



BRIEFING PAPER

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Which digital weight loss intervention features are associated with success?

Obesity is a growing public health problem, with a variety of proposed treatment approaches. Drug therapies are one option, often recommended alongside lifestyle interventions involving diet and physical activity changes. Weight management services have resource limitations and therefore digital tools are becoming of interest. These can be used to support patients with weight loss in the community, but it is unclear what features make a digital tool successful.

Therefore, we conducted a systematic review which investigated different digital programs supporting people to lose weight and broke them down to observe their features. We then analysed the results of the included studies to determine which features were linked to better weight loss using component network meta-analysis.

A component network meta-analysis (cNMA) is type of network meta-analysis (NMA), which is a statistical test that compares several treatments at once, even if some haven't been directly compared in studies. It uses a network of interventions to connect the results and figure out which work best overall. A cNMA is a version of an NMA that compares features of interventions, instead of complete interventions.

Key Findings

- **There were nine digital components commonly identified across interventions:** Goal setting, peer support, reminders, self-monitoring, information/education; specialist contact; feedback, competition/challenges and incentives/rewards.
- **No single component was associated with success, but three 'best bets' stood out from the nine:** information/education, specialist contact and incentives/rewards. These were consistently numerically (but not statistically) linked with success.
- **A careful selection of digital components is required.** We identified an abundance of studies, often combining many features, but there were no trials featuring the three components above in combination.
- Exploratory modelling suggested **combining these three** might help support **successful weight loss** or **BMI reduction** at 6- and 12-months.



This is a high-level overview of our research to inform decision-making. Further outputs including plain language summaries and academic papers are available:



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Obesity is rising in prevalence in the UK, with 27% of adults in England considered obese in 2017¹; expected to rise to 35% by 2030².

The economic cost to the UK National Health Service by obesity and related illnesses is estimated at £6.1 billion a year³.

There is an abundance of literature on the use of digital technology to support weight loss interventions, including many systematic reviews.

Why did we do this review?

Review rationale—the 'why'

Access to current recommended treatments (drugs and lifestyle modifications) varies nationally

Resources (such as clinicians) are sometimes limited within weight management services

There is abundant literature on using digital tools to support weight loss interventions

This abundant evidence is heterogenous, with an variety of different findings



Digital interventions can augment weight management services, offering more coverage and flexibility and costing less resources



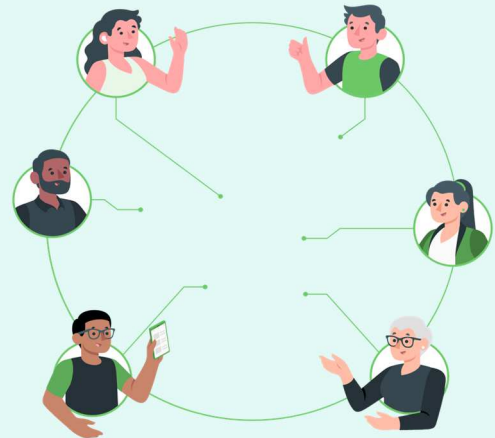
Therefore, we aimed to synthesise the evidence to identify components of digital support for weight loss interventions that are most likely to be effective in supporting patients to achieve weight loss goals.

Patient and Public Involvement/Engagement

This review was strengthened by the involvement of a group of around 15 public collaborators, called PERSPEX. This culturally, geographically and demographically diverse group meet monthly, and brought carer, patient, or public perspectives to Isca Evidence work (<https://www.exeter.ac.uk/research/groups/medicine/esmi/workstreams/perspex/>).

This group had major contributions to this review, including discussing the topic at protocol stage and highlighting issues such as digital exclusion and health inequalities.

The group were involved in further stages including providing feedback on the protocol, reviewing the search strategy, and commenting on the initial categorisation of components elucidated by the synthesis.



