

Smartphone apps for weight loss and smoking cessation: Quality ranking of 120 apps

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The tobacco epidemic and burden from overweight/obesity are major causes of health loss in New Zealand.¹ Changes to the obesogenic environment and the use of various price signals are probably the most critical interventions required (eg, tobacco tax increases^{2,3}). But there is potentially a place for the promotion of individual-level interventions, including the use of innovative internet and smartphone technologies.

In New Zealand, smartphone access has been increasing, and a survey in 2013 found 59% smartphone ownership or access by New Zealand adults.⁴ It was even higher, at 71%, for those aged 18 to 54 years, and also for Māori or Pacific peoples compared to New Zealand European (70% vs 55% respectively).

There is some New Zealand randomised control trial (RCT) evidence for the effectiveness of mobile phone text messaging for smoking cessation,⁵ with this being equally effective for Māori as non-Māori.⁶ Work has also been done in New Zealand on smartphone-mediated cardiovascular management⁷ (eg, as per a New Zealand trial on 'Text4Heart'⁸). Internationally, there is evidence detailed in a systematic review that computer-based and other electronic aids can assist with smoking cessation, and are "highly likely to be cost-effective".⁹ Another systematic review of five RCTs has reported that mobile phone interventions are effective for smoking cessation.¹⁰ But the evidence from RCTs of 'smartphone apps' for smoking cessation is fairly limited (eg, we only identified two trials^{11,12}).

For smartphone apps for weight loss, one review reported on 10 RCTs which used

text messaging or app interventions to support weight loss in women, with significant improvements being observed in eight studies.¹³ Another review of 17 studies¹⁴ that utilised smartphone applications, text messaging and web resources, reported overall weight loss of 0.43 kg (95% CI 0.25–0.61, p -value \leq 0.01). But not included in this review were some other smartphone app specific studies which did not report statistically significant weight loss^{15–18} (albeit some of these being small pilot studies).

Given this background of some promising evidence, we aimed to assess the quality of existing apps for weight loss and smoking cessation available for downloading to smartphones by New Zealanders.

Method

We screened potential weight loss and smoking cessation apps to identify a final list of 120 Android and Apple apps (four groups of 30 apps each) based on their focus on the topic, price (all under \$4), being in English language and download popularity as estimated by a relevant website (xyo.net). Each app was examined by two assessors and was rated against a published "Mobile App Rating Scale" (MARS),¹⁹ (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). We designed these other criteria (in addition to the MARS) based on relevant New Zealand literature: eg, weight loss/smoking cessation criteria were based on New Zealand weight management guidelines²⁰ and New Zealand smoking cessation

Table 1: Scores and final ranking for smartphone apps in each of the four groupings (weight loss, smoking cessation, Android and Apple) for the top five apps and mean results for the 30 per category

