Attitudes towards SMS text message smoking cessation support: a qualitative study of pregnant smokers

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Abstract

SMS text messaging shows promise for delivering smoking cessation support. However, little is known about smokers’ feelings towards receiving behavioural advice and support on their mobile phones. This article explores the attitudes of women with experience of prenatal smoking towards receiving pregnancy-related smoking cessation support by text message. Data collected by semi-structured interviews and focus group from women who received either tailored smoking cessation texts or no text support (N = 33) were analysed using thematic analysis. Three themes emerged: convenience, high expectations and perceived source. Texting was regarded as a highly convenient mode of support delivery leading to high levels of attention to messages, although high convenience sometimes resulted in the value of a text being short-lived. Many who did not receive texts had high expectations for text support to intervene with routine smoking behaviour in real time. Those who received texts (with no real-time intervention element), however, felt they were helpful and supportive. Participants discussed how factors relating to perceived source, including personalization, personal relevance and salience of text automation, could affect message attention and impact. Our findings provide insight into how maximizing personalization and personal relevance can increase the value of text message support and reduce the risk of disengagement.

Introduction

Mobile phones are increasingly popular platforms for delivering behavioural support to help change health behaviours. SMS text messaging in particular may be well suited to intervention delivery given that mobile phone ownership is high across the social class spectrum [1], and that ‘texting’ is highly popular across Western Europe and other developed countries [2]. Narrative systematic reviews report that text message interventions can have positive effects on behaviour change across a range of behaviours [3, 4], including increasing physical activity, weight loss and glycaemic control. However, these reviews pose a number of as yet unanswered questions. These include the combination of text message delivery and content factors that produce the best results [3] and the importance of investigating the impact of tailoring and interactivity on intervention efficacy and participant engagement [4].

These questions have high relevance for self-help smoking cessation interventions, which are favoured by smokers under 40 over traditional forms of behavioural support such as quitlines or group support [5] and have shown to be moderately effective for pregnant smokers [6]. While a recent large trial demonstrates the effectiveness and likely cost effectiveness of a text message smoking cessation intervention for non-pregnant smokers [7], there are still too few trials to determine how and when these types of intervention might be effective [8].
An important route to addressing such questions is to examine the patient or user perspective [9]. However, to date there has been little research focusing on user expectations and experiences of receiving behavioural support on mobile phones [10, 11]. Insight into these aspects of smoking cessation and other types of mobile health (mhealth) interventions should help optimize intervention content and delivery and enhance their effectiveness.

Several feasibility and acceptability studies of text message smoking cessation support provide some data on user views. Overall, these studies report positive responses to receiving cessation support by text message. Liked aspects of programmes include reminders, encouragement and having high personal relevance of text messages [12]. Tailoring content to the individual is considered of high importance, particularly for high risk situations [13]. Some less favoured aspects of smoking cessation text programmes include, among some participants at least, the use of text abbreviations [14], exclusive use of motivation assessment for on-going tailoring and a lack of diverse feedback [15]. In the only study of a text intervention for pregnant smokers published to date [16], undertaken subsequent to the study described in this article, individually tailored text support was found to be acceptable and the vast majority of participants rated the texts as helpful, identifying risk information texts as the most helpful type received.

While these findings can help inform text message content development, little has been reported on how message content may interact with aspects of intervention delivery. Delivery is an important feature of text messaging interventions given that texts are delivered direct to an individual’s phone in real time, unlike most other forms of self-help. As a consequence, message receipt is likely to occur in a range of contexts. Furthermore, as text messaging is primarily used for personal communication, the way the sender is perceived may also be an important factor in intervention engagement. These issues are not only important for smoking cessation interventions but will help inform other mhealth behaviour change interventions.

For pregnant smokers, the high interest in receiving smoking cessation support [17] but yet low uptake of one-to-one support [18, 19] makes increasing our knowledge about wide reaching intervention media such as text messaging all the more important. Therefore, the aim of this study was to explore pregnant smokers’ attitudes towards receiving smoking cessation support by text message and how content and delivery factors might affect message impact. While it was important to obtain the views of women who had experienced receiving smoking cessation text messages, we also wanted to elicit the views of women who had no experience of such text support. This study was undertaken primarily to inform the development of a text message intervention for pregnant smokers (MiQuit) which was guided by the Medical Research Council’s (United Kingdom) framework for the development and evaluation of complex interventions [20].

