

# Physical Activity Trackers in Combination with Motivational Interviewing to Increase Physical Activity



Maria Perez<sup>1</sup>, Laura D. Ellingson<sup>1</sup>, Yang Bai<sup>2</sup>, Karissa Peyer<sup>3</sup>, Gregory Welk<sup>1</sup>

1. Department of Kinesiology, Iowa State University, Ames, IA
2. Department of Rehabilitation and Movement Science, Vermont University, Burlington VT
3. Department of Health and Human Performance, University of Tennessee, Chattanooga, TN

## Rationale

- Wearable physical activity (PA) trackers may promote PA but results are inconsistent (Cadmus-Bertram et al., 2015; Jakicic et al., 2016).
  - The use of PA monitors such as a Fitbit may be more effective when combined with additional behavior change strategies (Patel et al., 2015; Piwek et al., 2016).
- PURPOSE:** To examine if the use of a Fitbit in combination with Motivational Interviewing is more effective in improving PA in healthy adults compared to the use of a Fitbit alone.

## Methods

### PARTICIPANTS

- Participants were recruited through mass emails and flyers posted around campus.
- Inclusion criteria: 1) between 24 and 65 years old, 2) regular access to computer or smartphone, 3) willing to wear a Fitbit for 12 weeks
- Exclusion criteria: 1) experience with a PA monitor in the past 6 months, 2) met current PA guidelines, 3) health condition that would prevent increase in PA

	FB (n=44)	FB+MI (n=42)	Group Differences (P Value)
Age (yrs)	42 ± 9	41 ± 9	>0.05
BMI (kg/m <sup>2</sup> )	30 ± 6	29 ± 7	>0.05
Body Fat (%)	36 ± 9	34 ± 9	>0.05
Resting HR (BPM)	70 ± 9	71 ± 12	>0.05
Sex (% male)	50	46	>0.05
Prev. Pedometer Exp. (%)	57	59	>0.05
College Degree (%)	96	98	>0.05

Table 1. FB=Fitbit Only; FB+MI=Fitbit with Motivational Interviewing; Values are mean ± SD unless otherwise specified.

### MEASURES

- Primary outcomes were physical activity (PA) behaviors assessed pre and post-intervention with activPAL and ActiGraph accelerometers.
- Fitabase software was utilized to monitor Fitbit activity (average steps/day) during each week of the intervention. This was used as a process measure.



### PROCEDURES

- Participants attended 3 visits: baseline, and weeks 1 and 12 of the intervention.
- Following baseline assessments, participants were randomized into one of two groups: Fitbit only (FB) or Fitbit plus motivational interviewing (MI) (FB+MI).
- Participants in FB+MI group received one in-person MI session and two phone call sessions
- Phone calls took place at weeks 4 and 8 during which participants answered questions regarding the use of the Fitbit and had MI sessions 2 and 3 (FB+MI group only)

