

Multimedia Appendix 1

Summary of included studies

| First Author and Year | Study Characteristics | | Input | | Intervention | | | Outcome | |
|---------------------------|--|------------------------------------|------------------------------|---|---|---|------------------------|---|---|
| | Participants (Sample Size, Mean Age) | Study Method, Duration | Mode | Content | Mode | Content | Theory ** | Mode of measurement | Content* |
| Block et al., 2015 [11] | U.S. Pre-diabetic patients (N=339, Age=55) | RCT, 1 Year | Text | Weekly weight goal, Diet, Weight, Height | In-App log, In-App feedback, Emails (other notification) | Personalized feedback on diet and risk of diabetes, Goal reviews, Gamification (Progression) | LT, TPB, SCT, SRT, TBC | Blood test and weight check by a scale in a lab | HS: Weight, BMI BO: Glucose level |
| Patrick et al., 2014 [12] | U.S. Obese college students (N=22, Age=22) | RCT, 6 Months | Text | Waist circumference, Diet, Weight, Height | In-App log, In-App feedback, Facebook, SMS, Emails (other notification) | Personalized feedback on diet and weight | SCT, CT, SNT | Self-reported | HS: Weight |
| Martin et al., 2015 [13] | U.S. Obese adults (N = 40, M = 44) | RCT, 12 Weeks | Text | Diet, Weight | In-App log, In-App feedback: "SmartLoss" | Personalized feedback on diet | LT | Self-reported | HS: Weight DBC: Dietary adherence (The changes of the number of days in the calorie zone of adherence, Zone: by fitting an upper and lower curve through the mean absolute error from the recommended calories for women: 1200 kcal/d, and for men: 1400 kcal/d) |
| He et al., 2017 [14] | China, Adults in a WeChat group for weight loss (N=15,310, Age=35) | Propensity score methods, 6 Months | Text message in WeChat group | Diet, Weight | In-App log, In-App feedback in WeChat Group (SNS) | Personalized feedback on weight, and diet, Social support, Gamification (Progression, Quest and challenges) | - | Self-reported | HS: Weight |
| Duncan et al., 2014 [19] | Australia, Middle-aged men (N=301, Age=44) | RCT, 9 Months | Text | Diet, Goals of diet, Weight | In-App log: "ManUp" | Educational information on diet, Goal reviews, Gamification (Progression) | SCT, SRT | Self-reported | DBC: Healthy food intake (the changes in the proportion of participants consuming higher-fiber bread and low-fat milk per day) |

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| Elbert et al., 2016 [20] | Netherlands, Adult (N=146, Age=41) | RCT, 6 Months | Text | Diet (Fruit and Vegetable) | In-App log, In-App feedback, Audio/ Text messages | Personalized feedback of diet | - | Self-reported | DBC: Fruit and vegetable intake (the change in the amount of consuming fruit and vegetable per week) |
| Gilliland et al., 2015 [21] | Canada, Adult (N=208, Age=33) | RCT, 10 Weeks | Text | Diet | In-App log In-App feedback | Personalized feedback of diet | TBC | Self-reported | DBC: Healthy food intake (the changes in the amount of consuming seasonal/ local foods, vegetables, fruits, processed foods, sugar, fat, and salt per day) |
| Gilson et al., 2016 [22] | Australia, Truck drivers (N=44, Age=48) | Field study, 20 Weeks | Text | Diet | In-App log | Only review logs, Comparison with other users | - | Self-reported | DBC: Healthy food choices (the changes in the amount of consuming saturated fat and sugar per week) |
| Helander et al., 2014 [23] | Finland, Active users (N=4,895, Age= -) | RCT, 6 Months | Photo recognition and text | Diet | In-App log, free iPhone app "The Eatery" | Only review logs, Peer feedback of diet (Social support), Gamification (Points, Leaderboard) | CT, SDT | Photo recognition | DBC: Healthy food intake (the changes in the amount of consuming fat per day) |
| Kerr et al., 2016 [24] | Australia, Young adults: university students (N=247, Age=21) | RCT, 6 Months | Text | Diet (Fruit and vegetables, sugar-sweetened beverage) | In-App log, In-App feedback, weekly text messages | Personalized feedback on diet | SDT | Self-reported | DBC: Healthy food intake (the changes in the amount of consuming vegetables, fruit, sugar-sweetened beverages per day) |
| Lieffers et al., 2014 [25] | Canada, Dietetics' app users (N=139, Age=32) | Survey, One time | Text | Dietetic practice in mobile devices/apps | In-App log, In-App feedback | Personalized feedback on nutrients consumed | - | Self-reported | HS: Varied status changes DBC: Varied behavior changes (food with fewer calories, a proper amount based on exact information) |
| Mummah et al., 2016 [26] | U.S. Overweight adults (N=18, Age=43) | Qualitative Interview | Text | Diet (Vegetable), Weight | In-App log | Only review logs of diet | LT, TPB, SCT, SRT | Self-reported | HS: Weight DBC: Vegetable intake (the |

