Effect of seated Tai Chi on physical functioning among individuals with stroke : Pilot Study

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Purpose

- To test effect of Tai Chi applied stroke rehabilitation program on physical functioning (balance, mobility, flexibility, upper arm strength), activity of daily living, and self-efficacy in individuals with stroke

Methods

- Study design: One-group pre-posttest experimental design

Intervention		Stroke Rehabilitation Program for 48 weeks			
Time point for measures	Pretest	Posttest 1 (at 12 weeks)	Posttest 2 (at 24 weeks)	Posttest3 (at 36 weeks)	Posttest4 (at 48 weeks)
	Baseline data	Outcome variables	Outcome variables	Outcome variables	Outcome variables

- Subjects: 10 stroke patients with hemiplegia who are registered as a disabled person at the community service center

Intervention

- Modified Seated Tai Chi program
- Content: Seated tai chi (12 movements) plus Qi Gong, Stretching with meditation music
- Duration/Frequency : 2 sessions per week, 40~60 minutes per session for 48 weeks
- Teaching method: progressive practice in a block unit; using visualization
- Exercise: while being seated or standing

Measurement

- Physical functioning

1) **Upper arm strength**: grip strength
2) **Flexibility**: standard sit-and-reach test
3) **Mobility:** Timed Up and Go Test for 6 meters

4) Balance: Berg balance scale –the gold standard to measure functional balance test

- 15–20 minutes and comprises a set of 14 simple balance related tasks, ranging from standing up from a sitting position, to standing on one foot
- Reliability: excellent inter-rater (ICC = 0.98) and intra-rater relative reliability (ICC = 0.97),

Self-efficacy

- 17-item self-efficacy scale for hemiplegia patients (developed by Lee, 1998 and modified by Choi, 2002)
- 4-point Likert scale
- Cronbach's α= 0.93

Activity of Daily Living

- Korean version of Modified Barthel Index (K-MBI) (Jung et al., 2007)
- 10 items: bladder, bowel, grooming, bathing, feeding, toilet use, dressing, stairs, transfer, and mobility

Procedure

- Approval from IRB
- Recruit subjects from community service center
- Explained study purpose and methods and obtained informed consent
- Provided 48-week program by Tai Chi certified instructor
- Study outcomes are measured at pretest and 4 times (12 weeks 24 weeks 36 weeks 48 weeks)

Data Analysis

- Using SPSS WIN version 21.0
- Descriptive statistics for subjects' characteristics and outcome variables
- Paired t-test for program effects at pretest versus posttest outcomes
- Repeated measures of ANOVA

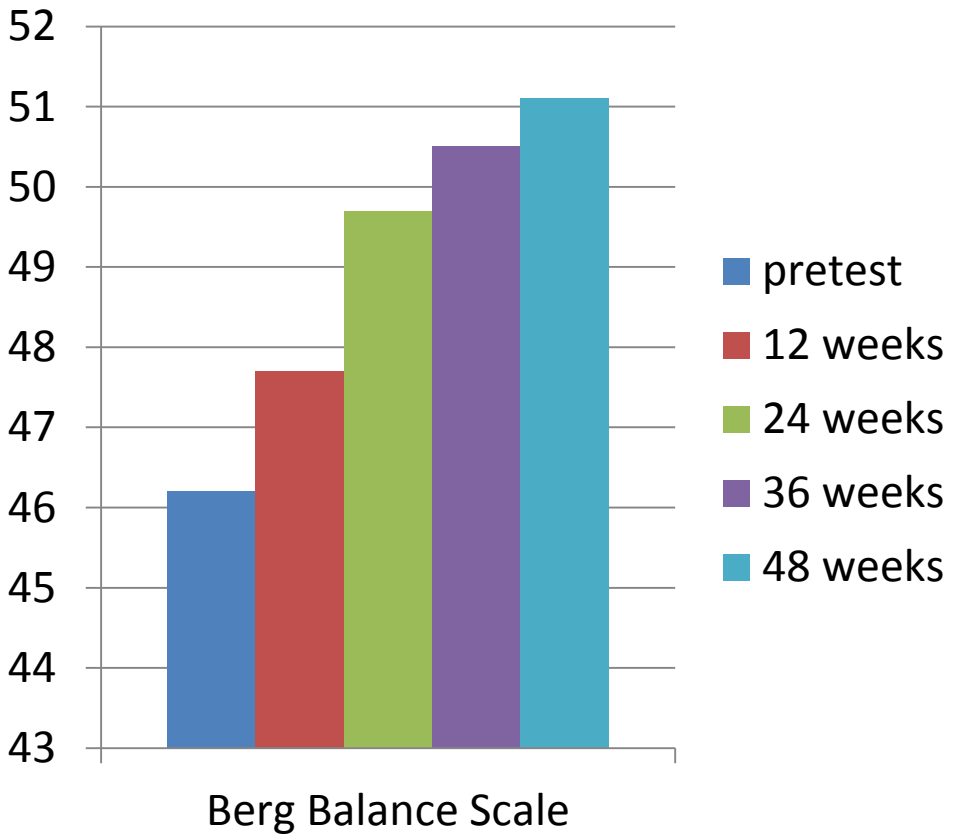
Results

- Age: 61-70 years (n=5), 71 or older (n=5)

  mean age: 72.2(9.3)
- Gender: 4 males and 6 females
- 70% living with spouse/family, 30% living alone
- Duration of stroke: 3 months or less: n=5,