### Methods

Qualitative data collected from two groups of participants were combined for this study; participants who received smoking cessation text messages prior to data collection (‘text participants’) and participants who did not receive any texts (‘no-text participants’). Semi-structured interviews were undertaken with no-text participants and a combination of a focus group and semi-structured interviews were undertaken with text participants. A focus group was undertaken in addition to interviews as they are considered particularly valuable when developing and refining health education messages and interventions [21]. While the interactions during a focus group can help generate valuable data, we paid minimal attention to those interactions per se given that the focus group data were analysed with the interview data where no interactions were present. Purposive sampling was used to access individuals with varied characteristics such as number of previous pregnancies, age and socioeconomic status. Recruitment continued until theoretical saturation was considered to have been reached [22].
Participants were recruited via community midwives in two GP practices (primary care clinics) in Cambridgeshire and Suffolk, through a Cambridgeshire SureStart programme and a Suffolk community ‘young mums’ group (United Kingdom). Several midwives handed out recruitment packs to pregnant women they saw who reported smoking. In addition, FN attended some of the midwives’ clinics later on in the recruitment process and attended the SureStart programme and community group to identify further potential participants. No-text participants were interviewed before text participants were recruited.

Individuals were given a participant information sheet and were invited to complete and return a study referral form to confirm their interest in taking part if they met the study inclusion criteria: 16 years old or over and had experience of smoking during a recent pregnancy (within last 6 months). Text participants completed a smoking behaviour questionnaire that enabled pilot intervention materials tailored to each individual to be generated. This included five text messages sent over 4 days (two sent on one of the days) to participants’ mobile phones in the week prior to the individual taking part in an interview/focus group (see Table I for examples of text messages sent). These text messages were guided by a set of theory specified determinants of behaviour change, informed by Social Cognitive Theory [23] and the Perspectives on Change Model (R. Borland, unpublished data). For more detail on theoretical underpinning, see work published elsewhere [16]. Text messages were also re-sent by a colleague during their interviews/focus group for those who did not store them on their phone. All participants provided written informed consent prior to taking part.

Socioeconomic status was measured using the UK National Statistics Socio-economic Classification self-coding method [24]. Ethical approval for the study was granted by the Cambridgeshire 2 Research Ethics Committee (06/Q0108/301).

### Data collection and analysis

Data collection occurred between March 2007 and September 2008. FN conducted the interviews, and FN and JJ conducted the focus group in a community centre. Interviews lasted between 30 min and 1 hour and mostly took place in participants’ homes. Interviews and the focus group were audio recorded and transcribed verbatim. One interview was not recorded due to a technical problem, and so extensive notes were taken.
The interview schedules were informed by the Elaboration Likelihood Model of Persuasion [25]. In the no-text group, topics raised by the interviewer of particular relevance were participants’ thoughts on the use of self-help and text messaging to deliver smoking cessation support. This included the perceived value of personalizing text messages and the types of messages and message frequency that would be most helpful. In addition, the text participants were asked about their opinions of the pilot text messages they received and general feelings on receiving support by text message. This included their thoughts on the content, length, degree of personalization and information source of the text messages received. FN made field notes to note down and reflect on thoughts, interpretations, initial analyses and questions for further exploration [22, 26].

The analysis was primarily undertaken by FN and guided by Braun and Clarke’s [27] phases of thematic analysis. Initially, the transcripts of the focus group and interviews were read in detail as part of a familiarization phase. Once a coding framework was developed, based partly on the pre-defined research questions and from coding several transcripts in depth, data were coded into related categories or groups. These codes formed the scaffolding for a number of themes and subthemes. These themes were then reviewed to ensure that they were supported by the data and were refined and named. There was a greater interest in semantic (i.e. concepts directly described during interviews) rather than latent themes [28] and so the analysis did not go beyond describing and interpreting the accounts provided by the participants. To improve the coherence of the coding framework, two colleagues skilled in qualitative data analysis coded 20% of the raw data from the no-text interviews when the coding framework was being developed [26]. The coding agreement between the raters was high, and any differences were resolved through discussion. Coding and analysis was aided through the use of mindmaps [22] and NVivo version 8. Particular attention was paid to ‘deviant cases’ during the analysis to increase the credibility of the findings [29].