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| | | | | | | | | | changes in quantity (i.e., servings) and variety (i.e., types) of consuming vegetables per a serving) |
| Pirolli et al., 2017 [27] | U.S. Mobile users recruited at Univ., Craigslist, and Nextdoor. (N=64, Age=30) | Field study, 28 Days | Text | Diet, Goals of diet | In-App log: "PARC Coach" | Only review logs of diet, Reminders, Goal reviews, Gamification (Progression) | - | Self-reported | DBC: Vegetable choices (the changes in the amount of consuming vegetables per day) |
| Recio-Rodriguez et al., 2016 [28] | Spain, Adults in primary care centers (N=833, Age=51) | RCT, 3 months | Text | Diet | In-App log, In-App feedback | Personalized feedback on diets | - | Self-reported | DBC: Mediterranean food intake (the changes in the average amount of consuming Mediterranean diet per day) |
| Rodrigues et al., 2013 [29] | Portugal, Adults who use application "SapoFit" (N=100, Age=-) | Survey, One time | Text | Diet | In-App log: "SapoFit", In-App feedback | Personalized feedback on diets | - | Self-reported | DBC: Healthy food intake (the changes in the amount of consuming calories before and after a survey) |
| Turner-McGrievy et al., 2013 [30] | U.S. Obese adults (N=96, Age=44) | RCT, 12 months | Text | Diet | In-App log: "MOVE!" | Only review logs of diet, General podcasts reminders | - | Self-reported | DBC: Healthy food intake (the changes in the amount of consuming calories, fat, added sugar, fruit, vegetables per day and week) |
| Hebden et al., 2013 [31] | Australia, Young adults obese patients (No = 51, Age = 27) | RCT, 36 Weeks | Text | Diet (Fruit, vegetables, beverages, and total energy), Weight | In-App log, In-App feedback, SMS notifications, calls, emails (other notification) | Personalized feedback on diet, Motivational advice, Gamification (Progression) | PCT | Self-reported | HS: Weight DBC: Healthy food intake (the changes in the frequency of consuming specific foods and drinks i.e., fruit, vegetables, energy-dense take-away meals, SSB, and water, per day) |
| Hales et al., 2016 [32] | U.S. Overweight adults in a weight loss | RCT, 12 Weeks | Text | Diet, Weight | In-App log In-App feedback, | Personalized feedback of diet, Social | SCT | Self-reported | HS: Weight DBC: Healthy food intake (the |