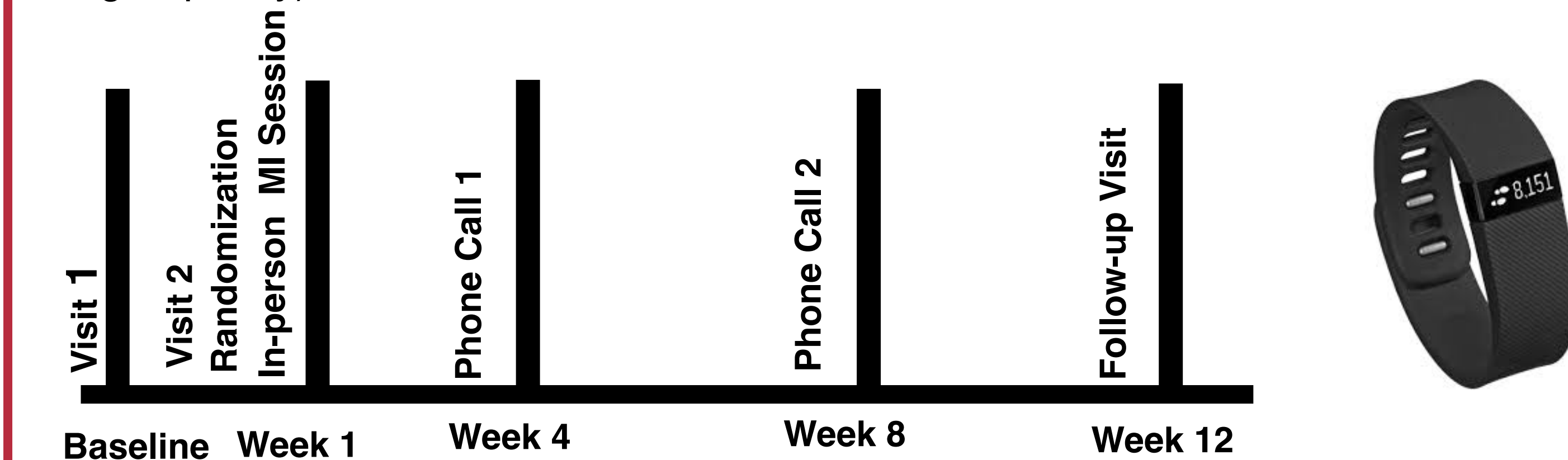


Figure 1. Timeline for visits and phone calls during the intervention.

### ANALYSES

- Average steps per day were compared within and between groups (FB vs. FB+MI) pre- and post-intervention with paired and independent sample t-tests, respectively.
- Based on high variability in the data, groups were then divided into those who did or did not improve daily step counts and demographic and baseline activity levels were examined using independent samples t-test and effect size calculations (Cohen's d) to determine for whom the intervention was effective.
- Based on these results, the total sample was then divided into those who had high and low steps counts at baseline (< or > 7500 steps) and original groupings (FB vs FB+MI) were again examined using t-tests and effect sizes.

## Key Findings

- A 12-week intervention with Fitbit monitors and Motivational Interviewing (MI) did not significantly increase PA in our sample of healthy adults.
- Those who improved over the intervention accumulated significantly fewer steps at baseline.
- Those who started off with higher activity levels did better with MI.

## Conclusions

- The Fitbit may be useful tool to increase PA for healthy men and women with low PA levels.
- Prior inconsistent results on physical activity monitors in combination with the high variability observed in the current study highlight the effect of individual differences.
- Future research is needed to further explore which populations may benefit from wearable technology.

