Table 1. Summary of Studies Included in the Meta-Analysis.

| | Study | ES | V | N | Age | Subgroup | Topic | Theory | Use Type | Outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Abraham (2015) [58] | 0.58 | 0.10 | 32 | 14.4 | Obesity clinic patients | Obesity - BMI, physical activity | HBM, TTM, SCT, CIPT | SMS | BMI |
| 2 | Allman-Farinelli (2016) [74] | 0.38 0.42 | 0.02 0.02 | 248 | 27.6 | Overweight/obese young adults | Obesity - nutrition, physical activity | TTM | SMS | Weight |
| 3 | Arora (2014) [80] | 0.21 | 0.03 | 128 | 50.7 | ED patients with diabetes | Diabetes management | HBM | SMS | HbA1c |
| 4 | Baron (2016) [59] | 0.23 | 0.05 | 81 | 57.1 | Patients with poorly controlled diabetes | Diabetes management | SCT, illness beliefs model, TAM | Telehealth | HbA1c |
| 5 | Bell (2012) [88] | 0.00 0.05 0.24 | 0.06 0.06 0.06 | 64 | 58 | Patients with poorly controlled diabetes | Diabetes management | | SMS (video) | HbA1c |
| 6 | Bhati (2015) [45] | 0.25 | 0.12 | 34 | 26.6 | First-time mothers | Mental health & postpartum depression | HBM | SMS & app | Sleep disturbance |
| 7 | Block (2015) [8] | 0.60 1.65 | 0.01 0.02 | 339 | 55 | Pre-diabetic individuals | Diabetes risk - physical activity, healthy eating, weight loss | Learning theory, SCT, TPB | App | HbA1c Fasting glucose |
| 8 | Bobrow (2016) [89] | 0.09 0.13 | 0.00 | 915 | 54.3 | Adult clinic patients with hypertension | Hypertension - systolic blood pressure | IBM | SMS | Systolic blood pressure |
| 9 | Chau (2012) [60] | -.47 0.38 | 0.19 0.10 | 40 | 72.9 | COPD patients | Self-care management for older adults with COPD | SMT, SCT | Tracking oxygen saturation, pulse rate, and respiration rate | Hospital readmissions, Pulmonary function |
| 10 | Cho (2009) [26] | 0.27 -0.24 -0.17 | 0.06 0.06 0.06 | 69 | 48.2 | Type 2 diabetes patients | Diabetes management | | SMS & Telehealth | HbA1c Mean fasting plasma glucose 2-hr postprandial glucose |

| # | Author (Year) | | | | | Population | Intervention focus | Theory | Delivery | Outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Choi (2016) [57] | 0.22 | 0.13 | 30 | 33.7 | Pregnant women | Physical activity, depressive symptoms | SCT | App | Depressive symptoms |
| 12 | Chow (2015) [61] | 0.15 | 0.01 | 710 | 57.6 | CHD patients | CHD risk (including BMI) and health behaviors | Control theory, IMBSM, SCT, TPB, TRA | SMS | Cholesterol, BP, BMI, physical activity, diet, medications |
| 13 | Cingi (2015) [90] | 0.59 | 0.03 | 139 | 31.1 | Allergic rhinitis patients | Allergic rhinitis management & medication | | App | QOL |
| | | 0.77 | 0.05 | 89 | 32.8 | Asthma patients | Asthma management & medication | | | Asthma control |
| 14 | Cobb (2014) [62] | 0.15 | 0.00 | 1502 | 42.5 | Adults | Well-being | Game mechanics, SCT | | Well-being |
| 15 | Constant (2014) [83] | 0.26 | 0.01 | 381 | 25.8 | Women undergoing abortion | Support for women undergoing abortion | | SMS | Anxiety |
| | | 0.10 | 0.01 | | | | | | | Socially negative emotions |
| | | 0.17 | 0.01 | | | | | | | Internally negative emotions |
| 16 | De Niet (2012) [39] | 0.05 | 0.03 | 141 | 9.9 | Overweight/obese children | Lifestyle behavior and weight maintenance for overweight/obese children | Social learning theory, SCT, SRT | SMS | BMI |
| 17 | DeVito Dabbs (2016) [91] | 0.18 | 0.04 | 201 | 62 | Lung transplant recipients | Self-management after transplant | Orem's theory of self-care | App | Re-hospitalization |