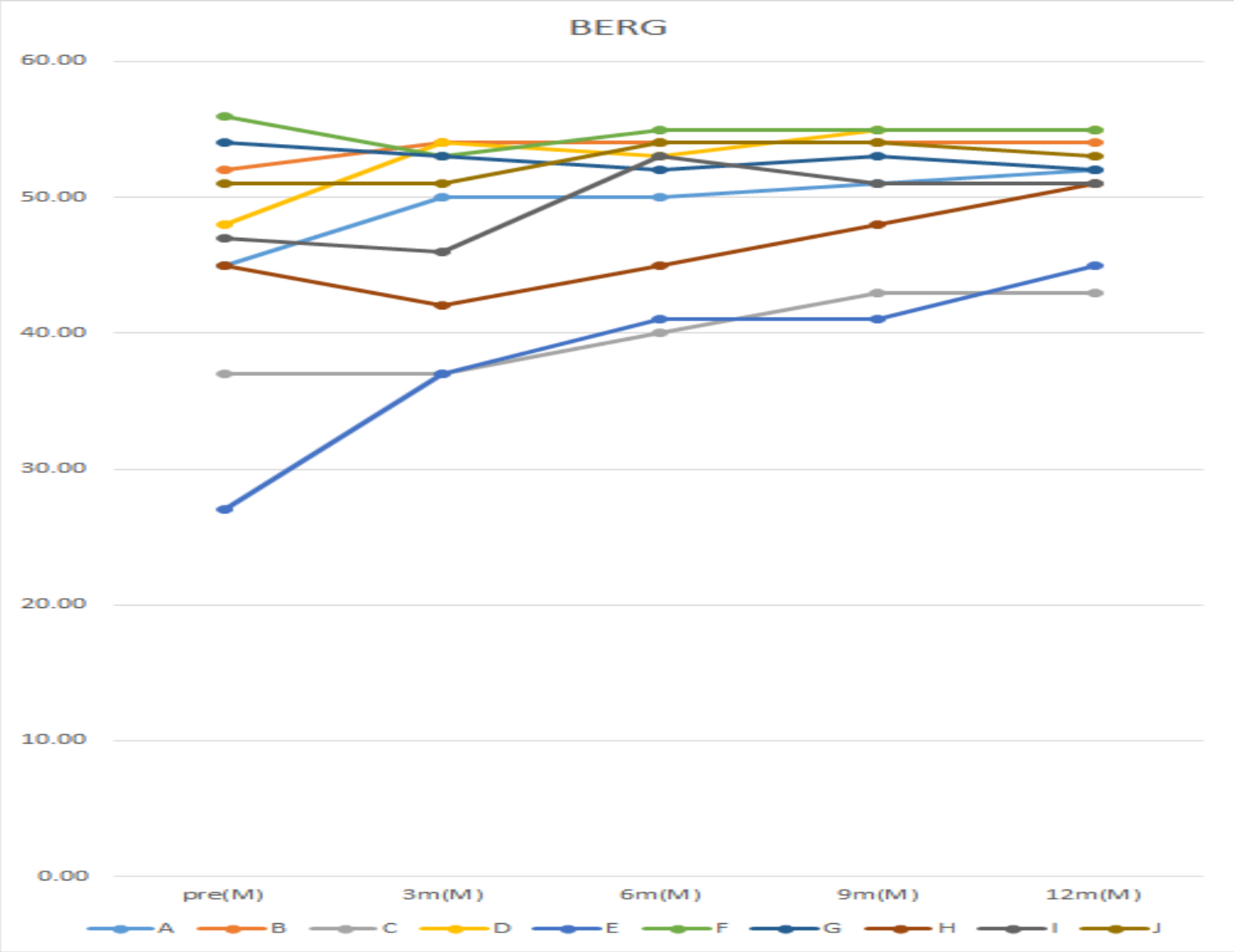
  3-6 months n=3, 6-12 months n=2

Results

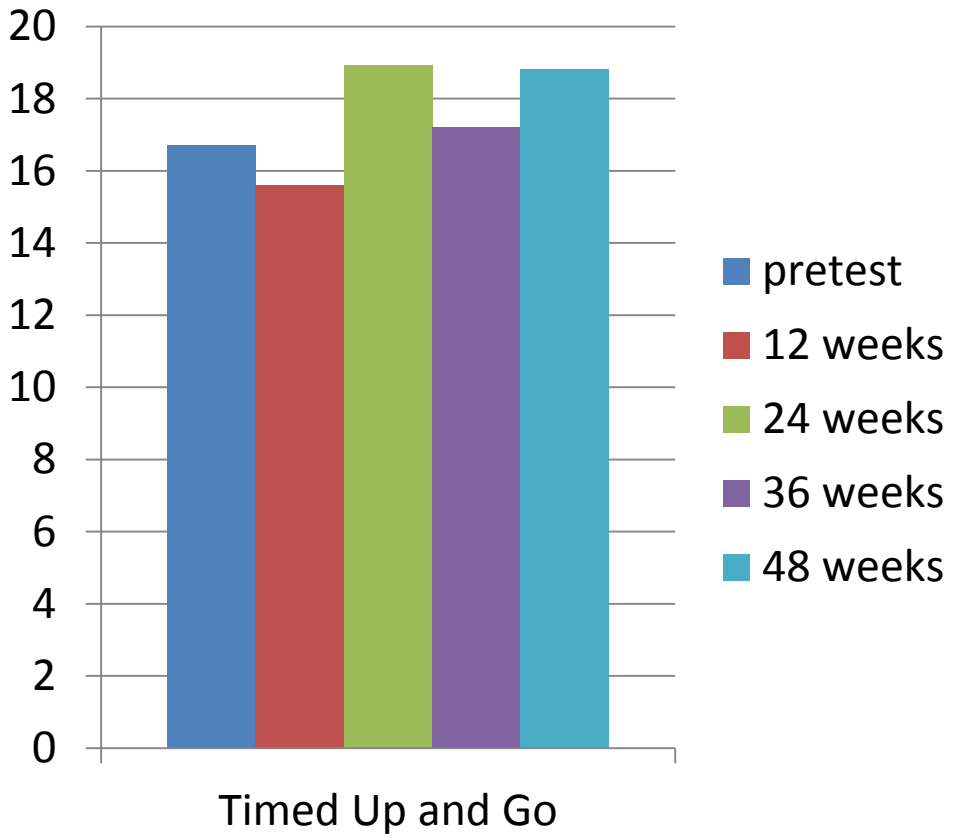


Balance

- Significant improvement from pretest to T2,T3,T4 posttest (paired t-test)
- Not significant from RM ANOVA

