

# Electronic prompts significantly increase response rates to postal questionnaires: a randomized trial within a randomized trial and meta-analysis

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Accepted 21 January 2015; Published online 27 January 2015

## Abstract

**Objectives:** To assess the effectiveness of sending electronic prompts to randomized controlled trial participants to return study questionnaires.

**Study Design and Setting:** A “trial within a trial” embedded within a study determining the effectiveness of chronic obstructive pulmonary disease (COPD) screening on smoking cessation. Those participants taking part in COPD who provided a mobile phone number and/or an electronic mail address were randomized to either receive an electronic prompt or no electronic prompt to return a study questionnaire. The results were combined with two previous studies in a meta-analysis.

**Results:** A total of 437 participants were randomized: 226 to the electronic prompt group and 211 to the control group. A total of 285 (65.2%) participants returned the follow-up questionnaire: 157 (69.5%) in the electronic prompt group and 128 (60.7%) in the control group [difference 8.8%; 95% confidence interval (CI):  $-0.11\%$ ,  $17.7\%$ ;  $P = 0.05$ ]. The mean time to response was 23 days in the electronic prompt group and 33 days in the control group (hazard ratio = 1.27; 95% CI: 1.105, 1.47). The meta-analysis of all three studies showed an increase in response rate of 7.1% (95% CI: 0.8%, 13.3%).

**Conclusion:** The use of electronic prompts increased response rates and reduces the time to response. © 2015 Elsevier Inc. All rights reserved.

**Keywords:** Reminder system; Data collection; Randomized trial; Research methodology; Short messenger service; Electronic mail

## 1. Introduction

Within randomized controlled trials (RCTs), postal questionnaires are frequently used to elicit responses from participants. Postal questionnaires are often chosen when designing a trial as they are an inexpensive data collection tool, easy to administer, and can be used to access a large geographical area [1]. One issue with postal questionnaires is, however, when they are not filled in and returned by the participant, this can mean that bias can be introduced into the study. It is essential for the internal validity of a randomized trial that a high response rate to questionnaires is received [2]. High attrition and potentially introducing bias into a study will also reduce the power of the study as the sample size is reduced [3]. Furthermore, a rapid response rate to

postal questionnaires is also desirable to establish treatment effects within a given period. Slow response may underestimate the speed of a treatment's effect.

Using methods to increase response rate (and therefore reduce attrition) and time to response is essential and necessary. One such method could be the use of electronic prompts. This refers to participants being sent a reminder either as electronic mail or a short message service (SMS) for a mobile phone. The benefits of these types of electronic prompts are that they are not resource intensive, as they can be automated, and consequently, they can be used to reach a large number of participants easily and quickly. It is estimated that 93% of adults in 2014 own/use a mobile phone in the United Kingdom [4], thus suggesting that they could be a useful means of contacting participants in a research study.

There are few studies in the area of using electronic prompts to reduce attrition in randomized trials. As far as we know, there are only two published trials: both from the York Trials Unit. One small study found that electronic prompts, although increasing response rates by 3%, did not reduce the

Conflict of interest: None.

Funding: This study was funded by the York Trials Unit at the University of York.

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**What is new?****Key findings**

- Attrition in randomised controlled trials is an important issue. There have been relatively few ‘trials within trials’ of interventions to reduce trial attrition. We undertook a trial of electronic reminders (SMS/email) for questionnaire return.
- The trial within a smoking cessation trial found a significant reduction in attrition and improvement in time to response.

**What this adds to what was known?**

- Combining this with two previous studies in meta-analysis showed a significant reduction in attrition of 7%.

**What is the implication and what should change now?**

- Randomise trials among middle aged people using postal questionnaires should send electronic reminders to reduce attrition. Future research should look either in different populations (younger or older) or modification of message.

time to response and the difference in response rates was not statistically significant [1]. However, this study had fewer than 130 participants and had low statistical power to show a useful difference. Similarly, in a slightly larger trial, Ashby et al. [5] found that electronic prompts, although again showing a small increase in response rates (5%), that was not statistically significant, did show a statistically significant decrease in the time to response. Both of those trials were nested within larger randomized trials.

A recent (2013) systematic review by Brueton et al. [6] of looking at methods to improve retention in randomized controlled trials only found our two previous studies of using electronic prompts vs. no electronic prompts for reducing attrition in RCTs. Consequently, larger studies of electronic prompts are needed that are in the context of reducing questionnaire attrition within randomized trials.

The aims of this RCT were to assess the effectiveness of using electronic prompts (both email and SMS) to improve response rates and reduce time to response in a population of participants who were in a randomized trial of a diagnostic pathway among smokers for chronic obstructive pulmonary disease (COPD) [7].

## 2. Materials and methods

There are relatively few “trials within trials” examining different methods of reducing attrition in RCTs. The

systematic review by Brueton et al. [6] found only 38 randomized trials of interventions to reduce attrition. This present study is a nested RCT within an established research study “Determining the Optimal approach to identify individuals with Chronic obstructive pulmonary disease” (DOC) [7]. DOC is a case-finding study for COPD and a randomized trial of the impact of case finding on smoking cessation, which involves a population of smokers aged 35 years or more undertaking lung function tests and symptom-based questionnaires. As part of the DOC study, participants were asked to complete a postal follow-up questionnaire. Two reminder letters were sent in an attempt to encourage response. The first reminder letter was sent 2 weeks after the follow-up questionnaire, and the second reminder was sent 2 weeks later (i.e., 4 weeks after the follow-up questionnaire). The follow-up questionnaire was sent to participants between 2 and 6 months (depending on study site) after the date of randomization.

To investigate whether sending an electronic prompt is an effective means of increasing the response rate for returning the follow-up questionnaire, DOC participants who supplied mobile phone numbers and/or email addresses were randomized into two groups: to either receive an additional electronic prompt (email and/or text messages) to return their questionnaire or to receive no additional prompt. This was in addition to the two reminder letters that all DOC participants received. At recruitment, patients were asked for consent for us to contact via their mobile phone or email when they gave us these details.

We deliberately used the same methods as in our two previous trials [1,5] to facilitate a meta-analysis of the results. This is because when planning such trials we cannot usually undertake a study large enough to capture the small but important differences in attrition as our sample size is always restricted by the sample size calculations of the “main” RCT. Therefore, we envisaged, a priori, that we would combine all three studies in a meta-analysis.

As with our two previous studies, participants received the prompt at the same time as they were expected to receive their postal follow-up questionnaire (i.e., 2 days after the questionnaire was sent). The electronic prompt was a text message, email message, or both depending on the contact details provided: The email received was Thank you for your involvement in the DOC study. We really appreciate your help with this study. We recently sent you a questionnaire along with a freepost envelope in connection with this study, which you should by now have received. Your answers are really important so we would be very grateful if you could return your completed questionnaire as soon as you can. If you have already returned the questionnaire please accept our apologies and ignore this email. Thank you again for your help with this study. The SMS sent was: DOC Study: You should by now have received a questionnaire from us to complete. Your answers are important so please help by returning it as soon as you can. Thank you.

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