## Results

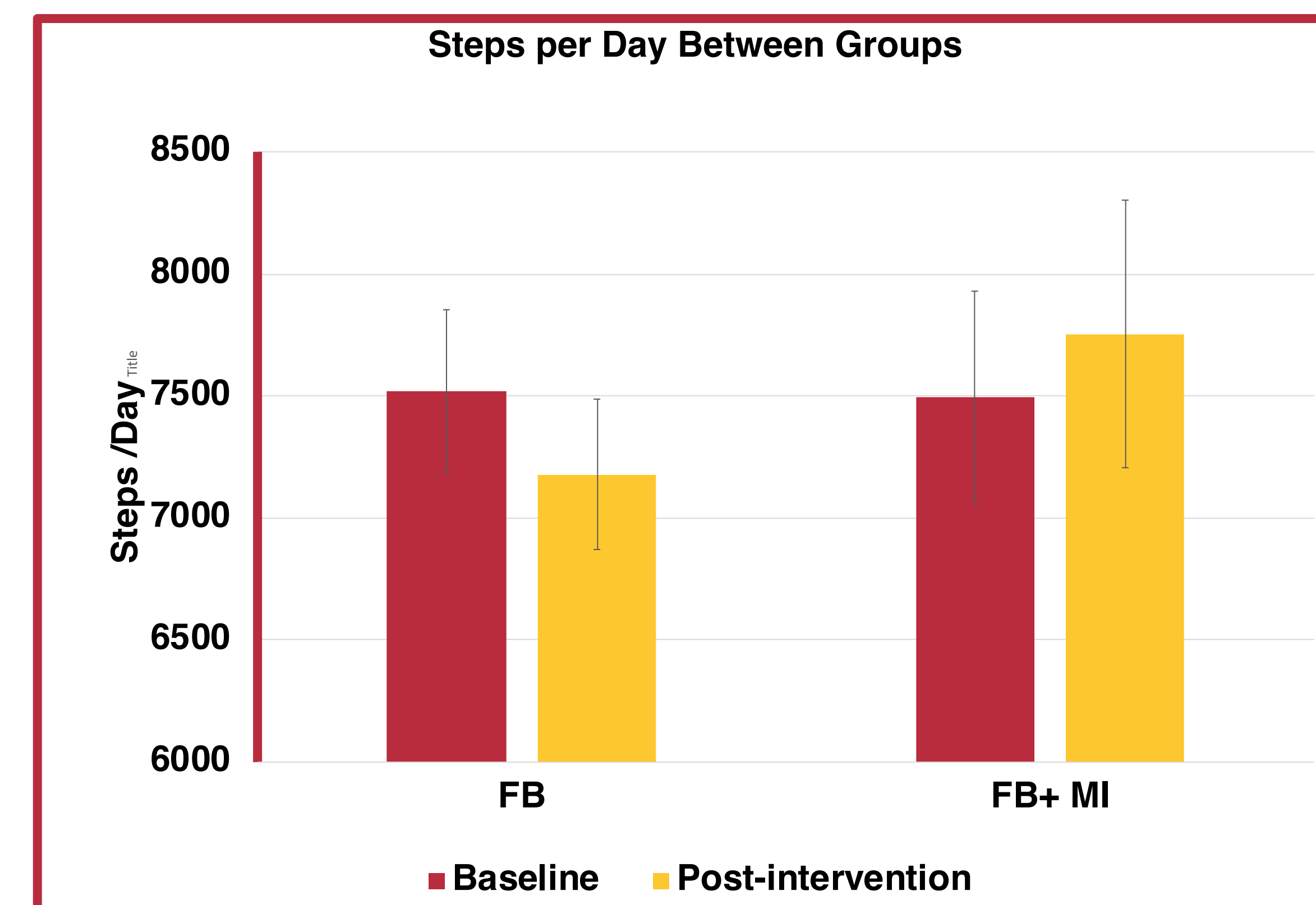


Figure 2. Average daily step count from for 1 week at baseline vs. 1 week post-intervention from accelerometer data. No significant difference was observed post-intervention compared to baseline for either group. Effect size = 0.15. Data are mean ± SD.

