The state of knowledge regarding delivering behavior change techniques via short text messages is already quite advanced: A response to “Can behavior change techniques be delivered via short text messages?”

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Abstract

Doğru et al. recent study reported developing text messages that attempted to capture each of 93 behavior change techniques (BCTs) in a standardized taxonomy. They found that a panel of experts identified the majority of the messages developed as having good fidelity to the intended BCTs. While this work has clear merit, we do not believe it accurately reflects the large body of existing research in this area. A process of producing text messages to address BCTs that yielded high fidelity has previously been reported. Furthermore, this work showed that messages developed for one behavior can be modified to address another behavior with similarly good fidelity. Importantly, these messages have been shown to successfully change target constructs in an experimental study and are being used in a randomized trial that has recently completed recruitment of over 1000 people with Type 2 diabetes.

Lay summary

Doğru et al. developed a list of text messages to deliver behavior change techniques (BCTs). BCTs are methods for changing behavior and a standardized taxonomy has described 93 such BCTs. The authors found that of 93 messages addressing these 93 BCTs, 66 of the messages were agreed by experts to deliver the intended BCT. According to the authors, the next step would be to analyze the effectiveness of the messages. This work has clear merit, however, the suggested process does not accurately represent the work that has already been done in this area. A body of work has developed text messages to target adherence to medication in people with Type 2 diabetes. These messages were rated by experts as delivering the intended BCTs and were rated as acceptable by people with Type 2 diabetes. Furthermore, these messages have been successfully modified to address other behaviors such as diet and physical activity with experts rating these messages as delivering the intended BCTs. These messages have been found to change constructs such as intention when delivered in an experimental study and are now being used in a randomized controlled trial that has completed recruitment of over 1000 people with Type 2 diabetes.

Keywords: behavior change techniques; medication adherence; Type 2 diabetes; intervention; short text messages

Implications

Practice: Short text messages based on behavior change techniques have the potential to reach a large number of people for a low per-unit cost.

Policy: Policymakers would benefit from reading the breadth of research in this area to support decisions around utilizing short text messages to support behavior change.

Research: Future research should clearly highlight what is novel and what is established on delivering behavior change techniques by short text messages.

Text messages can be delivered to a large number of people at a low cost [1] and hence are a promising method to encourage and support behavior changes. A recent article in this journal “investigated whether it is possible to reliably deliver BCTs using short text messages” [2]. This research described a detailed process of message development to identify whether...
the 93 behavior change techniques (BCTs) that have been identified in a standardized taxonomy [3] can be adequately delivered via text message [2].

Although this work has many merits, we believe it did not fully capture the advanced state of knowledge derived from studies that utilized text message-based interventions. In particular, we have previously developed text messages targeting medication adherence for people with Type 2 diabetes [4]. We produced a library of text messages that were explicitly designed to deliver BCTs via this medium which demonstrated fidelity to the intended BCTs and acceptability to patients [4]. Acceptability of the messages, as defined in the theoretical framework of acceptability [5], was measured in several ways across the studies. Anticipated acceptability was assessed via survey, where 61 participants with Type 2 diabetes rated messages in terms of understanding, how much they liked them, and whether the messages were perceived as useful. Experienced acceptability was tested with a proof-of-concept study, with 48 participants consenting to receive text messages for 12 weeks and providing text ratings to understand how much they liked them and how useful they thought they were as well [6]. In addition, the acceptability of the messages has been explored in the qualitative work conducted as part of the pilot and feasibility studies [4].

We have preliminary data from a randomized controlled feasibility trial targeting adults above the age of 35 years with a diagnosis of Type 2 diabetes, who could access a mobile phone (shared or individual access) and could read and understand text messages (with help if required) [7]. There were 209 participants in the feasibility study, who were recruited from all 10 IMD deciles, and with a mean age of 63.4 years [8]. The feasibility study shows that short text messages designed to deliver BCTs, between 78 and 206 characters, with 91% of the messages around 160 characters or less, result in improvements to multiple psychological constructs [8]. Moreover, changes in some of these psychological constructs are correlated with changes in self-reported medication adherence [8]. The messages are currently being tested in a definitive randomized trial, which has recruited over 1000 people with Type 2 diabetes [9]. This Đoğru et al [2] indicate would be the logical next step in analyzing the effectiveness of the messages. As part of the trial, in addition to assessing effectiveness compared to monthly study-related texts (with no BCT content), we are conducting a process analysis with quantitative components identifying potential mechanisms of action and qualitative components to gain an understanding of both the perceived mechanisms of action and contextual factors that may influence the effect of the intervention.

In our view, the main unique contribution of the Đoğru et al [2] study is that they considered the entire taxonomy of 93 BCTs that have been identified [3]. In contrast, for our research, we initially identified 46 BCTs for which there was some evidence that they could change medication adherence [10]. We eliminated 21 BCTs for consideration, as either an expert panel could not develop appropriate messages or a different expert panel rated them as having low fidelity to the intended BCT [4].

A weakness of the Đoğru study [2] is that it only examined a single behavior (cycling), and it is entirely possible that the delivery of BCTs is more feasible for some behaviors than others. In contrast, our team has also recently investigated whether messages can be adapted for different target behaviors by adapting medication adherence messages to target diet and physical activity behaviors for people with Type 2 diabetes. Following experts’ review of the messages, we found this is possible without losing fidelity to the intended BCTs. These messages will shortly be evaluated for acceptability by the target population.

We look forward to reading about the next steps taken by Đoğru et al. To advance this field most efficiently, it is important for discussion of delivering BCTs by short text messages to more clearly highlight what is novel and what has already been established. Given the wide range of 93 BCTs available, and the wide range of behaviors text message-based interventions could target, no study can cover all the BCTs and all the behaviors. However, by considering the full range of studies that are using BCTs to develop text messages, we can identify the behaviors or populations where each BCT is unacceptable, has low fidelity, or by contrast is effective at changing behavior. This should lead to more efficient and effective development processes.

**Conflict of Interest Statement**
None declared.

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**Ethical Approval**
All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Ethical approval for the feasibility study was granted by the National Health Service (NHS) West of Scotland Research Ethics Committee 05 (reference number 18/WS/0173).

**Informed Consent**
Informed consent was obtained from all individual participants included in the study.

**Welfare of Animals**
This article does not contain any studies with animals performed by any of the authors.

**Transparency Statements**
The studies were pre-registered at ISRCTN Registry ISRCTN13404264; ISRCTN13404264 and ISRCTN Registry ISRCTN15952379; ISRCTN15952379. The analysis plan was not formally pre-registered. The analysis plan was not formally pre-registered. De-identified data from this study are
not available in a public archive. De-identified data from this study will be made available (as allowable according to institutional IRB standards) by emailing the corresponding author. There is no analytic code associated with this study. Materials used to conduct the study are not publicly available.

References