Text messaging to help medicines adherence

A meta-analysis of 16 randomised controlled trials found that a mobile text messaging intervention approximately doubled reported medicines adherence in middle-aged adults with chronic disease over a median of 12 weeks. However, it has several limitations. For example, adherence was self-reported in most studies and the trials were heterogeneous in several ways, including the characteristics of the text messaging intervention and the definition of adherence. This study is consistent with the NICE guideline on Medicines adherence, which highlights that patients may need support to help them make the most effective use of their medicines.

Overview and current advice

Medicines adherence is defined as the extent to which the patient’s behaviour matches agreed recommendations from the prescriber\(^1\). Non-adherence can be intentional where the patient decides not to follow treatment recommendations, or non-intentional where the patient wants to follow treatment recommendations but is prevented from by barriers which are beyond their control. It has been estimated that between a third and a half of all self-administered medicines prescribed for long-term conditions are not taken as recommended\(^1\). A report commissioned by the Department of Health highlights that people need help to take their medicines as intended, avoid waste and improve health outcomes. The annual cost in England for unused prescription medicines has been estimated at £300 million (2009 figures)\(^2\).

The NICE guideline on Medicines adherence recommends that where non-adherence is identified, possible causes should be clarified and any action agreed with the patient. It also advises that, although adherence can be improved, no specific intervention can be recommended for all patients and health professionals should tailor any intervention to increase adherence to the specific difficulties with adherence the patient is experiencing.

A recent NICE Medicines Evidence Commentary discussed the INTERACT trial, a randomised controlled trial (RCT) that found an exchange of text messages to identify those people requiring individual follow-up or to remind them to take their medicines improved the medicines adherence of people taking blood pressure and/or lipid-lowering medicines for the prevention of cardiovascular disease (CVD)\(^3\).

NICE has published several Medicines Evidence Commentaries on medicines adherence (see March 2015, March 2015, October 2015, October 2015 and February 2016). The NICE guideline on
Medicines optimisation considers interventions that can help to ensure the safe and effective use of medicines to achieve the best possible outcomes. The guideline recommendations on medicines optimisation and medicines adherence are brought together in a NICE pathway.

New evidence

A meta-analysis of 16 RCTs (which included the INTERACT trial discussed above) has estimated the effect of mobile text messaging on medication adherence in 2742 adults with chronic disease. The sample size of included studies ranged from 21 to 538 people (median 97 people) and their durations from 4 to 48 weeks (median 12 weeks). Participants had various chronic diseases including human immunodeficiency virus (HIV) infection, CVD, asthma, allergic rhinitis, diabetes mellitus and epilepsy. Their ages ranged from 31 to 64 years (median 39 years) and half of them were female.

There were large variations between studies in the characteristics of the text message intervention. For example, 8 studies used a 2-way communication strategy. The text messages consisted predominantly of medication reminders, but also included medical educational information or non-medical topics. Messages were personalised in 5 studies. In most studies (15 out of 16) they were sent at a fixed predetermined frequency, but 1 study used a system where the patient only received a message if they failed to open their medication dispenser. The most common texting pattern was a daily text message (8 studies) followed by a weekly text message (3 studies), and 1 study used a variable frequency of messaging. Message send times were matched with the times doses were due in just 4 studies and 10 studies used a computer to automate the messages.

The most commonly used method to assess adherence in studies was recall by the patient (9 studies), followed by a medication event monitoring system (4 studies) and then pill count (3 studies). Adherence outcomes were reported as the proportion of medication doses taken as prescribed or the proportion of patients that were adherent to their medicines. The cut-off level for adherence varied in the studies and was between 80 and 95%. In the pooled analysis, text messaging doubled reported medication adherence (odds ratio [OR] 2.11, 95% confidence interval [CI] 1.52 to 2.93, \( p < 0.001 \)). These effects did not appear to be sensitive to type of disease, or characteristics or duration of the intervention. Ten of the 16 studies were considered high quality and in these the effect of text messaging on reported adherence was still statistically significant but reduced (OR 1.67, 95% CI 1.21 to 2.29, \( p = 0.002 \)). There was evidence of publication bias. However, when the authors adjusted for publication bias, text messaging had a statistically significant but reduced effect on improving reported adherence (OR 1.68, 95% CI 1.18 to 2.39, \( p < 0.05 \)).

Eleven RCTs reported participant feedback and most of these reported moderate to high levels of satisfaction with the text messaging intervention and expressed a desire to continue with it. However, 6% of people in one study of twice daily text messaging reported that they were intrusive and inconvenient. In 2 other studies, participants reported that text messages during morning hours (7am and 10am) tended to disrupt routines.

Commentary

Commentary provided by NICE

This meta-analysis found that, in the short-term, mobile text messaging approximately doubles the odds of reported medicines adherence in middle-aged people who have various chronic illnesses. However, as highlighted by the authors and an associated editorial, it has several limitations. Many of the included studies looked at self-reported adherence by patients, which is likely to overestimate the effect of text messaging. In addition, there was a lot of heterogeneity between trials in clinical conditions, medication regimens, the text-messaging interventions, baseline adherence, study settings and the levels of definition of adherence. Only 2 studies used low baseline adherence as a criterion for eligibility and so the other studies may have underestimated the effects of text messaging for these
people, who might benefit the most from such an intervention. Only 1 study was carried out in the UK (the INTERACT trial) and settings varied from hospitals to the general population. This makes it difficult to generalise the results to a specific setting within the UK. The definition of adherence varied from 80% in some studies to 95% in others. Publication bias was also evident.

Despite its limitations, this study is consistent with the NICE guideline on Medicines adherence, which highlights that patients may need support to help them make the most effective use of their medicines. Furthermore, the NICE guideline on Medicines optimisation advises that when discussing medicines with people who have chronic or long-term conditions, using an individualised, documented self-management plan to support people who want to be involved in managing their medicines, should be considered.

Text messaging to aid adherence may have the advantage over other interventions because it is simple and easy to implement often in an automated fashion. Information and reminders by text messaging may benefit patients who are forgetful, have poor knowledge of their medication or disease or who have busy schedules. However, text messaging will not be suitable for everyone; the NICE guideline on Medicines adherence advises that no specific intervention can be recommended for all patients. Whilst most people in the studies reported moderate to high satisfaction, some people found text messaging to be intrusive, inconvenient or disrupted their routines. Text messaging may not help people who are not comfortable using mobile phones, or people who are intentionally non-adherent such as those who do not believe the medication will benefit them or those who have ingrained cultural or social barriers that stop them from taking their medicines consistently. People in this meta-analysis were middle-aged (31 to 64 years) and so the benefits in elderly people are less clear. The socioeconomic or educational level of participants was not reported by most studies, so there is not enough data to determine whether these things are important in the response. Also, more studies are needed to help understand what aspects of text messaging makes it effective.

The median duration of RCTs in this meta-analysis was 12 weeks. RCTs looking at whether text-messaging sustains adherence in the long term are needed, as well as studies showing the effects of this intervention on clinical outcomes that matter to patients.

Study sponsorship

No funding source was stated for the meta-analysis nor for the individual studies that were included.

References

About this Medicines Evidence Commentary

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