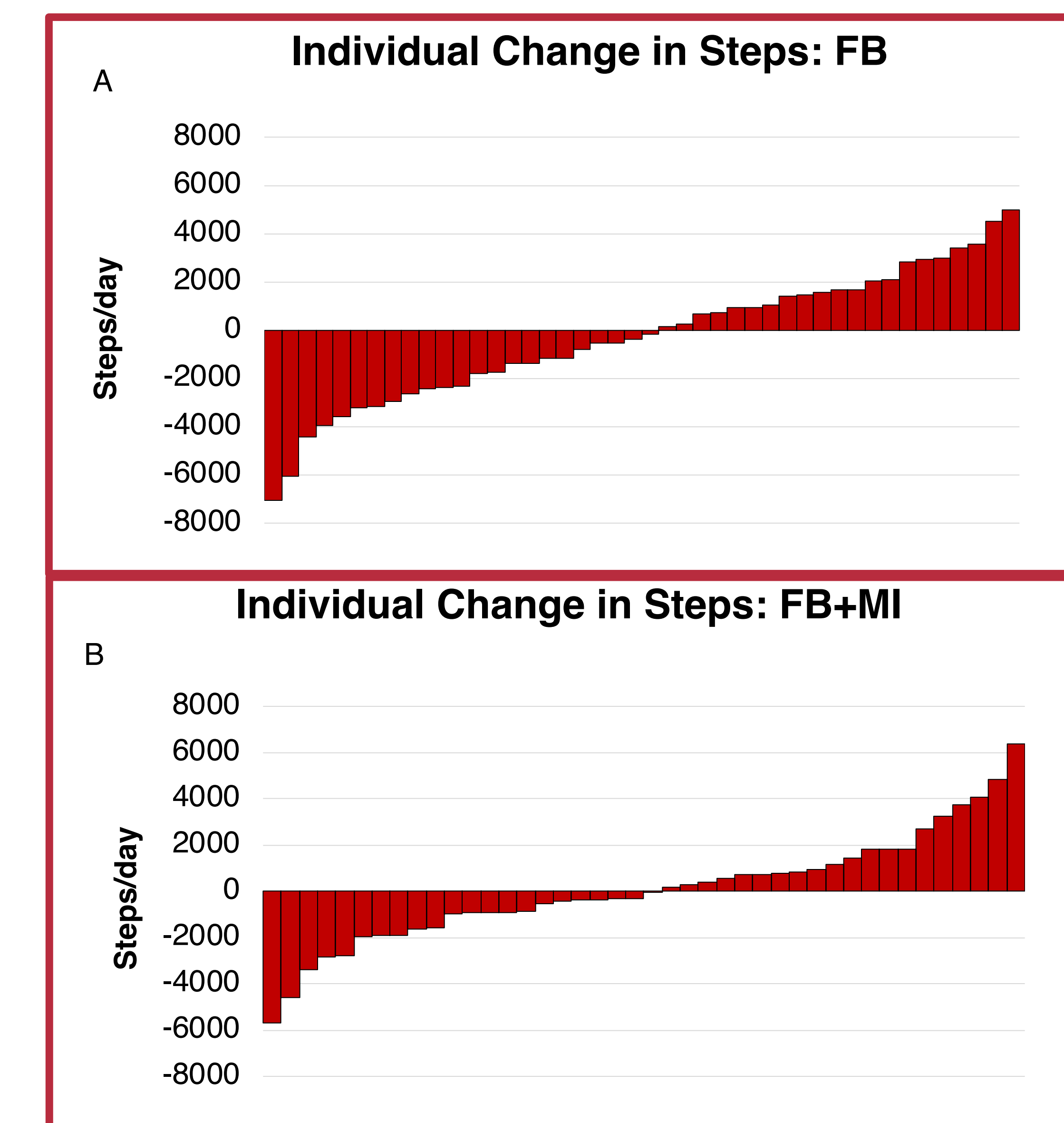


Figure 3. The change in daily steps from baseline to post-intervention in the FB group (A) and in the FB+MI group (B) demonstrates high variability in the effects of the intervention.

