Ready to Change evidence review

Executive summary

Based on a review of the current evidence, several key findings and recommendations were found for developing digital interventions that support smoking cessation, alcohol consumption, weight management, healthy dietary behaviours, and physical activity:

- Digital interventions have been shown to be effective in supporting all five of the proposed key health behaviours.
- There is some evidence that digital behaviour change interventions that are tailored and personalised may be more effective in influencing intervention uptake and engagement, as well as in producing positive behaviour change outcomes than those that are not tailored/personalised.
- Text messaging and email are useful enhancements to other digital based behaviour change interventions (including websites). While emails can be effective, they show smaller effect sizes than text message enhancements. Text messages are also highly versatile in their use and are effective for a range of different user groups.
- The inclusion of a combination of behaviour change techniques (BCTs) is recommended for digital behaviour change interventions. The specific BCTs of 'goal setting', 'feedback on behaviour' (particularly personalised, normative feedback), 'social support', and 'self-monitoring' were the most commonly recommended across all the target behaviours in systematic reviews and meta-analyses reviewed.
- There were also clear BCT recommendations specific to each of the behaviours. These are detailed in the following sections and summarised in a table on page 11.
- Evidence also suggests that digital behaviour change interventions should incorporate some mental health support and advice, particularly focused around stress management, as stress may underpin these key health behaviours.
- Presently there is an absence of evidence around the most effective approach for changing multiple behaviours, simultaneously or in sequence.

Search strategy

This report drew on evidence from the Norfolk County Council (NCC) Digital Content Team user insights testing as well as reviews, systematic reviews and meta-analyses from peer reviewed journal articles recommended by consulting team experts and through a primary search of key electronic databases, e.g., PubMed.

We chose to include and review literature relevant to internet-delivered interventions including smartphones, as while the intended intervention resource will be web-based, it is likely users will view this resource on their mobile phones.

Overview of the Norfolk County Council (NCC) Digital Content Team user insights testing

The Norfolk County Council (NCC) Digital Content Team conducted a series of qualitative interviews with participants local to the Norfolk area (N=16). These interviews aimed to understand the possible determinants for health behaviour change (e.g., their motivations) in regard to the 'Big 4' (smoking, weight loss, activity, and alcohol consumption) and how a web-based resource might support local users to change their behaviour.

Based on the findings of the NCC interviews, key recommendations for website content include:
- Content based around mental health support and advice, particularly in regard to managing stress which may be linked to unhealthy behaviours.
- A combination of simple 'nudges' as well as more complex behaviour change interventions.
- Recommended activities and interventions should have the option to involve the users' wider family.
- Signposting to relevant events in the local county including online events and guidance on how to start up groups.
- Links to trusted, credible websites, particularly the NHS.

Recommended website functionality and design elements include:
- Functionality in a wide range of formats, particularly mobile phones.
- Having a social media presence and links to partners' social media e.g., Active Norfolk.
- A considered search engine optimisation (SEO) approach to increase accessibility and awareness to the site.

Overview of findings from a review of peer-reviewed academic literature

In addition to the findings from the NCC user testing interviews, a review was conducted of the relevant, peer-reviewed academic literature to determine the key recommendations for developing digital interventions to promote health behaviour change. These findings are described below.

Key recommendations for developing digital interventions to promote health behaviour change

There are many effective, evidence-based digital interventions that support health behaviour change across a number of key health behaviours (Rogers et al., 2017). However, many of these evidence-based interventions are not publicly available (Rogers et al., 2017). In addition, there are currently no evidence-based digital interventions that are available to the community of Norfolk that support multi-behaviour change, which might include smoking cessation, weight management, physical activity, dietary behaviour, and alcohol consumption. Developing a publicly available, evidence-based, digital intervention that can support multiple behaviours relevant to the people of Norfolk is therefore warranted.

Factors influencing uptake and engagement in digital interventions to promote health behaviour change

Digital interventions are commonly associated with low uptake and poor engagement (Kohl et al., 2013; Michie et al., 2017). Szinay et al. (2020) recently performed a review which determined 26 factors which influence uptake and engagement with wellbeing smart phone apps. These factors might reasonably be considered when developing other digital interventions to benefit health behaviour change more broadly. These factors are presented below.

