

I. Introduction

Physical strength required for judo

● Duration of a match: 5 minutes + 3-minute extra time by “Golden Score”

● Number of matches: 4 to 5 matches
(One-day tournament)

● Body parts to be used: **Entire body (upper extremities, body trunk, and lower extremities)**

- Offence and defense by kumite technique
- Standing technique
- Ground technique



→ **Explosive power to use technique**

→ **Power for continuous movement**

→ **Restorative capability**

Daily schedule of a university judoist (weekday)

7:00 - 8:00 Strength & conditioning
(metabolic or strength training)

9:00 - 16:30 School classes

17:45-18:00 Warming-up

18:00 - 20:30 Exercise

21:00 - Dinner



| | MON | TUE | WED | THU | FRI | SAT | SUN |
|---------|----------------|----------|----------|------------------|----------|-----------------------------|---------|
| Morning | High-power tr. | WT tr. | | Middle-power tr. | WT tr. | Exercise → Low-power tr. | Holiday |
| Evening | Exercise | Exercise | Exercise | Exercise | Exercise | | |

※ Generally, 60 - 100 minutes of weight training is performed twice or three times a week, approximately 90 times a year.

II. Purpose

©To investigate the effects of strength training executed for the players in a certain collegiate women's judo team of Japan

©To investigate the differences of them between weight classes.

III. Methods

【Subjects】

49 female judoists who participated in the judo club during the period from 2007 to 2012

→ **Lightweight class** (25 judoists): -48 kg (5 judoists)
-52 kg (6 judoists)
-57 kg (14 judoists)

→ **Middleweight class** (17 judoists): -63 kg (9 judoists)
-70 kg (8 judoists)

→ **Heavyweight class** (7 judoists): -78 kg (4 judoists)
+78 kg (3 judoists)

【Measurement】

○ Measurement period

- 1st (July for first-year students),
- 2nd (December for first-year students),
- 3rd (July for second-year students),
- 4th (December for second-year students),
- 5th (July for third-year students),
- 6th (December for third-year students),
- and 7th (July for fourth-year students)

○ Details of measurement

● Muscle strength

- Maximum muscle strength: 1 repetition maximum (RM)
[bench press (BP), squat (SQ), power clean (PC)]
- Chinning, back muscle strength, grip strength

● Speed, endurance of speed, endurance, adjusting power, suppleness

【Analysis】

In the analysis on 1 RM of BP, SQ and PC, average values were calculated regarding 2 items in judoists of the lightweight, middleweight and heavyweight classes, and all judoists.

1) Rate of change

Rate of change in the values of individual measurements calculated assuming the values of the first measurement as 100%

* Calculation formula: Measurement value/first measurement value *100 (%)

