NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Guideline

Behaviour change: digital and mobile health interventions

Draft for consultation, January 2020

This guideline covers interventions that use a digital or mobile platform to help people change established unhealthy behaviour. It covers people who want to stop smoking, be more active, practise safer sex, or improve their eating and drinking habits.

Who is it for?

- Local policy makers and commissioners
- Individuals, groups or organisations wishing to work or working with health and social care service providers
- Designers and providers of digital and mobile health interventions and programmes
- Behaviour change practitioners
- Trained staff working in health and social care services who have contact with the general public.
- People who want to change their behaviour (for example, to stop smoking) or who are interested in self-managing a chronic condition, their families or carers and other members of the public.

What does it include?

This draft guideline contains:

- the draft recommendations
- recommendations for research

- rationale and impact sections that explain why the committee made the recommendations and how they might affect practice.
- the guideline context.

This guideline does not cover the use of digital or mobile platforms that involve significant interaction or involvement with a healthcare or other professional.

Information about how the guideline was developed is on the guideline's page on the NICE website. This includes the evidence reviews, the scope, and details of the committee and any declarations of interest.

NICE worked with Public Health England to develop this guideline.

1

2

Contents

Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity) and safeguarding.

1.1 Developing digital and mobile health interventions

These recommendations relate to the 4 behaviours covered in this guideline.

1.1.1 Refer to the NICE evidence standards framework for digital technologies when developing and evaluating digital and mobile health interventions for behaviour change.

1.1.2 Follow the advisory frameworks for assessment when developing and evaluating a digital and mobile health intervention for behaviour change. (These include the Digital Assessment Questionnaire and the Code of conduct for data-driven health and care technology.)

1.1.3 When designing digital and mobile health interventions, use evidence-based behaviour change techniques that help people start and maintain changes. These include: goals and planning, feedback and monitoring, and social support (see NICE's guideline on behaviour change: individual approaches).

1.1.4 Design interventions so they can scaled up and customised for local needs and use.

1.1.5 When developing digital and mobile health interventions involve stakeholders, including potential users, as early as possible to:

- Develop and review the content, structure, interface and flow of the intervention (user acceptability testing).
- Identify the best digital platforms for the target population (user acceptability testing).
- Make sure users understand who the intervention is for, which behaviour it's trying to change, its aims, any possible harms, the time needed and frequency.
- Once developed, test how well the intervention works for a wide range of people from the target population.

To find out why the committee made the recommendations on developing digital and mobile health interventions and how they might affect practice, see rationale and impact.

1.2 Commissioning digital and mobile health interventions

These recommendations relate to the 4 behaviours covered in this guideline.

1.2.1 Consider digital and mobile health interventions as options for behaviour change.

1.2.2 If commissioning digital and mobile health interventions, do this as a supplement to existing services, not as a replacement.

1.2.3 Assess whether specific digital and mobile health interventions could meet the needs of the local population by using a needs assessment.

1.2.4 Select interventions that meet current frameworks, regulatory advice and evidence standards for the development and use of digital and mobile health interventions (see the NICE evidence standards framework for digital technologies).

1.2.5 Check expert sources (such as Public Health England or the NHS apps library) for any existing evidence-based digital and mobile health interventions that can meet local needs. Do this before commissioning development of a new one.

1.2.6 If a new digital and mobile health intervention is needed, assess whether a regional-level multidisciplinary collaboration, or partnerships with other health and care organisations, would be appropriate to share development costs.

1.2.7 When commissioning digital and mobile health interventions, take into account equality of access. For example:

- anything that might limit usability of the intervention (such as literacy, sensory impairments and language barriers)
- potential related costs for users (such as cost of apps and data usage)
- availability of the necessary hardware and operating system
- access to the internet, phone signal and data networks (for example in rural communities, closed institutions and detention settings).

To find out why the committee made the recommendations on commissioning digital and mobile health interventions and how they might affect practice, see rationale and impact.

