Supplementary Material 1 - Search Strategy (Pubmed)

1 Adult [mh]

2 Sedentary [tw]

3 Inactive [tw]

4 Men [tw]

5 Women [tw]

6 ((((Adult [mh]) OR Sedentary [tw]) OR Inactive [tw]) OR Men [tw]) OR Women [tw]

7 Wearable Electronic Devices/Fitness Trackers* [majr]

8 Fitness Trackers/utilization [sh]

9 Accelerometry [mh]

10 Activity tracker [tw]

11 Activity monitor [tw]

12 Fitness monitor [tw]

13 Technology-based system [tw]

14 Fitbit* [all]

15 Jawbone UP* [all]

16 Garmin* [all]

17 Misfit* [all]

18 Fuelband* [all]

19 Withings* [all]

20 SenseWear* [all]

21 ((((((((((((Wearable Electronic Devices/Fitness Trackers* [majr]) OR Fitness Trackers/utilization [sh]) OR Accelerometry [mh]) OR Activity tracker [tw]) OR Activity monitor [tw]) OR Fitness monitor [tw]) OR Technology-based system [tw]) OR Fitbit* [all]) OR Jawbone UP* [all]) OR Garmin* [all]) OR Misfit* [all]) OR Fuelband* [all]) OR Withings* [all]) OR SenseWear* [all]

22 Physical exertion [mh]

23 Physical activit* [tw]

24 Step [tw]

25 ((Physical exertion [mh]) OR Physical activit* [tw]) OR Step [tw]

26 (((((((Adult [mh]) OR Sedentary [tw]) OR Inactive [tw]) OR Men [tw]) OR Women [tw])) AND ((((((((((((Wearable Electronic Devices/Fitness Trackers* [majr]) OR Fitness Trackers/utilization [sh]) OR Accelerometry [mh]) OR Activity tracker [tw]) OR Activity monitor [tw]) OR Fitness monitor [tw]) OR Technology-based system [tw]) OR Fitbit* [all]) OR Jawbone UP* [all]) OR Garmin* [all]) OR Misfit* [all]) OR Fuelband* [all]) OR Withings* [all]) OR SenseWear* [all])) AND (((Physical exertion [mh]) OR Physical activit* [tw]) OR Step [tw])

Supplementary Material 2 – Inclusion and Exclusion Criteria

Types of participants

The review considered only studies in which participants were aged 18 years and over. Participants who were hospital inpatients, terminally ill, and/or receiving hospice care were excluded, as acute illness or hospitalisation may change PA behaviour.

Types of intervention(s)

The review included interventions whose primary or secondary aim was to change PA behaviour. A fitness tracker must have been used wholly or as part of the intervention. Studies were excluded if the fitness tracker was used to only measure outcomes.

Studies were included if a fitness tracker was used in the intervention and some studies used the fitness tracker as the only intervention component. Interventions that included some form of behavioural counselling were also included. Fitness trackers vary in manufacturer and model but this review is limited to only those which are designed for a consumer, are commercially available and provide feedback on PA through the tracker and/or an associated app. Intervention approaches of included studies were those used to increase participation in all forms of PA and included PA during leisure time, occupationally, within the household and that used for commuting. However, where the intervention included delivery of structured exercise, these studies were excluded. Settings included everyday living and the workplace.

Comparator(s)

The review considered studies that compared the intervention to normal daily physical activities. This comparative was sometimes termed control, waitlist, usual or conventional care. This review considered studies that compared the intervention to provision of literature on PA, the wearing a fitness tracker but blinded to feedback, and other behavioural PA interventions.

Outcomes

The review considered studies that included PA behaviour as an outcome. This included an outcome of physical exertion reported as light, moderate and/or vigorous PA (MET-min/week or MET-min/day), time walking (duration or number of bouts) or energy expenditure (kcal/week or kcal/day), and steps (steps/day). These outcomes were assessed objectively by accelerometer or by self-report.

Study Types

The primary study design of interest for this review was randomised clinical or controlled trials. It considered only studies published in English since 01/01/2010 as the emergence of fitness trackers is a recent phenomenon.