Factors related to uptake	Factors related to engagement	Both
• Low cost • App awareness • Recommendations from others for apps/websites	• Health information • Statistical information on progress • Well-designed reminders • Designed to reduce cognitive load • Self-monitoring • Positive tone • Personalisation • Embedded health professional support • Social networking • Positive feedback • Available rewards • Goal setting • Perceived utility of the app	• Literacy skills • Available user guidance

Recommended behaviour change techniques (BCTs) to promote general health behaviour change

Behaviour change techniques (BCTs) are considered to be the specific strategies or 'active ingredients' included in interventions that promote changes in behaviour (Michie et al., 2013). A review of the evidence shows that several BCTs have been recommended as effective when included in digital interventions that promote general health behaviour change (Michie et al., 2013).

Webb et al. (2010) conducted a systematic review investigating which characteristics of internet-based interventions best promoted health behaviour change. They found that a higher number of BCTs used in an intervention were associated with larger effect sizes. Specific BCTs of 'modelling', 'relapse prevention/coping planning', 'facilitating social comparison', 'goal setting', 'action planning', and 'provision of feedback on performance' specifically were associated with positive behaviour change (Webb et al., 2010). The largest effect sizes were observed for interventions that included stress management and general communication skills training, although few studies incorporated these components (Webb et al., 2010). This finding suggests that the inclusion of stress management and general communication skills could enhance the proposed 'Healthy lifestyles' website resource.

The use of normative feedback is regularly cited as an effective BCT, used across a range of digital interventions supporting various health behaviours (e.g., alcohol reduction, weight management, and smoking cessation) (Riper et al., 2018, Asbjornsen et al., 2019, McCrabb et al., 2019). In Webb et al's (2010) review it was noted that there are two main types of normative feedback that might be used – information about others' approval and information about others' behaviour. They found that information about others' behaviour can influence behaviour and decision making more than information about others' approval (Webb et al., 2010).

Recommended delivery channels to enhance digital interventions that promote health behaviour change

Digital interventions that promote health behaviours can be enhanced by the use of text messaging and emails. Webb et al (2010) found that internet-based interventions that support health behaviour change that included text messages, as an adjunct, reported large effects on behaviour, whereas interventions enhanced with emails were associated with smaller effect sizes. Text messaging interventions (TMIs) have been shown to be effective in supporting a range of important health behaviours including smoking cessation, weight management and physical activity (Hall et al. 2015). TMIs have also been shown to be cost-effective and versatile as they can be tailored, interactive and personalised (Hall et al., 2015).

Key recommendations for developing digital interventions that promote specific primary health behaviours

The proposed intervention aims to support local users to make healthy lifestyle choices and reduce the prevalence of the mains behaviours that cause morbidity and mortality: smoking, consumption of poor diet, alcohol consumption, lack of physical activity, and weight gain. The key recommendations for developing effective digital interventions to promote these specific behaviours are summarised below.

Smoking cessation

Internet-based smoking cessation interventions have been associated with improved rates of smoking cessation both in the short and long term (McCrabb et al., 2019). There is also

evidence to suggest that websites that are tailored and interactive may be more effective than low intensity websites (e.g., listing resources) (Civjlak et al., 2010).

Specific BCTs that have been found to be associated with internet-based, smoking cessation intervention effectiveness in the short and long term include: 'goals and planning', 'social support', 'natural consequences', 'comparison of outcomes', and 'regulation' (McCrabb et al., 2019). 'Feedback and monitoring' was only associated with effectiveness in the short term, and 'rewards and threats' were only associated with effectiveness in the long term (McCrabb et al., 2019).

Other evidence shows text messaging interventions (TMIs) have been found to be generally effective for smoking cessation with no evidence to show that high intensity TMIs are more effective than low intensity ones (Whittaker et al., 2019). However, TMIs may be less effective for women than men (Scott-Sheldon et al., 2016). Reasons for this gender disparity are unclear but it has been recommended that TMIs try to target women's specific needs around smoking cessation (Scott-Sheldon et al., 2016). There is also evidence that TMI interventions can increase smoking cessation behaviour among pregnant smokers (Griffiths et al., 2018).

There is currently no evidence that smartphone apps are effective at promoting smoking cessation (Whittaker et al., 2019).