Results

Of those women approached by FN to take part (N = 27), eight were recruited (30%). We were unable to determine the overall recruitment rate due to using midwives and community group workers to help recruit. In total, 20 participants were interviewed for the no-text component and 7 were interviewed and 6 took part in a focus group for the text component (N = 33). There was a fairly broad range of characteristics across the participants, though the majority (85%) had a smoking partner and were from the lowest socioeconomic category (58%) (see Table II). At participation, most participants were pregnant (61%) and currently smoking (79%). In the text group, 8 of 13 were recruited as a community group with similar background characteristics that reduced the variability of this sample.

Three themes emerged from the analysis which reflected the main features of the participant’s talk about text messaging as a delivery medium for smoking cessation support.

Convenience

The convenience of not having to ‘carry anything extra with you’ (6001, text, smoker) and so being able to receive support ‘wherever or whenever’ (5001, text, smoker) was seen as a major advantage of text messaging over other types of support. As a consequence, participants felt they would read all the texts they received from a support system even if it included content they would not usually choose to read. Several participants also expressed the view that support via text messaging is less confrontational and avoids having ‘to be somewhere at a certain time and sit and listen to someone talking’ (5001, text, smoker) as exemplified by one participant:

So text messaging, 100% better because it’s not inconveniencing me so much, I’m not having to really stop and actually talk to somebody… this morning, I come down and I looked at my phone and thought “ooh I’ve got a text” and it was one of yours but I weren’t
Table II. *Participant demographic and background characteristics*

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<sup>a</sup>Percentages may not add up to 100 due to rounding.

<sup>b</sup>1 = managerial and professional occupations, 2 = intermediate occupations, 3 = small employers and own account workers, 4 = lower supervisory and technical occupations and 5 = semi-routine and routine occupations.
being put out by it. And I read it and then carried on with my day. (6001, text, smoker)

There were generally positive views on the idea of an instant support text facility, where supportive texts could be requested on demand by texting the system a keyword. While a few participants thought they would feel ‘daft’ texting the system at a time of crisis, others felt it would be ‘a lot less hassle’ than calling a helpline and would be a discreet way of getting support in public places:

I think if you’re sat in the pub with a group... who are smoking and you’re struggling, I think the last thing a lot of people would do is say they’re struggling ... and I think that’d be good to have just that option. Just to send a quick text-message, get one back, you can tell them it’s from anyone couldn’t you. It’s a lot more discreet. (4519, no-text, smoker)

However, a few felt that in some situations it was important to still have the option to speak to a person. In addition, as one individual pointed out, in some situations the convenience of support does not always feature when a smoker has a strong craving:

If I was determined I was going to go and have one, it wouldn’t matter if you stood in front of me, you know with knives and I don’t know, whatever, you know point a gun at my head... I would go and have one. (6001, text, smoker)

Some participants felt the convenience aspect of texts would affect how they would process the information in them. It was felt by some that being able to read texts in their own time and their brief nature meant they would ‘take it in more’. One participant upon receiving a text message recommending she should set a quit date went immediately to her phone calendar and set a date. However, some information, for it to be influential, requires deeper processing or elaboration. In some cases, information sent by text message may only have a short-term impact, potentially due to the delivery medium:

Oh yeah [the cot death text], that really does scare me quite a bit and that one I thought, ooh... like I don’t think I had [a cigarette] for at least 15 minutes after that because I thought ooh, but then as soon as I forgot about it I was fine. (6004, text, smoker)

A potential downside, therefore, of text messages being highly convenient is their ephemeral nature. Many of the text participants said they tended to routinely delete texts after they had read them or once their inbox became full. Furthermore, just the ease of access in many cases seemed to reduce the value of the message:

