

Johns Hopkins University Department of Psychiatry  
Research Conference  
Baltimore, MD

### Drawing upon successes in other fields to inform opportunities for technology-based mental health promotion

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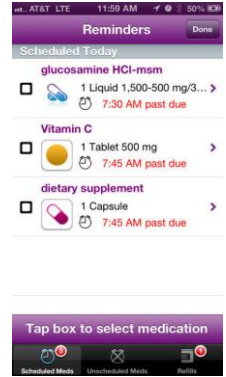
\*Thank you for your interest in this presentation. Please note that analyses included herein are preliminary. More recent, finalized analyses may be available by contacting CiPHR for further information.



Decoding how technology influences and can improve public health

### Opportunities for the mental health field

Medication reminders



<https://itunes.apple.com/us/app/medcoach-medication-reminder/id443065594?nc=8>

### Opportunities for the mental health field

Symptom monitoring / facilitated communication



<http://www.glasbergen.com/doctor-patients-are-not-computer-virus>  
"you caught a virus from your computer and we had to erase your brain. I hope you've got a back-up copy!"

### Opportunities for the mental health field

Health literacy / disease management skills



<http://blog.surroundhealth.net/2013/10/21/how-have-you-been-celebrating-health-literacy-month/>

### Benefits of using technology

- The wide adoption of technology provides novel opportunities to go where people are.
- Technology-based programs overcome many structural issues of traditional programs:
  - Lack of services in the local area,
  - Transportation,
  - Competing life demands.
- They are cost-effective.



Image from: <http://tecnicorichard.wordpress.com/2012/03/29/como-proteger-tus-datos-personales-en-internet/>

### Text messaging versus Internet

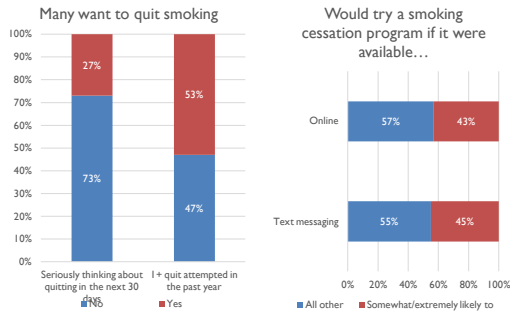
- Messages are “pushed” to the user rather than “pulled” as is the case for online programs / “apps”
- Greater ubiquity because more people have phones that can text than have smart phones
- Text messaging-based delivery may be superior because most you carry your cell phone with you everywhere, making intervention messages never far from reach.

### SMS Turkey / cebiniz bırakın diyor

### SMS Turkey: Development steps

1. Survey of adult smokers to document the demand for cessation programs (n=148)
2. Content development
3. I-arm trial for feasibility and acceptability (n=75)
4. Pilot RCT to further test feasibility and acceptability, preliminary efficacy (n=151)

### Despite high prevalence rates, smokers want to quit



### SMS Turkey theoretical model -> content map

Message type	Description
Preparing to quit	Describes steps to take in preparing to quit smoking, including preparing oneself mentally and physically, and preparing one's own and others' environment
Benefits of quitting	Describes the health-related, social, and financial benefits of becoming a nonsmoker
Coping and coping strategies	Describes and encourages the effectiveness and use of cognitive and behavioral strategies to avoid smoking during a craving or impulse to smoke
Discomfort and difficulties	Discusses discomfort associated with the quitting process and how the participant may see his or her discomfort as normal and how to cope with such discomfort
Encouragement	Offers motivation and support to the participant to continue with quitting
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### Algorithm for cessation messages

Message type	Pre-quit	Quit day and Day 2	Early quit	Late quit	Relapse	Encouragement
Preparing to quit	17	0	0	0	0	0
Benefits of quitting	4	2	3	19	3	2
Coping and coping strategies	14	4	11	6	7	1
Discomfort and difficulties	1	6	3	1	2	0

### Example SMS Turkey messages: Encouragement arm

Timing	Message text
Day 1a	Most smokers try to quit 6-7 times before they quit for good. Don't quit quitting!
Day 1b	It's a great thing that you've tried to quit smoking. You learned some things that you can apply to the next time you try to quit. What worked? What didn't?
Day 2a	Quitting smoking is the single most important step you can take to improve your health.
Day 2b	Medicines that treat craving can double your success. Try medicine next time you quit. If you used medicine, try a different one next time. Ask your doctor.
Day 3a	Smokers live an average of 7-12 years less than nonsmokers. Consider quitting again!
Day 3b	Whatever you decide about smoking, believe in yourself. You CAN quit smoking if you put your mind to it and have a plan for success.