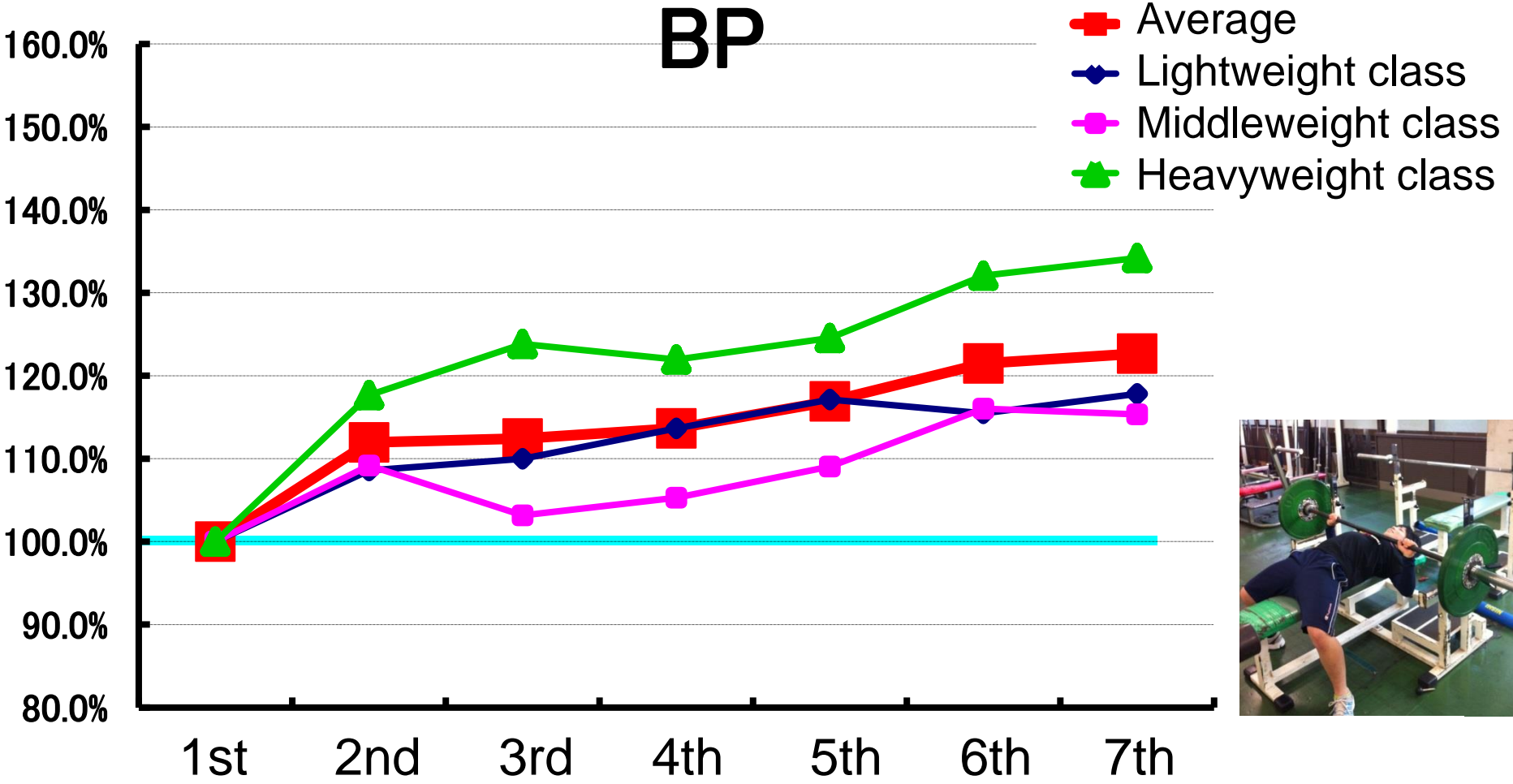
2) 1 RM per body weight

The value obtained by dividing the measurement value of individual items in each measurement by body weight