1.3 Using digital and mobile health interventions

These recommendations are for healthcare professionals and relate to the 4 behaviours covered in this guideline.

1.3.1 Consider digital and mobile health interventions as an option for behaviour change. But note that it is not clear whether or not they are effective.

1.3.2 When advising on the use of a digital or mobile health intervention take into account:

- the user's preferences and behaviour change goals
- the user's capability, opportunity and motivation for change
- the digital platforms available
- the aim of the intervention
- how frequently and intensely the user is willing to use interventions
- how it would fit into the user's current care pathway.

1 1.3.3 Advise those who may use a digital and mobile health intervention to:

2 • use one from an expert source if available (such as Public Health
3 England or the NHS apps library) because it is likely to have been
4 assessed for safety, effectiveness and data security
5 • check and set preferences for how their personal information and data
6 may be used
7 • check how much mobile data it uses and if they can afford it
8 • read the terms and conditions
9 • be aware that it may contain adverts
10 • be aware of any possible extra costs.

11 1.3.4 When providing advice on the use of a digital and mobile health
12 intervention, take into account whether the content is appropriate for the
13 user and any possible adverse effects. For example, whether the
14 intervention could:

15 • lead to people self-managing with digital interventions when their
16 behaviour could be better modified using existing health or social care
17 services that involve clinical expertise, face-to-face interaction or
18 treatment
19 • be used to prevent vulnerable people from accessing face-to-face
20 services and interventions
21 • have components that could encourage the person to adopt unhealthy
22 behaviours, such as excessive exercise or disordered eating.

To find out why the committee made the recommendations on using digital and mobile health interventions and how they might affect practice, see rationale and impact.

23 ## *1.4 Diet and physical activity*

24 1.4.1 Consider digital and mobile health interventions as an option for people
25 who would benefit from improving their diet or increasing their physical
26 activity levels. But note that it is not clear whether or not they are effective.

1.4.2 Advise people to use digital and mobile health interventions that include self-monitoring, such as food or exercise diaries. This can enable the person to review their own progress towards their diet or physical activity goals.

1.4.3 If you know the person is at risk of developing or resuming an eating disorder or another unhealthy behaviour such as excessive exercise, consider interventions that do not include self-monitoring.

To find out why the committee made the recommendations on diet and physical activity and how they might affect practice, see rationale and impact.

1.5 Smoking

1.5.1 Consider digital and mobile health interventions as an option to help people stop smoking. But note that it is not clear whether or not they are effective.

1.5.2 Advise people who want to stop smoking using a digital and mobile health intervention that text message interventions that send tailored messages may be more effective than other digital and mobile health interventions.

To find out why the committee made the recommendations on smoking and how they might affect practice, see rationale and impact.

1.6 Alcohol

1.6.1 Consider digital and mobile health interventions as an option for people who would benefit from reducing, or wish to reduce, their alcohol consumption. But note that it is not clear whether or not they are effective.

1.6.2 As part of any alcohol-related intervention, consider a motivational assessment to help decide which digital and mobile health intervention will suit the person best.

1.6.3 Advise the person that there may be particular components of the intervention that could help with reducing their alcohol consumption. For

example, a component that compares the person's consumption with that of their peers (a personalised normative feedback approach).

1.6.4 Advise the person that an intervention they interact with multiple times may be better than a one-off intervention, but a one-off intervention is better than no intervention at all.

> To find out why the committee made the recommendations on alcohol and how they might affect practice, see rationale and impact.

1.7 Unsafe sexual behaviour

1.7.1 Consider online brief interventions as an option to help reduce unsafe sexual behaviour. But note that it is not clear whether or not they are effective.

1.7.2 If advising people to use online interventions, consider ones that include videos with set choice points, scripted scenarios or dramatisation.

1.7.3 When advising on the use of a digital and mobile health intervention, make the person aware that some may have sexually explicit content.

> To find out why the committee made recommendations on unsafe sexual behaviour and how they might affect practice, see rationale and impact.

