

Multimedia Appendix 2. Characteristics of all included studies

First author (year)	Study Design and Intervention Duration	Sample Size	Diabetes Type	Intervention Group and Comparison Group Characterization	Outcomes	Sample Characteristic
Quinn et al (2008) [1]	2-arm Multicenter RCT; 3 months.	I: N=13 C:N=13	T2D	IG: 1.Real time feedback on blood glucose levels. 2. Medication regimens display. 3. Hypo- and hyperglycemia treatment algorithms. 4. Access to additional data. CG: NR (Received a glucometer).	HbA _{1c} ; Change in medication; Diabetes self-care (SDSCA questionnaire).	Age:51.04±11.03 Female:65% Race/Ethnicity:62% AA; 38% white (non-Hispanic) Diabetes Duration: 9.31±NR A1c eligibility:≥7.5% within three month Low Income: NR Setting: Three community physician practices Subject attrition:13.33%
Quinn et al (2011) [2, 3]	4-arm cluster RCT; 12 months.	I:N=56 C:N=51 (12 month	T2D	IG (maximal intervention): 1.Text message reminders and coaching.	HbA _{1c} ; Diabetes Distress Scale; Diabetes	Age:52.57±8.18 Female:51.28% Race/Ethnicity:37.29% black (non-

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		s)		2. Blood and medication monitoring. 3. Web portal with secure messaging, medical knowledge database. 4. Access to analyzed personal health records CG: Usual care.	symptom inventory; Depression (PHQ-9) □ Systolic blood pressure; Diastolic blood pressure; LDL; HDL; Triglycerides; Total cholesterol.	Hispanic); 55.08% white (non-Hispanic); 7.63% other Diabetes Duration: 8.58 ± 6.15 A1c eligibility: ≥ 7.5% within 3 month Low Income: NR Setting: Primary care practice Subject attrition: 9.32% (12 month)
Kirwan et al (2013) [4]	2-arm RCT, nine months.	I: N=25 C: N=28	T1D	IG: 1. Personal health records (blood glucose levels, insulin dosages, other medication, diet, physical activity). 2. Access to personal data via customizable	HbA _{1c} ; Summary of Diabetes Self Care Activities (SDSCA, include general diet, specific	Age: 35.20 ± 10.43 Female: 61.11% Race/Ethnicity: NR Diabetes Duration: 18.94 ± 9.66 A1c eligibility: ≥ 7.5% Low Income: NR

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				graph, and data transfer via email. 3. At least one personalized text-message communication per week for the first six months (feedback on logs, diabetes questions, educational tips, positive reinforcement). CG: Usual care (included a visit to primary diabetes health care practitioner every three months)	diet, exercise, glucose testing); Diabetes Empowerment Scale (DES-SF); Diabetes Quality of Life (DQOL); Worry.	Setting: Freely online randomization program Subject attrition: 26.39%
Orsama et al (2013) [5]	2-arm RCT, approximate ly ten months.	I:N=24 C:N=24	T2D	IG: 1. Personal health-related parameters monitoring (and remote reporting).	Change in HbA _{1c} ; change in weight; change in	Age:61.90±7.83 Female:45.83% Race/Ethnicity: NR Diabetes Duration:

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				2. Automatically generated messages (theory based, rich information, behavioral skill feedback) linked to patients' remote reports. 3. Access to personal health records. CG: Standard medical care (including diabetes education, annual checkups, diabetes guidance).	systolic blood pressure; change in diastolic blood pressure.	NR A1c eligibility: ≥6.5% Low Income: NR Setting: NR Subject attrition: 14.29%
Holmen et al (2014) [6-8]	3-arm RCT, 12 months.	I:N=40 C:N=41	T2D	IG2: 1. Blood glucose level measuring with wireless data transfer; 2. Diet manual, physical activity registration, and personal goals management;	HbA _{1c} ; weight; BMI; Self-management (heiQ); Health-related quality of life (SF-36);	Age: 56.73 ± 12.10 Female: 45.00% Race/Ethnicity: NR Diabetes Duration: NR A1c eligibility: ≥7.1% Low Income: NR

