

CADTH Reference List

Electronic Food Assessments for People with Increased Body Mass Index

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Key Messages

- Three randomized controlled trials and 1 non-randomized study were identified regarding the clinical effectiveness of electronic food assessments for people with increased body mass index.
- No economic evaluations were identified regarding the cost-effectiveness of electronic food assessments for people with increased body mass index.
- No evidence-based guidelines were identified regarding the use of electronic food assessments for people with increased body mass index.

Research Questions

- What is the clinical effectiveness of electronic food assessments for people with increased body mass index?
- What is the cost-effectiveness of electronic food assessments for people with increased body mass index?
- What are the evidence-based guidelines regarding the use of electronic food assessments for people with increased body mass index?

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine's MeSH (Medical Subject Headings), and keywords. The main search concepts were obesity, diet records and mobile applications. No filters were applied to limit retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2016 and February 4, 2021. Internet links were provided, where available.

Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available, and relevant recommendations were summarized.

Table 1: Selection Criteria

Criteria	Description
Population	People with BMI ≥ 30 kg/m ² or a percent body fat of $\geq 25\%$ in men and $\geq 33\%$ in women
Intervention	Electronic food assessments (e.g., electronic food journals or diaries, digital food tracking systems)
Comparator	Q1 and Q2: Usual care (e.g., basic dietary education, dietician assessment, no dietary assessment or food logging); alternative methods of tracking dietary intake (e.g., paper-based systems) Q3: Not applicable
Outcomes	Q1: Clinical effectiveness Q2: Cost-effectiveness Q3: Recommendations regarding best practices
Study designs	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, economic evaluations, evidence-based guidelines

BMI = body mass index.

Results

Four relevant references were identified for this report.¹⁻⁴ Three randomized controlled trials¹⁻³ and 1-non-randomized study⁴ were identified regarding the clinical effectiveness of electronic food assessments for people with increased body mass index. No health technology assessments or systematic reviews were identified regarding the clinical effectiveness of electronic food assessments for people with increased body mass index. No economic evaluations were identified regarding the cost-effectiveness of electronic food assessments for people with increased body mass index. No evidence-based guidelines were identified regarding the use of electronic food assessments for people with increased body mass index.

Additional references of potential interest that did not meet the inclusion criteria are provided in Appendix 1.

Overall Summary of Findings

The 3 randomized controlled trials¹⁻³ compared standard self-monitoring interventions with technology-based self-monitoring interventions but found inconsistent results. The first randomized controlled trial¹ compared the effectiveness of self-monitoring through a smartphone-based weight loss intervention with dietary food journals on mean body mass index within obese minority stroke survivors. The authors found that there was no significant difference in weight change between the group self-monitoring using the smartphone app Lose it! and the group self-monitoring using food journals.¹ The authors of the second randomized controlled trial² examined the effect of a Vegethon mobile app with a self-monitoring feature on daily vegetable consumption in comparison with a control group. The authors found that there was a significant difference in vegetable consumption between the 2 groups, with consumption higher in the group using the mobile app.² The third randomized controlled trial³ compared 6-month weight loss among adults with overweight and obesity using one of the following: a technology-based self-monitoring intervention, a standard self-monitoring intervention, and a technology plus phone-based self-monitoring intervention. The

authors found that weight loss after 6 months differed significantly between the groups, with approximately 15% of the standard self-monitoring group achieving at least 5% of weight loss and approximately 44% of the technology-based and technology plus phone-based groups achieving 5% weight loss or greater.³ The authors also analyzed adherence to the intervention and found that the technology plus phone-based group had the highest level of adherence.³

The authors of the non-randomized study⁴ assessed the validity of a web-based electronic application called the Boden Food Plate compared to a paper-based 3-day food diary. The authors reported that 70% of participants found the electronic food diary easier to use than the traditional paper-based food diary.⁴

References

Health Technology Assessments

No literature identified.

Systematic Reviews and Meta-analyses

No literature identified.

Randomized Controlled Trials

1. Ifejika NL, Bhadane M, Cai CC, Noser EA, Grotta JC, Savitz SI. Use of a smartphone-based mobile app for weight management in obese minority stroke survivors: pilot randomized controlled trial with open blinded end point. *JMIR Mhealth Uhealth*. 2020 04 22;8(4):e17816. [Medline](#)
2. Mummah S, Robinson TN, Mathur M, Farzinkhou S, Sutton S, Gardner CD. Effect of a mobile app intervention on vegetable consumption in overweight adults: a randomized controlled trial. *Int J Behav Nutr Phys Act*. 2017 09 15;14(1):125. [Medline](#)
3. Ross KM, Wing RR. Impact of newer self-monitoring technology and brief phone-based intervention on weight loss: a randomized pilot study. *Obesity (Silver Spring)*. 2016 08;24(8):1653-1659. [Medline](#)

Non-Randomized Studies

4. Fuller NR, Fong M, Gerofi J, et al. Comparison of an electronic versus traditional food diary for assessing dietary intake-a validation study. *Obes Res Clin Pract*. 2017 Nov - Dec;11(6):647-654. [Medline](#)

Economic Evaluations

No literature identified.