* Calculation formula: Measurement value/body weight

IV. Results

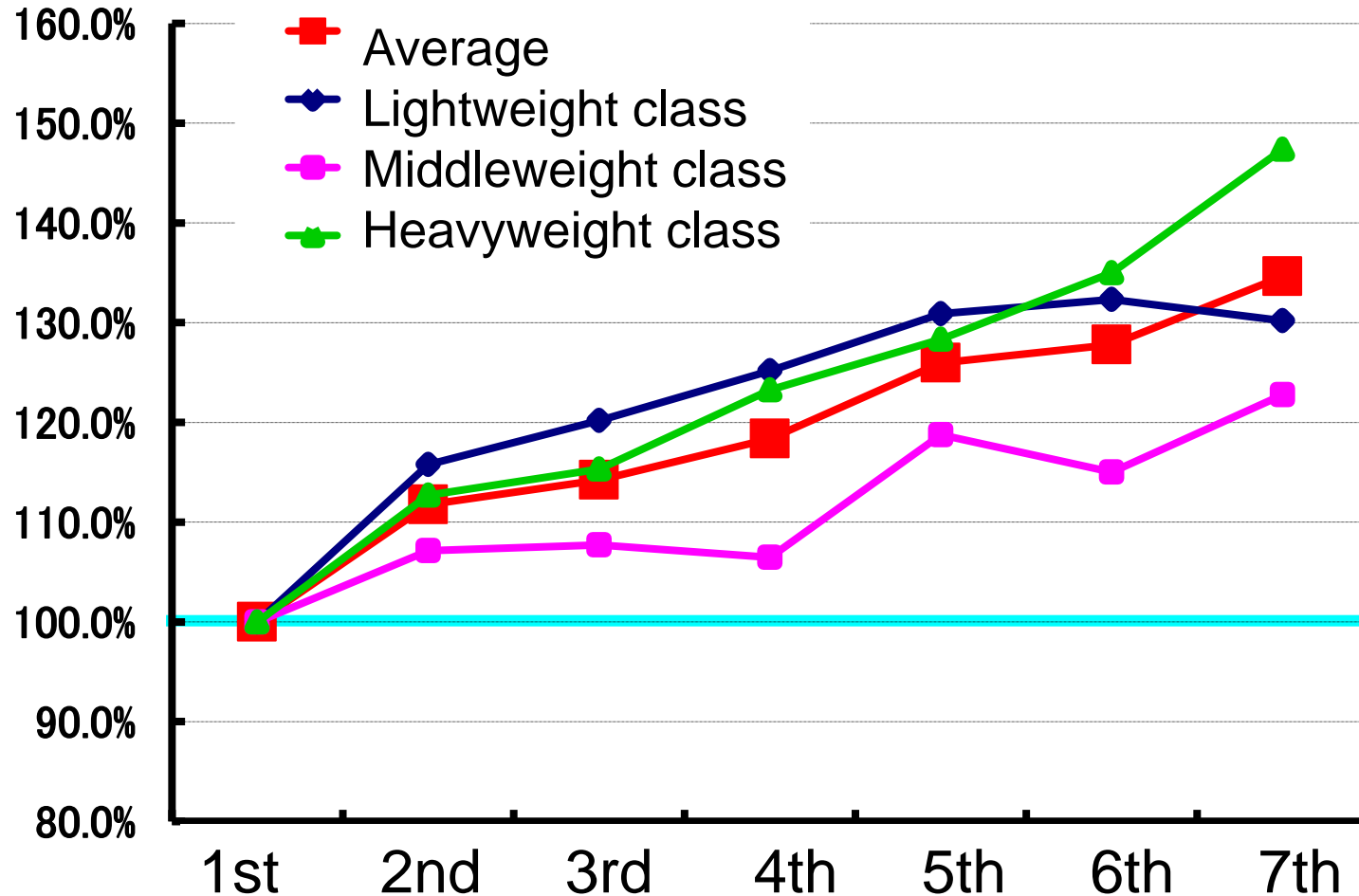
1) Rate of change



→ The average values of all items increased over time. (■)