| 18 | Direito (2015) [79] | 0.45 | 0.12 | 34 | 15.7 | Inactive healthy adults | Physical activity | SRT | App | Cardiorespiratory fitness |
| | | 0.36 | 0.13 | 32 | | | | | | |
| 19 | Du (2016) [7] | -.41 | 0.07 | 60 | 36 | Adults | Physical activity and nutrition | TPB, SCT | App | Perceived stress |
| | | -.62 | 0.07 | 64 | | | | | SMS (video) | A1c |
| | | 0.20 | 0.07 | 60 | | | | | App | Cardiorespiratory fitness |
| | | 0.00 | 0.06 | 64 | | | | | | |
| 20 | Fountoulakis (2015) [63] | 1.01 | 0.05 | 105 | 55.3 | Diabetes patients with inadequate glycemic control | Diabetes management | SMT, SCT | Telemonitoring | HbA1c |
| | | 0.68 | 0.05 | | | | | | | |

| # | Study | | | | | Population | Domain | Theory | Technology | Outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| 21 | Frederix (2015) [64] | 0.34 | 0.03 | 139 | 61 | CVD patients | CVD | SMT, SCT | Telemonitoring & SMS | Peak aerobic capacity |
| 22 | Gamito (2014) [92] | -0.21 | 0.07 | 54 | 45.5 | Patients with Alcohol Dependence Syndrome | Alcohol dependency | | Apps for cognitive functioning | General cognitive abilities |
| 23 | Hebden (2014) [75] | 0.12 | 0.08 | 51 | 22.8 | Young adults | Physical activity, eating behaviors | TTM | App & SMS | BMI |
| 24 | Heber (2016) [25] | 0.94 | 0.02 | 264 | 43.3 | Employees with stress symptoms | Stress | Lazarus's transactional model of stress | SMS | Perceived stress |
| | | 1.10 | 0.02 | | | | | | | |
| 25 | Holmen (2014) [77] | -.01 | 0.05 | 81 | 57 | Diabetics with elevated HbA1C | Diabetes self-management | TTM | App | HbA1c |
| | | 0.13 | 0.05 | | | | | | | |
| 26 | Hsu (2016) [93] | 0.65 | 0.11 | 40 | 53.6 | Patients with Type 2 diabetes | Diabetes medication management | Cognitive apprenticeship model, situated learning theory | App, in-app texts, & virtual visits | HbA1c |
| 27 | Hurling (2007) [85] | 0.45 | 0.06 | 77 | 40.4 | Healthy adults | Physical activity | Social comparison, decisional balance, ELM, goal theory | App | BMI |
| | | 0.49 | 0.06 | | | | | | SMS | Body fat |
| | | 0.01 | 0.05 | | | | | | App | Diastolic BP |
| | | 0.03 | 0.05 | | | | | | | Systolic BP |
| 28 | Irvine (2015) [40] | 0.21 | 0.01 | 398 | | Adults with back pain | Low back pain | SCT, TPB | App | Back pain |
| | | 0.23 | 0.01 | | | | | | | |
| | | 0.21 | 0.01 | | | | | | | |
| | | 0.23 | 0.01 | | | | | | | |
| | | 0.10 | 0.01 | | | | | | | |
| | | 0.28 | 0.01 | | | | | | | Functionality, QOL, well-being |
| | | 0.11 | 0.01 | | | | | | | |
| | | 0.30 | 0.01 | | | | | | | |
| 29 | Istepanian (2009) [65] | 0.24 | 0.02 | 137 | 58.6 | Diabetes patients | Diabetes self-management | SMT, SCT | Telemonitoring | HbA1c |
| 30 | Johnson (2016) [66] | 0.45 | 0.04 | 87 | 14.1 | Adolescents | Medication adherence | SMT, SCT | App & SMS | QOL |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Kamal (2015) [67] | 0.27 | 0.02 | 200 | 56.9 | Stroke survivors | Medication adherence | HBM, SCT | SMS | Diastolic BP |
| 32 | Karhula (2015) [87] | 0.00 | 0.02 | 201 | 66.2 | Heart disease patients | Health-related QOL for diabetic patients | Wagner's chronic care model | App for Telemonitoring | Physical QOL |
| | | -.09 | 0.02 | 204 | | | | | | Mental QOL |
| | | 0.15 | 0.02 | 230 | 69.1 | Diabetes patients | Health-related QOL for heart disease patients | | | Physical QOL |
| | | -.07 | 0.02 | | | | | | | Mental QOL |
| 33 | Kerr (2016) [42] | 0.12 | 0.02 | 147 | 24.6 | Young adults | Diet/nutrition | SDT | App & Text | Body weight |
| | | 0.39 | 0.02 | 141 | 24.3 | | | | App | |