Cos the thing is with text-messages and especially with having [a child] anyway is you get a message, you read it and then chuck your phone back in ya bag and that’s it, it’s gone out ya head within five minutes. (1501, no-text, smoker)

On the other hand, several individuals who were fairly motivated to quit regarded the texts as having more value and saved them to their phone:

I had already set a date yeah but I think you can read that [text] again and say right, I’ve got to give it another shot and if you keep giving it another shot, another shot, that’s why I haven’t got rid of [the texts]. (6005, text, smoker)

One way of making individuals pay more attention to the information in a text suggested by participants was to ask for a reply. An interactive text inviting a reply would make ‘you think more about the text message’ otherwise ‘you don’t have to do anything with it so you read it and then forget about it’ (6003, text, smoker).

A further potential downside of it being easy to receive regular text messages about smoking cessation was the risk that it might cue the individual to think about smoking when they were trying to put it out of their mind:

Once you’ve heard the word smoking, and you know, you’ve thought of smoking and having a fag and think oh I really need a fag now. So it could work beautifully, [or] it could actually make you need a fag. (5002, text, smoker)
However, other participants who considered this issue did not see this as a likely problem for them, either because they felt a smoking cessation text would remind them not to smoke or because they felt when quitting the issue of smoking is ‘in your mind a lot of the time anyway’ (4613, no-text, quitter).

High expectations

When no-text participants were asked about how they thought a smoking cessation text system might work, few envisioned it providing general advice to help them prepare for and sustain a long-term quit attempt. Many had the expectation that text support would be most helpful if it provided a short-term deterrent from smoking. In some cases, often among those with low levels of motivation to quit, it was anticipated that the texts would only be effective if their delivery time corresponded with when they would usually smoke to immediately put them off lighting up:

Unless it’s when you’re just about to light up a cigarette and you get a text then you might put it back in the packet. (1501, no-text, smoker)

Some also felt that the texts needed to be sent early enough to put them off smoking for the rest of the day. One text participant felt that receiving a text later in the day had reduced its potential impact:

Like the first [text] I think that was about 3pm so by then well you’d smoked loads by then. It’s, I think it’s, they should come first thing in the morning because that’s more likely when people are having them and then like it’s more likely to put you off. (6004, text, smoker)

While the no-text participants revealed that it was common to think about quitting on a day-by-day basis, the text participants regarded the texts received, which focused on cumulative support rather than a day-by-day deterrent, as appropriate and did not express any feelings that these would not be helpful.

Alongside a desire for lapse prevention advice were high expectations that any advice or strategies to help avoid smoking sent by text should be as specific as possible. However, in some cases, highly specific advice not tailored to an individual’s lifestyle, circumstances and preferences risked disengagement from the support. For example, advice suggesting activities to deal with cravings that were not child friendly generated a negative response from some text participants who already had children:

R2: You can’t say like ‘oh go to the gym’ or whatever, that costs money
R1: You can’t really do a lot. ‘Cos you’ve got to think about the kids, it takes about an hour to get out to the park…
R2: Like if you’re pregnant and you [go] out, you’ve got time to do that, d’you know what I mean, you’ve got time to just sit there and do nothing, do the housework… But if you’ve got a kid you’re a bit stuffed
(Focus group, text, smokers)

Perceived source

As well as affecting the risk of disengagement from the intervention, the content and delivery of text messages also affected who it was the individual would perceive to have sent the texts. As texts from an automated support system would be directly sent by a computer, rather than a personal phone, we were concerned that this might reduce the impact of the support received. No-text participants had more varied feelings about the impact of receiving texts from a computer compared with text participants. While some thought that it would just make the support feel a little less personal, a few individuals felt that the texts could be perceived as ‘junk’ (1517, no-text, smoker) leading to disengagement. However, many felt that ultimately some kind of professional would have written the messages and decided which one should be sent making the computer’s role in the delivery irrelevant:

I don’t really suppose that’d make an awful lot of difference because you know there’s someone behind there anyway that’s worked it all out and sat and done it from the start.
But you don’t tend to think, when you get text-messages coming through… ‘Oh it come from a computer’. (4519, no-text, smoker)

