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| Question**eTable 1. Participant engagement and notification schedule of symptom surveys.**  | Symptom Domain | Notification Days | Mean (Std) Completed Surveys/Patient |
|  |  |  |  |
| Today I feel anxious | Anxiety (GAD-7) | TR | 12.3 (10.6) |
| Today I cannot stop worrying |
| Today I am worrying too much about different things |
| Today I have trouble relaxing |
| Today I feel so restless it’s hard to sit still |
| Today I am easily annoyed or irritable |
| Today I feel afraid something awful might happen |
|  |  |  |  |
| Today I feel little interest or pleasure | Mood (PHQ-9) | MWF | 13.4 (11.6) |
| Today I feel depressed |
| Today I had trouble sleeping |
| Today I feel tired or have little energy |
| Today I have a poor appetite or am overeating |
| Today I feel bad about. Myself or that I have let other down |
| Today I have trouble focusing or concentrating |
| Today I feel too slow or too restless |
| Today I have thoughts of self-harm |
|  |  |  |  |
| Today I have heard voices or saw things other cannot | Psychosis | TR | 13.0 (11.3) |
| Today I have had thoughts racing through my head |
| Today I feel I have special powers |
| Today I feel people are watching me |
| Today I feel people are against me |
| Today I feel confused or puzzled |
| Today I feel unable to cope and have difficulty with everyday tasks |
|  |  |  |  |
| In the last three days, I have had someone to talk to | Social | TR | 20.4 (17.2) |
| In the last three days, I have felt uneasy with groups of people |
| In the last three days, I have taken my medications as scheduled | MWF |
| In the last three days, during the daytime I have gone outside my home |
| In the last three days, I have preferred to spend time alone |
| In the last three days, I have had arguments with other people |
|  |  |  |  |
| Last night I had trouble falling asleep | Sleep | MWF | 13.6 (11.8) |
| Last night I had trouble staying asleep |
| This morning I was up earlier than I wanted |
|  |  |  |  |
| An interactive game where users touch randomly scattered jewels in ascending order. | Jewels Trail A | MWF | 9.0 (8.9) |
|  |  |  |  |
| An interactive game where users touch randomly scattered jewels in a multivariate order—e.g. jewels differ by color, shape, and number | Jewels Trail B | TR | 10.0 (10.0) |

Participants were prompted with questions on the app regarding various psychosocial symptoms, batched into domain categories. Question responses were the in the form of a 0-3 Likert scale. Participants were reminded to take surveys on either MWF or TR, depending on the symptom domain. Although the notification scheduled was consistent throughout their course of participation, subjects were allowed to complete any number of assessments at any point during the day and week; extra records were not excluded from analysis. Survey compliance in the patient group, measured by average number of surveys taken by a participant, is shown in the right-hand column.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Controls** | **Patients** | **PHQ-9** | **GAD-7** | **PANSS** | **PANSS (+)** | **PANSS (-)** | **BACS** | **Sleep Duration** | **P value** **(+ and HC)** |
| **Mood** | 0.15 (0.33) | 0.72 (0.69) | 1.14 (0.69) | 0.95 (0.67) | 0.91 (0.67) | 0.95 (0.67) | 0.81 (0.65) | 0.8 (0.67) | 0.76 (0.64) | <0.001 |
| **Anxiety** | 0.12 (0.29) | 0.74 (0.78) | 1.09 (0.83) | 1.03 (0.8) | 0.91 (0.76) | 0.94 (0.79) | 0.84 (0.73) | 0.81 (0.75) | 0.86 (0.79) | <0.001 |
| **Psychosis** | 0.03 (0.13)  | 0.66 (0.71)  | 0.97 (0.79) | 0.84 (0.67) | 0.89 (0.75) | 0.98 (0.72) | 0.84 (0.72) | 0.77 (0.7) | 0.8 (0.68) | <0.001 |
| **Social** |  0.36 (0.41) | 0.96 (0.60)  | 1.23 (0.57) | 1.14 (0.54) | 1.03 (0.62) | 1.10 (0.60) | 1.02 (0.62) | 0.92 (0.6) | 0.95 (0.61) | <0.001 |
| **Sleep** | 0.11 (0.27)  | 0.77 (0.90) | 1.18 (0.97) | 1.07 (0.96) | 0.97 (0.99) | 0.97 (1.00) | 0.87 (0.94) | 0.85 (0.92) | 0.77 (0.96) | <0.001 |
| **Jewels A**  | -1.63 (0.74) | -1.6 (0.72 | -1.57 (0.7) | -1.62 (0.72) | -1.78 (0.68) | -1.76 (0.68) | -1.75 (0.68) | -1.91, (0.66) | -1.81 (0.68) | 0.63 |
| **Jewels B** | -2.66 (2.52) | -3.22 (1.43) | -3.15 (1.69) | -3.22 (1.68) | -3.5 (0.9) | -3.62, (1.66) | -3.65, (1.58) | -3.58 (1.53) | -3.69 (1.57) | <0.01 |

Survey scores on scaled from 0-3, with 0 indicating minimal-to-no symptom expression and 3 indicating severe expression. Moment-by-moment attention scores (Jewels Trail A/B) are scaled from unbounded negative numbers, indicating poor performance, to 0, indicating optimal performance. Standard deviation is listed in parentheses.

**eTable 2. Mean self-reported survey and cognition scores across patients, controls, and clinical subgroups.**

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| --- |
| **Domain** |
| **Mood** | **Anxiety** | **Psychosis** | **Sleep** | **Social** | **Jewels A** | **Jewels B** |
| 0.747 | 0.805 | 0.867 | 0.588 | 0.606 | 0.471 | 0.333 |

**eTable 3. The transition probability of a domain staying in an elevated state in the *(t+1)* timestep given that it is in an elevated state the *(t)* timestep for the patient cohort.**

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| --- |
| **Induced Domain** |
|  |  | **Mood** | **Anxiety** | **Psychosis** | **Sleep** | **Social** | **Jewels A** | **Jewels B** |
| **Elevated Domain** | **Mood** | NA | 0.222 | 0.162 | 0.208 | 0.166 | 0.094 | 0.019 |
| **Anxiety** | 0.357 | NA | 0.204 | 0.268 | 0.08 | 0.1 | 0.035 |
| **Psychosis** | 0.276 | 0.195 | NA | 0.184 | 0.09 | 0.069 | 0 |
| **Sleep** | 0.192 | 0.190 | 0.189 | NA | 0.136 | 0.05 | 0.022 |
| **Social** | 0.158 | 0.1 | 0.156 | 0.156 | NA | 0.19 | 0.11 |
|  | **Jewels A** | 0.059 | 0.067 | 0.037 | 0.227 | 0.083 | NA | 0.115 |
|  | **Jewels B** | 0.067 | 0.059 | 0 | 0.154 | 0.125 | 0.167 | NA |

|  |  |
| --- | --- |
|  | **Induced Domain** |
|  |  | **Mood** | **Anxiety** | **Psychosis** | **Sleep** |
| **Elevated Domain** | **Mood** | NA | 0.257 | 0.5 | 0.433 |
| **Anxiety** | 0.444 | NA | 0.6 | 0.346 |
| **Psychosis** | 0.52 | 0.324 | NA | 0.333 |
| **Sleep** | 0.25 | 0.32 | 0.286 | NA |

b.

a.

**eTable. 4. Associated transition probabilities for the patient cohort (a) and the validation cohort (b).**