## Results

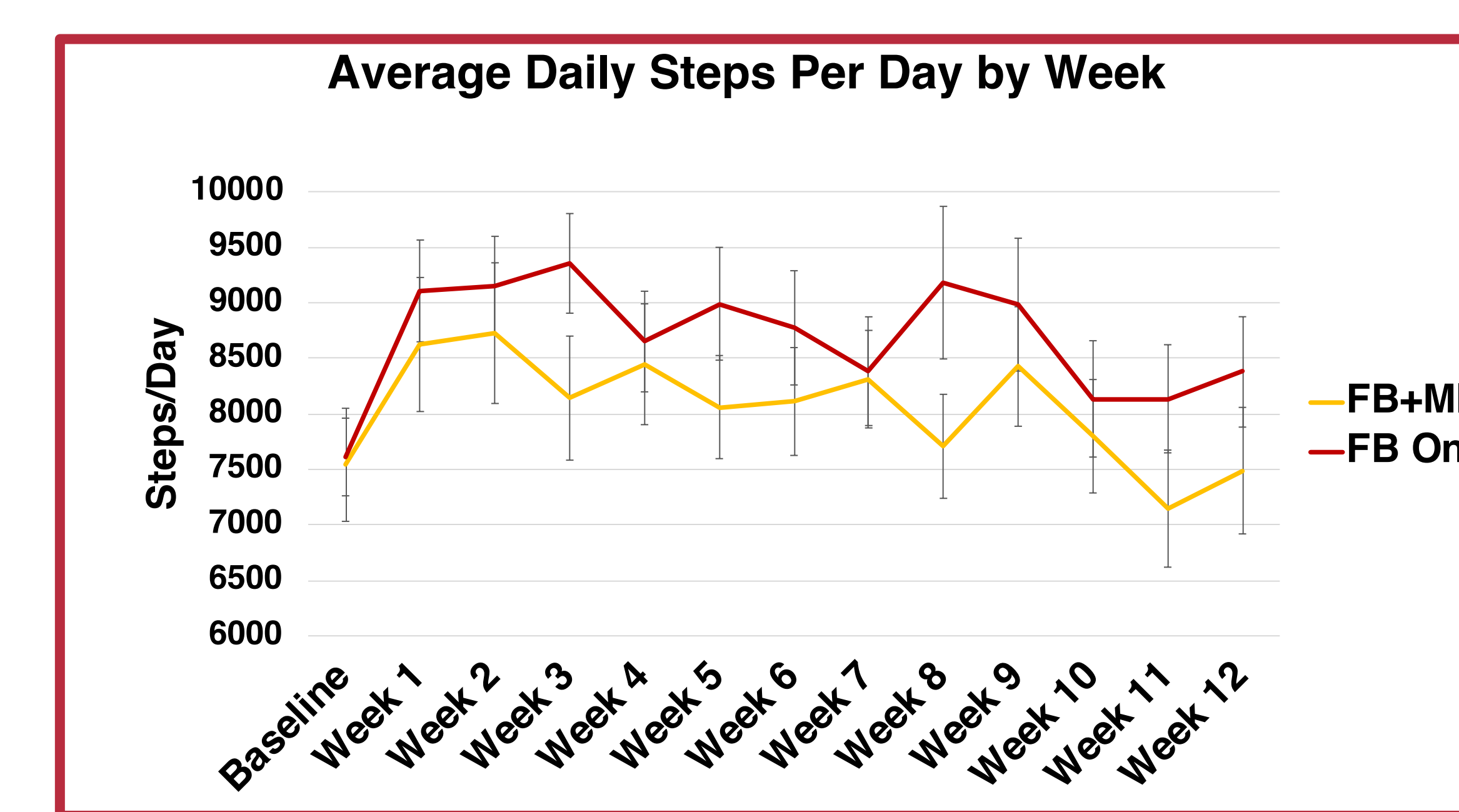


Figure 4. Fitabase data providing average steps per day by week was not significantly different between groups but a large SD revealed high variability.

	Improved	Not Improved	P Value
Age (yrs)	41 ± 9	43 ± 9	> 0.05
BMI (kg/m <sup>2</sup> )	29 ± 6	29 ± 6	> 0.05
Body Fat (%)	34 ± 8	35 ± 9	> 0.05
Sex (% Male)	52	44	> 0.05
Baseline Steps	6650 ± 2056	8522 ± 2871	< 0.0001*

Table 2. When comparing those who improved and those who did not, only the number of baseline steps was significantly different between groups.