App purpose and name (for top five and summarised for all 30 apps in each of the 4 categories)	App developer	MARS score	Weight loss / smoking cessation criterion score	Cultural-appropriateness criterion score	Overall score* (ranked)
Weight loss, Android					
Noom Coach: Weight Loss Plan	Noom Inc	83%	68%	17%	70%
Lifesum – The Health Movement	Lifesum	79%	68%	17%	68%
Calorie Counter – MyFitnessPal	MyFitnessPal, Inc	86%	50%	17%	63%
Calorie Counter & Diet Tracker	SparkPeople	73%	59%	17%	61%
Lose weight without dieting	Harmonic Soft	77%	55%	17%	61%
Mean for all 30 apps studied	–	62%	32%	18%	44%
Range for all 30 apps studied	–	37%–86%	0%–68%	0%–33%	20%–70%
Weight loss, Apple					
Calorie Counter and Food Diary by MyNetDiary	MyNetDiary Inc	82%	64%	17%	67%
Calorie Counter, Dining Out, Food, and Exercise Tracker	Everyday Health, Inc	72%	68%	17%	65%
Calorie Counter & Diet Tracker by MyFitnessPal	MyFitnessPal.com	78%	59%	17%	64%
5K Runner: 0 to 5K run training, Couch to 5K running, free	Clear Sky Apps Ltd	80%	55%	17%	62%
Jillian Michaels Slim-Down: Weight Loss, Diet, Fitness, Workout & Exercise Solution	Everyday Health, Inc	76%	55%	17%	60%
Mean for all 30 apps studied	–	60%	29%	17%	42%
Range for all 30 apps studied	–	27%–82%	5%–68%	17%–17%	16%–67%
Smoking cessation, Android					
My Quit Smoking Coach	Andreas Jopp	83%	48%	33%	62%
You Can Quit Smoking	Insplisity	69%	52%	50%	59%
STOP Cigarettes – Quit smoking	Academiacea	61%	44%	17%	49%
Quit Pro: stop smoking now	Muslim Pro Ltd	76%	26%	17%	48%
SmokeLess!	Kroaqs	61%	30%	17%	43%
Mean for all 30 apps studied	–	52%	18%	17%	33%
Range for all 30 apps studied	–	33%–83%	0%–52%	0%–50%	17%–62%
Smoking cessation, Apple					
Quit Now: My QuitBuddy	Australian National Preventive Health Agency	94%	70%	33%	77%
LIVESTRONG MyQuit Coach – Dare to quit smoking	Demand Media, Inc	79%	61%	50%	68%
Stop-tobacco	Université de Genève	75%	65%	17%	65%
MyQuitSmokingCoach: Europe’s No 1 Quit Smoking APP	Oliver Fuxen	68%	48%	17%	54%
Smoke Free – Quit smoking now and stop for good	David Crane	61%	52%	17%	53%
Mean for all 30 apps studied	–	51%	20%	17%	33%
Range for all 30 apps studied	–	30%–94%	0%–70%	0%–50%	15%–77%

* 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.

guidelines.^{21,22} We also collected 48 hours of experiential data on 10 of the weight loss apps. The full details of the methods are detailed in an online report.²³

Results

Overall, these 120 apps did not perform particularly well against the various criteria (eg, mean scores by group for the MARS: 51%, 52%, 60%, 62%; for weight loss: 29%, 32%; for smoking cessation: 18%, 20%;

and for cultural appropriateness overall: 17%. See Table 1). The poor scores for the cultural appropriateness criterion reflected the lack of specific designs for the New Zealand market. Nevertheless, there were still some high-scoring individual apps, with the top five in each category shown in Table 1. The top weight loss app was “Noom Coach: Weight Loss Plan” (score: 70%), and the highest-scoring smoking cessation app was “Quit Now: My QuitBuddy” (77%).

The latter was produced by an Australian Government agency.

In 48 hours of experiential use, we found that some of the top 10 weight loss apps (5 Android, 5 Apple), had additional desirable features of note: low battery usage, provision of feedback, provision of motivation/encouragement, memory functions retaining previously logged meals, and offline functionality. But most did not have a food barcode scanning capacity that was relevant to the New Zealand market. Additional details on the top five apps in each category are given in an online seven minute video (<http://vimeo.com/133304804>). Other more detailed results and discussion of study limitations are in an online report.²³

Discussion

This study found that these 120 apps were generally of limited quality—but the top scoring apps did have some reasonable high quality aspects. As such, these particular high scoring apps could be subject to

further research, including head-to-head comparisons with text-messaging interventions (eg, the Txt2Quit service provided by the NZ Quitline). There may also be a case for New Zealand health authorities (eg, the Ministry of Health, the Health Promotion Agency, and DHBs) to systematically evaluate such apps and list the top ones on their official websites (eg, the National Health Service in the UK has a website that includes “approved” apps: <http://www.nhs.uk/Conditions/online-mental-health-services/Pages/introduction.aspx>).

Health professionals could consider suggesting the highest quality apps to interested patients. But given the uncertainties with the evidence-base for app effectiveness, they could do this in conjunction with recommending more well-established evidence-based measures (eg, Quitline support and pharmacotherapy for smoking cessation) and referral to a dietician for dietary counselling for weight management.

