Clinical severity of depression using machine learning among users of a digital mental health platform

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What is Big White Wall?

**SupportNetwork**
24-7, self-referral, professionally moderated peer support and self-management info

**Guided Support**
Group courses for common MH issues, drinking, smoking, weight, problem solving...

**LiveTherapy**
One to one CBT or counselling via video, audio and live chat: BWW or local clinicians
Peer support in an online community

Talkabouts

Starting a Talkabout helps you connect with other members.

- Feeling good today
  Today @ 07:35
  Today I started my new job and it was a great day and after I went to the gym I feel good and feel like I've achieved something!

- Relationship counselling
  Today @ 07:31
  Does anyone have experience of relationship counselling, particularly with Relate? Going through some painful marriage difficulties at the moment and it would be good to know if counselling has helped anyone else. Am spending all of my time trying to evaluate what I want for my future and am in desperate need of some guidance from somewhere, just not sure where to look for it. Thanks.

- Keeping going
  Today @ 10:24
  I've been away from BWW for some time and things have been going pretty well. However, today I feel like I've slammed in to a wall so I decided to reconnect with the community and seek other's advice. How do others keep themselves motivated when they hit a rough patch? I have particular issues with maintaining a healthy diet and making sure I exercise. Even my meditation practice ...

Start your journey to feeling better
PHQ9 assessment on Big White Wall

Assess Yourself

Depression

You scored | 19/27 | 18/03/16

Your score suggests that you are experiencing moderately severe depression. At this stage you may want to consider therapy and it is possible that medication may be an option in your treatment. Also it is often important to understand your condition and find out more about depression, post a brick about your feelings or talk with others. Also, you may wish to consider going to your doctor, finding a local support group or seeking other professional help. Please contact a Wall Guide if you are unsure how to find further help.

History

27/01/13 | 14
18/03/16 | 19

Next steps...

- Continue on to measure your anxiety level
- Understand more
- Back to My Home
# PHQ – 9 Depression Scale

1. Over the last 2 weeks, how often have you been bothered by the following problems?

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Several days</th>
<th>More than half the days</th>
<th>Nearly every day</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Little interest or pleasure in doing things</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Feeling down, depressed, or hopeless</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Trouble falling or staying asleep, or sleeping too much</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>d. Feeling tired or having little energy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Poor appetite or overeating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Feeling bad about yourself, or that you are a failure . . .</td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>g. Trouble concentrating on things, such as reading . . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Moving or speaking so slowly . . .</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Thoughts that you would be better off dead . . .</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Subtotals:** 3 4 9

**SCORE = 16**
Most significant word-pairs for PHQ9 severe threshold

- Can’t cope
- Self harm
- Don’t want
- Need help
- Don’t know
- Hurt myself
- Here anymore
- Depression suicide
- Depression anxiety
- What point
- Start your journey to feeling better
**Significant Association: AUC scores by number of words**

<table>
<thead>
<tr>
<th>Number of words</th>
<th>AUC score</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.817</td>
</tr>
<tr>
<td>20</td>
<td>0.873</td>
</tr>
<tr>
<td>50</td>
<td>0.907</td>
</tr>
<tr>
<td>100</td>
<td>0.919</td>
</tr>
</tbody>
</table>
PHQ9 “severe” scores in the early morning hours

32% have depressive symptoms
Where next?

• Offer extra help to the members who need it most

• Model levels of depression for different groups within Big White Wall

• Help commissioners understand depression in their populations

• Try the model for other conditions and tests
Thank you

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