| 34 | Kim (2010) [99] | 0.34 | 0.09 | 92 | | Patients with Type 2 diabetes | Diabetes management | | SMS & Telehealth | HbA1c |
| 35 | Kirwan (2013) [68] | 1.33 | 0.08 | 60 | 35.2 | Patients with diabetes | Diabetes self-management | SMT, SCT | App & Text | HbA1c |
| | | 1.33 | 0.09 | 53 | | | | | | |
| 36 | Laing (2014) [69] | 0.10 | 0.02 | 162 | 43.3 | Adults with BMI > 25 | Weight loss | SCT, SRT | MFP app | Weight loss |
| | | 0.08 | 0.02 | 157 | | | | | | |
| 37 | Lappalainen (2013) [48] | 0.39 | 0.17 | 23 | 47.1 | Males with stress, exhaustion, or sleeping problems | Stress-related problems | | App | Psychological symptoms |
| | | 0.56 | 0.18 | | | | | | | Depression |
| 38 | Lee (2017) [86] | 0.28 | 0.07 | 59 | 52.6 | Female workers | Stretching | SCT, social support | SMS | Flexibility |
| | | 0.33 | 0.07 | | | | | | | Back strength |
| | | 0.13 | 0.13 | | | | | | | Flexibility |
| | | 0.19 | 0.07 | | | | | | | Back strength |
| | | 0.20 | 0.08 | | | | | | | Flexibility |
| | | 0.49 | 0.08 | | | | | | | Back strength |
| | | 0.10 | 0.08 | | | | | | | Flexibility |
| | | 0.05 | 0.08 | | | | | | | Back strength |
| 39 | Lee (2014) [47] | 0.53 | 0.06 | 65 | 48 | BPS/IC patients | Alleviate pain and increase QOL | | SMS | Physical function |
| | | -.45 | 0.06 | | | | | | | Role physical |
| | | 0.71 | 0.06 | | | | | | | Bodily pain |
| | | 0.64 | 0.06 | | | | | | | General health |
| | | 0.90 | 0.06 | | | | | | | Vitality |
| | | 0.60 | 0.06 | | | | | | | Social function |
| | | 0.46 | 0.06 | | | | | | | Role emotion |
| | | 0.66 | 0.06 | | | | | | | Mental health |
| 40 | Levy (2015) [94] | 1.39 | 0.14 | 60 | 46.7 | Patients with diabetes | Diabetes management | SMT, SCT | SMS | Reached optimal dose |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 41 | Liguori (2016) [84] | 0.91 | 0.11 | 39 | 8.7 | Children with a planned surgery | Preoperative anxiety | | App | Preoperative anxiety |
| 42 | Liu (2011) [100] | 0.73 | 0.05 | 89 | 52.3 | Patients with moderate to severe asthma | Asthma control | | Phone software program | Respiratory function |
| 43 | Markowitz (2015) [95] | 0.27 | 0.04 | 90 | 18.7 | YYAs with diabetes | Diabetes management | | SMS | PA and healthy food efficacy |
| 44 | McGillicuddy (2013) [43] | 0.96 0.98 | 0.24 0.24 | 19 | 50.42 | Recipients of a kidney transplant | Medical adherence, BP | SDT | SMS | Systolic BP diastolic BP |
| 45 | Mira (2014) [41] | 0.25 0.48 | 0.04 0.04 | 99 | 71.9 | Elderly multi-morbid patients | Medical adherence | | App (ALICE) | Medication error # of missed doses |
| 46 | Montes (2012) [16] | 0.28 0.04 | 0.02 0.02 | 251 | 39.7 | Adults with schizophrenia | Medical adherence | | SMS | QOL |
| 47 | Newton (2014) [37] | 0.20 | 0.15 | 27 | 8.7 | Sedentary children | Physical activity | SCT | SMS | Sedentary time |
| 48 | Newton (2009) [97] | -0.09 0.03 0.43 | 0.05 0.05 0.05 | 78 | 14.4 | Adolescents with Type 1 diabetes | Diabetes management | | SMS & pedometer | A1c |
| 49 | Nguyen (2013) [70] | -.08 0.22 | 0.04 0.04 | 83 | 14.1 | Overweight or obese youth | Weight loss | SCT | SMS | Body weight |
| 50 | Oh (2015) [34] | 0.44 0.44 | 0.01 0.01 | 140 | 9.9 | Obese patients | Weight control | | SMS | Body weight |
| 51 | Patrick (2013) [38] | 0.27 0.25 0.30 0.44 | 0.09 0.10 0.09 0.10 | 334 46 | 48.42 14.13 | Adolescents at risk of diabetes | Weight control | Behavioral determinants model and TTM | SmartCare app SMS | Body weight BMI |