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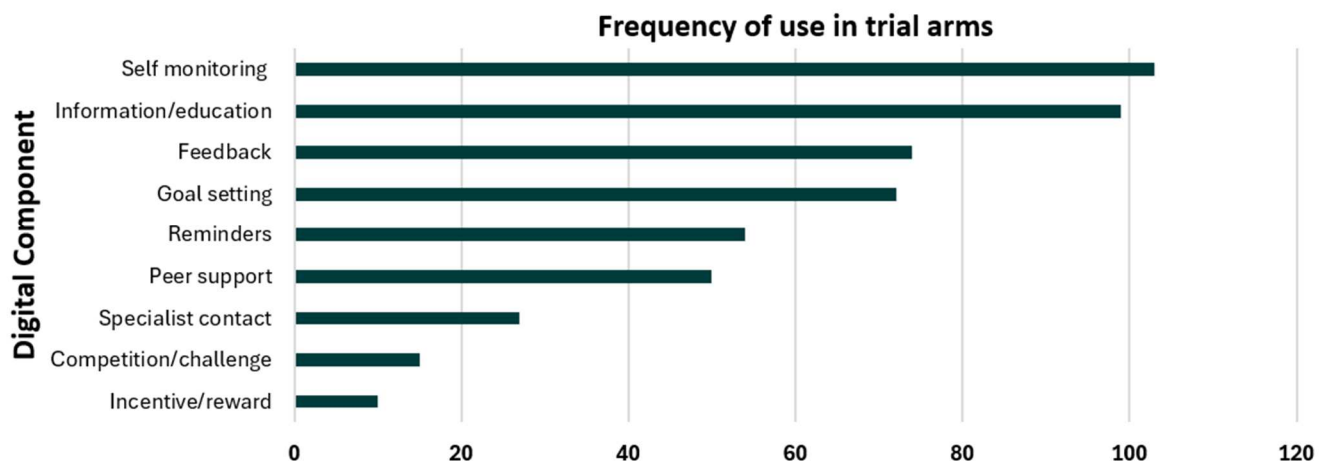
Overview of the evidence

- The search retrieved **433 papers** eligible for inclusion. **After prioritisation, 119 reports** from **99 studies** were included in the intervention component analysis. **Further prioritisation left 68 trials** for full synthesis.
- 20 studies** were assessed as at a relative **low risk of bias**, **25 studies** had **some concern for risk of bias**, **23 studies** were considered to be at a **high risk of bias**.

What did we find?

What are the important features of digital weight loss interventions?

- **There were 151 trial arms included:** 90 exclusively digital interventions, 28 digitally-led interventions, 22 treatment as usual or alternative non-digital information provision and 11 waitlist.
- **The interventions had nine common digital components.** Some were used more frequently than others:



The three 'best bet' digital components

Component network meta-analysis (cNMA) was used to examine which components had the best numerically positive effects on 6- and 12-month outcomes, including but not limited to **absolute weight loss** and **absolute change in BMI**.

Three components emerged as 'best bets' across the outcomes:

Information/Education: Participants receive educational information in relation to diet, exercise, weight loss or general wellbeing. Often provided via websites, email newsletters or videos. Participants may have self-directed access to information (e.g. website, smartphone app) or receive more structured sessions (e.g. podcasts, text messages, webinars).

Example: "The [intervention] group also received one-way text messages containing content on healthy eating and physical activity"

Incentives and rewards: Digital incentives or rewards were offered either as an explicit component of the intervention or in relation to goal progression (e.g. virtual 'badges'). Incentives could be linked to peer support (social incentives).

Example: "In-app reward of medals/trophies for regular login and progress"

Specialist contact: Participants had contact with a trained expert (e.g. a dietitian, nutritionist or psychiatrist). This may have been to discuss progress, revise goals or provide education. Digital contact methods included email and Zoom.

What are the implications of this review?

In conclusion...

This is the first systematic review to investigate which digital components of weight loss interventions are associated with successful weight loss.

9 widely used digital approaches were identified (goal-setting, feedback, self-monitoring, information and education, reminders, contact with specialists, peer support, competition/challenges and incentives/rewards). 3 of these 9 identified components were identified as 'best bets', including **information and education**, **specialist contact**, and **incentives and rewards**. These findings contribute to a better understanding of how digital interventions can be useful in supporting weight loss.

Implications

- This evidence should be used to inform future development of digital interventions for weight loss management by suggesting which components have a positive influence on intervention effectiveness.
- It also explores the combination of different components and how they may work together to increase the benefit of digital interventions.
- These findings have implications on digital approaches to weight loss management not only in isolation, but also with the rollout of new GLP-RA obesity drugs if digital interventions are used to support their delivery.



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Future research

- This review suggests that interventions combining the three digital components of information, specialist contact and incentives or rewards may lead to weight loss benefits, but trials using this specific combination are needed.
- The nature (e.g. intensity, mode of delivery, timing etc) of digital interventions combining key components will also need further study.
- There is also a general requirement for more trials of digital interventions to collect longer term outcome data (two years and beyond).

References

1. NHS Digital. Statistics on Obesity, Physical Activity and Diet - England, 2017, <<https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-obesity-physical-activity-and-diet/statistics-on-obesity-physical-activity-and-diet-england-2017#resources>> (2017).
2. The Organisation for Economic Co-operation and Development (OECD). Obesity Update 2017, <<https://www.oecd.org/els/health-systems/Obesity-Update-2017.pdf>> (2017).
3. Department of Health and Social Care. Policy Paper: Tackling obesity: empowering adults and children to live healthier lives. London: Department of Health and Social Care,; 2020. URL: <https://www.gov.uk/government/publications/tackling-obesity-government-strategy/tackling-obesity-empowering-adults-and-children-to-live-healthier-lives#fn:16> (accessed 20 October 2023).



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Isca Evidence

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