Supplementary Material 3 – Results of JBI Critical Appraisal Instrument for Randomised Controlled Trials

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
Barwais et al[43]	Y	U	Y	N	U	U	Y	U	Y	Y	Y	Y	Y
Brakenridge et al[44]	Y	Y	N	N	N	U	Y	Y	Y	Y	Y	Y	Y
Cadmus-Bertram et al[45]	Y	U	Y	N	N	U	N	N	Y	Y	Y	Y	Y
Finkelstein et al[46]	Y	Y	Y	N	U	Y	N	Y	Y	Y	Y	Y	Y
Hartman et al[47]	Y	Y	N	N	Y	U	N	Y	Y	Y	Y	Y	Y
Jakicic et al[48]	Y	Y	Y	N	U	U	N	Y	Y	Y	Y	Y	Y
Jauho et al[49]	Y	U	Y	N	U	U	N	N	Y	Y	Y	Y	Y
Kim et al[50]	U	U	Y	N	U	U	Y	Y	Y	Y	Y	Y	Y
Kooiman et al[51]	Y	U	Y	N	U	U	Y	Y	Y	U	Y	Y	Y
Lewis et al[52]	Y	U	Y	N	U	U	N	Y	Y	Y	Y	Y	Y
Li et al[53]	Y	U	Y	N	U	U	Y	Y	Y	Y	Y	Y	Y
Lystrup et al[54]	U	U	Y	N	U	U	Y	U	Y	Y	Y	Y	Y
McDermott et al[55]	Y	U	Y	N	U	Y	Y	Y	Y	Y	Y	Y	Y
Melton et al[56]	Y	U	Y	N	U	U	N	Y	Y	Y	Y	Y	Y
Pellegrini et al[57]	Y	U	N	N	U	U	N	Y	Y	Y	Y	Y	Y
Shuger et al[58]	Y	U	Y	N	U	U	N	Y	Y	Y	Y	Y	Y
Thomas et al[59]	Y	U	Y	N	U	U	N	N	Y	Y	Y	Y	Y
Thompson et al[60]	Y	Y	Y	N	U	U	N	Y	Y	Y	Y	Y	Y
Thorndike et al[61]	Y	U	Y	N	U	U	Y	Y	Y	Y	Y	Y	Y
Uhm et al[62]	Y	U	Y	N	U	U	N	Y	Y	Y	Y	Y	Y

Vidoni et al[63]	Y	U	Y	N	N	U	N	Y	Y	Y	Y	Y	Y

Supplementary Material 4 - Characteristics of Studies

Study	**Country /context /population**	**Participant characteristics** *N* **(randomized) /mean age (years) /sex (% female)**	**Intervention (device) /duration**	**Control /comparator**	**Out**
Barwais et al[43]	Australia; Home; Sedentary adults	33 (i;18, c;15); 27.8; 33%	Fitness tracker (Gruve Solution) + app 4 weeks	Normal daily activities	Sed min PA Self vers
Brakenridge et al[44]	Australia; Workplace (single organisation); Office workers	153 (i_1;66, i_2;87); 38.9; 46%	Fitness tracker (LUMOback) + app + organisational wellness program 3 months 12-month follow-up	Organisational wellness program	Sitti bou star Obj
Cadmus-Bertram et al[45]	USA; Home; Inactive, overweight post-menopausal women	51 (i_1;25, i_2;26); 60.9; 100%	Fitness tracker (Fitbit One) + app + individualised goals + 1 x follow-up call at 4 weeks 16 weeks	Pedometer + printed materials + brief goal setting guidance	Ligh cou Obj acc
Finkelstein et al[46]	Singapore; Workplace (multiple organisations); Employees	800 (i_1; 203, i_2; 199, i_3; 197, c;201); 35.5; 53%	(i_1); Fitness tracker (Fitbit Zip) + app + printed materials (i_2); Fitness tracker + app + printed materials + charity donation incentive (i_3); Fitness tracker + app + printed materials + cash incentive 12 months	Printed materials	MV Obj acc
Hartman et al[47]	USA; Home; Inactive, overweight women, aged	54 (i;36, c;18); 59.5; 100%	Fitness tracker (Fitbit One) + MyFitnessPal app + 12 x coaching calls	U.S. Dietary Guidelines for Americans + 2 x follow-up calls	MV Obj acc