| 52 | Patrick (2009) [35] | 0.62 | 0.08 | 46 | 44.9 | Overweight adults | Weight loss | SMT, SCT | SMS | Body fat |
| 53 | Petrella (2014) [96] | -.30 | 0.03 | 127 | 56.74 | Adults at metabolic risk | Diabetes management | | App (Healthany-where) | Systolic BP |
| 54 | Proudfoot (2013) [81] | 0.27 0.39 0.06 | 0.01 0.01 0.02 | 321 324 267 | 38.9 | Patients with depression, anxiety or stress | Mental health | | SMS | Depression |
| 55 | Quinn (2008) [71] | 0.79 | 0.14 | 30 | 51.04 | Patients with Type 2 diabetes | Diabetes management | SCT, behavioral theories | Tracking software | A1C |

| # | Study | | | | | Population | Intervention | Theory | Delivery | Outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| 56 | Ramanchandran (2013) [76] | 0.29 | 0.01 | 537 | 46 | Men with impaired glucose tolerance | Diabetes prevention (physical activity & diet) | TTM | SMS | Type 2 diabetes incidence |
| 57 | Reid (2011) [82] | 0.11 | 0.05 | 83 | 18.05 | YYAs with mental health issue | Mental health management | | App | Depression |
| | | 0.09 | 0.05 | 86 | | | | | | |
| | | 0.09 | 0.05 | 78 | | | | | | Emotional self-awareness |
| | | 0.59 | 0.05 | 82 | | | | | | |
| 58 | Shaw (2013) [17] | 0.28 | 0.07 | 60 | 53.3 | Obese adults | Weight loss | Regulatory focus theory, TTM, HTT | SMS | Weight loss |
| | | 0.32 | 0.07 | | | | | | | |
| | | 0.31 | 0.06 | | | | | | | |
| | | 0.38 | 0.06 | | | | | | | |
| 59 | Torbjornsen (2014) [78] | -.17 | 0.05 | 79 | 57 | Patients with Type 2 Diabetes | Self-management | TTM | App | HbA1c levels |
| | | 0.13 | 0.05 | 83 | | | | | | Self-management |
| | | 0.02 | 0.05 | 79 | | | | | | HbA1c levels |
| | | 0.48 | 0.05 | 84 | | | | | | self-management |
| 60 | Watts (2013) [76] | -.04 | 0.17 | 25 | 41 | Patients with depression | Treatment program for depression | | App (Get Happy) | Psychological distress |
| | | -.09 | 0.18 | 23 | | | | | | |
| | | 0.48 | 0.17 | 25 | | | | | | Major depressive disorder |
| | | 1.31 | 0.22 | 23 | | | | | | |
| 61 | Wayne (2015) [44] | 0.45 | 0.04 | 97 | 53.2 | Patients with Type 2 diabetes | Diabetes management | | Connected Wellness Platform | HbA1c levels |
| | | 0.14 | 0.04 | | | | | | | |
| 62 | Yoon (2008) [98] | 1.14 | 0.09 | 51 | 47.2 | Patients with Type 2 diabetes | Diabetes management | | SMS | HbA1c |
| 63 | Youl (2015) [72] | 0.65 | 0.01 | 330 | 32 | Randomly selected adults | Skin cancer prevention and self-examination | SCT | SMS | Skin self-examination |
| | | 0.49 | 0.01 | 512 | | | | | | |
| 64 | Zarina (2016) [73] | 0.27 | 0.06 | 69 | 31.4 | Pregnant women with diabetes | Asthma control and QOL | SMT, SCT | App (Breathe-easy) | Asthma control |
| | | 0.35 | 0.06 | 67 | | | | | | QOL |
| | | 0.58 | 0.06 | 60 | | | Alleviate pain and increase QOL | | | Asthma control |
| | | 0.79 | 0.06 | 67 | | | | | | QOL |

*Note.* The study was named by the first author's last name and the year of publication. SMS = short messaging service. SCT = social cognition theory, IBM = integrated behavioral model, SMT= self-management theory, TPB = theory of planned behavior, TTM = transtheoretical model, HBM = health belief model, SDT= self-determination theory, SRT= self-regulation theory, CIPT = Consumer information processing theory, ELM = elaboration likelihood model, TAM = technology acceptance model, HTT = habituation-tedium theory, IMBSM = information-motivation-behavioral skills model, CVD = cardiovascular disease, QOL = QOL, BMI = body mass index, BP = blood pressure, YYA = youth and young adult.