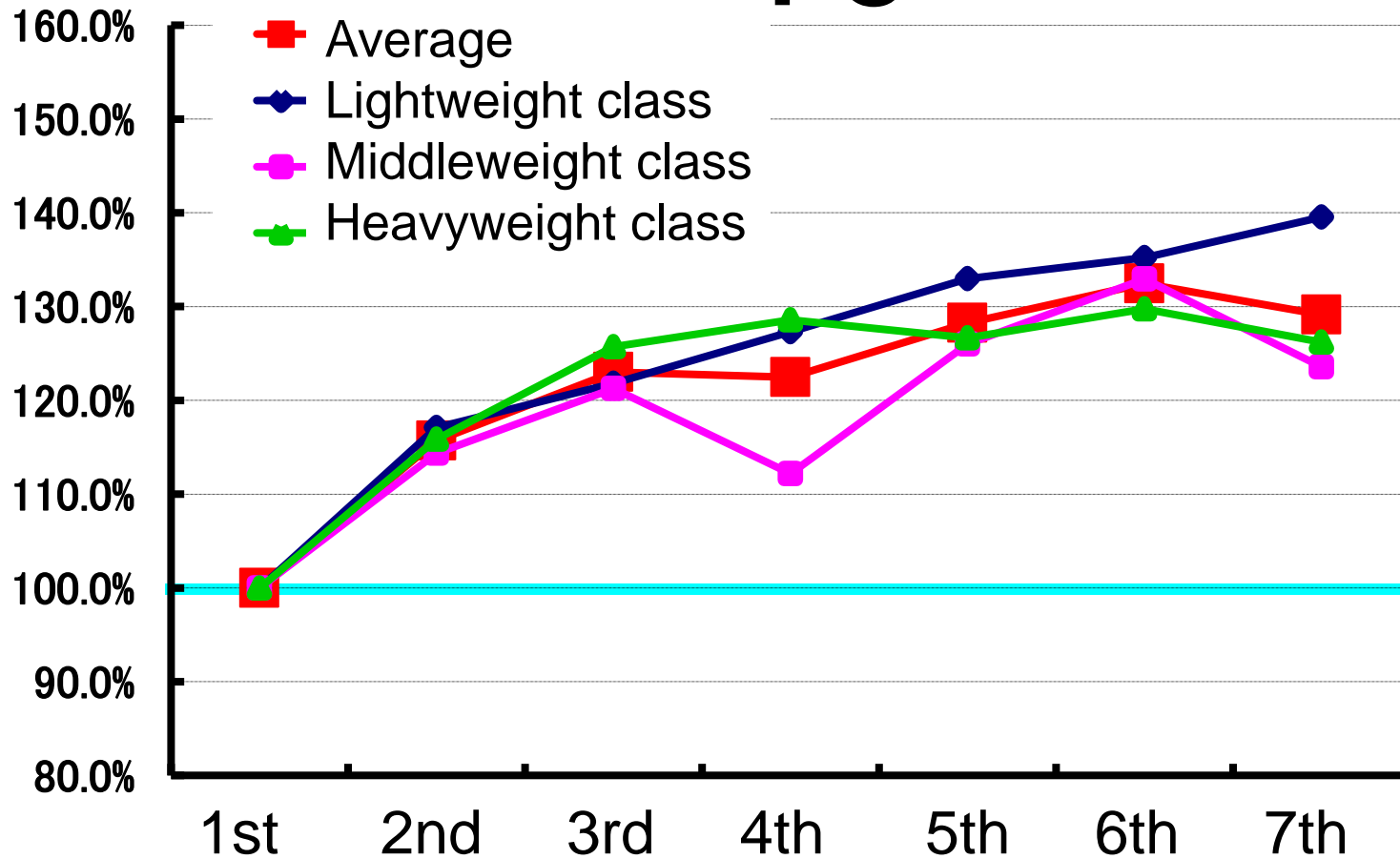
→ Especially, the rate of change in the heavyweight class was significant. (▲)

SQ



- The average values of all items increased over time. (■)
- The rate of change in the 7th measurement in the heavyweight class reached 147%. (▲)