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				3. Operated using a diabetes diary app; 4. Health counseling (based on behavior change theory for the first four months). CG: Usual care (by a general practitioner).	Depressive symptoms (CES-D)□ Lifestyle changes (dietary habits and physical activity).	Setting: Study centers in collaboration with a general practitioner; and public health clinics in the municipalities. Subject attrition: 19.00%
Waki et al (2014) [9]	2-arm RCT, three months	I:N=27 C:N=27	T2D	IG: App (1.Health data monitoring; 2.Exercise and diet information records. 3. Email and lifestyle modification advice; 4.Dietary evaluation). CG: Usual care, continue their self-care regimen.	HbA _{1c} ; Fasting blood sugar; LDL; HDL; Triglyceride; BMI; Blood pressure; Change in medication; Diabetes self-management (diet, exercise).	Age:57.25±9.72 Female:24.07% Race/Ethnicity: NR Diabetes Duration:9.05±7.47 A1c eligibility: No limitation Low Income: NR Setting: Home based Subject attrition: 0%

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Block et al (2015) [10]	2-arm RCT, 6 months.	I:N=14 2 C:N=15 0	Prediabetes	IG: 1. Tailored behavioral support; 2. Goal setting via emails; 3. Health-related parameters' tracking; 4. Provide relevant information on diabetes; 5. Social support through virtual teams; 6. Modest monetary rewards and team competition; 7. Feedback on goal achievement. CG: Usual-care.	HbA _{1c} , change in fasting glucose; weight; BMI; waist circumference; TG/HDL ratio; Framingham diabetes risk score.	Age:55±8.9 Female:31.3% Race/Ethnicity: NR Diabetes Duration:67.6% white;6.2% Hispanic;20.6% Asian; 5.6% other A1c eligibility: Fasting glucose or HbA1c in the prediabetes' range Low Income: NR Setting: NR Subject attrition:13.86%(6 months)
Fukuoka et al (2015) [11]	2-arm RCT, 5 months.	I:N=31 C:N=30	Prediabetes	IG: 1.In-person lifestyle intervention; 2. iPhone with the mDPP trial app (short	Weight change; BMI change; HbA _{1c} ; Other diabetes risk	Age: 55.2±9.0 Female:77.0% Race/Ethnicity:22.9 % Asian;

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				educational video clips and texts, daily messages); 3.Mobile weight diary and activity/caloric diary, physical activity records, tailored feedback; 4. Home-based physical activity plan. CG: Standard medical care.	factors (hip circumference, blood pressure, DBP, lipid panel, glucose), dietary behavior, physical activity, barriers, social support, and depression.	4.9%African American; 11.5%Hispanic;52.5 %white(non-Hispanic);8.2% more than 1 race Diabetes Duration: NR A1c eligibility:5.7%-7.0% Low Income: NR Setting: Home based. Subject attrition: 0%
Karhula et al (2015) [12]	2-arm RCT, 12 months.	I:N=16 2 C:N=63	T2D and Heart disease	IG: 1.Regular intervals personal health coach (every 4 to 6 months, the coach provided information, assistance, and support to the patients); 2.Goal setting based on	Health-related quality of life (SF-36); clinical outcomes (blood pressure, weight, waist circumference,	Age:66.29±8.61 Female: 44.4% Race/Ethnicity: NR Diabetes Duration: NR A1c eligibility:≥6.5% within one year Low Income: NR

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				<p>patients health condition;</p> <p>3. Personal health recording and health parameters monitoring (data transferred to the individual health records center by SMS automatically or mobile phone once a week);</p> <p>4. Information provided for increasing patients' knowledge of their chronic disease.</p> <p>CG: Standard care (include disease management information booklet, laboratory tests once a year, one appointment or phone call by</p>	<p>triglycerides, total cholesterol, LDL, HDL).</p>	<p>Setting: South Karelia Social and Health Care District (Eksote) in Finland</p> <p>Subject attrition: 10.00%</p>

