Welcome to 2019 NAMI National Convention

Digital Mental Health: Recent Findings and New Directions

John Torous MD, MBI and Liza Hoffman, MSW, LICSW

@JohnTorousMD and @LHoffmanLICSW
Outline

• State of Smartphones and Mental Health

• Smartphones Digital Phenotyping

• Informed Decision Making For Smartphone Apps
Our Movement. Our Moment.
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Visit www.SMIadviser.org

SMIadviser.org
Finding Focus in Digital Mental Health

Device Category

<table>
<thead>
<tr>
<th>Mobile</th>
<th>Hybrid</th>
<th>Home</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearables</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| - Continuous wear
| - Heart rate, step count
| - Small touchscreen |
| Smartphones |
| - Mobile communication
| - Ubiquitous
| - Robust, open-source markets/apps for apps |
| Tablets |
| - Large, user-friendly touchscreen
| - Home and office usage
| - Connectivity with mobile devices |
| Telehealth |
| - Connect virtually with clinician
| - Frequent monitoring |
| Virtual Reality |
| - Immersive cognitive therapy
| - Adapts to unique virtual settings |
| Video Games |
| - Fun, high engagement
| - Adapts to unique virtual settings |
| Smart Homes |
| - Interact with patients passively
| - Assist in daily life |

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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL
Finding Focus in Digital Mental Health


But What is a Mental Health App?

![Graph showing mean proportion of app categories]

But What is a Mental Health App?

Figure 2. Patterns of app use.

Pung A, Fletcher SL, Gunn JM. Mobile App Use by Primary Care Patients to Manage Their Depressive Symptoms: Qualitative Study. Journal of Medical Internet Research. 2018;20(9):e10035.
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HARVARD MEDICAL SCHOOL TEACHING HOSPITAL
Torous J, Roux S. Patient-driven innovation for mobile mental health technology: Case report of symptom tracking in schizophrenia. JMIR mental health. 2017 Jul;4(3).
NOW AVAILABLE
Free tool to help you or your loved one with schizophrenia and related disorders.
Digital Phenotyping

What it is?

Why is matters?

### Digital Phenotyping: One of Many Platforms

<table>
<thead>
<tr>
<th><strong>Trust</strong></th>
<th><strong>Control</strong></th>
<th><strong>Community</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>App co-design, full sharing and access to data, ability to delete data, remote consent built into the app</td>
<td>App and software support data security and privacy. Research conducted in a transparent and rigorous manner. App tools are shared to encourage research</td>
<td>App, database, middleware, and data visualization code publicly available</td>
</tr>
<tr>
<td>App co-design and iterative releases, ability for users to alter settings and nonfiction schedules</td>
<td>App data structured for access control. Users retain ultimate control of data</td>
<td>App data shared with users. All methods and data processing code made publically available</td>
</tr>
<tr>
<td>Research conducted in ethical and transparent manner</td>
<td>Personalized data collection matched to clinical needs. Ability to customize learning and interventions</td>
<td>App uses case and clinics designed to strengthen the therapeutic alliance between patient and clinician</td>
</tr>
</tbody>
</table>

### Portal (Admin)
- Create Surveys
- Schedule Surveys and Cognitive Assessments
- Download Data
- Generate Study IDs to Access Custom Configurations of the App Created in the Portal

### LAMP APP (Patients)
- Learn from Articles and Tips
- Take Surveys
- Take Cognitive Assessments
- Complete Mindfulness Exercises
- View Results

### LAMP Visualizations (Admin + Patients)
- View Chart and Graphs of Results
- View Timeline of Results
- Run Custom Scripts on Results

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Our Movement. Our Moment.

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Image by Ian Barnett PhD, UPenn
Putting it all Together: ‘Digital’ Clinics
Our Movement. Our Moment.

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Previously Collected Data Streams
- Active
  - Symptom Surveys
  - Location/Social Environment Tagging
- Passive
  - Geolocation (GPS)
  - Call and Text Logs (Social)

Digital Phenotyping

Cognition Tests
Step Count & Exercise Data

New Data Streams to Improve Relapse Prediction

Anomaly Detection

1. LAMP creates a baseline digital phenotype for users based on active + passive data. New data to improve phenotyping will be added to the model.

2. LAMP monitors users’ digital phenotype at all times for anomalies in surveys, behaviors, cognition, and activity patterns, and identifies relapse risk.