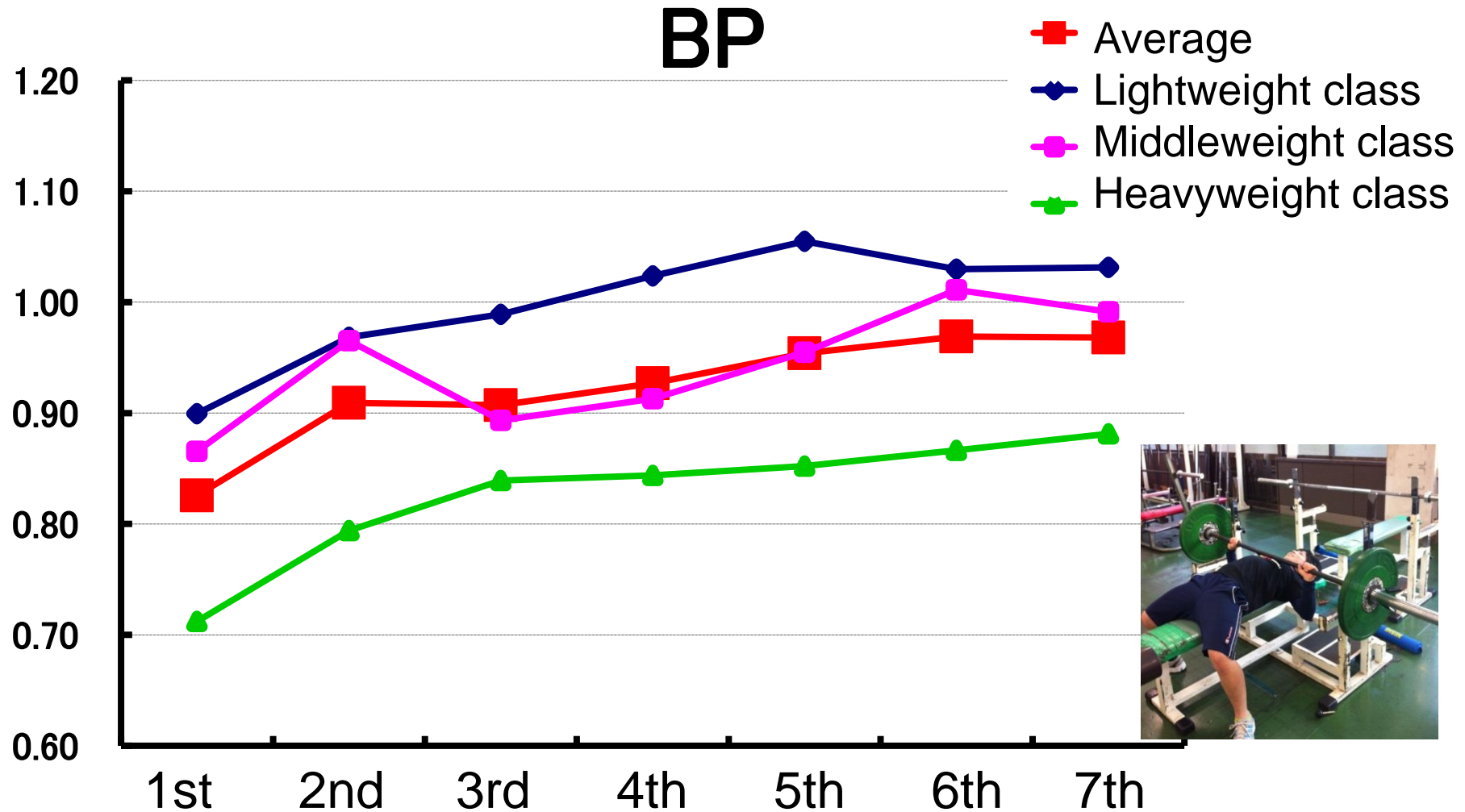
PC



→ In the 4th and 7th measurements, overall average values were lower than those in previous measurements. (■)