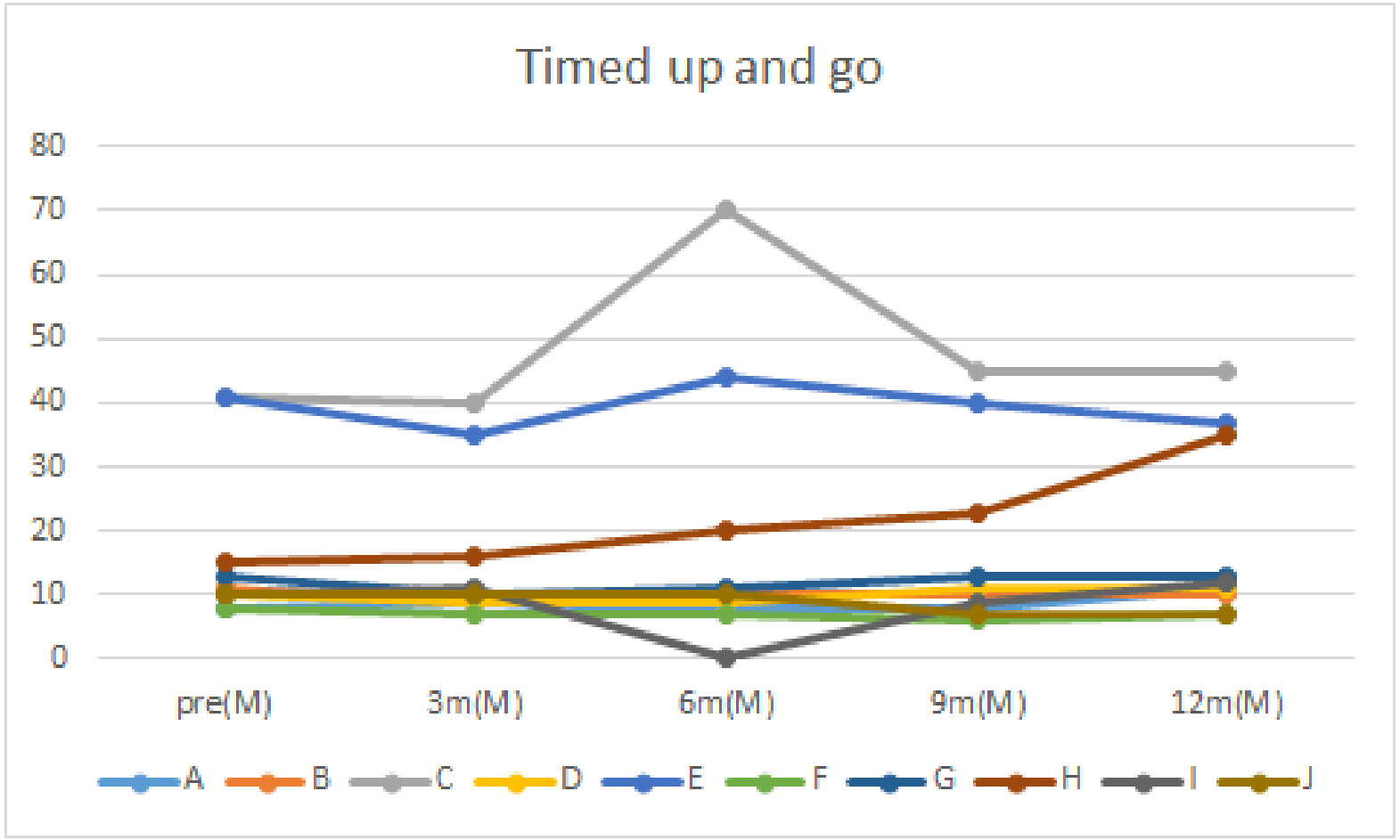

BERG
60.00
50.00
40.00
30.00
20.00
10.00
0.00
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Results

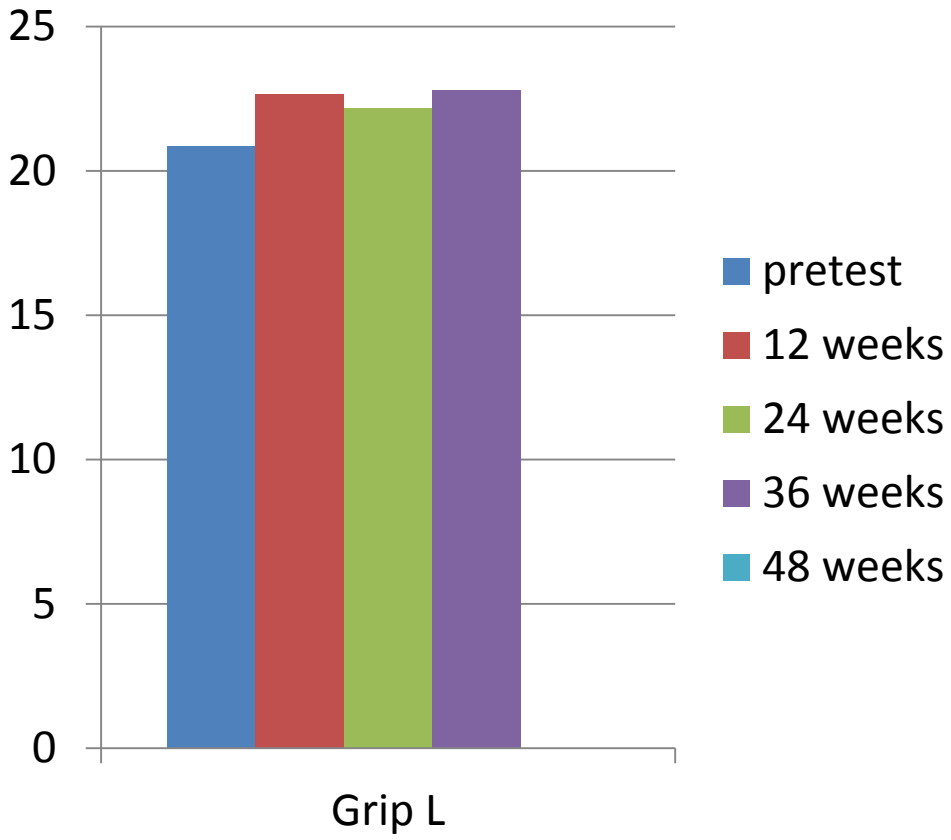


Mobility

- No significant improvement from pretest to 4 posttest (paired t-test)
- No significant from RM ANOVA

