Characteristics of mobile app and SMS mHealth interventions for physical and mental health.

Author (year) and app	Trial type and primary outcome measure	Intervention and control group	Main findings	Within F and between g effect size
Abroms et al [53] Quit4baby	Within-group Pregnancy smoking cessation	Intervention n=20 Control Not applicable (N/A)	High retention rate. Highly rated aspects of program. Reportedly helpful for cessation and psychoeducation	Smoking cessation d=0.12$_{a,f}$
Abroms et al [54] Text2Quit	Randomized controlled trial (RCT) Smoking cessation	Intervention n=262 Control n=241	Biochemically confirmed abstinence favored the intervention group	N/A
Buller et al [58] REQ-Mobile	RCT Smoking cessation	Intervention n=51 Control n=51	App was a feasible method of smoking cessation	Point-prevalence abstinence d=0.45$_{a,g,i}$ d=0.30$_{b,g}$ d=0.13$_{d,g}$ d=0.27$_{e,g}$
Choi et al [59] Unnamed	RCT Inactivity of pregnant women	Intervention n=15 Control n=15	Intervention group reported lower perceived barrier to being active, lack of energy than the control group	Steps per day d=0.05$_{b,g}$ d=0.16$_{c,g}$ d=0.48$_{d,g}$ d=3.25$_{b,f}$ d=3.08$_{c,f}$ d=3.10 $_{d,f}$ Center for Epidemiologic Studies Depression Scale (CES-D) d=0.2$_{d,f}$ d=0.17$_{a,g}$ d=0.44$_{d,g}$
Glynn et al [60] SMART MOVE	RCT Physical activity and perceived health state	Intervention n=37 Control n=40	Significant increase of physical activity	Step count d=0.23$_{a,g}$ d=0.26$_{c,g}$ d=0.08$_{c,f}$ d=0.42$_{c,f,h}$ EuroQol-Visual Analogue Scale

				(EQ-VAS) $d=0.56_{c,f}$ $d=0.32_{c,f}$ $d=0.05_{a,g}$ $d=0.15_{c,g}$
Harries et al [61] bActive	RCT Physical activity	Intervention (a) n=53 Intervention (b) n=50 Control n=49	Individual and social weekly feedback groups had significantly higher amount of steps	N/A
Hertzberg et al [62] mCM	RCT Smoking cessation	Intervention n=11 Control n=11	High compliance rates + mobile Contingency Management (mCM) may be a useful adjunctive smoking cessation treatment	N/A
Lee et al [55] mScreening	Within-group Psychoeducation	Intervention n=30 Control N/A	High usage rate and significant increase in cervical cancer psychoeducation	Knowledge about human papillomavirus (HPV) and vaccination $d=1.4_{a,f,j}$
McGillicuddy et al [63] FORA device	RCT Medication adherence	Intervention n=9 Control n=10	High participation and retention rates. mHealth intervention group exhibited significant improvements in medication adherence and significant reductions in clinic-measured systolic blood pressures	Medication adherence $d=0.63_{b,f}$ $d=0.80_{c,f}$ $d=0.86_{d,f}$ $d=0.77_{b,g}$ $d=0.88_{c,g}$ $d=1.02_{d,g}$
Mira et al [64] ALICE	RCT Medication adherence	Intervention n=51	Experimental group missed fewer doses of medication.	Morisky Medication Adherence Scale-4 (MMAS-4)

		Control n=51	Higher adherence, fewer missed doses, and fewer medication errors in patients with no experience of using information and communication technology (ICT). Furthermore, 88% of participants agreed ALICE improved medication management	d=0.12a,f,j d=0.07a,f d=0.12a,g,j Self-perceived health status d=0.04a,f d=0.20a,f d=0.30a,g
Park et al [56] Unnamed	RCT Medication adherence	Intervention (a) n=30 Intervention (b) n=30 Control n=30	Text message (TM) shown higher correct doses	MMAS-8 d=0.22b,g d=0.40b,g d=0.16b,g d=0.16b,f d=0.48b,f d=0.57b,f
Partridge et al [78] TXT2BFiT	RCT Weight management	Intervention n=125 Control n=125	Adherence to calls and short message service (SMS) exceeded 90%. At 12-week follow-up, intervention group had lost more weight, ate less sugar and takeout meals, and consumed more vegetables than control. Also increased physical activity	Weight management d=0.17d,f, d=0.02d,f,i d=0.26d,g,i Body mass index (BMI) d=0.42d,f,j d=0.12d,f,h d=0.19d,g,h
Turner-McGrievy	RCT	Intervention	Podcast + mobile	Weight loss d=0.02e,f