Importantly, none of the text participants thought that the texts felt like they had come from a computer rather than a person, providing the same texts were not repeatedly sent, as then they might think that the source of the support ‘clearly don’t care’ (6003, text, smoker). Likewise, if the texts were received at the same time every day ‘you’d know what it was and you’d just delete it or you wouldn’t be as interested’. (1517, no-text, smoker)

Other factors affecting the perception of the sender include the use of personalization, type of text message and writing style. Text messages that included the name of the individual gave the text participants the feeling that the sender was ‘someone who knew you’ (5002, text, smoker) and had come from a friend:

The named one’s just like a friend helping you, sort of thing, it’s just, like, if it weren’t saying, like, hi, [name of participant], it’s felt like someone that’s [just] got your number. (5008, text, smoker)

Receiving a ‘you can do it’ type encouragement text also gave participants the feeling that it had come from a friend as it was the type of support they would expect from a friend. In contrast, texts providing specific advice about quitting were considered to have come from someone other than a friend, although the use of their name made them feel that it was still someone who knew them. One participant summed up how the content affected the perceived source:

I suppose it felt like different people wrote different texts really…like the encouragement text you could say…that was from someone who has given up smoking or even someone that you know and they’re just trying to support you. And then the sort of the more like medically ones you could say were probably more someone who studies that or you know is professional in sort of helping people quit smoking or whatever. Yeah I guess different people wrote different texts…if one text doesn’t work then another one might help. (6003, text, smoker)

Across both groups there was a fairly strong feeling that texts should be written fully and not in text-talk or textsense (where words are abbreviated or represented by letters that phonetically represent the word), although a small amount of abbreviation was considered appropriate. These individuals felt that this type of support requires an ‘air of professionalism’, which it would not achieve if texts were written entirely in text-talk:

Don’t get me wrong at the end of a text-message I think a smiley face is fine. But if you started using like the great as in g-r-8 and the rest of it, I’d just, you know, that’s not a health service, d’you know what I mean, it’s not no, you wouldn’t trust any health service that started, you know, using, that level of jargon. (1502, no-text, smoker)

While a few individuals favoured the use of text-talk, making them feel the support was more personal, modern and up to date, they were still happy for messages to be written fully and felt that it would make little difference to the overall impact.

**Discussion**

This study provides novel insights into user perspectives of a text messaging smoking cessation intervention for pregnant smokers and highlights several aspects of content and delivery that may affect message attention, acceptance and impact. One of the strengths of this study was that it elicited views from two perspectives, individuals who did and did not have experience of receiving a short programme of tailored smoking cessation text messages.

Text messaging was regarded as a highly convenient method of receiving and potentially retrieving support to quit smoking, with many highlighted benefits over more traditional forms of support. Participants felt that the convenience of text messaging would increase their interest in reading and thinking about all the content received compared...
with more traditional formats. This is supported by our subsequent evaluation of MiQuit, where 87% of MiQuit arm participants reported reading all the text messages received (approximately 90 over 12 weeks) at least once compared with 74% of control participants reading all of a brief self-help leaflet at least once [16]. However, the findings of this study suggested that a product of that convenience was a potential devaluation of the messages themselves, especially among those not highly motivated to quit smoking, in some cases resulting in low levels of elaboration of the message content.

Among those who had not experienced the text support, initial expectations for a real-time delivery support system were one that provided an immediate deterrent from smoking, as a result of some awareness of the individual's activities. This is discrepant with typical behavioural support. However, those text participants who pre-tested the pilot intervention did not feel its approach was inappropriate or likely to be ineffective. In addition, our concern that the texts may be devalued as a result of their automated delivery was not supported, and the majority of both groups felt that the texts would be perceived to have been written ultimately by a person. However, the potential for a smoking cessation text to unintentionally cue an individual to think about smoking was raised as a potential consequence of using this real-time delivery technology—a particular risk if adopting an intensive deterrent approach. This perceived counterproductive consequence has also been raised by adolescents experiencing a weight management text message system regarding the mention of avoiding unhealthy foods or behaviours [30].