Guidelines and Recommendations

No literature identified.

Appendix 1: References of Potential Interest

Systematic Reviews and Meta-Analyses

Unclear Population

5. Dounavi K, Tsoumani O. Mobile health applications in weight management: a systematic literature review. *Am J Prev Med.* 2019 Jun;56(6):894-903. [Medline](#)

Randomized Controlled Trials

Alternative Population

6. Ahn JS, Lee H, Kim J, Park H, Kim DW, Lee JE. Use of a smartphone app for weight loss versus a paper-based dietary diary in overweight adults: randomized controlled trial. *JMIR Mhealth Uhealth.* 2020 07 31;8(7):e14013. [Medline](#)
7. Ipjian ML, Johnston CS. Smartphone technology facilitates dietary change in healthy adults. *Nutrition.* 2017 Jan;33:343-347. [Medline](#)

Alternative Comparator

8. Dunn CG, Turner-McGrievy GM, Wilcox S, Hutto B. Dietary self-monitoring through calorie tracking but not through a digital photography app is associated with significant weight loss: the 2SMART pilot study-a 6-month randomized trial. *J Acad Nutr Diet.* 2019 09;119(9):1525-1532. [Medline](#)
9. Patel ML, Hopkins CM, Brooks TL, Bennett GG. Comparing self-monitoring strategies for weight loss in a smartphone app: randomized controlled trial. *JMIR Mhealth Uhealth.* 2019 02 28;7(2):e12209. [Medline](#)
10. Burke LE, Zheng Y, Ma Q, et al. The SMARTER pilot study: testing feasibility of real-time feedback for dietary self-monitoring. *Prev Med Rep.* 2017 Jun;6:278-285. [Medline](#)
11. Turner-McGrievy GM, Wilcox S, Boutte A, et al. The dietary intervention to enhance tracking with mobile devices (DIET Mobile) study: a 6-month randomized weight loss trial. *Obesity (Silver Spring).* 2017 08;25(8):1336-1342. [Medline](#)
12. Hutchesson MJ, Tan CY, Morgan P, Callister R, Collins C. Enhancement of self-monitoring in a web-based weight loss program by extra individualized feedback and reminders: randomized trial. *J Med Internet Res.* 2016 Apr 12;18(4):e82. [Medline](#)

Mixed Intervention

13. Wang J, Cai C, Padhye N, Orlander P, Zare M. A behavioral lifestyle intervention enhanced with multiple-behavior self-monitoring using mobile and connected tools for underserved individuals with type 2 diabetes and comorbid overweight or obesity: pilot comparative effectiveness trial. *JMIR Mhealth Uhealth.* 2018 Apr 10;6(4):e92. [Medline](#)

Non-Randomized Studies

No Comparator

14. Hu EA, Pasupuleti M, Nguyen V, Langheier J, Shurney D. Sustaining weight loss among adults with obesity using a digital meal planning and food purchasing platform for 12, 24, and 36 months: a longitudinal study. *Nutr J.* 2021 01 21;20(1):8. [Medline](#)
15. Kwon BC, VanDam C, Chiuve SE, et al. Improving heart disease risk through quality-focused diet logging: pre-post study of a diet quality tracking app. *JMIR Mhealth Uhealth.* 2020 12 23;8(12):e21733. [Medline](#)

Alternative Population

16. Rodgers RF, Pernal W, Matsumoto A, Shiyko M, Intille S, Franko DL. Capitalizing on mobile technology to support healthy eating in ethnic minority college students. *J Am Coll Health.* 2016;64(2):125-132. [Medline](#)

Review Articles

17. Tay W, Kaur B, Quek R, Lim J, Henry CJ. Current developments in digital quantitative volume estimation for the optimisation of dietary assessment. *Nutrients.* 2020 Apr 22;12(4):22. [Medline](#)
18. Holzmann SL, Holzzapfel C. A scientific overview of smartphone applications and electronic devices for weight management in adults. *J Pers Med.* 2019 Jun 07;9(2):07. [Medline](#)
19. Archundia Herrera MC, Chan CB. Narrative review of new methods for assessing food and energy intake. *Nutrients.* 2018 Aug 10;10(8):10. [Medline](#)

20. Allman-Farinelli M, Gemming L. Technology interventions to manage food intake: where are we now? *Curr Diab Rep.* 2017 Sep 23;17(11):103. [Medline](#)