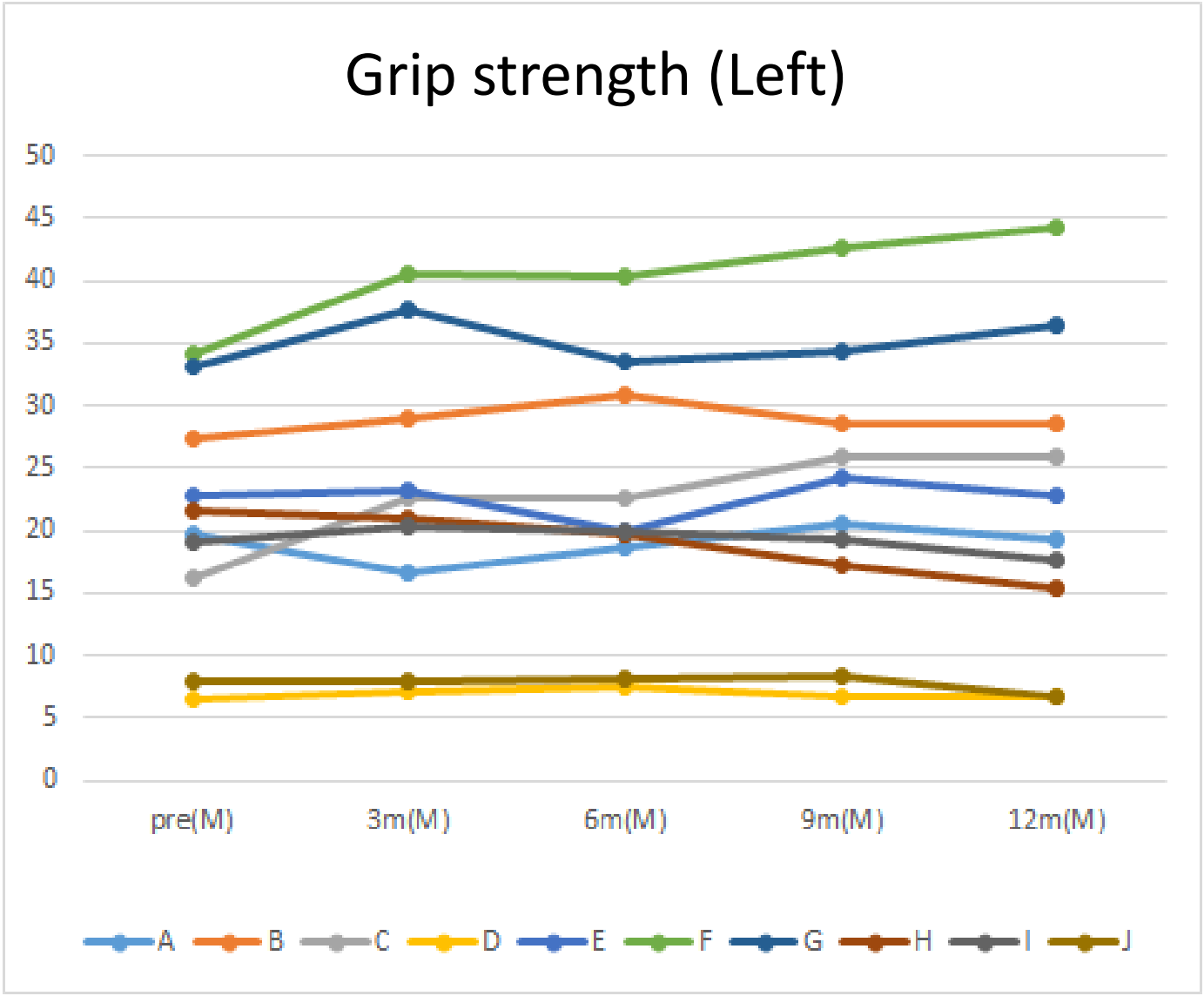

Timed up and go
80
70
60
50
40
30
20
10
0
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Results

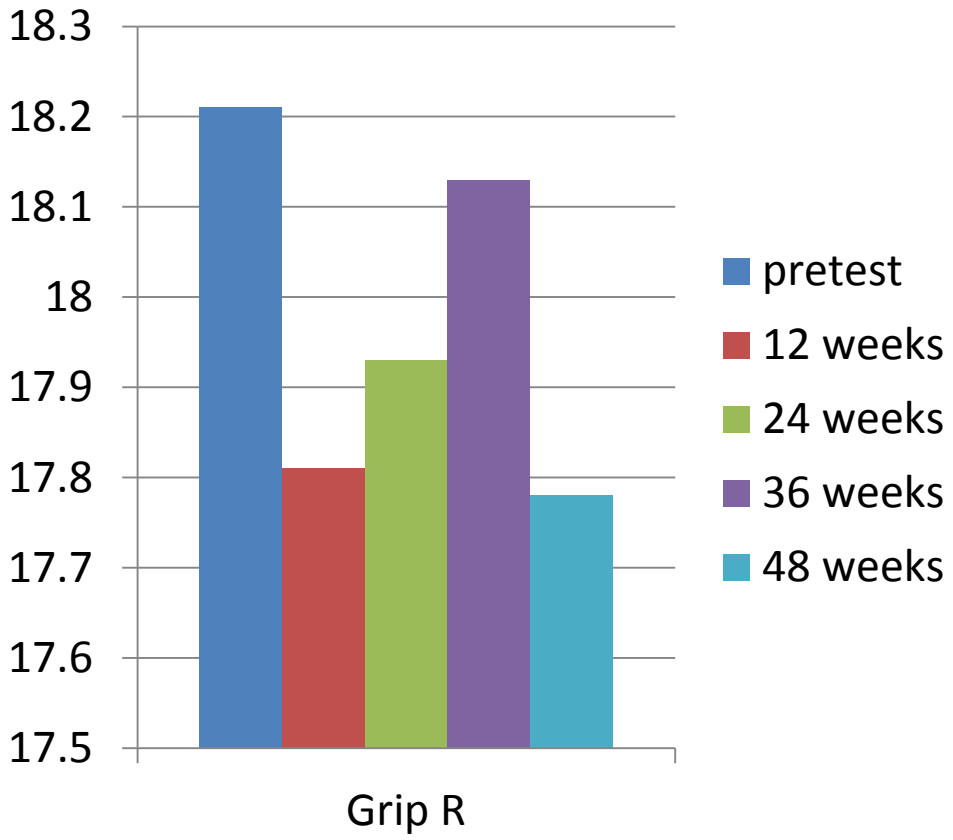


Muscle strength (Lt arm)