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Skrøvseth et al (2015) [13]	Randomized stepped-wedge trial with two groups, About five months. (T1:13 weeks, about three months).	I:N=11 C:N=11	T1D	healthcare givers, freely contact health care services any time). IG: 1. Blood glucose data records, daily graph; 2. Data-driven feedback (weekly diagram were presented to the users); 3. Medication reminder; 4. A smartphone application called Diabetes Dairy. CG: A smartphone application called Diabetes Dairy.	HbA _{1c} ; out of range events.	Age: 39.70±10.8 Female: 63.33% Race/Ethnicity: NR Diabetes Duration: At least one year A1c eligibility: NR Low Income: NR Setting: NR Subject attrition: 27%
Wayne et al (2015) [14]	2-arm RCT, 2 centers, 6 months.	I:N=48 C:N=49	T2D	IG: Health coach of smartphone interaction (1. Decision support: health goals; 2. Action support: goal achievement; 3.	HbA _{1c} ; weight; waist circumference; BMI; psychometric questionnaires	Age: 53.2±11.3 Female: 72% Race/Ethnicity: 1% Frisnations; 5% Black: African; 40% Black: Caribbean;

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				<p>37min/week (SD 22) of interaction (mean); 4. Samsung Galaxy Ace 2, connected wellness platform account; 5. Tracking/monitoring of meals, exercise, blood glucose, and mood). CG: Health coach without smartphone interaction (1. Decision support: health goals; 2. Action support: goal achievement; 3. 39min/week (SD 28) of interaction (mean); 4. Verbal discussion of meals, exercise, blood glucose, and mood).</p>	<p>(Hospital Anxiety and Depression Scale; Positive and Negative Affect Schedule; Short Form Health Survey-12)</p>	<p>27% Caucasian; 9% Hispanic; 4% South Asian; 4% South East Asian; 6% West Indian; 3% Other Diabetes Duration: NR A1c eligibility: $\geq 7.3\%$ within one month Low Income: Yes (90% participants were from a lower-income neighborhood, and 10% participants were from a midlevel-SES community) Setting: 2 primary health clinics Subject</p>

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Weegen et al (2015) [15]	3-arm clustered RCT, 9 months.	I:N=52 C:N=65	T2D and COPD	IG 1: 1. Dialogue sessions and feedback on app and website (Tool); 2. Behavioral change consultations in general practice (SSP). CG: Usual care.	Physical activity moderate and vigorous; Self-efficacy (General self-efficacy scale, Exercise self-efficacy scale); Quality of life (RAND physical component, RAND Mental component).	attrition:26% Age:58.37±7.28 Female:53.38% Race/Ethnicity:6.02 % Origin non-Dutch Diabetes Duration: NR A1c eligibility: NR Low Income: NR Setting: 24 practices in 2 blocks Subject attrition:12.03%
Zhou et al (2016) [16]	2-arm RCT, 3 months.	I:N=50 C:N=50	T1D and T2D (18 T1D, 82 T2D)	IG: Welltang application (consists of three main parts: knowledge, self-management, and communication between patients and	HbA1c, FBG, 2h-BG, weight, BMI, waist circumference, hip circumference,	Age: 54.25±12.71 Female: 43% Race/Ethnicity: NR Diabetes Duration: NR A1c eligibility: NR

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				clinicians): 1. Knowledge of diet, exercise, medicine, blood glucose monitoring and the last guidelines for diabetes care as summaries; 2. Self-management, self-care data records, patients have access to their self-care data; 3. Communication between patients and clinicians, the study team provided feedback on the blood glucose levels of patients and personalized medication regimens based on patients' data. CG: Usual care (did not	systolic blood pressure, diastolic blood pressure, diabetes knowledge score, self-care behaviors score, hypoglycemic events, LDL-C.	Low Income: NR Setting: Hospital Subject attrition:0%

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Plotnikoff et al (2017) [17]	2-arm RCT, 5 months.	I:N=28 C:N=32	T2D (at risk of, or diagnosed with T2D)	use the Welltang application). IG: 1.Phase 1 (weeks 1-10): (1) face-to-face group sessions which included cognitive mentoring sessions and outdoor PA sessions; (2) eCoFit smartphone app: (a) A description of where and how to use the outdoor physical environment (e.g., park benches) to be physically active; b) 'eCoFit challenges' in 11 different park locations; c) 'Indoor Challenges' which provided aerobic and RT PA sessions that can be completed	Aerobic fitness; lower body muscular fitness, chair stand test; physical activity; functional mobility; upper body muscular fitness, arm curl test; waist circumference; BMI; systolic blood pressure; diastolic blood pressure.	Age: 44.7±14.0 Female:70.2% Race/Ethnicity:83.3% Australian; 3.6% Asian; 8.3% European; 1.2% African; 3.6% Other Diabetes Duration: NR A1c eligibility: including but not limited to HbA1c level >7.0 Low Income: NR Setting: NR Subject attrition:28.57%