Terms used in this guideline

This section defines terms that have been used in a particular way for this guideline. For other definitions see the NICE glossary or, for public health and social care terms, the Think Local, Act Personal Care and Support Jargon Buster.

Choice points

In an interactive scripted scenario, choice points give the person using the intervention options on what the character should do next at key moments. This models how the person would react in a similar situation in real life, and the consequences of their actions. The intervention can give feedback on how choosing differently may help them change their behaviour.

Components and characteristics

A component is one part of an intervention, for example, a diary that people can use to track their eating habits. Interventions can be made up of many components. A characteristic is an attribute that applies to the whole intervention. For example, how often it will be performed, or if it is specific for a group with a certain condition.

Motivational assessment

An assessment to evaluate a person's motivations for behaviour change. It can be done as part of the intervention itself.

Recommendations for research

The guideline committee has made the following recommendations for research.

Key recommendations for research

1 Engaging people with digital and mobile health interventions

How can providers and healthcare professionals identify groups that do not initially engage, or do not stay engaged, with digital and mobile health interventions?

To find out why the committee made the research recommendation on engaging people with digital and mobile health interventions see rationale and impact.

Full details of the research recommendation are in evidence review 1: smoking.

2 Effective components of behaviour change interventions

What components and characteristics of digital and mobile health interventions are most effective, separately and in combination, to achieve behaviour change?

To find out why the committee made the research recommendation on effective components see rationale and impact.

Full details of the research recommendation are in evidence review 1: smoking.

3 Effects for low socioeconomic and other underserved groups

What is the effectiveness and cost effectiveness of digital and mobile health interventions in low socioeconomic and other underserved groups?

To find out why the committee made the research recommendation on the effect on health inequalities see rationale and impact.

Full details of the research recommendation are in evidence review 1: smoking.

4 Populations who will benefit most from digital and mobile health interventions

Are digital and mobile health interventions as effective as face-to-face, standard care, or combination approaches for some populations?

To find out why the committee made the research recommendation on populations who will benefit most see rationale and impact.

Full details of the research recommendation are in evidence review 1: smoking.

5 Sustainability of behaviour change using digital and mobile health interventions

What is the long-term (more than 12 months) effectiveness and cost effectiveness of digital and mobile health interventions at changing behaviours relating to smoking, alcohol consumption, unsafe sex, diet and physical activity?

To find out why the committee made the research recommendation on sustainability of behaviour change see rationale and impact.

Full details of the research recommendation are in evidence review 1:smoking.

Other recommendations for research

Harms associated with the use of digital and mobile health interventions

What are the harms and adverse effects associated with different digital and mobile health behaviour change interventions?

For a short explanation of why the committee made the research recommendation on harms associated with digital and mobile health interventions see rationale and impact.

Full details of the research recommendation are in evidence review 1: smoking.

Rationale and impact

These sections briefly explain why the committee made the recommendations and how they might affect practice. They link to details of the evidence and a full description of the committee's discussion.

Sections on developing, commissioning, and using interventions are applicable to the 4 behaviours covered in this guideline.

Developing digital and mobile health interventions

Recommendations 1.1.1 to 1.1.5

Why the committee made the recommendations

The committee discussed the lack of evidence surrounding which components and characteristics would lead to healthy behaviour change in different populations. This is common to all behaviours and why the recommendations cannot be more specific. The committee made recommendations for research to fill this gap in evidence.

The committee noted that digital and mobile health interventions are a rapidly changing and developing area. As such, they agreed it was important to develop them in line with national supporting frameworks such as the NICE evidence standards framework for digital technologies to ensure they are as effective as possible.

The committee discussed the views from expert testimony that said many developers of these interventions do not have a background in healthcare. This is another reason why the committee wanted to stress the importance of using these frameworks, as well as NICE guidelines.

The committee agreed with expert testimony which stressed that technologies should cope with a larger number of people or organisations using it across different parts of the country.