- No significant improvement from pretest to 4 posttest (paired t-test)
- Not significant from RM ANOVA

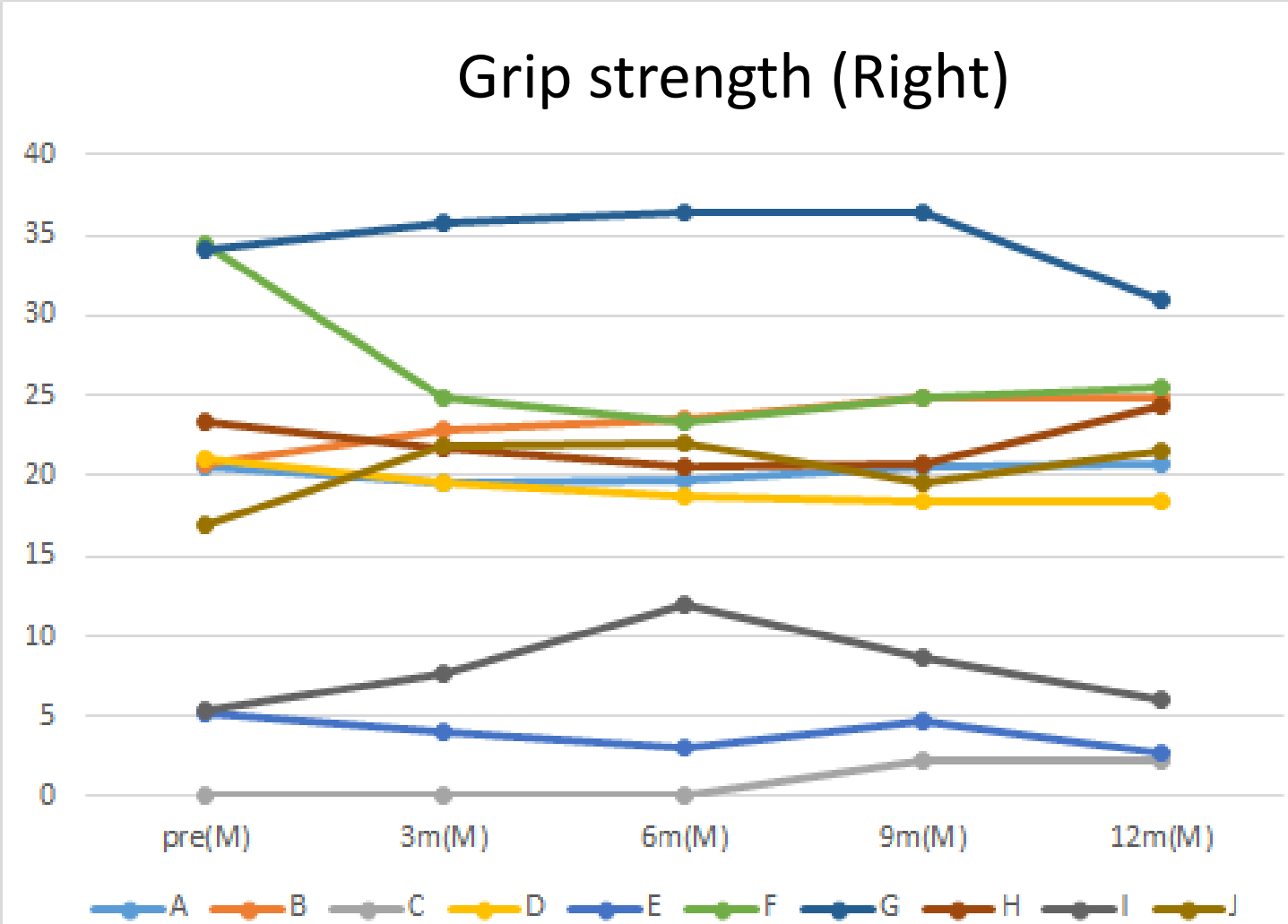

Grip strength (Left)
50
45
40
35
30
25
20
15
10
5
0
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Results

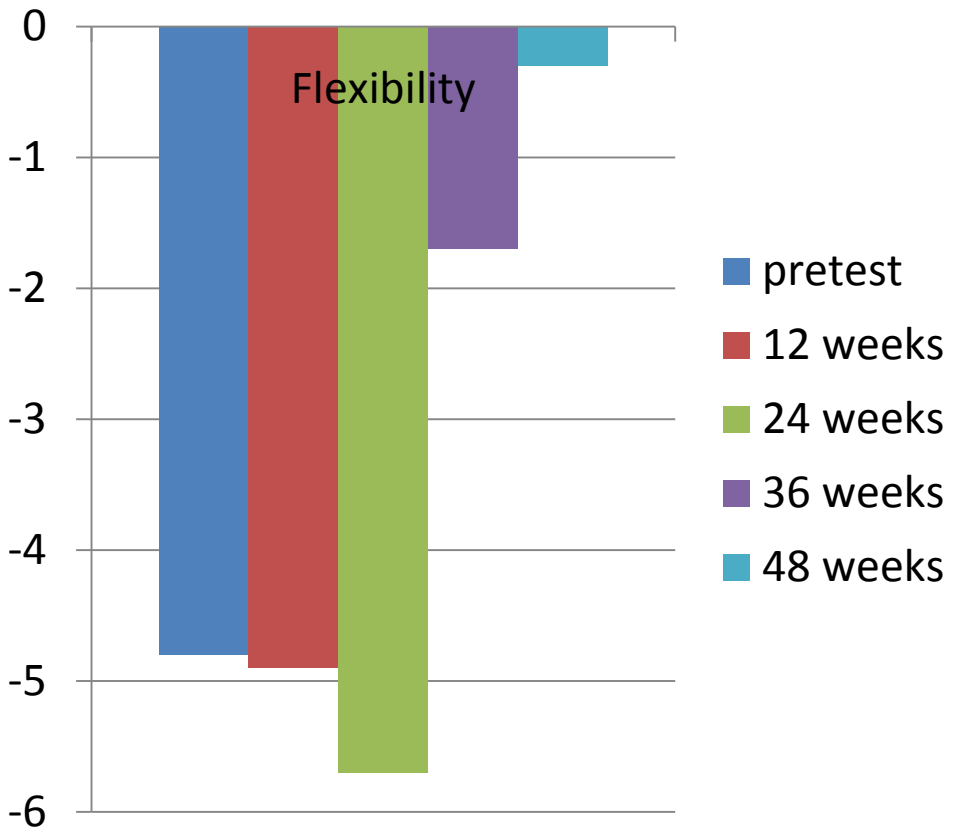


Muscle strength (Rt arm)