One study compared the effectiveness of different email schedules on smoking cessation and found that emailing users 3-4 emails with links to downloadable smoking cessation resources was as effective as more intensive email schedules, and more effective than a single, non-tailored email on smoking abstinence (Westmaas et al., 2018). In addition, another study examined user preferences for smoking cessation information during the current COVID-19 pandemic, which showed a strong preference for email-based information and support (Pettigrew et al., 2020).

Some evidence indicates that digital-based smoking cessation interventions may be as effective as some person-delivered cessation services (Graham et al. 2016).

Alcohol reduction
Recent reviews have shown that compared with comparators, internet-based interventions are effective in reducing alcohol consumption (Kaner et al., 2017; Ramsey et al., 2019; Riper et al., 2019; Sundström et al., 2017). There is also some evidence to show that multi-session interventions may be more effective than single session interventions and that those users who are above 55 years of age and female may have a better response to treatment than younger, male counterparts (Black et al., 2016; Riper et al., 2019; Sundström et al., 2017).

In terms of effective intervention behaviour change components, a Cochrane review by Kaner et al. 2017 found that digital behaviour change interventions that included 'goal setting', 'information about antecedents', 'behaviour substitution', 'problem solving' and 'credible source' were associated with reduced alcohol consumption rates. Personalised normative feedback (PNF) is also reported as a commonly used intervention component for reducing alcohol consumption (Black et al., 2016; Riper et al., 2019). Evidence has shown PNF is most effective when used in conjunction with other integrated therapeutic principles rather than a standalone technique (Black et al., 2016; Riper et al., 2019).

Internet-delivered cognitive behaviour change (iCBT) interventions have also shown promising findings in reducing alcohol consumption. One recent review of iCBT based approaches for reducing alcohol consumption showed small to large effect sizes in reducing alcohol consumption (Hadjistavropoulos et al., 2020). It was noted that most iCBT interventions also included modules pertaining to 'alcohol education', 'preparing for change', 'skills training' and 'wellbeing' (Hadjistavropoulos et al., 2020).

Weight management

Internet-based weight loss interventions achieve greater post-intervention weight loss than those with no-intervention controls and minimal intervention (Hutchesson et al., 2015, Sorgente et al., 2017). In addition, self-directed interventions which provide personalised feedback and tailored information appear to have promising effects in promoting weight loss (Tang et al., 2014). Feedback includes progress charts, physiological calculators, and past journals (Krukowski et al., 2007). Interventions which provide information alone without feedback appear to have very limited effectiveness on weight loss (Neve et al., 2010; Saperstein et al., 2007; Tang et al., 2014). Engagement with internet-based interventions (e.g., number of log-ins) has also been strongly associated with positive weight loss outcomes (Arem & Irwin, 2010). Neve et al. 2010 found that retention rates and engagement with digital interventions can be improved with the inclusion of enhanced programme features such as email reminders or telephone prompts.

Maintaining weight after initial weight loss poses a significant ongoing challenge to individual users and intervention developers (Asbjørnsen et al., 2019). Several reviews of effective BCTs in internet-based weight loss maintenance interventions found those that included 'self-monitoring', 'feedback', 'goal setting', and 'shaping knowledge', combined with a human social support component resulted in significant weight loss maintenance effects (Asbjørnsen et al., 2019, Krukowski et al., 2007). A recommended ideal combination of these BCTs was not found however.

Dietary behaviours

Several recent reviews reporting on the effectiveness of healthy eating interventions (e.g. increasing or reducing particular food groups, adherence to specific diets) across a range of populations (e.g., adults in retirement age and overweight, obese adults) identified 'self-monitoring' of diet with 'personalised feedback' and 'goal setting' as effective behaviour change techniques (Mandracchia et al., 2019; McCarroll et al., 2017; Prestwich et al., 2014; Samdal et al., 2019). Specifically for those in peri-retirement, the BCTs of 'barrier identification/problem solving', and 'plan for social support/social change' may increase the effectiveness of dietary interventions promoting fruit and vegetable uptake (Lara et al., 2014a).

There is also some evidence to show that ongoing social support, the number of intervention contacts and 'long-lasting' interventions are associated with maintenance of dietary changes (Lara et al., 2014b; Mandracchia et al., 2019).