Based on limited evidence and expert testimony, the committee understood that it can be challenging to get people involved on an ongoing basis with these interventions. They agreed that more collaboration between developers,

stakeholders and potential users would be likely to produce more applicable and engaging interventions.

For example if people with physical disabilities and sensory impairments, or young people and children, are given the opportunity to contribute, the interventions are more likely to be used by them and more likely to be effective. In addition, during testing, users may give developers an idea of how often they would like to use a given intervention. For example, they may prefer a one-off intervention, multiple brief interventions or interventions that they can interact with multiple times.

How the recommendations might affect practice

Designing interventions that can be scaled up to be used by many people may help reach more people at a lower average cost. Wider implementation would allow local usage patterns to be monitored and services to be standardised between regions.

Developers will need to work with topic experts to develop content that meets evidence standards. This may mean sharing development costs with other organisations, which would help to reduce the resource impact.

Full details of the evidence and the committee's discussion are in evidence reviews 1 to 4.

Return to recommendations

Commissioning digital and mobile health interventions

Recommendations 1.2.1 to 1.2.7

Why the committee made the recommendations

There is poor evidence that digital and mobile health interventions may be effective for behaviour change – and not enough to suggest that they can be used instead of other services.

The committee agreed that it is important that existing services are not simply replaced by a digital and mobile health intervention that may be less effective. So they recommended considering them as a supplement to other behaviour change services.

The committee discussed the importance of differences in local populations and assessing local needs when commissioning a digital and mobile health intervention. These needs would be routinely assessed by a Joint Strategic Needs Assessment.

They agreed that these new technologies should cater for groups and issues that are not covered by existing behaviour change services. For example, by targeting people with learning disabilities, hearing, vision, mobility requirements, neurodevelopmental disorders or cancer.

The committee also agreed that expert sources would only list interventions that have been assessed for safety, effectiveness and data security. So they highlighted the need to check those sources before commissioning any new interventions.

Commissioning the development of new interventions can be costly. By collaborating, regions and developers may be able to reduce costs. Collaboration could also lead to coordinated implementation so the interventions can reach a wider audience.

Expert testimony suggested that interventions are often developed without the input of healthcare professionals. Multidisciplinary teams would ensure that interventions are as useful and relevant as possible.

The committee agreed that not everyone may have access to digital and mobile interventions. So they made a recommendation to ensure potential communication, access and cost issues are addressed.

How the recommendations might affect practice

Commissioners would use the NICE evidence framework and a needs assessment when choosing digital and mobile health interventions.

Networks may be needed for collaboration between regions and people, which may need to be set up if they do not already exist. These networks will facilitate how costs are shared.

Full details of the evidence and the committee's discussion are in evidence reviews 1 to 4.

Return to recommendations

Using digital and mobile health interventions

Recommendations 1.3.1 to 1.3.4

Why the committee made the recommendations

The committee were not confident that digital and mobile health interventions would be effective on their own for most people because of the poor evidence. But they agreed it would be better than nothing for people who want a more discreet tool to help change their behaviour or who cannot make it to face-to-face consultations.

Based on their experience, the committee agreed that behaviour change is complex. The person's preferences and goals have to be taken into account alongside the COM-B model (capability, opportunity and motivation) to identify what may be most beneficial.

The committee agreed with expert testimony that said users, particularly people from vulnerable groups, need to be made aware of certain issues relating to digital and mobile health interventions and how they work. For example, they usually contain advertising. In addition, there are many such interventions available and the quality varies.

The committee recommended using interventions from a reliable source such as the NHS apps library, if possible. That's because potential users may trust digital and mobile health interventions, and may not be as alert to data security issues as they would be normally.

Because digital and mobile technology is a fast-moving field, the committee agreed that it was best to focus on content rather than specific interventions in any discussions because interventions may become unavailable or their content may change.

In addition, they agreed that using digital and mobile health interventions may lead to limited interaction with healthcare professionals and that this may not be suitable for some people, in particular vulnerable groups. As an example, these interventions could be used by abusers to prevent people who are trafficked and young people

who are vulnerable to sexual exploitation from having a face to face consultation that would expose the person to the authorities.