### Testing for feasibility and acceptability: I-arm trial

- No one requested that we stop sending text messages, complained about the text messages, or requested to be removed from the study. In contrast, when the program had ended, 15 participants asked to receive more text messages. Many participants told the research staff that they kept the text messages on their phones and referred back to them.
- Participants had favorable reactions to the text messages.
  - Most (89%) said the messages were easy to understand and talked about what they were experiencing and feeling during the quitting process (78%).
  - Although 63% reported that there were too many text messages received per day, respondents said that they read almost all of their messages (an average of 9.7 on a scale of 1 being never, and 10 being always).

### Testing for feasibility and acceptability: I-arm trial

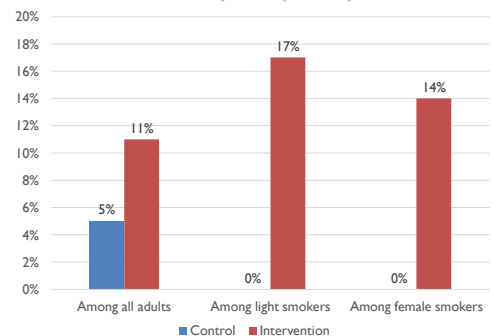
- Sixty-three participants (84%) provided 12-week post Quit day carbon monoxide data at the study office.
- Based upon intention-to-treat, 13% (n=10) of participants reported continuous abstinence since their quit date at 12-week follow up, confirmed by carbon monoxide readings.

<https://mfinochiario.files.wordpress.com/2012/06/cigarette-smash1.jpg>

### Preliminary efficacy: Pilot RCT

- Participants were randomly assigned to the intervention (n=76) or control group (n=75)
- Intervention group:
  - Received 6 weeks' worth of text messages tailored to where in the quitting process the person was
  - On Day 2 and Day 7 post-quit, the RA called the participant, asked if s/he had a cigarette and assigned them the subsequent content "path" accordingly
- Control group participants received a brochure with quitting tips

### SMS Turkey pilot RCT cessation rates at 3-months post quit-day



Ybarra M<sup>1</sup>, Bağıcı Boşu AT, Korçınaroz J, Emir S. A text messaging-based smoking cessation program for adult smokers: randomized controlled trial. *J Med Internet Res*. 2012 Dec 27;14(6):e172.

## Stop My Smoking (SMS) USA



StopMySmoking.com a comprehensive quit program based on leading research that provides you daily guidance on how to get ready to quit, and then works with you through your quit day and beyond to help you stay quit.

## SMS USA: Development steps

Translating the program for salience for young adult smokers:

1. Focus groups to understand why young adults smoke, what their common triggers are, what their previous experiences are with quitting, and what issues we need to be aware of when designing a text messaging-based smoking program (n=35)
2. Young Adult Advisory Board to review and provide feedback on the content messages (n=10)
3. Beta test the program and protocol (n=12, 28)
4. Pilot RCT for feasibility, acceptability, and preliminary efficacy (n=164)

## SMS USA: Lessons learned

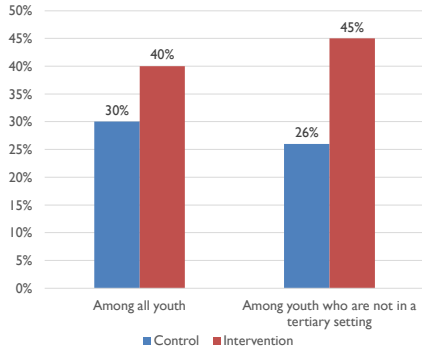
- Young adults 18-24 years old are just as addicted to cigarettes as older adults
- Young adults *\*want\** to quit – for themselves, for their families
- They have a lot going on: almost of our participants had a job – even if they were enrolled in tertiary education
- Many did not want to use NRT as it was seen as “more nicotine”
- **DO A COMPLETE BETA TEST!!**