- No significant improvement from pretest to 4 posttest (paired t-test)
- Not significant from RM ANOVA

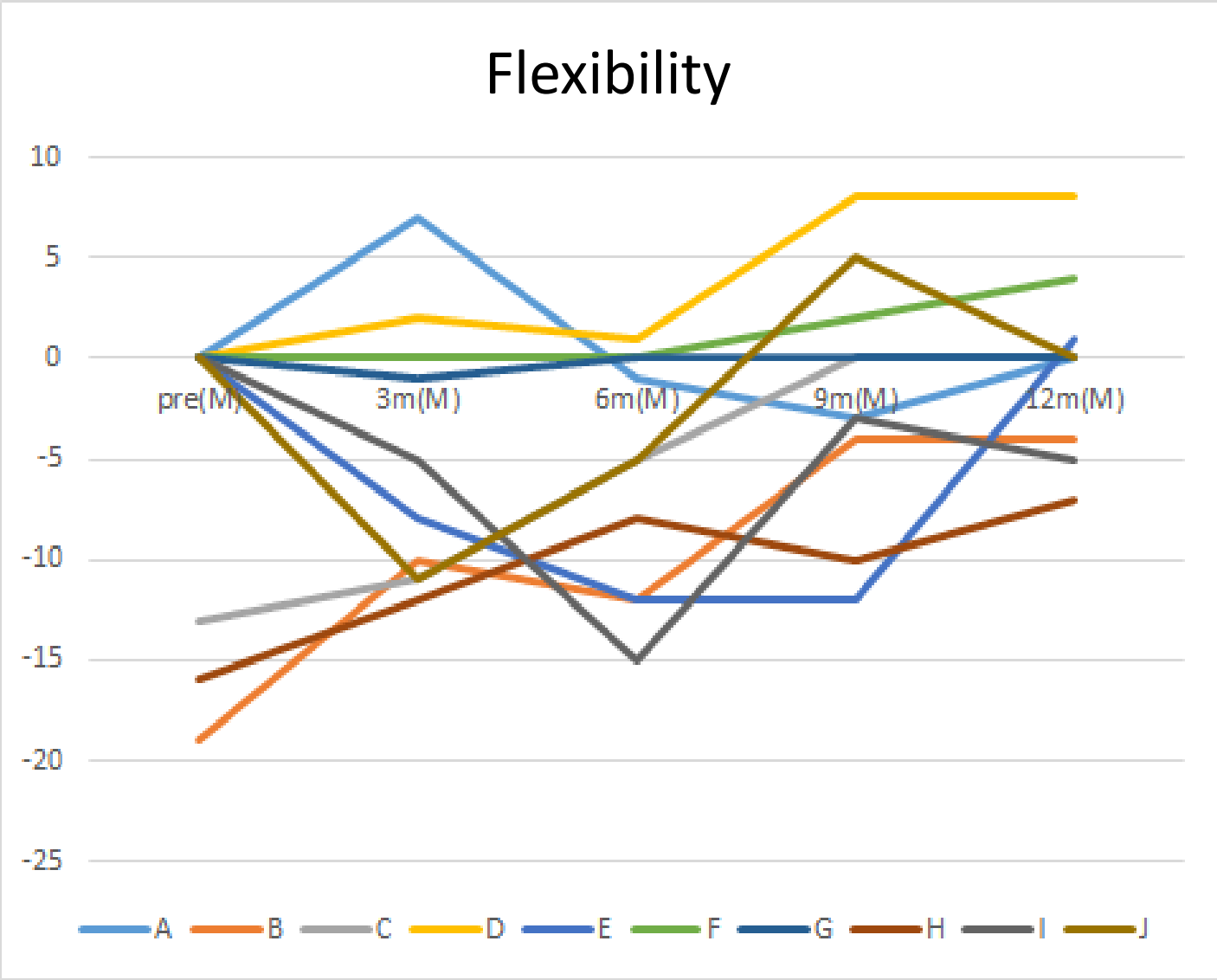

Grip strength (Right)
40
35
30
25
20
15
10
5
0
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Results