The committee also discussed evidence from expert testimony that digital and mobile health interventions can lead to some unintended consequences, specifically to unhealthy behaviours such as disordered eating or excessive exercise. They decided it was important to make referrers aware of these risks so they could try to mitigate them where possible.

How the recommendations might affect practice

Extra time may be needed for healthcare professionals and users to discuss digital and mobile health interventions as an option for behaviour change. But after the initial consultation, because people use these interventions on their own, healthcare resources would be freed up for other activities. This would lead to cost savings.

Full details of the evidence and the committee's discussion are in evidence reviews 1 to 4.

Return to recommendations

Diet and physical activity

Recommendations 1.4.1 to 1.4.3

Why the committee made the recommendations

Evidence showed that digital and mobile health interventions may help people to reduce their weight, increase their fruit and vegetable intake and become more physically active. But the evidence was poor and inconsistent, so the committee recommended considering these interventions as an additional option for behaviour change.

The committee discussed evidence and heard from expert testimony that self-monitoring may help people lose weight and become more physically active. (Examples include using a food or exercise diary.) This is because it gives them the opportunity to review their own progress towards their diet and physical activity goals. (See also NICE's guideline on behaviour change: individual approaches).

But expert testimony also warned that self-monitoring may be harmful to people who have, or who have previously had, an eating disorder or exercise addiction because it may become excessive. (Self-monitoring is part of disordered eating and excessive exercise.) Because there was a lack of evidence, they agreed to recommend considering this course of action.

How the recommendations might affect practice

Professionals need time and resources to check that potential users are not at risk of harmful behaviours by using these interventions, especially if they contain self-monitoring aspects.

More people using digital or mobile health interventions may mean fewer face-to-face appointments, making resources available for other services.

Full details of the evidence and the committee's discussion are in evidence review 3: diet and physical activity.

Return to recommendations

Smoking

Recommendations 1.5.1 to 1.5.2

Why the committee made the recommendations

There was evidence that digital and mobile health interventions can help people to stop smoking although it was unclear which aspects of the interventions work. On the basis of the evidence, the committee recommended considering these interventions as an additional option for behaviour change.

The committee discussed limited evidence that suggested that interventions using tailored text messages may be more effective. They used this and their expertise to agree a recommendation on the use of tailored messages. There was also evidence that using text messages as a supplement to face-to-face care was cost effective.

How the recommendations might affect practice

More people using digital or mobile health interventions may mean fewer face-to-face appointments. This would lead to cost savings and make resources available for other services.

Full details of the evidence and the committee's discussion are in evidence review 1: smoking.

Return to recommendations

Alcohol

Recommendations 1.6.1 to 1.6.4

Why the committee made the recommendations

There was limited evidence that digital and mobile health interventions can help people reduce their alcohol consumption. The committee agreed that these interventions may work in some settings and for some populations. But it was not clear how effective they would be, so the committee recommended considering them as an additional option for behaviour change.

Expert testimony suggested that people who are trying to reduce their alcohol consumption often find it difficult to adhere to a digital and mobile health intervention. But limited evidence showed that a motivational assessment may help to decide which intervention may work best for them. The committee thought about recommending this for all behaviours. But they agreed that motivation is likely to make more of a difference in alcohol than other behaviours, where other drivers are more important.

The committee noted that NICE's guideline on behaviour change: individual approaches says motivation is needed for any behaviour change.

Some evidence showed that presenting excessive drinkers with how much they consume may help to reduce their drinking.

Limited evidence showed that the interventions people needed to interact with a number of times were more effective than one-off interventions – although a one-off

intervention is more effective than doing nothing. Because the committee did not want anyone to be excluded from the advice provided, they made a recommendation to reflect this.

How the recommendations might affect practice

More people using digital or mobile health interventions may mean fewer face-to-face appointments. This would lead to cost savings and make resources available for other services.