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Spring et al (2017)	3-arm RCT, 12 months.	I:N=31 C:N=24	Obesity	indoors or at home; d) A function to set weekly PA goals (options: when, where, with whom, and what I will do to make it happen) and self-monitor the progress; e) 'FitMind Challenges' which involved short tasks to increase motivation, overcome barriers, and develop positive PA behaviors; and f) Links to social media.); 2. Phase 2 (week 11-20): eCoFit smartphone app; CG: NR.	Weight change.	Age: 40.25±10.82 Female:85.95%

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[18]				group (TECH) received eight in-person group treatment sessions; 2. TECH used a smartphone application with social networking features and wireless accelerometer. CG: Self-guided (used paper diaries to self-monitor diet, activity, and weight).		Race/Ethnicity: 14.05% Hispanic or Latino; 85.95 Other Diabetes Duration: NR A1c eligibility: NR Low Income: NR Setting: NR Subject attrition: 14.06%
Bao et al (2017) [19]	2-arm RCT, 3 month.	I:N=50 C:N=53	T2D	IG: 1. Regular dietary intervention as a control group; 2. Smartphone application for diabetes management (knowledge about diabetes, daily care, physical activity	FPG; 2h PBG; HbA1c; TC; TG; HDL; LDL.	Age: 58.39±11.21 Female: 46.36% Race/Ethnicity: NR Diabetes Duration: NR A1c eligibility: By Chinese T2D prevention guideline Low Income: NR

First author (year)	Study Design and Intervention Duration	Sample Size	Diabetes Type	Intervention Group and Comparison Group Characterization	Outcomes	Sample Characteristic
				records, self-monitoring, personalized diet recommendation based on patients health condition and physicians support). CG: Normal dietary intervention (provided dietary health education handbook).		Setting: Hospital Subject attrition: 6.36%
Kennelly et al (2018) [20]	2-arm RCT,	I:N=24 1 C:N=25 7	Pregnant women (at risk of gestational diabetes mellitus)	IG: The intervention consisted of specific dietary and exercise advice that addressed behavior change supported by a tailor-designed smartphone application. CG: Usual care.	The incidence of GDM (at 28-30 weeks of gestation); gestational weight gain; dietary glycemic index; glycemic load; exercise; mid-	Age:32.44±4.41 Female:100% Race/Ethnicity:91.15% Caucasian; 8.85% Other Diabetes Duration: NR A1c eligibility: NR Low Income: NR Setting: Hospital

First author (year)	Study Design and Intervention Duration	Sample Size	Diabetes Type	Intervention Group and Comparison Group Characterization	Outcomes	Sample Characteristic
					upper arm circumference; body fat mass; blood loss at delivery; postpartum hemorrhage; antenatal admissions; maternal lipid profile; glucose homeostasis; prenatal and postnatal characteristics.	Subject attrition: 11.86%
Rossi et al (2010) [21]	2-arm RCT, six months	I: N=67 C: N=63	T1D	IG: The intervention (DID system) consists of: 1. Blood glucose value records and a dose of insulin injections in real	HbA _{1c} ; FBG; Systolic blood pressure; Diastolic blood pressure; Total cholesterol;	Age: 35.7±9.4 Female: 56.92% Race/Ethnicity: NR Diabetes Duration: 16.5±10.5 A1c eligibility: NR

