

Smartphone apps for weight loss and smoking cessation

6 September 2015

Nick Wilson, Cristina Cleghorn, William Leung, Osman David Mansoor



Are smartphone apps for weight loss and smoking cessation well-designed? We were involved in a study published in last Friday's *NZ Medical Journal* that tried to answer that question from a NZ public health perspective. In this blog we discuss what we found and its implications for 'what next' for using these new technological tools for health research and promotion in NZ.

In NZ, tobacco use and overweight/obesity are the two leading risk factors leading to health loss [1]. The key ways to address these are probably price signals (e.g., tobacco tax increases [2,3]) and a healthier food environment (prices, marketing controls, and healthier food composition). In addition, individuals need support to change. Rapid evolution of Information & Communication Technology (ICT) offers ever more kinds of support, including innovative internet and smartphone technologies. Most adults have a smartphone [4], and are using ever more services through them.

In our recent publication with a group of medical students (last week's *NZ Medical Journal*

[5]) we briefly considered some of the NZ specific literature that indicates the value of mobile phone text messaging for smoking cessation [6], including for Māori [7]. We also noted NZ work on smartphone-mediated cardiovascular management [8,9]. But in particular we reported that there is some evidence from systematic reviews that: (i) computer-based and other electronic aids can assist with smoking cessation [10]; and that (ii) mobile phone interventions are effective for smoking cessation [11]. Nevertheless, the evidence from randomised controlled trials (RCTs) of “smartphone apps” for smoking cessation is still fairly limited [12,13].

For smartphone apps for weight loss, we noted two generally favourable reviews [14,15] but also that some recent studies did not report statistically significant weight loss [16-19].

So what did this new study do?

The study involved the systematic identification and evaluation of 120 apps (30 apps of each of Android/Apple for smoking cessation/weight loss – full details are online [20]). Each app was examined by two assessors and was rated against a published “Mobile App Rating Scale” (MARS) [21] (45% of the total score); in terms of weight loss/smoking cessation as appropriate (45% of the total score); and cultural appropriateness criteria (10% of the total score).

What was found?

Overall, these 120 apps did not perform that well against the various criteria. The average scores across the four groups for the MARS scale were only: 51% to 62%; for weight loss: 29%, 32%; for smoking cessation: 18%, 20%; and for cultural appropriateness overall: 17%.

Nevertheless, there were still some high-scoring individual apps, with the top two apps in each category shown in the Table below.

An additional 48 hours of experiential use by the student researchers of the top 10 weight loss apps (5 Android, 5 Apple), found additional desirable features. These included low battery usage, provision of feedback, provision of motivation/encouragement, memory functions retaining previously logged meals, and offline functionality. But a problem was that most did not have a food barcode scanning capacity that was relevant to the NZ market. Additional details on the top five apps in each category are given in an [online seven minute video](#) and other more detail results are covered elsewhere [20].

Table: Final scores for the top two smartphone apps in each of the four groupings (weight loss, smoking cessation, Android and Apple)

App purpose and name (for top 2 out of 30 apps in each of the 4 categories)	App developer	Overall score* (ranked)
<i>Weight loss, Android</i>		
Noom Coach: Weight Loss Plan	Noom Inc	70%
Lifesum – The Health Movement	Lifesum	68%
<i>Weight loss, Apple</i>		

App purpose and name (for top 2 out of 30 apps in each of the 4 categories)	App developer	Overall score* (ranked)
Calorie Counter and Food Diary by MyNetDiary	MyNetDiary Inc	67%
Calorie Counter, Dining Out, Food, and Exercise Tracker	Everyday Health, Inc	65%
Smoking cessation, Android		
My Quit Smoking Coach	Andreas Jopp	62%
You Can Quit Smoking	Insplisity	59%
Smoking cessation, Apple		
Quit Now: My QuitBuddy	Australian National Preventive Health Agency	77%
LIVESTRONG MyQuit Coach - Dare to quit smoking	Demand Media, Inc	68%

* Overall score based on the weightings of: 45% for the MARS criterion, 45% for the weight loss/smoking cessation criterion, and 10% for cultural appropriateness criterion.

What do these results mean?

The apps rated relatively poorly overall, but some individual apps had features covered in the relevant guidelines and so could potentially have some efficacy.

The potential to improve the apps to better support lifestyle changes, raises several issues of responsibility and capacity for a resource-constrained health sector. This is whilst the private sector continues to develop more health-related tools, a trend that may be accelerating with the introduction of the Apple watch and Apple's health app.

A case can be made for public health authorities to assess health-related apps to recommend for use to support clinical care as well as self-care. Doing this would require both capacity and resources - including research funding for more RCTs to assess which features of apps are most important for effectiveness and maintaining long-term use. Of note is that some official endorsement of apps is being done by the National Health Service in the UK e.g., [see this website](#).

An alternative case would be to develop capacity for public health authorities to develop health apps themselves. One vision could be to design an app that was intended to 'house' the person's electronic 'medical home'; of course linked to a secure web-database that all health professionals could access as they treated the person. Such an app ideally could include the sort of preventive advice and behavioural cues that are currently included in many kinds of apps.

Integration is a key task for the health sector; an integrated information system is critical infrastructure to enable effective and efficient integration between providers. Patient-centred care means that the patient should also be at the centre and control point for their

integrated electronic medical/health record.

Does NZ have the capacity to develop such an information system? A simple initial step might be to start with the design of apps to help people with their personal health goals, such as becoming smokefree and losing weight.

We would be interested to start a conversation on the above ideas - so please give us your thoughts in the comments box below.

Acknowledgements: Three of the authors (NW, CC, WL) are supported by funding from the Ministry of Business, Innovation and Employment (MBIE), grant number: UOOX1406.

