The development of a novel sensing smoking cessation app (Q Sense)

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MRC Medical Research Council

UKSBM 2014
Introduction

- Smoking tobacco associated with over 100,000 deaths in the UK annually
  Peto et al (2012) [http://www.ctsu.ox.ac.uk/~tobacco/](http://www.ctsu.ox.ac.uk/~tobacco/)

- 3 million smokers attempt to quit each year in England

- Over 80% relapse by the end of the year
  West & Brown (2012) [www.smokinginengland.info](http://www.smokinginengland.info)
Craving

- Background craving
- Episodic craving (cue induced craving)

Ferguson & Shiffman (2009) J Subst Abuse Treat
Craving

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Conditioning

Ferguson & Shiffman (2009) J Subst Abuse Treat
Craving

Background craving

Episodic craving (cue induced craving)

Implicated in 44% of lapses
Shiffman et al (1996)

Ferguson & Shiffman (2009) J Subst Abuse Treat
Craving

Background craving

Episodic craving (cue induced craving)

Half of lapses occur within 11 minutes of episodic craving
Shiffman et al (1996)

Ferguson & Shiffman (2009) J Subst Abuse Treat
Q Sense

- Informed by two theory-guided text message interventions
  - MiQuit
  - iQuit in Practice
- Mood focused sensing app (Emotion Sense)
- Relapse prevention model
- Early piloting work
- PPI input
- Feasibility study
Users log every time they smoke. Location logged each time
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If smoking is reported >4 times in one location, a geofence around that area is created.
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**SET QUIT DATE**

**QUIT DATE ARRIVES**

**GEOFENCE TRIGGERED SUPPORT**
Users log every time they smoke. Location logged each time.

If smoking is reported >4 times in one location, a geofence around that area is created.

If the smoker enters or spends time within a geofence, support messages are delivered – tailored to the context of that location.

Fast forward to tonight.
After a day at work amongst other smokers, would you rather go home as a smoker who'd given in to the cigarettes, or go home feeling proud that you stayed quit?
**Daily support messages** targeting outcome expectancies, self-efficacy and lapse / relapse prevention

**Smoking log feedback** targeting preparation, motivation, self-efficacy and lapse / relapse prevention

**Behavioural feedback** – simple bar chart and text summaries of antecedents of smoking

Things will get easier the longer you quit for - all your hard work will pay off. Just keep going and remind yourself that a slip is a learning opportunity, and not a reason to think you can’t do it. You definitely have what it takes to succeed Felix.

It’s never just one

Don’t let your head tell you its ok to have a cigarette. Don’t listen to it. Instead tell yourself you are an ex-smoker and that you don't need them anymore.
QSense

- Informed by two theory-guided text message interventions
  - MiQuit
  - iQuit in Practice

- Mood focused sensing app (Emotion Sense)
- Relapse prevention model
- Early piloting work
- PPI input
- Mixed methods feasibility study (N=~15)
  - Feasibility of collecting smoking episode data
  - App’s accuracy in identifying high-risk situations
  - Explore views on high-risk situation proximity triggered support
  - Technological limitations and issues in everyday use of app
QSense preliminary data

- Initial feasibility data (n=15)

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<tr>
<th>Parameter</th>
<th>Value</th>
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<td>Total number of smoking reports to date</td>
<td>462</td>
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<tr>
<td>Location capture for smoking reports</td>
<td>96.1%</td>
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<tr>
<td>Mean accuracy of location capture</td>
<td>31.4 meters*</td>
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<td>Mean smoking reports on days smoking reported (range)</td>
<td>2.9 (0-10)</td>
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<td>Mean end of day no. of cigarettes smoked</td>
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<td>% of participants receiving Geofence messages</td>
<td>43%</td>
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* Based on a subsample
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**Smoking locations**

- **Home**: 62%
- **Working**: 23%
- **Socialising**: 11%
- **Other**: 5%
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## QSense Preliminary Data

### Initial feasibility data (n=15)

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### Smoking locations

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### Challenge

- Insight from qualitative interviews
  - Cutting down
  - Forgetting
  - Not having phone on them/unable to log
  - Social inhibition
QSense preliminary data

- Initial feasibility data (n=15)

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| % of participants receiving Geofence messages                 | 43%        |

Smoking locations

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Q Sense preliminary data

Mean usefulness ratings for different support messages (739 ratings)

- Preparation feedback (97%)
- Behaviour feedback (98%)
- Geofence (81%)*
- Daily support (57%)

* Based on 3 participants
Conclusion

• While challenging, smoking routine recording and context-tailoring can be feasible and opens up many opportunities.

• Observational studies using same tech may help plug the theoretical and clinical evidence gap.

• Next steps: complete v2, move on to acceptability study with a clinical population.
Thank you

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