Designing technologies to scaffold user-driven approach to facilitate quitting smoking

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NO SMOKING

PLEASE QUIT

NO SMOKING
EVER AGAIN

SMOKING CAN MAKE YOU DIE

SMOKING IS REALLY BAD
Andy decides to quit smoking.

He throws his cigarette packs away.

But every time he hangs out at the bar, he starts smoking again.
37.8 million adults in the US smoke cigarettes (2016)

**CDC. 2016.** Current Cigarette Smoking Among Adults in the United States.

Need for better individualized support

• **Health care providers** can offer individualized support
  • Lack of support outside clinic
  • Barriers of cost, time, access, stigma


Need for better individualized support

• **Health care providers** can offer individualized support
  • Lack of support outside clinic
  • Barriers of cost, time, access, stigma

• **Technologies** can tailor support
  • Over 500 apps
  • How do we design for different individual needs?

Paay et al. 2015. Understanding individual differences for tailored smoking cessation apps. CHI’15.
Hartzler et al. 2016. Prioritizing the mHealth Design Space : A Mixed-Methods Analysis of Smokers ’ Perspectives. JMIR mHealth and uHealth 4
How can technologies facilitate individualized support for quitting smoking?
Human Centered Design Approach

Understanding current practices

Understanding the need

Iterative design and development
Discuss – 5 min

**Social issue:** supporting people who want to quit smoking

1. Who are potential stakeholders to help understand the need to design for quitting smoking?

2. Who are potential stakeholders you want to include in the design process?

3. What method(s) will you use?
Methods

Design low fidelity mock-ups

| Study 1 | Interviews with health care providers | Design feedback from health care providers |
Methods

Design low fidelity mock-ups

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Iterative design: Low fidelity prototype

| Study 2       | Interviews with people who want to quit smoking | Design feedback from people who want to quit smoking |
## Methods

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| Study 3 | Real-world feasibility study with people who want to quit smoking |
Study 1 with health care providers
Study 1: Methods

Interviews with 28 health care providers across 12 states in US

Participants:
4 primary care physicians (P#),
5 mental health practitioners (M#),
19 tobacco cessation & addiction counselors (C#)

10 Males, 18 Females
Study 1: Methods

Interview procedure:
1. Understanding strategies, tools, and challenges
2. Feedback on design of a self-management app
Qualitative Data Analysis

Providers involve clients in **brainstorming context-appropriate strategies.**

Providers emphasize dynamic **support for nicotine withdrawal**

Providers **mediate social support for clients**

Providers need to **navigate dependencies** with other providers and conflicting priorities
Providers involve clients in **brainstorming context-appropriate strategies.**

Providers emphasize **dynamic support for nicotine withdrawal**

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Providers need to **navigate dependencies** with other providers and conflicting priorities

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Bhattacharya et al. Lessons from practice... CHI 2017
Providers involve clients in brainstorming context-appropriate strategies

“What can you do if you have an urge to smoke?” – things that they do already, things they can afford, things they like to do.” (C11)
Providers involve clients in brainstorming context-appropriate strategies

“I'll have them [clients] come up with examples. I'll ask them, ‘If stress is a big trigger for you what are some other things that you can do to manage your stress?’...Sometimes people will say to me, ‘well, I'm going to exercise.’ And I'll say to them, ‘you can't exercise 24/7, so if you get up in the middle of the night because you're worried about your cancer, what are you going to do?’” (C24)
Technology can help contextualize interventions

Who?  Where?  Activity?  When?
Design Activity – 10 min

Social issue: supporting people who want to quit smoking

Brainstorm a tool for providing context-based support

Write a 3-5 line story on how the tool can be used to benefit the user.
Write a 3-5 line story on how the tool may harm the user.
Study 2 with people who want to quit smoking
Phase 2 Design: Context Cards

Reflect on Triggers

Examples of triggers

Elaborate on triggering context

Recommended strategies to help quit smoking

Individuals plan their strategies for the context
Trigger cards

Many people smoke when they have intense emotions.

- Stressed
- Lonely
- Anxious
- Bored
- Excited
- Satisfied
- Happy
- Cooling off after fight.
- Others?