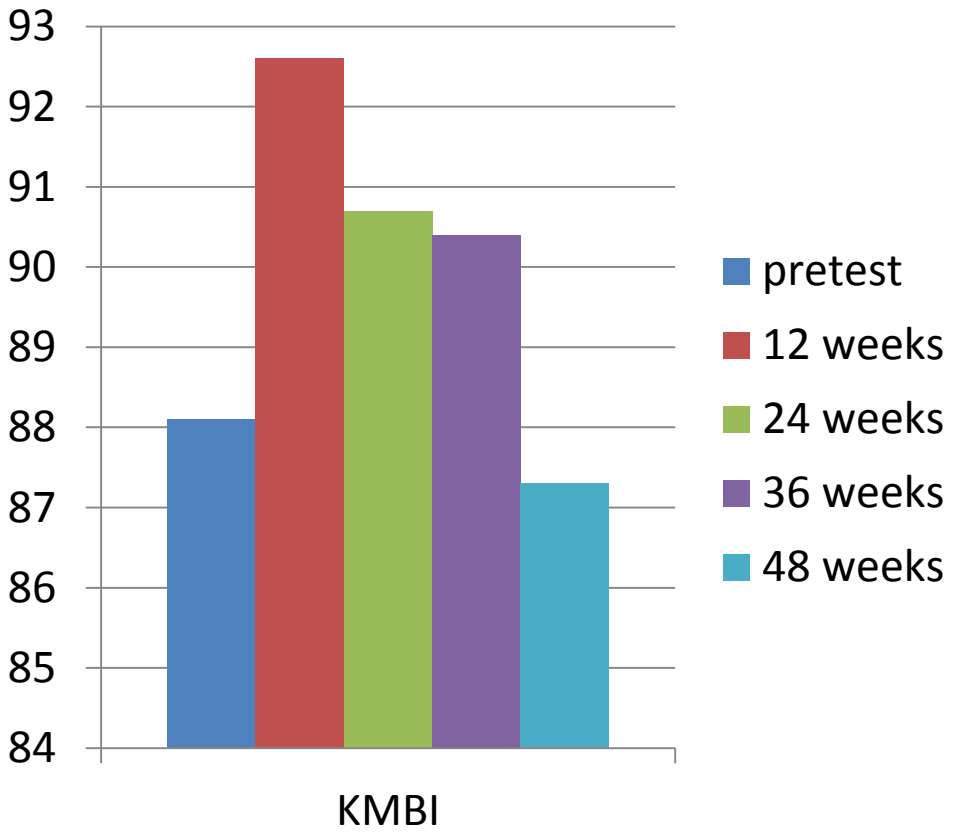


Flexibility

- No significant improvement from pretest to 4 posttest (paired t-test)
- Not significant from RM ANOVA

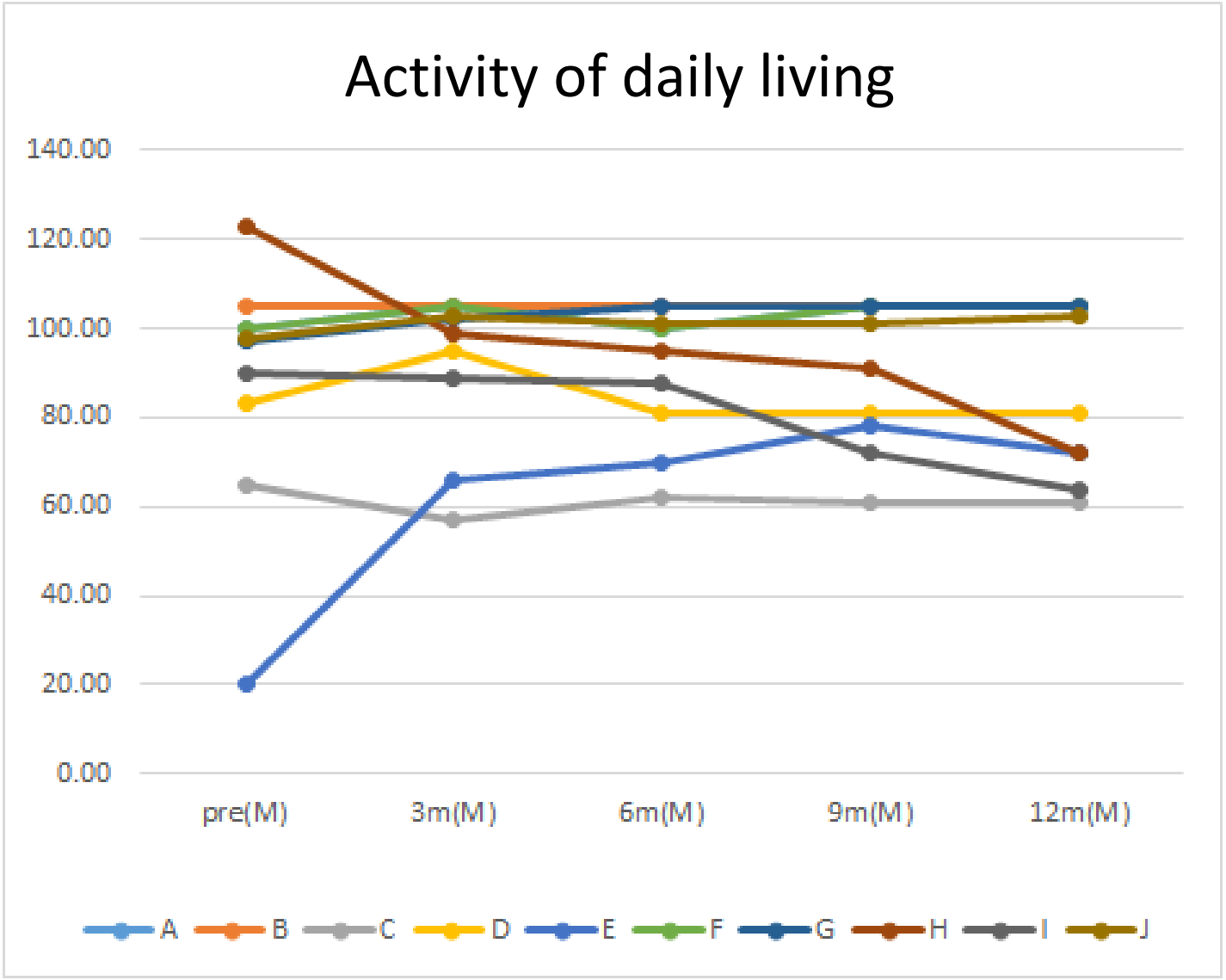

Flexibility
10
5
0
-5
-10
-15
-20
-25
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Results