	>40 yrs with elevated breast cancer risk		6 months		
Jakicic et al[48]	USA; Home; Overweight adults aged 18-35 yrs	471 (i_1;237, i_2;234); 30.9; 71%	0-6 months; group-based dietary intervention + exercise prescription 7-24 months; Fitness tracker (FIT Core) + app + group-based dietary intervention + weekly text messages + monthly phone calls 24 months	0-6 months, as per intervention 7-24 months as per intervention except no fitness tracker. Self-report of daily MVPA via a website designed for the study.	Sed sed MV Obj
Jauho et al[49]	Finland; Home; Young adult males	276 (i;137, c;139); 17.9; 100% male	Fitness tracker (Polar Active) 3 months	Blinded fitness tracker	Sitt Self
Kim et al[50]	USA; Home; College students	187 (i;101, c;86); 20.6; 62%	Fitness tracker (Misfit Flash) + app 13 weeks	Normal, daily activities	Sed PA; Obj
Kooiman et al[51]	Netherlands; Home; Type 2 diabetic adults	72 (i;40, c;32); 56.4; 47%	Fitness tracker (Fitbit Zip) + eHealth program 3 months	Normal daily activities	MV Self
Lewis et al[52]	USA; Home; Inactive, overweight, older adults	40 (i_1;20, i_2;20); 63.7; 75%	Fitness tracker (Jawbone UP24) + app 3 months	Pedometer + activity log	MV Obj
Li et al[53]	USA; Home; Older adults with knee osteoarthritis	34 (i;17, c;17); 55.5; 82%	Fitness tracker (Fitbit Flex) + app + education session + 4 x follow up calls 1 month	Normal, daily activities	Sed Obj
Lystrup et al[54]	USA; Military medical school; First year medical students	107 (i;50, c;57); 25.4; 37%	Fitness tracker (Fitbit Zip) + app 1 year	Normal, daily activities	Ste Obj
McDermott et al[55]	USA; Home; Adults with lower-extremity	200 (i;99, c;101); 70.3; 53%	Fitness tracker (Fitbit Zip) + 4 x weekly supported sessions + diminishing follow-up phone calls	Normal, daily activities	Acc Obj

	peripheral artery disease		9 months		
Melton et al[56]	USA; Home; Female, African-American students	69 (i_1;28, i_2;41); 19.7; 100%	Fitness tracker (Jawbone UP) + app + weekly e-mails 6 weeks 8-week follow up	Diet app + weekly e-mails	Acc Obj acc
Pellegrini et al[57]	USA; Home; Inactive, overweight adults	51 (i_1;17, i_2;17, i_3; 17); 44.2; 86%	(i_1); Fitness tracker (BodyMedia Fit) + app + e-mailed goals + supported telephone calls (i_2); Fitness tracker + Standard behavioural weight loss 6 months	Standard behavioural weight loss	Ene Self que
Shuger et al[58]	USA; Home; Inactive, overweight adults	197 (i_1;49, i_2;49, i_3;49, c;50); 46.9; 81%	**(i_1)**; Fitness tracker (Sensewear armband + wristwatch) + app **(i_2)**; Group-based behavioural weight loss program only 14 sessions + 6 x telephone **(i_3)**; i_1 + i_2 9 months	Printed materials	Ene Obj
Thomas et al[59]	USA; Home; Overweight adults	271 (i_1; 91, i_2;94, c; 86); 55.0; 77%	**(i_1)**; Fitness tracker (ActiveLink) + app + Weight Watchers Online program **(i_2)**; Weight Watchers Online program only 12 months	Printed materials	MV Obj
Thompson et al[60]	USA; Home; Inactive, overweight, older adults	49 (i;25, c;24); 79.5; 81%	Fitness tracker (Fitbit) + printed materials + bi-monthly counselling 6 months	Blinded fitness tracker	Pro Obj acc
Thorndike et al[61]	USA; Hospital; Physicians	104 (i;52, c;52); 29.0; 54%	**Phase 1 only** Fitness tracker (Fitbit) + app 6 weeks	Blinded fitness tracker	Ste Obj
Uhm et al[62]	Korea; Home; Post-treatment	356 (i_1;179, i_2;177); 50.3; 100%	Fitness tracker (InBodyBand) + app + prescribed activity goal 3 months	Prescribed activity goal + printed materials	Ene Self

	breast cancer survivors				
Vidoni et al[63]	USA; Home; Mild-very mild cognitively impaired, inactive, older adults	30 (i;14, c;16); 71.5; 57%	Fitness tracker (Fitbit Zip) + app + prescribed activity goal + printed materials 8 weeks	Blinded fitness tracker	Step Obj