Self-efficacy (an individual's belief that they are capable of performing a behaviour) has also been shown to be a key determinant of healthy eating behaviours. A meta-analysis by Prestwich et al. (2014) that looked to determine which BCTs might support dietary self-efficacy, found that healthy eating interventions which included stress management techniques were consistently associated with improved self-efficacy. 'Self-monitoring', 'feedback on behaviours', 'social support', 'prompted review of behavioural goals' and 'contingent rewards' were BCTs found to significantly increase dietary self-efficacy as well (Prestwich et al., 2014).

Physical activity

A recent review found that physical activity (PA) interventions (including digital based interventions) successfully promoted behaviour change and maintenance (at 6 months postintervention) in healthy, inactive adults (Howlett et al., 2019). Specific BCTs that were effective in changing PA behaviours were 'biofeedback', 'demonstration of the behaviour', 'behaviour practice/rehearsal', and 'graded tasks' (Howlett et al., 2019). BCTs associated with maintenance of PA included 'action planning', 'instruction on how to perform the behaviour', 'prompts/cues', 'behaviour practice/rehearsal', 'graded tasks', and 'self-reward' (Howlett et al., 2019). It should be noted that maintenance of PA is important for generating sustained health benefits (Goldberg et al., 2007).

Internet-based interventions have been shown to have a significant effect on improving PA levels across a diverse range of age groups (Davies et al., 2012, Cotie et al., 2018, Muellman et al., 2016). Theoretical foundation and BCTs are considered to be positive elements of effective e and mHealth interventions (Fielder et al., 2020).

More specifically, a review of mHealth interventions for PA also found mHealth interventions were equally as effective at increasing PA and walking, and more effective at reducing sedentary behaviours when compared with usual care, traditional interventions or intensive

counselling (Hardeman et al., 2019). BCTs noted as commonly used across mHealth interventions (but not necessarily found to be effective) were 'goal setting', 'self-monitoring of behaviour', 'social support', 'feedback on behaviour', 'instruction on how to perform the behaviour', 'adding objects to the environment' (e.g., a pedometer or wearable), 'information about health consequences' of being active, and 'prompts and cues' (Hardeman et al., 2019).

There is also promising evidence to show that text messaging may be an effective enhancement to PA interventions (increased step/day) and can be used in a number of ways, e.g., to provide education, provide feedback related to goals, enhance motivation, and remind participants of PA plans (Smith et al., 2020).

Recommendations for multiple health behaviour change digital interventions
A review by the Programme Development Group (PDG) for the National Institute for Health and Care Excellence (NICE) (2014) found a lack of evidence pertaining to the most effective approach for targeting multiple behaviours. Some important evidence gaps identified included whether behaviours should be addressed in sequence or in combination and if in combination, how an order of preference might be determined. The PDG recommended that further research be conducted to address these gaps.

Summary
There is a large amount of evidence to show that digital behaviour change interventions can effectively promote health behaviour change in the areas of smoking cessation, alcohol consumption, weight management, dietary behaviours, and physical activity. There are also clear recommendations for components (including functionality aspects and BCTs) that can help to increase uptake, engagement and positive behaviour change outcomes in digital behaviour change interventions. All these findings taken together support the development of a digital multi-behaviour change intervention relevant for the needs of people in the local Norfolk community and beyond.