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| | program (No=51, Age=48) | | | | (SNS): "Social POD" | support, Gamification (Progression, Points, Leaderboard) | | | changes in the average amount of consuming calories per day and week) |
| Brindal et al., 2013 [33] | Austria, Obese women (N=58, Age=42) | RCT, 8 Weeks | Text | Diet, Weight | In-App log, Push notification (notification in mobile app) | Personalized feedback, and Reminders of Diet, Weight | TPB | Self-reported | HS: Weight |
| Goh et al., 2015 [34] | Singapore, Patients with type 2 diabetes mellitus (N=84, Age=48) | RCT, 8 Weeks | Text | Diet, Goals of diet, Weight, Height | In-App log and In-App feedback, "iDAT" | Personalized feedback of diet, Goal reviews, Gamification (Progression) | - | Self-reported | HS: BMI BO: Blood pressure, and hemoglobin |
| Ipjian et al., 2017 [35] | U.S. Free mobile app active users (N=15, Age=35) | RCT, 4 Weeks | Text | Diet | In-App log, "MyFitnessPal" | Educational information on reducing sodium intake | - | Urine sodium test in a lab | BO: Urinary sodium |
| Kirwan et al., 2013 [36] | Australia, Patients with type 1 diabetes (N=72, Age=35) | RCT, 6 Months | Text | Diet, Blood glucose, Insulin dosage, Medication | In-App log | Review logs of diet, Blood glucose, Insulin dosage | - | Self-reported | BO: Blood glucose |
| Pendergast et al., 2017 [37] | Australia, Young adults recruited online or offline (N=90, Age=25) | RCT, 4 Days | Photo recognition, voice and text | Diet (Food and beverage), Weight, Height | In-App log: "FoodNow." | Only review logs of diets | - | Self-reported | HS: BMI |
| Rollo et al., 2015 [38] | Australia, Patients with type 2 diabetes mellitus (N=10, Age=54) | Experiment, 12 days | Photo recognition | Diet | In-App log "NuDAM" | Only review logs of diets | - | Weight check by a scale in a lab | HS: Weight |
| Smith et al., 2014 [39] | China, Young adults (N=110, Age=30) | Experiment, 3 days | Text | Diet (Food and beverage) | In-App log | Only review logs of diets and general 24-hour reminders | - | Urine volume test in a lab | BO: Urine volume |
| Bejar et al. 2016 [40] | Spain, University students (N=119, Age = 22) | Protocol, 28 days | Text | Diet (Drink and Food) | In-App log | Only review logs | - | Self-reported | DBC: Healthy food intake (the changes in the average amount of consuming a sugary drink and a variety of food products per day) |
| Spring et al., 2013 [41] | U.S. Obese adults at a hospital (N=69, Age=58) | RCT, 12 months | Text | Diet, Weight | In-App log, In-App feedback | Personalized feedback on diets | - | Self-reported | HS: Weight |
| Waki et al., 2015 [42] | Japan, Patients with Type 2 Diabetes using "DialBetics" (N=54, Age=59) | RCT, 3 months | Photo recognition and Text | Diet | In-App log: "DialBetics", In-App feedback | Personalized feedback on diets | - | Blood screening in a lab | BO: Blood glucose |

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| Wharton et al., 2014 [43] | U.S. Adults in an 8-week weight loss trial (N=19, Age=42) | Field study, 8 weeks | Text | Diet, Goals of diet and weight | In-App log: "Loose it!", In-App feedback | Personalized feedback on diets, Goal reviews, Gamification (Progression, Quest and challenges) | - | Self-reported | HS: Weight |
| Rabbi et al., 2015 [45] | U.S. Mobile users recruited at Univ. (N=17, Age=28) | RCT, 3 weeks | Text, Photo recognition | Diet, Goals of diet | In-App log: "MyBehavior", In-App feedback | Personalized and automated feedback on diet, Gamification (Progression) | - | Self-reported, photo recognition | DBC: Healthy food intake (the changes in the average amount of consuming calories per day) |

* Dietary behavior changes (DBC), Biochemical outcomes (BO), Health status (HS)

** Learning Theory (LT), Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), Self-Regulation Theory (SRT), Theory of Behavior Changes (TBC), Control Theory (CT), Self-Determination Theory (SDT), Social Network Theory (SNT), Processes-of-Change Theory (PCT)