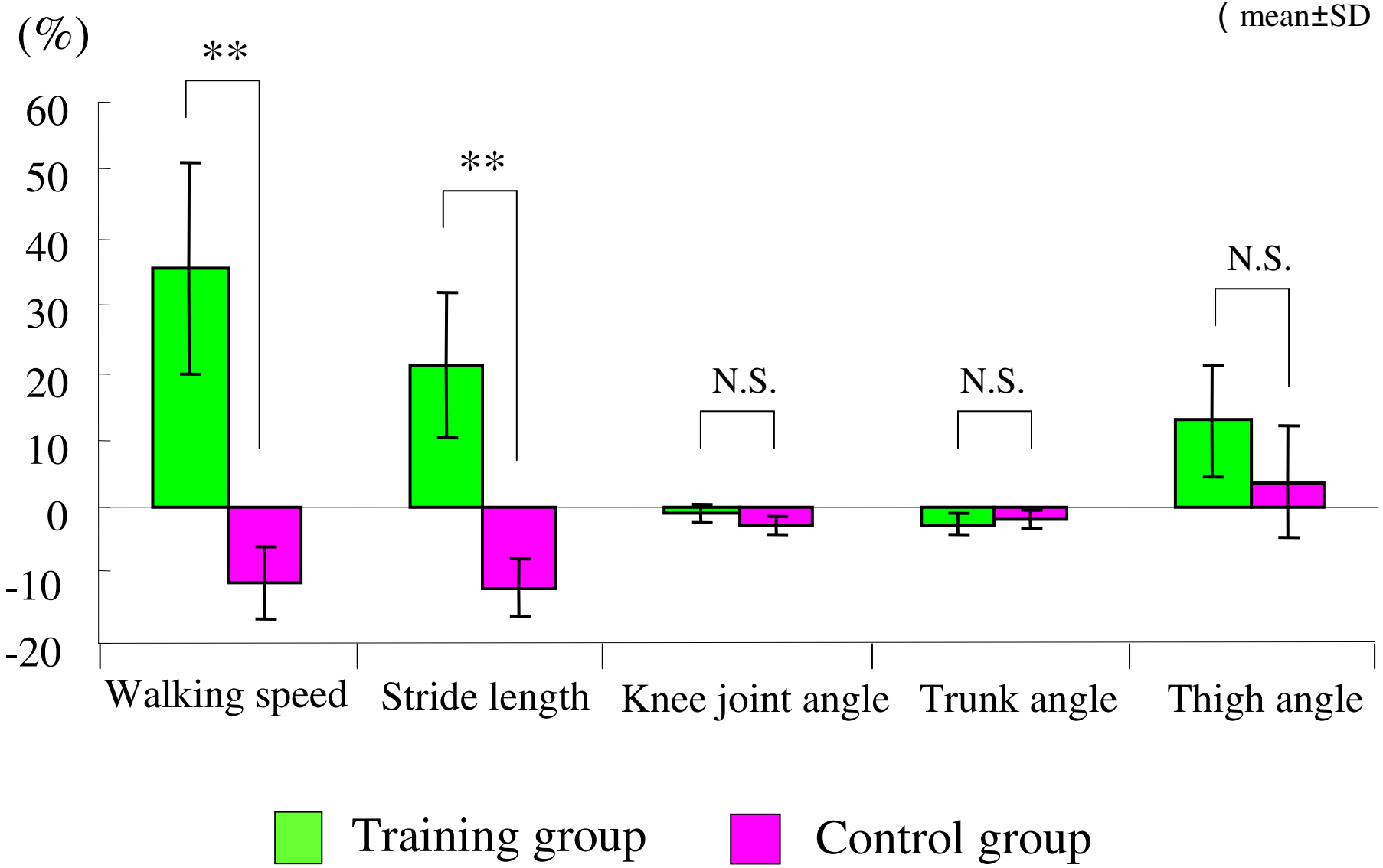
* ; p<0.05 Training group vs. Control group
* * ; p<0.01 Training group vs. Control group



# Rate of improvement in walking ability (Pre ⇒ Post)

* * ; p<0.01 Training group vs. Control group

( mean±SD )



# Hospitalization

| | Training group (n = 31) | Control group (n = 34) |
|---|---|---|
| Number of hospitalized persons | 7 | 8 |
| Cumulative hospitalization days | 258 | 628 |

・ Hospitalization during the follow-up period (May 2004-May 2005) was investigated from medial records.

・ No significant difference was observed between the Training and Control groups

## Discussion

- **The current multicomponent training can cause beneficial effects in physical fitness among the very elderly, without using special training machines.**
- **However, daily physical activity (i.e. total steps) was not increased by the training program.**

## Limitation

- **Non-randomized trial**
- **About 25 % of the participants could not be followed until the end of intervention.**

# Conclusions

- **The present training program improves lower-limb strength and flexibility, without using training machine, in the elderly with light disabilities.**

- **In addition, grip strength, endurance capacity (6-minute walk) and walking ability (walking speed and stride length) were maintained by the present training.**

- **The present training is considered to be a useful prevention program for the very elderly in the new Long-term Care Insurance System.**

# Collaborator

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