References

1. Ministry of Health: Health loss in New Zealand: A report from the New Zealand Burden of Diseases, Injuries and Risk Factors Study, 2006–2016. Wellington: Ministry of Health; 2013.
2. Blakely T, Cobiac LJ, Cleghorn CL, Pearson AL, van der Deen FS, Kvizhinadze G, Nghiem N, McLeod M, Wilson N: Health, health inequality, and cost impacts of annual increases in tobacco tax: Multistate life table modeling in New Zealand. *PLoS Med* 2015, 12(7):e1001856.
3. Cobiac LJ, Ikeda T, Nghiem N, Blakely T, Wilson N: Modelling the implications of regular increases in tobacco taxation in the tobacco endgame. *Tob Control* 2015, 24(e2):e154-160.
4. Research New Zealand: A Report on a Survey of New Zealanders' Use of Mobile Electronic Devices 2014. Wellington, Research New Zealand, 2014. http://www.researchnz.com/pdf/Special%20Reports/ResearchNZ%20Special%20Report%20-%20NZrs_Device_Use_09-04-14.pdf.
5. Patel R, Sulzberger L, Li G, Mair J, Morley H, Ng-Wai Shing M, O'Leary C, Prakash A, Robilliard N, Rutherford M et al: Smartphone apps for weight loss and smoking cessation: Quality ranking of 120 apps. *N Z Med J* 2015, 128(1421).
6. Rodgers A, Corbett T, Bramley D, Riddell T, Wills M, Lin RB, Jones M: Do u smoke after txt? Results of a randomised trial of smoking cessation using mobile phone text messaging. *Tob Control* 2005, 14(4):255-261.
7. Bramley D, Riddell T, Whittaker R, Corbett T, Lin RB, Wills M, Jones M, Rodgers A: Smoking cessation using mobile phone text messaging is as effective in Maori as non-Maori. *N Z Med J* 2005, 118(1216):U1494.
8. Wells S, Whittaker R, Dorey E, Bullen C: Harnessing health IT for improved cardiovascular risk management. *PLoS Med* 2010, 7(8):e1000313.
9. Dale LP, Whittaker R, Jiang Y, Stewart R, Rolleston A, Maddison R: Improving coronary heart disease self-management using mobile technologies (Text4Heart): a randomised controlled trial protocol. *Trials* 2014, 15:71.
10. Chen YF, Madan J, Welton N, Yahaya I, Aveyard P, Bauld L, Wang D, Fry-Smith A, Munafo MR: Effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation: a systematic review and network meta-analysis. *Health Technology Assessment* 2012, 16(38):1-205, iii-v.
11. Whittaker R, McRobbie H, Bullen C, Borland R, Rodgers A, Gu Y: Mobile phone-based interventions for smoking cessation. *Cochrane database of systematic reviews* (Online) 2012, 11:CD006611.
12. Bricker JB, Mull KE, Kientz JA, Vilardaga R, Mercer LD, Akioka KJ, Heffner JL: Randomized, controlled pilot trial of a smartphone app for smoking cessation using

- acceptance and commitment therapy. *Drug and Alcohol Dependence* 2014, 143:87-94.
13. Buller DB, Borland R, Bettinghaus EP, Shane JH, Zimmerman DE: Randomized trial of a smartphone mobile application compared to text messaging to support smoking cessation. *Telemedicine Journal and e-Health* 2014, 20(3):206-214.
 14. Derbyshire E, Dancy D: Smartphone medical applications for women's health: What is the evidence-base and feedback? *International Journal of Telemedicine and Applications* 2013, 2013:782074.
 15. Lyzwinski LN: A Systematic Review and Meta-Analysis of Mobile Devices and Weight Loss with an Intervention Content Analysis. *Journal of Personalized Medicine* 2014, 4(3):311-385.
 16. Turner-McGrievy G, Tate D: Tweets, apps, and pods: Results of the 6-month Mobile Pounds Off Digitally (Mobile POD) randomized weight-loss intervention among adults. *Journal of Medical Internet Research* 2011, 13(4):e120.
 17. Allen JK, Stephens J, Dennison Himmelfarb CR, Stewart KJ, Hauck S: Randomized controlled pilot study testing use of smartphone technology for obesity treatment. *Journal of Obesity* 2013, 2013:151597.
 18. Laing BY, Mangione CM, Tseng CH, Leng M, Vaisberg E, Mahida M, Bholat M, Glazier E, Morisky DE, Bell DS: Effectiveness of a smartphone application for weight loss compared with usual care in overweight primary care patients: a randomized, controlled trial. *Annals of Internal Medicine* 2014, 161(10 Suppl):S5-12.
 19. Nollen NL, Mayo MS, Carlson SE, Rapoff MA, Goggin KJ, Ellerbeck EF: Mobile technology for obesity prevention: a randomized pilot study in racial- and ethnic-minority girls. *Am J Prev Med* 2014, 46(4):404-408.
 20. Patel R, Sulzberger L, Li G, Mair J, Morley H, Ng-Wai Shing M, O'Leary C, Prakash A, Robilliard N, Rutherford M et al: Online Report: Smartphone apps for weight loss and smoking cessation: Quality ranking of 120 apps (full methods and results). Wellington: University of Otago, 2015. <http://www.otago.ac.nz/wellington/otago119763..pdf>.
 21. Stoyanov SR, Hides L, Kavanagh DJ, Zelenko O, Tjondronegoro D, Mani M: Mobile app rating scale: a new tool for assessing the quality of health mobile apps. *JMIR mHealth and uHealth* 2015, 3(1):e27.

Public Health Expert Briefing (ISSN 2816-1203)

Source URL:

<https://www.phcc.org.nz/briefing/smartphone-apps-weight-loss-and-smoking-cessation>