C = BCT mentioned in literature as commonly used; E = BCT mentioned in literature as being an effective	1.1 Goal setting	1.4 Action planning	1.2 Problem solving	1.7 Review of outcome goal(s)	2.2 Feedback on behaviour	2.3 Self-monitoring	2.6 Biofeedback	3.1 Social support (unspecified)	4. Shaping knowledge	4.1 Instruction on how to perform a behaviour	4.2 Information about antecedents	5. Natural consequences	5.1 Information about health consequences	6.1 Demonstration of the behaviour	6.2 Social comparison	7.1 Prompts/cues	8.1 Behaviour practice/rehearsal	8.2 Behaviour substitution	8.7 Graded tasks	9. Comparison of outcomes	9.1 Credible source	10. Rewards and threats	10.9 Self-reward	11. Regulation	12.5 Adding objects to environment
General health BC	I (E)	I (E)	I (E)		I (E)									I (E)	I (E)										
Smoking cessation	I (E)	I (E)			I (E)	I (E)		I (E)					I (E)							I (E)		I (E)		I (E)	
Alcohol reduction	I (E)		I (E)								I (E)							I (E)			I (E)				
Weight management	I (E)					I (E)				I (E)															
Dietary behaviours (Initiation)	I (E)		I (E)		I (E)	I (E)		I (E)																	
Dietary behaviours (Maintenance)								I (E)																	
Self-efficacy for dietary behaviours				I (E)	I (E)	I (E)		I (E)						I (E)									I (E)		
PA (Initiation)	I (C)				I (C)	I (C)	I (E)	I (C)	I (C)	I (E) I (C)		I (C)		I (E)		I (C)	I (E)		I (E)						I (C)
PA (Maintenance)		I (E)								I (E)							I (E)		I (E)			I (E)			
TOTAL	6	3	3	1	5	5	1	5	1	3	1	1	1	3	1	1	2	1	2	1	1	2	1	1	1

References

Arem, H., & Irwin, M. (2011). A review of web-based weight loss interventions in adults. *Obesity Reviews*, *12*(5), e236-e243.

Asbjørnsen, R. A., Smedsrød, M. L., Nes, L. S., Wentzel, J., Varsi, C., Hjelmesæth, J., & van Gemert-Pijnen, J. E. (2019). Persuasive system design principles and behavior change techniques to stimulate motivation and adherence in electronic health interventions to support weight loss maintenance: Scoping review. *Journal of medical internet research*, *21*(6), e14265.

Black, N., Mullan, B., & Sharpe, L. (2016). Computer-delivered interventions for reducing alcohol consumption: meta-analysis and meta-regression using BCTs and theory. *Health psychology review*, *10*(3), 341-357.

Cotie, L. M., Prince, S. A., Elliott, C. G., Ziss, M. C., McDonnell, L. A., Mullen, K. A., ... & Reed, J. L. (2018). The effectiveness of eHealth interventions on physical activity and measures of obesity among working-age women: a systematic review and meta-analysis. *Obesity Reviews*, *19*(10), 1340-1358.

Davies, C. A., Spence, J. C., Vandelanotte, C., Caperchione, C. M., & Mummery, W. K. (2012). Meta-analysis of internet-delivered interventions to increase physical activity levels. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 1-13.

Fiedler, J., Eckert, T., Wunsch, K., & Woll, A. (2020). Key facets to build up eHealth and mHealth interventions to enhance physical activity, sedentary behavior and nutrition in healthy subjects–an umbrella review. *BMC public health*, *20*(1), 1-21.

Goldberg, J. H., & King, A. C. (2007). Physical activity and weight management across the lifespan. *Annu. Rev. Public Health*, *28*, 145-170.

Graham, A. L., Carpenter, K. M., Cha, S., Cole, S., Jacobs, M. A., Raskob, M., & Cole-Lewis, H. (2016a). Systematic review and meta-analysis of Internet interventions for smoking cessation among adults. *Substance abuse and rehabilitation*, *7*, 55.

Griffiths, S. E., Parsons, J., Naughton, F., Fulton, E. A., Tombor, I., & Brown, K. E. (2018). Are digital interventions for smoking cessation in pregnancy effective? A systematic review and meta-analysis. *Health Psychology Review*, *12*(4), 333-356.

Hadjistavropoulos, H. D., Mehta, S., Wilhelms, A., Keough, M. T., & Sundström, C. (2020). A systematic review of internet-delivered cognitive behavior therapy for alcohol misuse: study characteristics, program content and outcomes. *Cognitive behaviour therapy*, *49*(4), 327-346.

Hall, A. K., Cole-Lewis, H., & Bernhardt, J. M. (2015). Mobile text messaging for health: a systematic review of reviews. *Annual review of public health*, *36*, 393-415.

Hardeman, W., Houghton, J., Lane, K., Jones, A., & Naughton, F. (2019). A systematic review of just-in-time adaptive interventions (JITAIs) to promote physical activity. *International Journal of Behavioral Nutrition and Physical Activity*, *16*(1), 31.