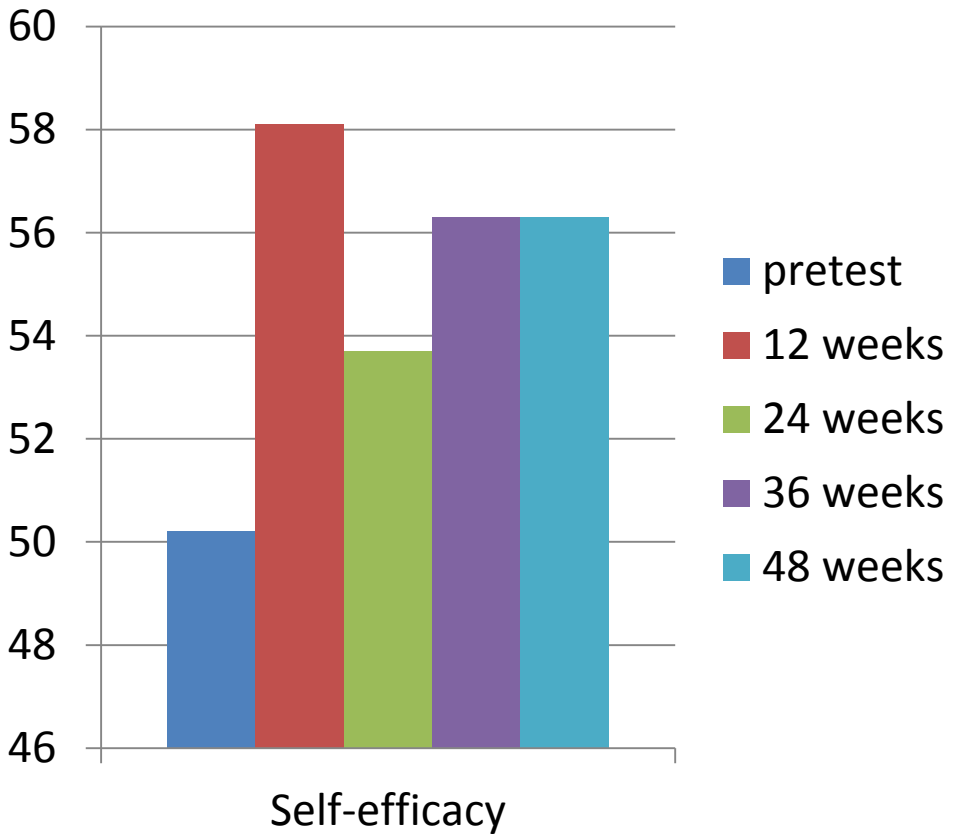


Activity of daily living

- Not significant improvement from pretest to all posttest
- Not significant from RM ANOVA

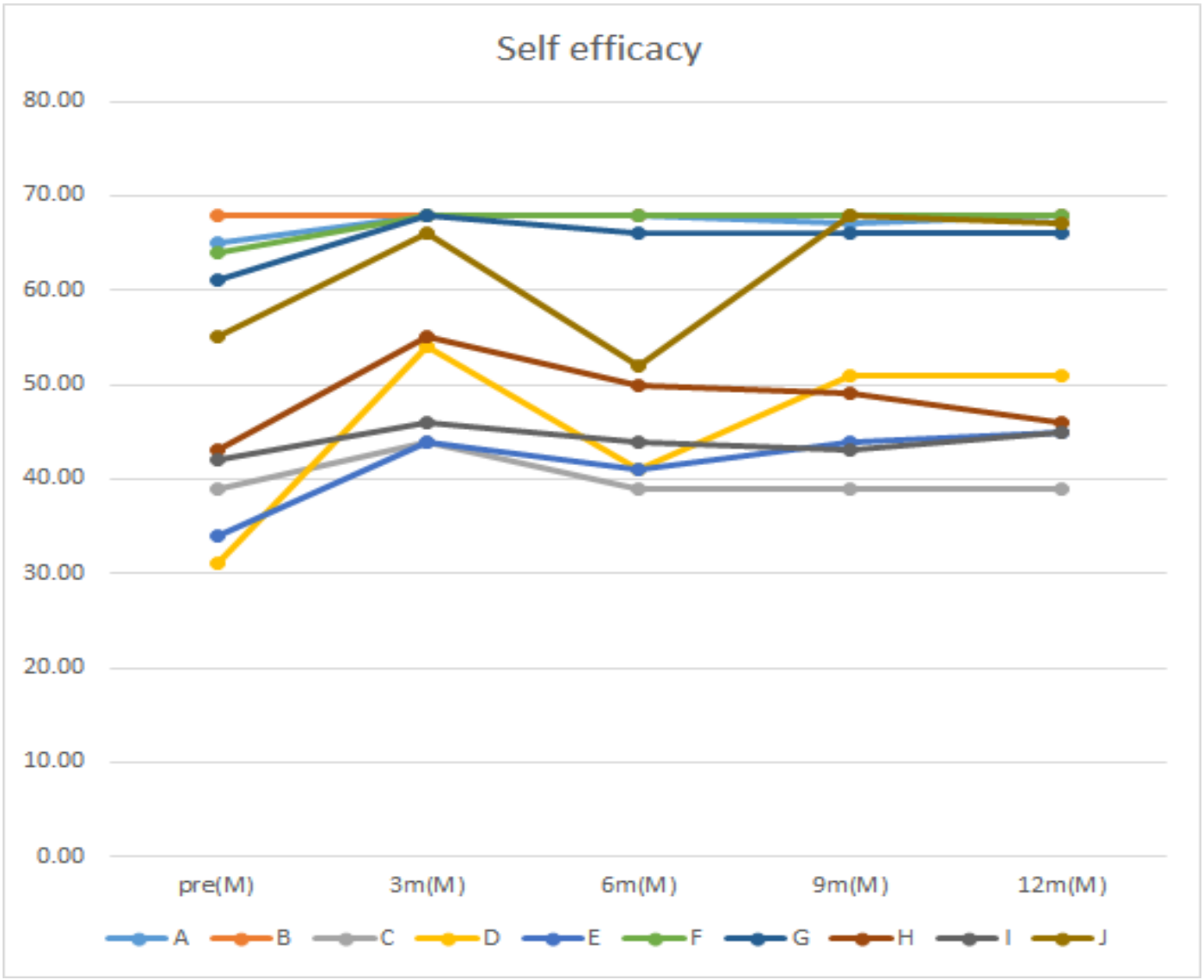

Activity of daily living
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Results



Self-efficacy

- Significant improvement from pretest to all 4 posttests ($p < .05$)
- Not significant from RM ANOVA


Self efficacy
80.00
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
pre(M)
3m(M)
6m(M)
9m(M)
12m(M)
A
B
C
D
E
F
G
H
I
J

Conclusion

- Tai Chi can be safely applied to rehabilitation program for individuals with stroke for one year
- Physically disabled individuals can perform Tai Chi for long term and improved their balance significantly.
- Tai Chi, as a mind-body exercise, can be useful to improve physical function and activities of daily living, consequently leading to the improved quality of life for this population.

Further studies

- Symptom clusters of stroke patients are inter-correlated, therefore further studies is warranted to examine the effect of Tai Chi applied stroke rehabilitation on various symptom clusters.
- Cognitive function may be correlated with movement control, therefore Tai Chi exercise may have positive effect on cognitive function in this population.

Let's practice

- ✓ Tai Chi greeting
- ✓ Tai Chi walking forward, backward, sidesteps
- ✓ Commencement
- ✓ Open and close movement
- ✓ Waving hands in the cloud
- ✓ Closing