SELF-TRACKING FOR MENTAL WELLNESS

Understanding Expert Perspectives and Student Experiences

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Lauren Wilcox, Georgia Tech, USA

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In a 2016 national survey of college students...

85% felt overwhelmed by demands over the last year

47.8% felt that things were hopeless

American College Health Association (ACH). 2016. National College Health Assessment II
Found **behavioral predictors** of:

- Student mental health (e.g., depression, loneliness, stress)
- Academic performance (grades across all their classes, term GPA and cumulative GPA)
Background  Studies  Findings  Discussion

DEVICES

APPS

You’re not alone.

Your life is unique. Your support system should be too. Ginger.io gets straight to what you need - great help, right now.

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But...

Human communication about **personal data** and **expert review** are vital in therapeutic contexts.

Image courtesy: http://tmsneuro.com
And...

Engagement with personal data is important in many health management contexts.

Image courtesy: http://tmsneuro.com
Unique challenges in the design and evaluation of health monitoring systems for stress and mental wellness. Image courtesy: http://tmsneuro.com
Our goals:

understand the current practices of student self-trackers—both general and mental wellness-focused
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understand the **current practices** of **student self-trackers**—both general and mental wellness-focused

...and the **expert perspectives** of **student health professionals**
Background  Studies  Findings  Discussion

Clinicians (2 Phases)

Students

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Clinicians (2 Phases)
S1 Phase 1: Focus Groups

$n=10$

4 focus groups over 11 months

Georgia Tech
Primary Care (4), Psychiatry (2)
Women’s Health (2)
Health Promotion (1)
Nutrition (1)

S1 Phase 2: Card Sorting & Interviews

$n=14$

Georgia Tech, Emory University
Primary Care (2)
Women’s Health (2)
Psychiatry (9)
Health Promotion (1)
Campus Health Professionals

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**Psychiatry (9)**
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S1 Phase 1: Focus Groups

How can technology play a positive role in student health?

What about self-tracking in particular?

When do you “prescribe” self-tracking?

What behavioral patterns and scenarios are common?
Campus Health Professionals

S1 Phase 1: Focus Groups

2 “Stress Personas”

- Student 1
  - Difficulty Sleeping
- Student 2
  - Poor Diet

3 Scenarios (each)

- Assessment
- Communication
- Self-Care
S1 Phase 2: Card Sorting & Interviews

2 “Stress Personas”

Student 1
- Difficulty Sleeping

Student 2
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3 Scenarios (each)

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26 Data Types from Dartmouth’s StudentLife Study

- Bed time, wake up time and sleep duration
- Number of conversations and duration of each / day
- Physical activity (walking, sitting, running, standing)
- Location and dwell time (i.e., dorm, class, party, gym)
- Stress level through the day, across the week
- Positive affect (how good they felt about themselves)
- Eating habits (where and when)

Full StudentLife dataset is available at http://studentlife.cs.dartmouth.edu/dataset.html
Campus Health Professionals

Assessment
Focus on mental health and the primary student challenge
More important: Depression Scale, Sleep Quantity, Sleep Quality

Communication
Focus on awareness, clarifying normalcy, and schoolwork
More important: Location, Workload, Class Attendance, Time Studying, Social Interactions, Eating Habits

Self-care
Focus on what the student can control
(e.g., “bed time” not “sleep quality”)
Physical activity data types ranked highest
Campus Health Professionals

Most Useful to Clinicians (overall)

1. Vigorous exercise
2. Sleep quantity
3. Class attendance
4. Academic workload
5. Bed time
6. Depression scale
S2 Online Survey

July–Aug 2016

\(n=297\)

58 institutions of higher education

Undergraduate \((n = 211, 71\%)\)

Graduate \((n = 86, 29\%)\)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Percent ((n))</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-24</td>
<td>82.83% (246)</td>
</tr>
<tr>
<td>25-34</td>
<td>14.81% (44)</td>
</tr>
<tr>
<td>35-44</td>
<td>1.35% (4)</td>
</tr>
<tr>
<td>45-54</td>
<td>0.67% (2)</td>
</tr>
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</table>

Male \((n = 185, \sim 62\%)\)

Female \((n = 108, \sim 36\%)\)

Unspecified \((n = 4, 1.35\%)\)
Survey Themes

- History of chronic and mental illness
- Self-tracking motivations and experiences
- Current sharing habits and preferences
- Willingness to track and share what experts found most useful
16.5% ($n = 49$) diagnosed with a mental illness (anxiety: 69%, depression: 45%)

Students with a mental illness were significantly more likely to have a co-morbid chronic illness ($p = .008$) and to be female ($p < .001$)

Students with mental illness scored significantly higher on PSS

6.73% currently see a mental health professional, and an additional 19.87% have previously seen a mental health professional

12% ($n = 36$) diagnosed with another chronic illness
For respondents with chronic or mental illness, many reported that their tracking is related to the illness

- 41.67% of those with chronic illnesses
- 43.48% of those with mental illnesses
Self-tracking motivations and experiences

For respondents with chronic or mental illness, many reported that their tracking is related to the illness

“[I track] exercise, sleep, and caffeine intake to minimize triggers.”

–P127
For respondents with chronic or mental illness, many reported that their tracking is related to the illness.

“...I do my best to track which medications I have taken when.”