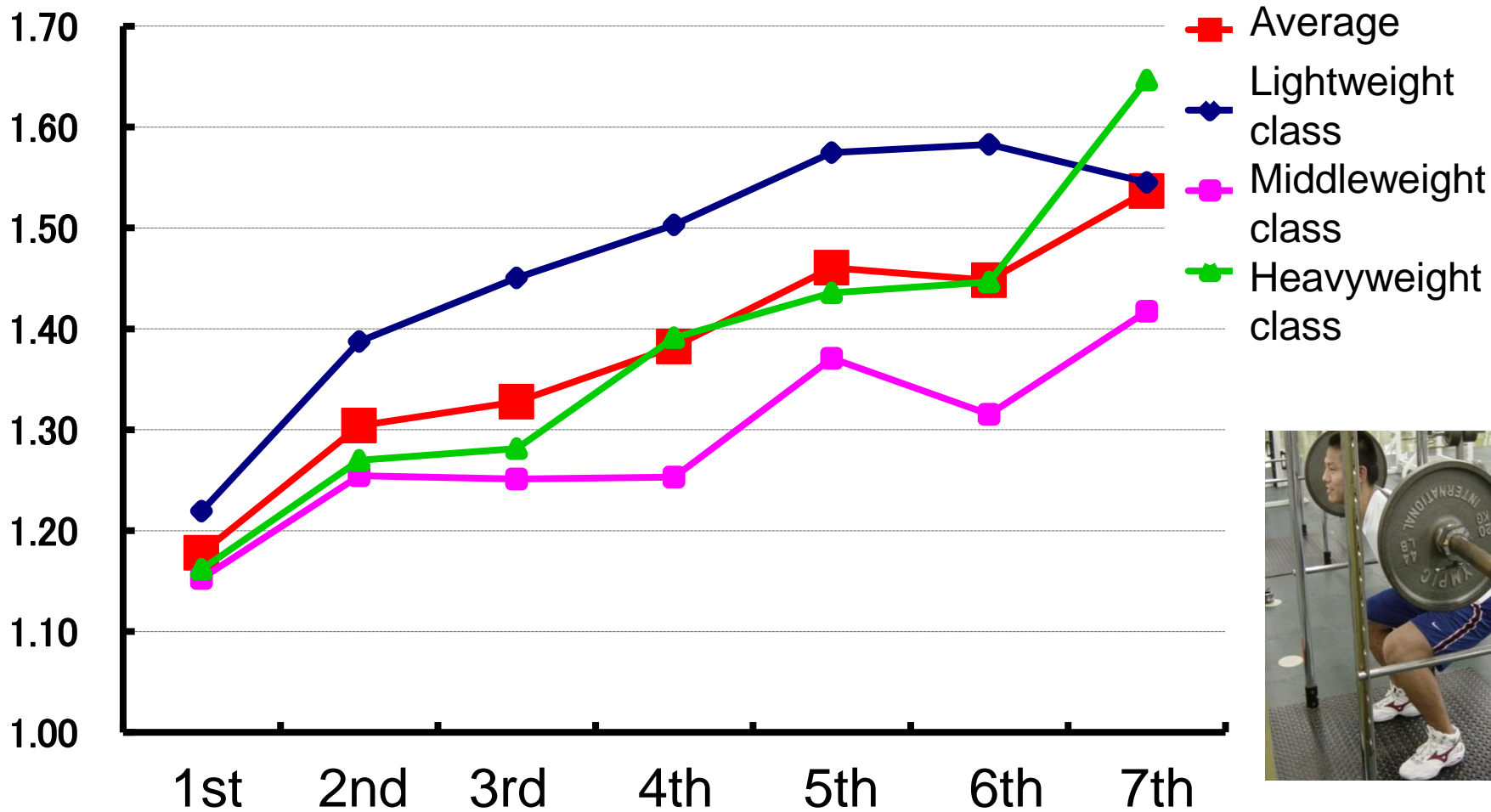
→ Especially, the measurement values in the 4th and 7th measurements in the middleweight class decreased significantly. (■)