and Tate [65] Mobile POD	Weight loss	n=47 Control n=49	were 3.5 times more likely than podcast to use intervention	$d=0.02_{e,f}$ $d=0.00_{d,g}$ $d=0.00_{d,g}$
Laing et al [66] My-FitnessPal	RCT Weight loss and dietary intake	Intervention n=105 Control n=107	Significant increase in self-monitoring of calorie intake	N/A
Arean et al [67] Project: EVO iPST Health Tips	RCT Depression	Intervention (a) n=209 Intervention (b) n=211 Control n=216	Cognitive control (CC) + problem-solving therapy (PST) had a greater effect on mood than information control (IC)	Patient Health Questionnaire -9 (PHQ-9) $d=0.81_{b,f}$ $d=1.02_{d,f}$ $d=0.96_{b,f}$ $d=1.22_{d,f}$ $d=0.12_{a,g}$ $d=0.20_{b,g}$ $d=0.32_{d,g}$
Kinderman et al [68] Catch it	Within-group Depression	Intervention n=285 Control N/A	Negative mood decreased and positive mood increased	Negative and positive mood $d=0.69_{a,f}$ $d=0.17_{a,f}$
Kuhn et al [69] PTSD Coach	Within-group and Qualitative Post-traumatic stress syndrome (PTSD)	Intervention n=45 Control N/A	Results show app is an effective self-management tool for PTSD	N/A
Proudfoot et al [70] myCompass	RCT Depression + anxiety + stress	Intervention (a) n=242 Intervention (b) n=248 Control n=230	Results show significantly greater improvement in depression, anxiety, and stress and social functioning symptoms. Symptoms remained same at 3-month follow-up	Depression and Anxiety Stress Scale (DASS) Depression (myCompass) $d=0.50_{a,f}$ $d=0.34_{b,f}$ $d=0.46_{a,g}$ (Attention control) $d=0.13_{a,f}$ $d=0.27_{b,f}$ $d=0.10_{a,g}$ DASS Anxiety

				(myCompass) d=0.25[a,f] d=0.52[b,f] d=0.46[a,g] (Attention control) d=0.13[a,f] d=0.27[b,f] d=0.13[a,g] DASS Stress (myCompass) d=0.41[a,f] d= 0.47[b,f] d=0.35[a,g] (Attention control) d=0.20[a,f] d=0.27[b,f] d=0.35[a,g]
Pramana et al [71] SmartCAT	Within-group Anxiety	Intervention n=9 Control N/A	App was highly usable and reduced childhood anxiety with brief cognitive behavioral therapy (CBT)	N/A
Whittaker et al [57] MEMO	RCT Depression	Intervention n=426 Control n=429	Significantly assisted participants to rid their selves of negative thoughts	Increased positivity d=1.19[a,g,j] Use the Internet safely d=3.37[a,g,j]
Kauer et al [72]	RCT Depression	Intervention n=69 Control n=49	Indirect effect of intervention on depressive symptoms via Emotional Self Awareness (ESA) statistically significant	DASS Stress: d=0.37[a,f] d=0.59[b,f,j] d=0.14[a,g] d=0.22[b,g] DASS Anxiety: d=0.31[b,f] d=0.45[b,f,h] d=0.25[a,g] d=0.07[b,g] DASS Depression: d=0.34 d=0.64[b,j] d=0.11[a,g]

				d=0.09[b,g] ESA: d=0.31[a] d=0.66[b,h] d=0.09[a,g,j] d=0.58[b,g,h]
Watts et al [27] Get Happy programme	RCT Depression	Intervention n=22 Control n=30	Mobile and computer groups had statistically significantly benefits in PHQ-9 posttest. This remained true still at 3-month follow-up	PHQ-9 d=1.56[a,f,j] d=-0.14[a,g] d=1.69[b,f,j] d=-0.28[b,g] Beck Depression Inventory-II (BDI-II) d=1.90[a,f,j] d=-0.11[a,g] d=2.11[b,f,j] d=-0.48[b,g]
Ben-Zeev et al [73] FOCUS	Within-group Schizophrenia	Intervention n=33 Control N/A	FOCUS shown significant reductions in psychotic symptoms, depression, and general psychopathology after 1-month usage	BDI-II d=0.50[a,e,g] Positive and Negative Syndrome Scale (PANSS) Positive scale d=0.70[a,e,h] Negative scale d=0.20[a,e] General psychopathology scale d=0.73[a,e,g]
Torous et al [74] Mindful Moods	Within-group Major depressive disorder (MDD)	Intervention n=13 Control N/A	High adherence and perceived levels of confidentiality	N/A
Hidalgo-Mazzei et al [75] SIMPLe	Within-group Psychoeducation	Intervention n=51 Control N/A	Feasible intervention for self-management in bipolar	N/A

Pham et al [76] Flowy	RCT Common mental health disorders	Intervention n=31 Control n=32	High usage and reduction in anxiety, panic, and self-report hyperventilation scores	Generalized anxiety disorder-7 (GAD-7) d=0.41$_{a,f}$ d=0.03$_{a,g}$ Panic Disorder Severity Scale-Self Report (PDSS-SR) d=0.30$_{a,f}$ d=0.21$_{a,g}$ Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q-SF) d=0.50$_{a,g,h}$ d=0.51$_{a,g,h}$
Ly et al [77] Unnamed	RCT Stress	Intervention n=36 Control n=37	Mobile app stress intervention based on Acceptance and Commitment Therapy (ACT) reduces perceived stress and increase general health	Generalized Health Questionnaire (GHQ-12) d=0.41$_{a,f}$ d= 0.37$_{a,g}$ Perceived Stress Scale-14 (PSS-14) d= 0.50$_{a,f}$ d= 0.62$_{a,g}$ Multifactor Leadership Questionnaire (MLQ, trans) d=0.49$_{a,f}$ d=0.35$_{a,g}$

[a] immediately posttest.
[b] 1-month follow-up
[c] 2-month follow-up.
[d] 3-month follow-up.
[e] 6-month follow-up.
[f] within-group effect.
[g] between-group effect.
[h] P<.05.
[i] P<.01.
[j] P<.001.

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