<http://holyskwalltop.com/smoke-savings-get-triggered-by-seeing-e-cigarettes>

## SMS USA example program messages

Day sent	Text message
Day 1 (Pre-Quit)	Congratulations! The hardest part – deciding to quit – is already behind you. Write down your quit date [insert day] and post it where you can see it every day.
Day 2 (Pre-Quit)	Write down a list of reasons why you want to quit smoking. Put the list in a place where you'll see it every day.
Day 3 (Pre-Quit)	Got stress? Maybe it's your cigarettes. In between cigarettes, your body goes through nicotine withdrawal and makes you feel stressed out and anxious.
Day 15 (Quit Day)	I bet you're feeling cranky and annoyed right now. This is all normal. Just take a deep breath and get through the next 5 minutes.
Day 20 (Early Quit)	Right now, you're learning to quit. Just like learning to ride a bike or drive a car, it takes time. Before you know it, you'll learn to be a non-smoker too.
Day 31 (Late Quit)	Encouragement from your friends and family might be starting to wane about now, but remember that they are probably still proud of you for quitting.

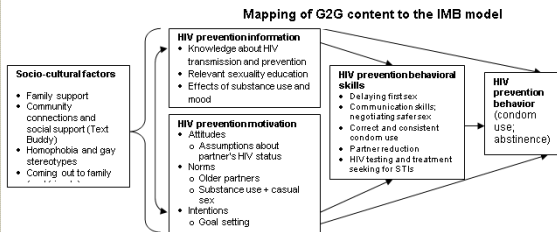
### SMS USA cessation at 3-months post quit-day



### Guy2Guy



### Guy2Guy theoretical model -> message development



### Guy2Guy: Development steps

1. Focus groups to understand their sexual decision making processes (n=80)
2. Content Advisory team to test messages and confirm tone, understandability (n=56; twice)
3. Beta test to confirm protocol (n=18)
4. Pilot RCT to examine preliminary efficacy (n=301)

### Guy2Guy: Lessons Learned

- Facebook is a \*great\* place to recruit gay, bisexual, and queer teen guys
- The “text buddy” is very popular. Safety is critical:
  - Constant monitoring
  - Geographical distance
- High interest and high engagement with the program (e.g., texting back to the program with “musings”)



### BullyDown theoretical model -> message development

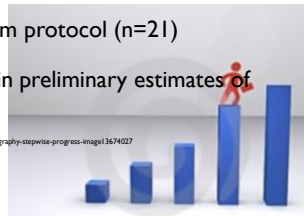
Social emotional learning:

- Empathy and communication
- Attitudes toward bullying and attitudes supportive of aggression
- Managing Anger, hostility, and impulsivity
- Problem solving and coping
- Perspective-taking, respect for diversity, and intentions to intervene to help others

### BullyDown: Development steps

1. Focus groups to understand youth's current exposure to bullying prevention programs in their schools (n=40)
2. Content Advisory Team to review and provide feedback on the text messages (n=10)
3. Beta test to confirm protocol (n=21)
4. Pilot RCT to obtain preliminary estimates of efficacy (n=?)

<http://www.dreamstime.com/royalty-free-stock-photography-stepwise-progress-image13674027>



### BullyDown: Lessons learned

- Facebook is \*not\* a good place to recruit youth for BullyDown, **nor are youth likely good recruitment targets**
- Middle school students' relationship with their phone is different than older teens:
  - They don't have as much control over their phone 'ownership'
  - They may not even know their own phone number
  - They don't bring their phones to school
- Text buddy seems to be acceptable, but they would prefer it to be with someone they don't know

### Limitations to technology-based interventions

- Use technology in a way that fits the population. Be aware that technology may not work for all populations.
- There's sometimes an assumption that: If you build it, will it come. Technology-based programs require self-motivation and interest.
- Can be costly to develop.

### Conclusions

- There is support from other fields that behavior change programs delivered online and via text messaging *can* change behavior
- Evidence-based programs for people with serious mental illness that utilize technology should be explored further
- Figuring out how to engage people with SMI and keep them coming back, may be key

<http://eurout.org/2010/03/24/studying-lesbians-being-ignored-and-excluded-from-targeted-research>

### Acknowledgements

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- BullyDown was funded by HopeLab

In all cases, the content is solely the responsibility of Dr. Ybarra and does not necessarily represent the official views of the Funders.