Text messaging interventions increase adherence to antiretroviral therapy and smoking cessation

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Context
Promoting the uptake of healthier behaviour, either in health promotion or in disease management, presents significant challenges, both at the individual and population levels, and calls for innovative strategies and methods. As mobile technologies have advanced exponentially in recent years, there is an increased scope for low-cost health promotion interventions with economy of scale, and for individualised self-management support for healthcare consumers which allows for personal tailored messaging and temporal synchronisation of intervention delivery. Communication technologies have radically changed how individuals access health information and communicate, and this generates a need to examine the effectiveness of mobile technology-based interventions delivered to healthcare consumers for health behaviour change and also for the management of diseases.

Methods
This systematic review by Free and colleagues includes studies in which mobile technology was the primary intervention component under evaluation. The primary outcome was any objective measure of health, or health service delivery or use. Secondary outcomes included self-reported health behaviours, disease management, health service delivery or use and cognitive outcomes. Excluded studies were those in which mixed mobile technologies were adopted, or those evaluating non-mobile technology-based interventions in which the treatment and control group both received the technology-based component or those interventions in which the treatment and control group differed in additional ways besides the use of mobile technology. Two reviewers identified potentially eligible trials and independently extracted data. The authors searched MEDLINE, EMBASE, PsycINFO, Global Health, Web of Science, the Cochrane Library and the Health Technology Assessment (HTA) database from 1990 to September 2010. They applied a taxonomy of behaviour change techniques to classify behaviour change interventions and assessed the risk of bias according to the criteria outlined by the Cochrane Collaboration. Risk ratios and standard mean differences were calculated, and the authors used random effects meta-analysis to give pooled estimates when there were two or more trials using the same technology function (eg, short message service (SMS)) and targeting the same disease (eg, diabetes control) or behaviour (eg, physical activity) and reporting the same outcome. Heterogeneity was examined visually and statistically, and funnel plots were included to assess the evidence of publication bias.

Findings
There were 75 controlled trials which met the review criteria: 49 targeted disease management for healthcare consumers (6832 participants, with sample sizes ranging from 17 to 5800) and 26 targeted health behaviour change (10 706 participants with sample sizes ranging from 16 to 273). Almost all the trials were conducted in high-income countries and the majority were of low quality; only two trials of disease management and two trials of health behaviour management had a low risk of bias. The findings suggest that healthcare services should consider the inclusion of text messaging intervention to encourage adherence to antiretroviral therapy in low-income settings (use of text messaging decreased viral load with RR 0.85, 95% CI 0.72 to 0.99). Text messaging interventions also promoted biochemically verified smoking cessation in high-income settings (RR 2.16, 95% CI 1.77 to 2.62). However, the authors indicate that these interventions need to be tested in other settings and that cost-effectiveness should be determined prior to implementation. The evidence for other mobile technology-based interventions was mixed, highlighting the need for more well-designed trials in mobile health (mHealth).

Commentary
This review contributes to the substantial and growing evidence-base concerning what works in technology-based interventions for health behaviour change. ‘Mobile health’ is a rapidly developing field and, as such, the inclusion of findings from trials published since the systematic review search was completed is a welcome addition to this review. Variability in the reporting of intervention content is common, yet the use of a tool offering criteria for the standardisation of definitions of the
techniques included in behaviour change interventions is a valuable approach. There is a widespread use of mobile phone technology as an adjunctive intervention or single aspect of a multicomponent health promotion programme and these studies will also require review for a thorough understanding of diversity in methods of implementation. Participants often indicate that mobile-technology-based interventions are feasible and acceptable in diverse settings and populations, although cost-effectiveness requires further attention, high attrition rates are a concern and evidence of longer term outcomes is often lacking. It is clear that more rigorous research is required in this field, although the evidence to date shows promise for technology-based approaches for health behaviour change and disease management.

Competing interests None.

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