Howlett, N., Trivedi, D., Troop, N. A., & Chater, A. M. (2019). Are physical activity interventions for healthy inactive adults effective in promoting behavior change and maintenance,

and which behavior change techniques are effective? A systematic review and meta-analysis. *Translational behavioral medicine*, *9*(1), 147-157.

Hutchesson, M. J., Rollo, M. E., Krukowski, R., Ells, L., Harvey, J., Morgan, P. J., ... & Collins, C. E. (2015). eH ealth interventions for the prevention and treatment of overweight and obesity in adults: a systematic review with meta-analysis. *Obesity reviews*, *16*(5), 376-392.

Kaner, E. F., Beyer, F. R., Garnett, C., Crane, D., Brown, J., Muirhead, C., ... & Michie, S. (2017). Personalised digital interventions for reducing hazardous and harmful alcohol consumption in community-dwelling populations. *Cochrane Database of Systematic Reviews*, (9).

Kohl, L. F., Crutzen, R., & de Vries, N. K. (2013). Online prevention aimed at lifestyle behaviors: a systematic review of reviews. *Journal of medical Internet research*, *15*(7), e146.

Krukowski, R. A., Harvey-Berino, J., Ashikaga, T., Thomas, C. S., & Micco, N. (2008). Internet-based weight control: the relationship between web features and weight loss. *Telemedicine and e-Health*, *14*(8), 775-782.

Lara, J., Evans, E. H., O'Brien, N., Moynihan, P. J., Meyer, T. D., Adamson, A. J., ... & Mathers, J. C. (2014a). Association of behaviour change techniques with effectiveness of dietary interventions among adults of retirement age: a systematic review and meta-analysis of randomised controlled trials. *BMC medicine*, *12*(1), 1-12.

Lara, J., Hobbs, N., Moynihan, P. J., Meyer, T. D., Adamson, A. J., Errington, L., ... & Mathers, J. C. (2014b). Effectiveness of dietary interventions among adults of retirement age: a systematic review and meta-analysis of randomized controlled trials. *BMC medicine*, *12*(1), 60.

Mandracchia F, Llauradó E, Tarro L, Del Bas JM, Valls RM, Pedret A, Radeva P, Arola L, Solà R, Boqué N. Potential Use of Mobile Phone Applications for Self-Monitoring and Increasing Daily Fruit and Vegetable Consumption: A Systematized Review. Nutrients. 2019 Mar 22;11(3):686. doi: 10.3390/nu11030686. PMID: 30909484; PMCID: PMC6471011.

McCarroll R, Eyles H, Ni Mhurchu C. Effectiveness of mobile health (mHealth) interventions for promoting healthy eating in adults: A systematic review. Prev Med. 2017 Dec;105:156-168. doi: 10.1016/j.ypmed.2017.08.022. Epub 2017 Sep 4. PMID: 28882743.

McCrabb, S., Baker, A. L., Attia, J., Skelton, E., Twyman, L., Palazzi, K., ... & Bonevski, B. (2019). Internet-based programs incorporating behavior change techniques are associated with increased smoking cessation in the general population: a systematic review and meta-analysis. *Annals of Behavioral Medicine*, *53*(2), 180-195.

Michie, S., Richardson, M., Johnston, M., Abraham, C., Francis, J., Hardeman, W., ... & Wood, C. E. (2013). The behavior change technique taxonomy (v1) of 93 hierarchically clustered techniques: building an international consensus for the reporting of behavior change interventions. *Annals of behavioral medicine*, *46*(1), 81-95.

Michie, S., Yardley, L., West, R., Patrick, K., & Greaves, F. (2017). Developing and evaluating digital interventions to promote behavior change in health and health care:

recommendations resulting from an international workshop. *Journal of medical Internet research*, *19*(6), e232.

Muellmann, S., Forberger, S., Möllers, T., Zeeb, H., & Pischke, C. R. (2016). Effectiveness of eHealth interventions for the promotion of physical activity in older adults: a systematic review protocol. *Systematic reviews*, *5*(1), 1-5.

National Institute for Health and Care Excellence (NICE). (2014). *Behaviour change: individual approaches – Gaps in the evidence*. [Public health guideline [PH49]]. https://www.nice.org.uk/guidance/ph49/chapter/10-Gaps-in-the-evidence

Neve, M., Morgan, P. J., Jones, P. R., & Collins, C. E. (2010). Effectiveness of web-based interventions in achieving weight loss and weight loss maintenance in overweight and obese adults: a systematic review with meta-analysis. *Obesity reviews*, *11*(4), 306-321.