Emotional Trigger

A pattern trigger is an activity you connect with smoking.

- Talking on phone
- Drinking alcohol
- Watching TV
- Driving
- Drinking coffee
- Taking break at work
- Waking up/going to bed.

Pattern Trigger

Occasions that include other people who smoke.

- Going to a bar
- Party/social event
- Going to concert
- Seeing someone smoke
- Being with people who smoke.

Social Trigger

Withdrawal symptoms are due to body craving nicotine.

- Craving cigarettes
- Trouble sleeping
- Feeling irritable, grumpy
- Feeling restless, jumpy
- Feeling more hungry
- Feeling sad
- Trouble concentrating

Withdrawal Trigger
Context Card

Time: 3:00 PM
Location: work

Coffee Break Stress

Activity: coffee break
People: other coworkers

Notes:
Strategy Cards

**Pattern Triggers**
- P1: Activity to keep hand busy
  - eg. squeeze handballs, beading, needlework, knitting
- P2: Keep mouth busy
  - eg. chew gum, cinnamon stick, candy, carrots
- P3: Physical activity
  - eg. walk, run, bike
- P4: Change your routine
  - eg. drink coffee at a different time, brush teeth after meal, go for a walk after waking up

**Emotional Triggers**
- E1: Talk about your emotions with friends, family, peers
- E2: Take some slow deep breaths
- E3: Physical activity
  - eg. walk, run, bike
- E4: Listening to calming music
- E5: Reinforce your reasons or benefits from quitting

**Occasions that include other people who smoke**
- D Going to a bar
- D Party / social event
- D Going to concert
- D Seeing someone smoke
- D Being with people who smoke

**Withdrawal Symptoms**
- are due to body craving nicotine
- □ Craving cigarettes
- □ Trouble sleeping
- □ Feeling irritable, grouchy
- □ Feeling restless, jumpy
- □ Feeling more hungry
- □ Feeling sad
- □ Trouble concentrating

**Social Trigger**
Strategy Card

Now add 2 strategies you want to try out

Coffee break stress

(1) Strategy 1 Relax and listen to music

(2) Strategy 2 engage with non smokers more

Strategy 1:
Engage in conversation with non smokers

Strategy 2:
Not drinking coffee
Study 2: Methods

• Interviews with 13 people who want to quit smoking
• 5 males, 8 females
Study 2: Methods

Procedures

• Survey questionnaire – motivation, smoking habits
• Interview on smoking history, challenges in quitting
• Walkthrough of low fidelity context-card prototype on Google Slides
• Feedback on storyboards and wireframes
Types of strategies planned by smokers

• **Avoiding** elements of the triggering context (such as not going to a bar)

• **Replacing** smoking behavior with another activity (such as cooking, physical activity, brushing teeth, drinking water)

• Changes in **routine** (such as delay studying until shortly before bed)

• **Reaching out** for social support (Facebook groups, meet-ups)
I met one of my friends again, and was boating, and my friend took a puff. I thought, okay, I can just have only one puff, and I tried a little control, but it didn't go like that... It's a fight that you're fighting with yourself and exhibiting yourself – I would say that I am the only barrier. My mind is barrier. (SC02)

I don't know, it's just a psychological thing. You know, once in a while I just feel like I need a cigarette. (SC07)
Challenge - perception of control

<table>
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<th>External factors</th>
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<tr>
<td>Psychological – thoughts, impulse, emotion (mind)</td>
<td>Stressful events</td>
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<tr>
<td>Physiological reactions to withdrawal</td>
<td>Social triggers (friends, family)</td>
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<td>Medical barriers – insurance, medication, access</td>
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Discuss (skipped due to time)

**Social issue:** supporting people who want to quit smoking

Make changes to your design (if any).
Future work: Development & Feasibility Study

Design to scaffold users to:

• Increase perception of control and empower users to act during craving

• Practice acting on planned strategies in-the-moment
Thank you!

“We can give them great tips and ideas and handouts and you name it. If they don't use it and they don't find what works for them, well, they probably won't quit.” (C27)

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