Full details of the evidence and the committee's discussion are in evidence review 2: alcohol.

Return to recommendations

Unsafe sexual behaviour

Recommendations 1.7.1 to 1.7.3

Why the committee made the recommendations

The evidence identified covered several populations including adolescents, men who have sex with men, people with HIV and university students. But because it was very limited, the committee agreed that they could not make recommendations for each of these groups.

The committee also agreed that they would only recommend people to consider these interventions as an option for behaviour change because of the limited evidence.

Limited evidence showed that interactive videos can help people change their sexual behaviour. These are scripted scenarios that need the person to take part in the story. Dramatisations, with the person just watching the story, are also effective.

The committee agreed that putting people in these 'virtual' situations allows them to experience difficult sexual situations and develop healthy response mechanisms that can be applied in real life. The committee also agreed that this approach is unlikely to be as effective for changing other behaviours because this method works particularly well for sexual behaviour.

The committee were aware that some interventions may contain sexually explicit content. They were also aware that some people cannot, or may not want to, view this material. They agreed that raising awareness of this issue would help people choose interventions that are appropriate for them.

How the recommendations might affect practice

More people using digital or mobile health interventions may mean fewer face-to-face appointments. This would lead to cost savings and make resources available for other services.

Full details of the evidence and the committee's discussion are in evidence review 4: unsafe sexual behaviour.

Return to recommendations

Recommendations for research

Why the committee made the recommendations

No published evidence was found on adverse effects or potential harms for any of the behaviour change areas considered. The committee discussed this and heard from expert testimony about potential harms related to digital and mobile health interventions. The committee noted that more published research is needed on harms, adverse effects or unintended consequences (see other recommendations for research).

The committee agreed that, as the field develops, it will be helpful to know if there are specific groups who may get as much benefit from digital and mobile health interventions used alone as they would from existing services (see research recommendation 4).

There is limited information on the effectiveness of digital and mobile health interventions for different socioeconomic groups, people with disabilities or underserved populations. The committee discussed the potential difficulties with recruitment and possible additional costs associated with reaching underserved populations. They agreed that more information on this topic would help to tackle health inequalities (see research recommendation 3).

The committee discussed the need to identify whether behaviour changes are sustained. Most of the evidence was based on 6-month follow-up data, with limited research on longer-term effects. Available evidence suggests there may be difficulties in achieving long-term effectiveness. The committee agreed more information was needed on this (see research recommendation 5).

The committee was aware that specific components or characteristics may be more effective at changing or targeting specific behaviours. Evidence on this is complex, and digital and mobile health interventions are a rapidly changing field. The committee agreed that research is needed to evaluate the effectiveness of specific components and characteristics (see research recommendation 2).

There is limited evidence on why and when people engage with and disengage from digital and mobile health interventions. This is important because initial engagement is lower in people with lower socioeconomic status, and there may be other members of the population not currently visible to services.

The committee agreed that research into ways that healthcare professionals can identify and encourage people to engage with and continue using digital and mobile health interventions is needed (see research recommendation 1).

Context

Routine surveillance of the existing NICE guidelines on behaviour change identified new evidence on technology-based interventions. This highlighted the need for a new guideline.

This guideline covers interventions that deliver behaviour change techniques or components through a digital or mobile platform. This includes those delivered by text message, apps, wearable devices or the internet. It addresses established lifestyle behaviours such as:

- tobacco dependence
- harmful or binge drinking
- unhealthy eating patterns
- a lack of physical activity or sedentary behaviour

- unsafe sexual behaviour.

This guideline covers everyone, including children and young people (and their families or carers), who would benefit from changing current unhealthy behaviours. This can help to reduce the risk of developing chronic conditions (for example diabetes and cardiovascular diseases) and to help people to self-manage, self-monitor or improve their health-related behaviours.

This guideline doesn't cover people who have already changed their behaviours and want to maintain the change.

Finding more information and resources

To find out what NICE has said on topics related to this guideline, see our web page on behaviour change.