2) 1RM per body weight

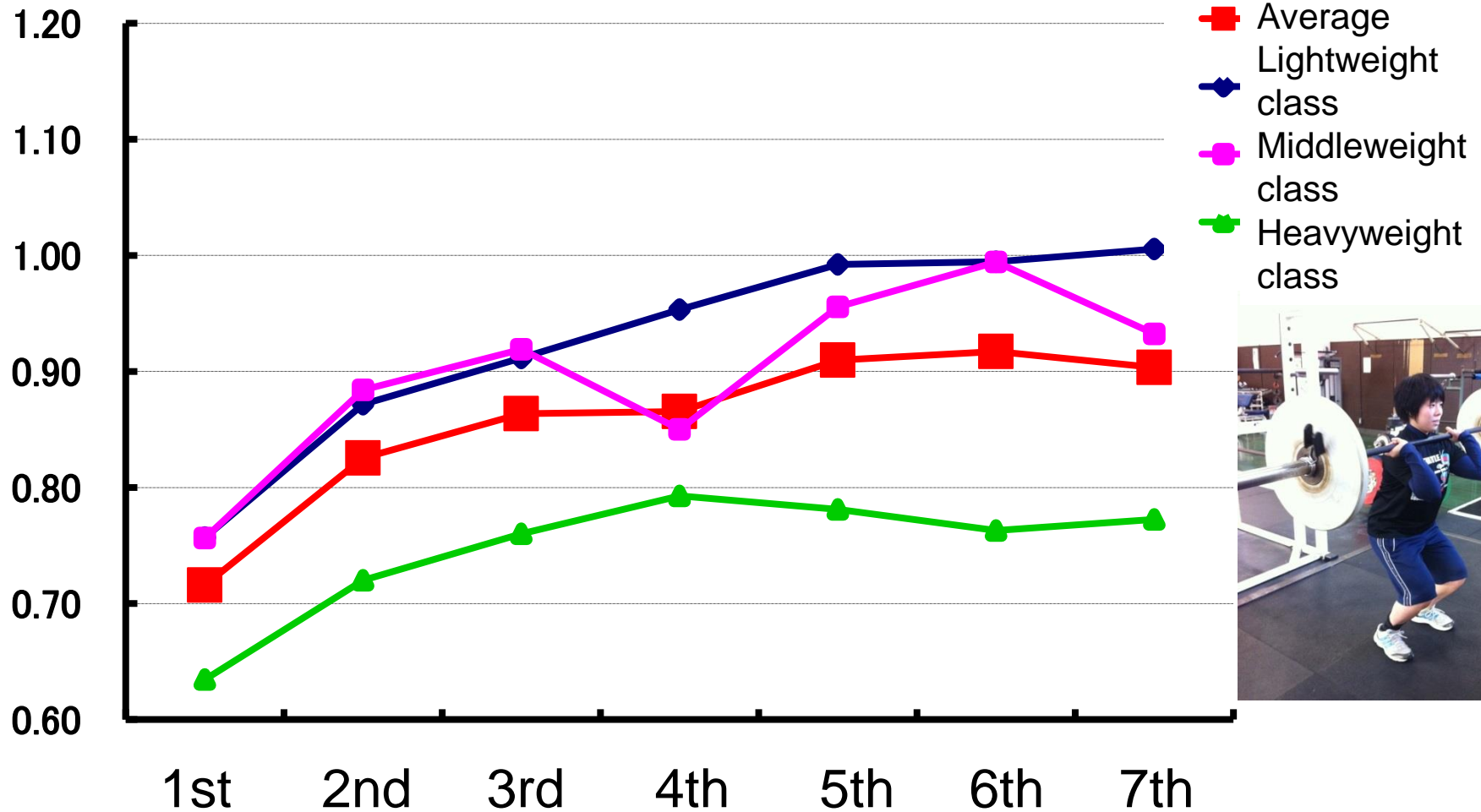


→ The measurement values in the heavyweight class were lower than those in the lightweight and middleweight classes.

SQ



PC



→ The measurement values in the heavyweight class were lower than those in the lightweight and middleweight classes.

V. Discussions

Increase of lean body weight

- Improvement of maximum muscle strength
- Improvement of power

<Future tasks>

Improvement of special muscle strength

For improvement of competition power of judo

Strategies to improve competition power of judo

Training effects were obtained through 4-year regular training.

Regarding PC, the measurement values in the 4th and 7th measurements were lower than those in previous measurements.

⇒ This may be because judoists undergoing no regular training participated in the measurements.

Importance of continuous training

Especially regarding BP and SQ, the rate of change in the heavyweight class was significantly increased.

Further improvement can be expected.

Regarding 1 RM per body weight in the heavyweight class, the values of BP and PC were low.

⇒ This may be because the heavyweight class included many judoists with **high body fat percentage**.



○ Judoists in the -78 kg class

⇒ Strategies to **decrease body fat percentage**

○ Judoists in the +78 kg class

⇒ Strategies to increase **absolute muscle strength**



Increase of lean body weight

VI. Conclusion and proposals for actual training

To improve competition power of women's judo, muscle strength and power should be improved, and in our cases in this study, improvement of maximum muscle strength was confirmed after continuous strength training.

In the heavyweight class, since the rate of change was significantly increased at the end of the fourth year by continuous training, it was suggested that the effectiveness of strength training would be improved by implementation not only for four years at university but also from an early stage before entering university.

Therefore, it is important to inform female high-school judo club members and their instructors about the importance of strength training.