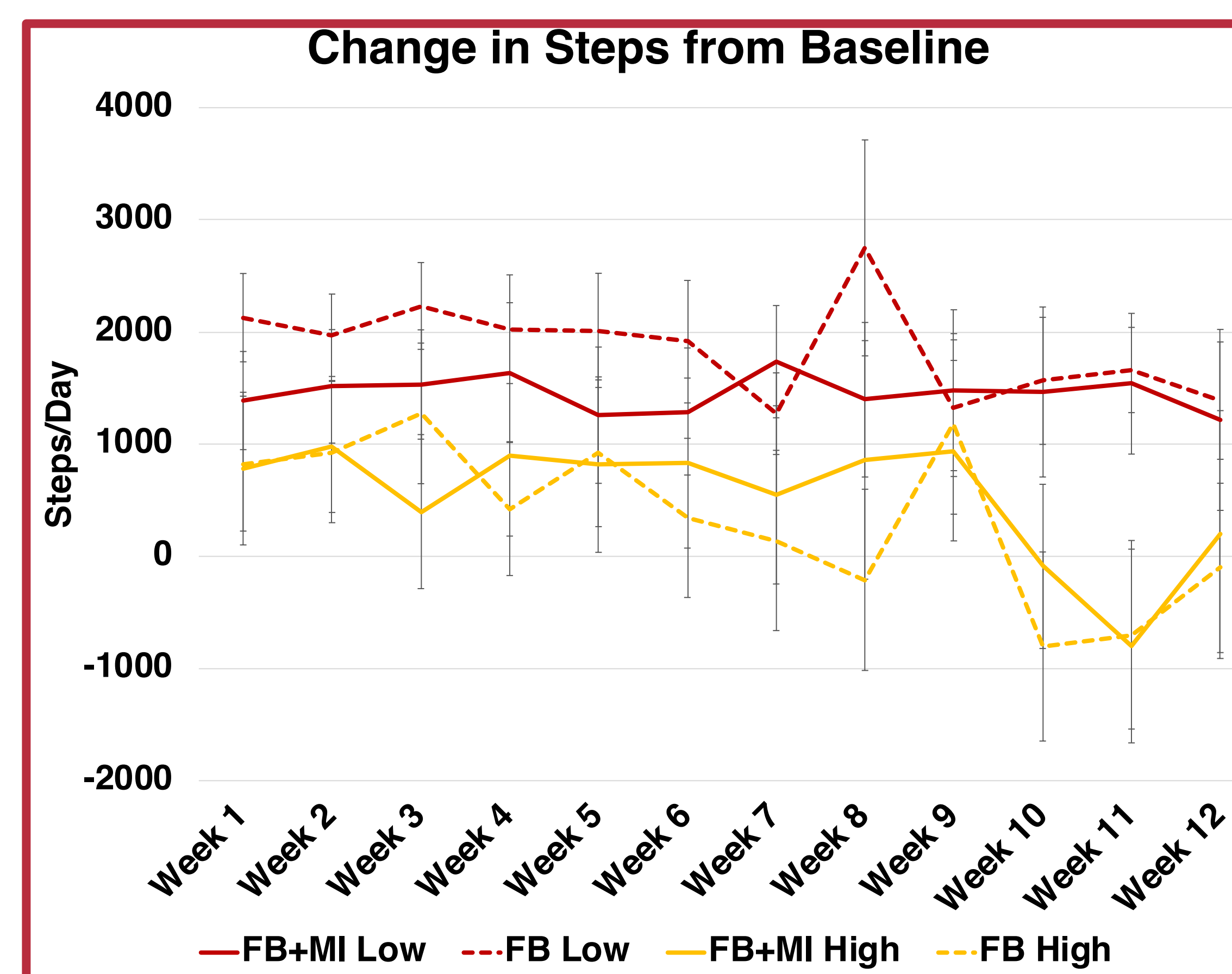


Figure 5. Intervention groups are split into those who started off with < 7,500 steps at baseline (Low) and > 7,500 steps at baseline (High). Those who started low with < 7,500 steps at baseline had a more noticeable improvement in change in steps compared to those who started high with > 7,500 steps.