The general preference for specific and personally relevant text messages has been identified by others piloting non-tailored smoking cessation interventions [12, 13, 15] and other text message based health behaviour change interventions [31–33]. Our study provided insight into how personal relevance can influence message attention and acceptance. It was clear that for some individuals highly specific advice not tailored to their individual situations could result in them disengaging from the intervention and devaluing the support. On the other hand, personalizing texts by using an individual's name affected the perceived source of the support, which in turn could increase its perceived value. Our findings are partly supported by a systematic review that observed that non-tailored text message interventions have higher attrition rates than tailored interventions [4].

The majority of participants felt that using text talk was inappropriate when the support was perceived as coming from a health service. Even adolescents, who one might expect to be favourable towards text talk, regarded it as too informal when part of a weight loss intervention [30] and seldom used it when communicating by text message with a weight management system [34].

While our participants liked the idea of two-way text support, user-initiated automated support when available is rarely used strategically by smokers [15, 35, 36]. Likewise, the on demand text support facility of MiQuit was seldom used [16]. However, this is matched by the low 'reactive' use of helplines [37, 38] and so may be a trend across different modes of delivery.

**Limitations**

Our recruitment approach may have led to a self-selection bias as a result of recruiting via midwives and community groups where it was down to the eligible women handed an information pack to contact the researchers. This approach also made it difficult to estimate the true response rate. In addition, while it can be advantageous to have a homogeneous focus group, the similarity of text participants may have reduced the group’s comparability with those interviewed. Furthermore, we ran only one focus group and we may have generated richer data if we had run more in place of interviews. However, it was felt that including interviews with text participants would increase the comparability of the text participant data with the no-text participant data.

A further limitation was the brief nature of the text message component of the pilot intervention. At the outset, five text messages prior to an
interview/focus group seemed an appropriate level of intensity to get useful feedback from participants. However, an intensity more similar to the finalized intervention might have provided further insight.

Clinical implications and future research

Our findings highlight some of the advantages of personalizing and tailoring smoking cessation text messages. Personalization, such as the use of the individual’s name in message content, may be particularly important for text messaging given that text messages have been traditionally used as a social medium. Personalization can easily be integrated into mhealth interventions and there is some evidence that it can increase smokers’ attention to written information, the perceived quality of that information and quitting activity [39, 40]. However, there is also experimental evidence showing that, when information is perceived as having low personal relevance, its persuasiveness is reduced when personalized [41]. This further supports the value of tailoring intervention content alongside personalization and suggests that personalization could be counterproductive if adopted for general, non-tailored advice.

This study, supported by the findings of our pilot trial [16], found that automatizing text message support was acceptable to pregnant smokers and did not seem to compromise the perceived value of the support. However, our data indicated that when automation was salient, as a result of low personal relevance, repeated content, lack of personalization or the identical timing of daily texts, there was a greater perceived risk of disengagement. As suggested by our participants, encouraging interaction with the text support may help to maximize engagement.

The short-term deterrent approach, which many participants imagined a mhealth intervention would provide, may have added value for traditional smoking cessation interventions. Such an approach is made possible using mobile phones due to their high ownership and portability. For example, the sensing technology on ‘smart phones’ could be used to track the behaviour of the individual and could trigger an alert or lapse prevention strategy message when they enter a high risk situation. High risk situations could include an individual’s location identified by GPS which signifies close proximity to other smokers, or stress, identified by a phone-based programme which categorizes emotion from voice input [42]. We are not aware of any smoking cessation interventions that are tailored to real-time events, therefore, the acceptability and potential impact of this approach requires further investigation.

Conclusion

Smoking cessation support delivered by text message is seen as highly convenient and may result in high levels of attention to the information communicated, especially if personalized and tailored. While text messages may have a shorter lifespan than more substantial communications, the potential advantages of this type of support, such as ease of providing regular contact and the portability of mobile phones, may offset any associated disadvantages. Opportunities for providing a short-term deterrent to smoking are also made possible by this medium although further research is required to explore the feasibility, acceptability and efficacy of this approach.

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Conflict of interest statement

None declared.
Attitudes towards smoking cessation text support

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