3. LAMP prompts users to complete intervention activities to reduce relapse risk. Intervention will be based on published evidence and created via co-design at all study sites.
Important to be aware of what is being collected and why

January 1, 2019

In Screening for Suicide Risk, Facebook Takes On Tricky Public Health Role

How text and comment classifiers work

Helping People Use New Tools
Helping People Use New Tools

Session 1: Smartphone Fundamentals and Your Health Goals
- Learn how apps may help you towards your health goals
- Learn about mental health apps and other digital resources
- Access and download apps
- Keep your personal data secure
- Remove harmful apps
- Use alarms, maps, and reminders on the phone available for

Session 2: Smartphones for Health and Wellness
- Set up mental health apps
- Collect your own data on mood, anxiety, sleep, and steps
- Learn to use wearables and smartwatches
- Learn to explore and discover local services via apps
- Learn how to connect with peers and family with apps (without a data plan)

Session 3: Smartphones for Personal Health
- Access and learn from your personal data
- Learn how to share your data with who you want and how to protect what you don’t want to share
- Customize apps to your needs
- Develop a digital mental health toolkit to support your recovery
- Evaluate apps that may be of help

Session 4: Smartphones for Your Recovery
- Develop insights into your recovery with digital data and smartphone tools
- Finalize your digital toolkit
- Help peers with technology
- Use apps to access community resources and services
- Action planning with apps
- Identify barriers and solutions to technology use
Helping People Use New Tools
Helping People Use New Tools

4. I know where to find helpful health resources on my smartphone

1) □ Strongly Disagree
2) □ Disagree
3) □ Undecided
4) □ Agree
5) □ Strongly Agree

5. I know how to find helpful health resources on my smartphone

1) □ Strongly Disagree
2) □ Disagree
3) □ Undecided
4) □ Agree
5) □ Strongly Agree

6. I know how to use my smartphone to answer my questions about health

1) □ Strongly Disagree
2) □ Disagree
3) □ Undecided
4) □ Agree
5) □ Strongly Agree

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Harvard Medical School Teaching Hospital
Helping People Find Apps

- Estimate to be over 10,000 mental health related apps

Magic Formula For Safe and Better Apps?

Up to 48% of NHS mental health patients are re-admissions - don’t be one of them

In 2014 the National Audit Office reported that each year the NHS deals with one million emergency readmissions within 30 days of discharge, costing an estimated £2.4 billion.

What can you do to change this?

Dedicate yourself to your own healing, and thereby avoid being readmitted.

This will help save the NHS some of the £2.4 billion, which they urgently need to help others like you.

Help others by helping yourself.

Be your own NHS.
In about four months’ of data reviewed by The Times, her location was recorded over 8,600 times — on average, once every 21 minutes.

<table>
<thead>
<tr>
<th>Coding element</th>
<th>n (%) of apps</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Positive claims</td>
<td>59 (81%)</td>
</tr>
<tr>
<td>3.a. Claims of effectiveness</td>
<td>47 (64%)</td>
</tr>
<tr>
<td>3.a.i. Detection or diagnosis</td>
<td>7 (10%)</td>
</tr>
<tr>
<td>3.a.ii. Improvement in symptoms or mood</td>
<td>22 (30%)</td>
</tr>
<tr>
<td>3.a.iii. Improvement in self-management</td>
<td>26 (36%)</td>
</tr>
<tr>
<td>3.b. Claims of acceptability</td>
<td>33 (45%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Search term</th>
<th>Identified in searches (n=1435)</th>
<th>Screened (n=350)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Android</td>
<td>iOS</td>
</tr>
<tr>
<td>Anxiety</td>
<td>249</td>
<td>200</td>
</tr>
<tr>
<td>Depression</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>250</td>
<td>32</td>
</tr>
<tr>
<td>Self-harm</td>
<td>85</td>
<td>29</td>
</tr>
<tr>
<td>Substance use</td>
<td>131</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>965</td>
<td>470</td>
</tr>
</tbody>
</table>

Noone and Hogan. A randomised active-controlled trial to examine the effects of an online mindfulness intervention on executive control, critical thinking and key thinking dispositions in a university student sample. BPJ Psychology. 2018
Eligible = 8,524
Enrolled = 7,953
Participants = 6,370
Robust Users = 2,317
( >=5 total surveys)
Milestone Users = 175
(completed survey at 6 months)

Digitalpsych.org
jtorous@bidmc.harvard.edu
lhoffma1@bidmc.harvard.edu
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   [App Download Instructions]
   Visit your App Store and search for the “Aventri Events” app. Download the app and enter Access Code: 778151 or scan the following QR Code:

2. You can also evaluate the session on your computer. Go to: [www.nami.org/sessioneval](http://www.nami.org/sessioneval), select the session and click “Rate This Session.”