## Results

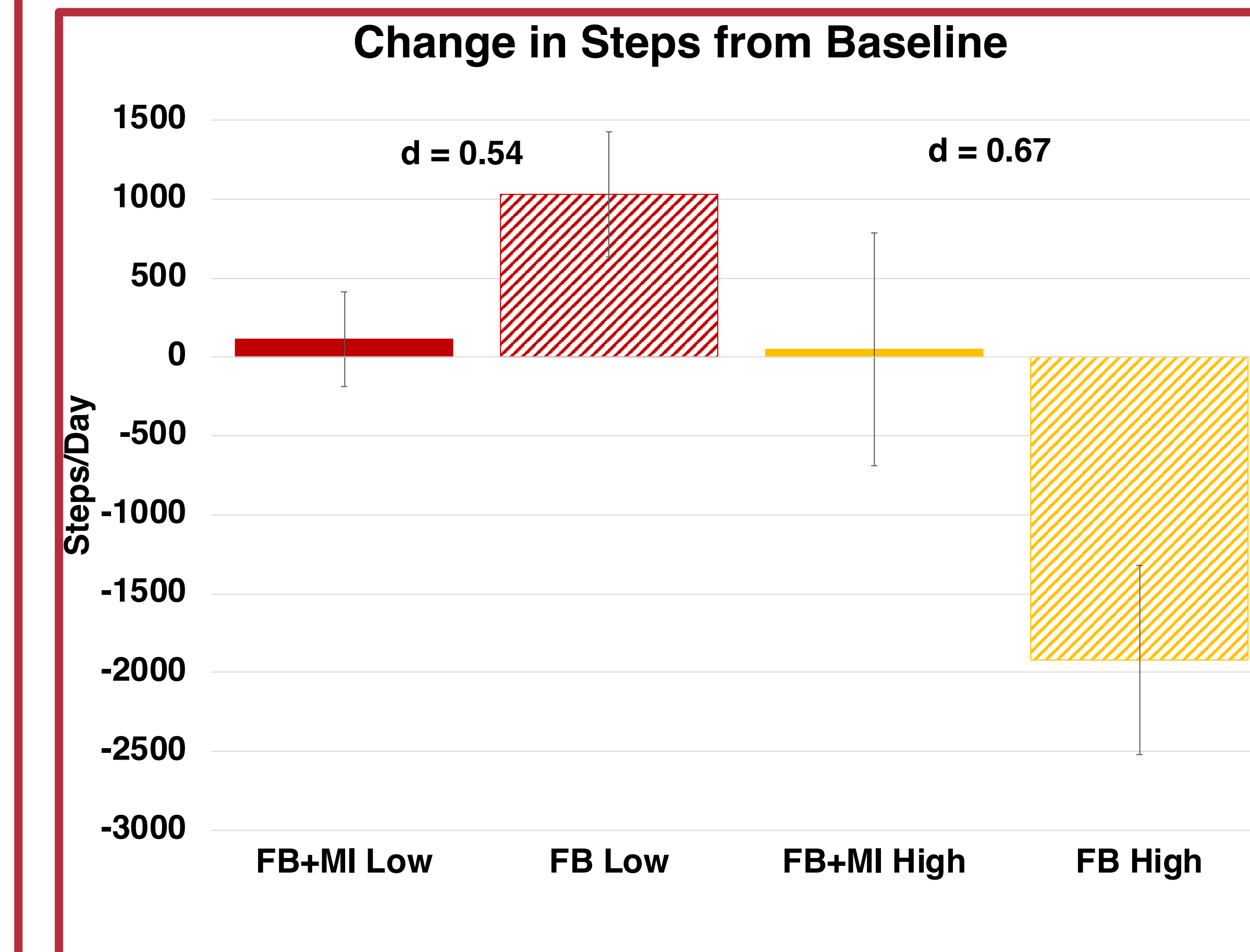


Figure 6. Mean change in steps per day did not change for FB + MI groups regardless of baseline steps. However, for those who started off with high baseline steps (>7,500 steps) decreased in steps per day when given a Fitbit only. Those who started with low baseline steps (<7,500 steps) increased steps per day when given a Fitbit only. A moderate effect size was observed for the FB+MI Low and FB Low groups and a moderate-to-high effect size was observed for the FB+MI high and FB High groups.