Competing interests: Nil

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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, et al. Health, health inequality, and cost impacts of annual increases in tobacco tax: Multistate life table modeling in New Zealand. *PLoS Med.* 2015;12:e1001856.
3. Cobiac LJ, Ikeda T, Nghiem N, et al. Modelling the implications of regular increases in tobacco taxation in the tobacco endgame. *Tob Control.* 2015;24:e154-60.
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. Rodgers A, Corbett T, Bramley D, et al. Do u smoke after txt? Results of a randomised trial of smoking cessation using mobile phone text messaging. *Tob Control.* 2005;14:255-61.
6. Bramley D, Riddell T, Whittaker R, et al. Smoking cessation using mobile phone text messaging is as effective in Maori as non-Maori. *N Z Med J.* 2005;118:U1494.
7. Wells S, Whittaker R, Dorey E, et al. Harnessing health IT for improved cardiovascular risk management. *PLoS Med.* 2010;7:e1000313.
8. Dale LP, Whittaker R, Jiang Y, et al. Improving coronary heart disease self-management using mobile technologies (Text-4Heart): a randomised controlled trial protocol. *Trials.* 2014;15:71.
9. Chen YF, Madan J, Welton N, et al. Effectiveness and cost-effectiveness of computer and other electronic aids for smoking cessation: a systematic review and network meta-analysis. *Health Technol Assess.* 2012;16:1-205, iii-v.
10. Whittaker R, McRobbie H, Bullen C, et al. Mobile phone-based interventions for smoking cessation. *Cochrane Database Syst Rev.* 2012;11:CD006611.
11. Bricker JB, Mull KE, Kientz JA, et al. Randomized, controlled pilot trial of a smartphone app for smoking cessation using acceptance and commitment therapy. *Drug Alcohol Depend.* 2014;143:87-94.
12. Buller DB, Borland R, Bettinghaus EP, et al. Randomized trial of a smartphone mobile application compared to text messaging to support smoking cessation. *Telemed J E Health.* 2014;20:206-14.
13. Derbyshire E, Dancey D. Smartphone medical applications for women's health: What is the evidence-base and feedback? *Int J Telemed Appl.* 2013;2013:782074.
14. Lyzwinski LN. A Systematic Review and Meta-Analysis of Mobile Devices and Weight Loss with an Intervention Content Analysis. *J Pers Med.* 2014;4:311-385.
15. 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. *J Med Internet Res.* 2011;13:e120.
16. Allen JK, Stephens J, Dennison Himmelfarb CR, et al. Randomized controlled pilot study testing use of smartphone technology for obesity treatment. *J Obes.* 2013;2013:151597.
17. Laing BY, Mangione CM, Tseng CH, et al. Effectiveness of a smartphone application for weight loss compared with usual care in overweight primary care patients: a randomized, controlled trial. *Ann Intern Med.* 2014;161:S5-12.
18. Nollen NL, Mayo MS, Carlson SE, et al. Mobile technology for obesity prevention: a randomized pilot study in racial- and ethnic-minority girls. *Am J Prev Med.* 2014;46:404-8.
19. Stoyanov SR, Hides L, Kavanagh DJ, et al. Mobile app rating scale: a new tool for assessing the quality of health mobile apps. *JMIR Mhealth Uhealth.* 2015;3:e27.
20. Ministry of Health & Clinical Trials Research Unit. Clinical guidelines for weight management in New Zealand adults. Wellington: Ministry of Health, 2009. <http://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>
21. Ministry of Health. The New Zealand guidelines for helping people to stop smoking. Wellington: Ministry of Health, 2014. <http://www.health.govt.nz/system/files/documents/publications/nz-guidelines-helping-people-stop-smoking-jun14.pdf>.
22. Ministry of Health. Background and Recommendations of The New Zealand Guidelines for Helping People to Stop Smoking. Wellington, Ministry of Health; 2014. pp1-38. <http://www.health.govt.nz/publication/new-zealand-guidelines-helping-people-stop-smoking>.
23. Patel R, Sulzberger L, Li G, 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>.