Norfolk County Council (NCC) Digital Content Team (2020). *Healthy lifestyles – user research report.* [User research report].

Pettigrew, S., Jun, M., Roberts, I., Bullen, C., Nallaiah, K., & Rodgers, A. (2020). Preferences for Tobacco Cessation Information and Support During Covid-19. *Journal of Addiction Medicine*, *14*(6), e362-e365.

Prestwich, A., Kellar, I., Parker, R., MacRae, S., Learmonth, M., Sykes, B., ... & Castle, H. (2014). How can self-efficacy be increased? Meta-analysis of dietary interventions. Health Psychology Review, 8(3), 270-285.

Ramsey, A. T., Satterfield, J. M., Gerke, D. R., & Proctor, E. K. (2019). Technology-based alcohol interventions in primary care: systematic review. *Journal of medical Internet research*, *21*(4), e10859.

Riper, H., Hoogendoorn, A., Cuijpers, P., Karyotaki, E., Boumparis, N., Mira, A., ... & Smit, J. H. (2018). Effectiveness and treatment moderators of internet interventions for adult problem drinking: an individual patient data meta-analysis of 19 randomised controlled trials. *PLoS medicine*, *15*(12), e1002714.

Samdal GB, Eide GE, Barth T, Williams G, Meland E. Effective BCTsfor physical activity and healthy eating in overweight and obese adults; systematic review and meta-regression analyses. Int J Behav Nutr Phys Act. 2017 Mar 28;14(1):42. doi: 10.1186/s12966-017-0494-y. PMID: 28351367; PMCID: PMC5370453.

Saperstein, S. L., Atkinson, N. L., & Gold, R. S. (2007). The impact of Internet use for weight loss. *Obesity reviews*, *8*(5), 459-465.

Scott-Sheldon, L. A., Lantini, R. C., Jennings, E. G., Thind, H., Rosen, R. K., Salmoirago-Blotcher, E., & Bock, B. C. (2016). Text messaging-based interventions for smoking cessation: a systematic review and meta-analysis. *JMIR mHealth and uHealth*, *4*(2), e49.

Smith, D. M., Duque, L., Huffman, J. C., Healy, B. C., & Celano, C. M. (2020). Text message interventions for physical activity: a systematic review and meta-analysis. *American journal of preventive medicine*, *58*(1), 142-151.

Sorgente, A., Pietrabissa, G., Manzoni, G. M., Re, F., Simpson, S., Perona, S., ... & Castelnuovo, G. (2017). Web-based interventions for weight loss or weight loss maintenance in

overweight and obese people: a systematic review of systematic reviews. *Journal of Medical Internet Research*, *19*(6), e229.

Sundström, C., Blankers, M., & Khadjesari, Z. (2017). Computer-based interventions for problematic alcohol use: a review of systematic reviews. *International journal of behavioral medicine*, *24*(5), 646-658.

Szinay, D., Jones, A., Chadborn, T., Brown, J., & Naughton, F. (2020). Influences on the Uptake of and Engagement With Health and Well-Being Smartphone Apps: Systematic Review. *Journal of Medical Internet Research*, *22*(5), e17572.

Tang, J., Abraham, C., Greaves, C., & Yates, T. (2014). Self-directed interventions to promote weight loss: a systematic review of reviews. *Journal of medical Internet research*, *16*(2), e58.

Webb, T., Joseph, J., Yardley, L., & Michie, S. (2010). Using the internet to promote health behavior change: a systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *Journal of medical Internet research*, *12*(1), e4.

Westmaas, J. L., Bontemps-Jones, J., Hendricks, P. S., Kim, J., & Abroms, L. C. (2018). Randomised controlled trial of stand-alone tailored emails for smoking cessation. *Tobacco Control*, *27*(2), 136-146.

Whittaker, R., McRobbie, H., Bullen, C., Rodgers, A., Gu, Y., & Dobson, R. (2019). Mobile phone text messaging and app-based interventions for smoking cessation. *Cochrane Database of Systematic Reviews*, (10).