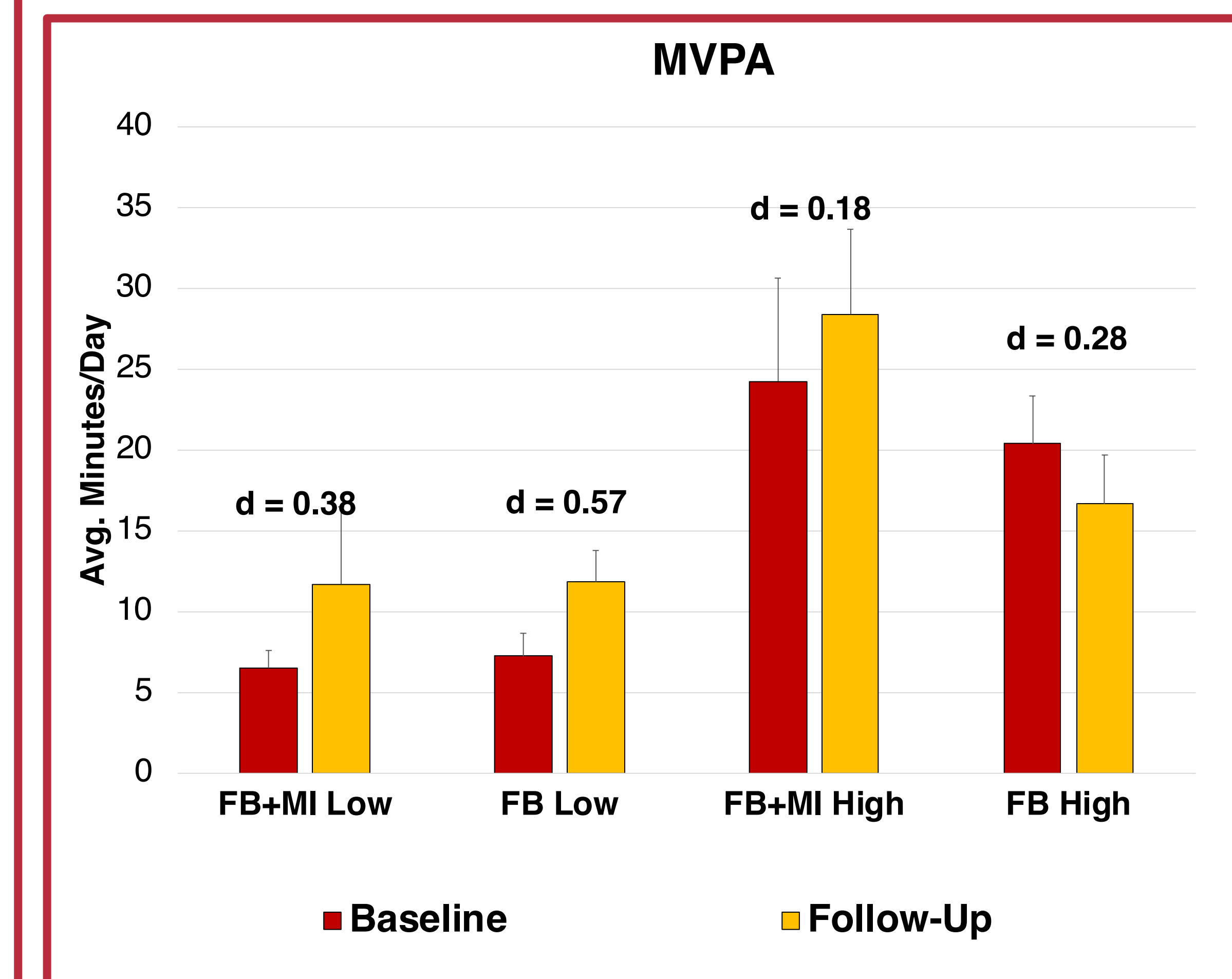


Figure 7. Moderate to Vigorous Physical Activity (MVPA) for participants who started High at baseline (>7,500 average daily steps) decreased for those in the FB group. MVPA increased slightly for those who started High for the FB+MI group and increased slightly for those who started low at baseline (<7,500 average daily steps) regardless of group assignment. Small effect sizes were observed for FB+MI Low, FB+MI High, and FB High groups while a moderate effect size was observed for the FB Low group.

## Key References

- Cadmus-Bertram et al., (2015). Randomized trial of a Fitbit-based physical activity intervention for women. *American Journal of Preventive Medicine*, 49(3), 414-418.
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- Patel et al., (2015). Wearable devices as facilitators, not drivers, of health behavior change. *Jama*, 313(5), 459-460
- Piwek et al., (2016). The rise of consumer health wearables: promises and barriers. *PLoS Med*, 13(2), e1001953.