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				time; 2. The suggestion of daily carbohydrate intake, summing the amount of carbohydrate consumed progressively; 3. Short text messages for patients and physicians' communication improvement. CG: Standard care.	HDL cholesterol; LDL cholesterol; Triglycerides; Weight; DTSQ; SF-36	Low Income: NR Setting: Seven diabetes outpatients clinics Subject attrition:8.46%
Rossi et al (2013) [22]	2-arm RCT, six months	I: N=63 C: N=64	T1D	IG: The intervention consists of: 1. Patients had three prandial injections per day of insulin glulisine associated with basal insulin glargine; 2. Use DID system, as	HbA _{1c} ; FBG; Blood glucose; MAGE; Body weight; Insulin mean daily dose; SBP; DBP; Total cholesterol;	Age: 36.9±10.5 Female:52,76% Race/Ethnicity: NR Diabetes Duration: 16.3±9.3 A1c eligibility: ≥7.5% Low Income: NR Setting: 12 diabetes

First author (year)	Study Design and Intervention Duration	Sample Size	Diabetes Type	Intervention Group and Comparison Group Characterization	Outcomes	Sample Characteristic
				previously mentioned. CG: Standard care	HDL-cholesterol; LDL-cholesterol; Triglycerides; DTSQ; DSQOLS	clinics Subject attrition:11.81%
Charpentier et al (2011) [23]	3-arm RCT, six months	I: N=56 C: N=60	T1D	IG: 1. A smartphone loaded with the Diabeo software (record SMPG level before meals, carbohydrate counts, and planned physical activity); 2. Face-to-face follow-up visits CG: Standard care (paper logbook, attend two follow-up visits at the hospital)	HbA _{1c} ; SMPG; insulin dose modification; QOL;	Age:34.87±13.06 Female:63.64% Race/Ethnicity: NR Diabetes Duration: 17.25±9.71 A1c eligibility: ≥8% Low Income: NR Setting: 17 hospital sites in France Subject attrition:4.13%
Faridi et al (2008)	2-arm RCT, three	I: N=15 C:	T2D	IG: The NICHE technology for type 2	HbA _{1c} ; BMI; weight; Blood	Age:56±9.55 Female:63.33%

First author (year)	Study Design and Intervention Duration	Sample Size	Diabetes Type	Intervention Group and Comparison Group Characterization	Outcomes	Sample Characteristic
[24]	months	N=15		diabetes management: tailored feedback and reminders based on patient-specific data; CG: Standard diabetes self-management and tracked their step count using a pedometer.	pressure (systolic, diastolic); DSES; SDSC; YPAS; Pedometer step count	Race/Ethnicity: NR Diabetes Duration: NR A1c eligibility: NR Low Income: NR Setting: Primary care network in the USA Subject attrition:0%
Nagrebetsky et al (2013) [25]	2-arm RCT, 12 months	I: N=7 C: N-6	T2D	IG: Intervention group patients followed a stepwise treatment plan for titration of oral glucose-lowering medication with self-monitoring of glycemia using real-time graphical feedback on a mobile telephone and remote nurse monitoring using a Web-based tool;	HbA _{1c}	Age: 58±11 Female: 29% Race/Ethnicity:100% White Diabetes Duration: at least three months A1c eligibility: ≥8.0%, □11.0% Low Income: NR Setting: general practices in the UK Subject attrition:7.14%

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Yoo et al (2009) [26]	2-arm RCT, three months	I: N=57 C: N=54	T2D	CG: Standard care. IG: Intervention group patients use a UCDC system: 1. The UCDC system sent an alarm on the cellular phone to remind the participant to measure their blood glucose, blood pressure, and weight; and automatically sent the results to a central study database. Received messages of encouragement, reminders, and recommendations; 2. Automatically recorded participant's exercise time using the SMS messages;	Weight; BMI; Waist circumference; Systolic blood pressure; Diastolic blood pressure; Right baPWV; Left baPWV; HbA _{1c} ; Fasting glucose; HOMA-IR; Total cholesterol; HDL-cholesterol; LDL-cholesterol; Triglyceride; Adiponectin; hsCRP;	Age: 58.17±8.81 Female: 41.44% Race/Ethnicity: NR Diabetes Duration: 6.58±5.71 A1c eligibility: 6.5-10.0% Low Income: NR Setting: A university hospital and a community healthcare center Subject attrition:9.76%

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				3. Participants received information via SMS three times a day regarding healthy diet and exercise methods, along with general information about diabetes, hypertension, and obesity; CG: Usual care.	Interleukin-6	

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