–P52

“I track my period so that I know how to increase my medication doses. About a week before my period should start, I take a higher dose of my anxiety medication.”

–P243
For respondents with chronic or mental illness, many reported that their tracking is related to the illness.

“[I’m] trying to understand [the] impact of sleep, exercise, diet on mood.”

– P232
Self-tracking motivations and experiences

**Top 5**

- **Steps**: 48.2%
- **Workout**: 47.1%
- **Weight**: 44.4%
- **Sleep**: 33.3%
- **Eating and Diet**: 30.6%

**What Students Track**

- Steps
- Workout
- Weight
- Sleep
- Phone or internet
- Heart rate
- Menstrual cycle
- Water intake
- Time spent working
- Medication
- Social
- Caffeine
- Allergies
- Alcohol
- Blood pressure
- Other
- Blood glucose
- Migraine

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What Students Track

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Percentages who track:

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<tr>
<td>Heart Rate</td>
<td>21.2%</td>
</tr>
<tr>
<td>Medication</td>
<td>7.4%</td>
</tr>
<tr>
<td>Menstrual cycle</td>
<td>20.9%</td>
</tr>
<tr>
<td>Time spent working</td>
<td>12.1%</td>
</tr>
<tr>
<td>Water intake</td>
<td>13.5%</td>
</tr>
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<td>Social interactions</td>
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**Background**

Studies Findings Discussion
Self-tracking motivations and experiences

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<td>Steps</td>
<td>48.2%</td>
</tr>
<tr>
<td>Alcohol</td>
<td>3.0%</td>
</tr>
<tr>
<td>Blood Glucose</td>
<td>2.4%</td>
</tr>
<tr>
<td>Blood Pressure</td>
<td>3.0%</td>
</tr>
<tr>
<td>Allergies</td>
<td>4.0%</td>
</tr>
<tr>
<td>Caffeine</td>
<td>4.7%</td>
</tr>
<tr>
<td>Migraine</td>
<td>2.0%</td>
</tr>
<tr>
<td>Psychometrics</td>
<td>3.7%</td>
</tr>
<tr>
<td>Other (e.g., $$)</td>
<td>3.0%</td>
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Self-tracking motivations and experiences

How Did You Decide What to Track?

- Formed my own hypothesis, trial and error: 34.6% (n=93)
- Device suggested what to track: 21.2%
- Looked at experiences of others: 14.9%
- Close friends or family helped me decide: 9.3%
- Peers helped me decide: 7.8%
- Doctor helped me decide: 6.7%
- Other: 5.6% (n=15)

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n = 93
Current sharing habits and preferences

What Students Share with Whom

<table>
<thead>
<tr>
<th>Category</th>
<th>Disappointments</th>
<th>Achievements</th>
<th>Goals</th>
<th>Details about what I track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Care Team</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No one</td>
<td></td>
<td></td>
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36% said tracking has in some way *changed* their visits with a healthcare provider.

Most who did not experience a change explained that they either do not see doctors frequently or had not shared their tracked data with one.
Current sharing habits and preferences

How Has Self-Tracking Affected Communication with Doctor?

- Made it harder for me to communicate: 1.8%
- Helped my doctor make a crucial decision about my care: 7.1%
- Helped me follow care instructions: 19.6%
- Helped me communicate better: 30.4%
- Did not change anything: 60.6%

Non-Diag and Diag respondents' percentages are shown.
How Has Self-Tracking Affected Communication with Doctor?

- Made it harder for me to communicate: 1.8%
- Helped my doctor make a crucial decision about my care: 5.7% (Non-Diag) 7.1% (Diag)
- Helped me follow care instructions: 8.9% (Non-Diag) 19.6% (Diag)
- Helped me communicate better: 23.2% (Non-Diag) 30.4% (Diag)
- Did not change anything: 60.6% (Non-Diag) 39.3% (Diag)

Percentage of Respondents Agreeing

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Willingness to track and share what experts found most useful

### Willing to Share Self-Tracking Data with Health Professionals

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Percentage of Respondents}

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Challenges and Opportunities: Encountering “Negative” Data

36% of respondents reported times that they felt that the data they collected reflected something negative about them.

Students with mental illness were significantly more likely to report experiences with negative data (p = .004)
Challenges and Opportunities: Encountering “Negative” Data

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Students with mental illness were significantly more likely to report experiences with negative data (p = .004)

“At times I felt embarrassed for having to be so dependent on my large amount of medicines.”

—P7
Challenges and Opportunities: Designing for Students’ Life Stage

Students’ Specific Developmental and Life Stage Shaped Their Goals

Along with instrumental tracking goals (Epstein et al.) and goals related to improving health (Choe et al.) students in our study set social and appearance-related goals.

Experts less concerned with details about specific workouts, but want a general sense of regular engagement in some physical activity.

Experts emphasized the importance of tracking for self-care.
Challenges and Opportunities: Helpful versus Harmful Tracking

Close monitoring is not always beneficial as a strategy of management

“I used to track my calorie intake with the intention of losing weight and would set goals for myself that were extremely low and see if I could beat them... this was a function of my eating disorder.”

—P129

“[I was] somewhat obsessive in tracking while I was losing weight, and can’t shake the habit for fear of gaining back the weight.”

—P96
THANK YOU!

To our study participants,

Kaya De Barbaro and Clayton Feustel

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