Using Mobile App to support Self-care of people with Panic Disorder

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1. Tentative Idea

i. Main Theme

Panic Disorder is a chronic condition associated with substantial reduction in quality of life[1] and lifetime prevalence rates are approximately 3%.[2] Panic disorder is diagnosed in people who experience spontaneous seemingly out-of-the-blue panic attacks and are preoccupied with the fear of a recurring attack. Panic attacks occur unexpectedly, sometimes even during sleep with no warning.[3] An attack typically lasts for 10 to 20 minutes, but in extreme cases, symptoms may last for more than an hour. The experience is different for everyone, and symptoms often vary.[1] The number of people with panic disorder in Korea has been increased gradually and is estimated as 127,053 in 2016.[4]

However, It seems like people with panic disorder in Korea hesitate to go see a psychiatrist. The Health at a glance 2015 reported that the consumption of antidepressant is the second to last among the 28 countries investigated.[5] Considering the fact that the suicide rate is the highest in Korea among OECD countries[6], and the increasing number of panic disorder patients, this result means lots of Koreans with mental illness don't go psychiatric hospitals. The Korean Psychiatric Association revealed that 70% of Koreans avoid mental care because of the fear of social prejudices of mental hospital.[7]

Mobile apps have the potential to be the solution of avoiding mental care problems. More and more people are using mobile health apps. Some 58 percent of smartphone users have downloaded a health-related app, according to a NYU Langone Medical Center study of 1,604 US smartphone owners conducted in June 2015.[8]

However, most apps for mental health have only features of temporary expedients. Most

[1] Keller MB et al, Remission and relapse in subjects with panic disorder and panic with agoraphobia, J Nerv Ment Dis, 1994
[2] Robins LN et al, Psychiatric Disorders in America : The Epidemiologic Catchment Area Study, New York : The Free Press, 1991
[3] Anxiety and depression association of America, 2017.6.2, https://www.adaa.org/understanding-anxiety/panic-disorder-agoraphobia
[4] 보건의료빅데이터개방시스템, http://opendata.hira.or.kr/op/opc/olapMfrnIntrsIlnsInfo.do
[5] Health at a glance 2015, http://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2015_health_glance-2015-en
[6] OECD health data, 2014.9
[7] Dong A news, 2009, http://news.donga.com/3/all/20090413/8719394/1
[8] NYU Langone Medical Center, 2015, http://www.mobihealthnews.com/48273/survey-58-percent-of-smartphone-users-have-downloaded-a-fitness-or-health-app

apps are dealing with breathing, relax melodies and sleep checker, for example, 'Relax Melodies',' iSleepEasy' and 'Belly Bio'. Some other apps are related to self-checking of feelings and conditions, such as 'WhatsMyM3', 'Optimisim'. Only few apps are based on the mental theory like CBT(Cognitive Behavioral Therapy). However, they are just dealing with the theory lightly because they only make users recognize their feeling and thought. They don't consider the links to the behavior which is the key part to care the people with panic disorder. In this paper, therefore, we report the descriptive model of our app to change patients' behavior based on TRA theory and CBT theory to inform what we believe to be the self-care app for people with panic disorder.

II. RQs in this paper
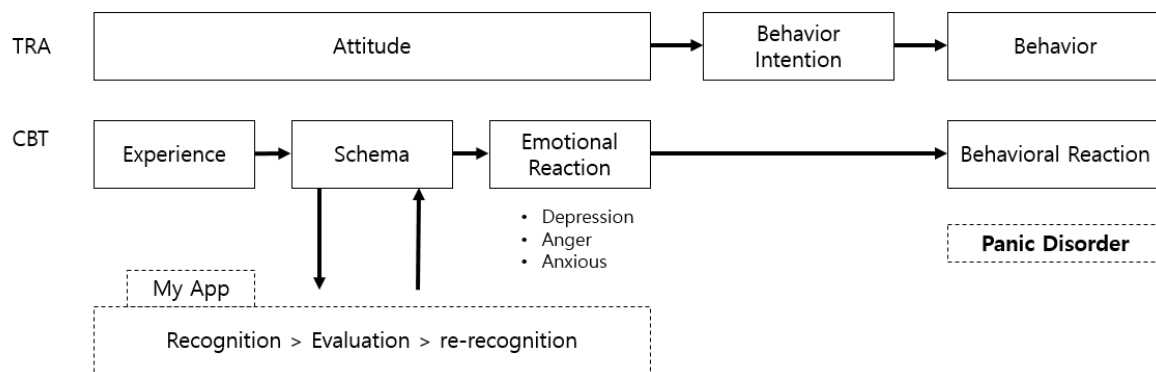
Based on the theory of TRA and CBT, we expected to change people's panic disorder by using our app. According to the TRA, changing attitude should occur first to change behavior.[9] We can specify the attitude as experience, automatic thinking, and emotional reaction based on the theory of CBT.[10] Every people have their own automatic thinking process, so they accept every experience differently. For example, when explosion incident occur, someone will take it as just a mistake and feel just ok, but others will take it as the beginning of the catastrophe and mortal fear. The one who feel extremely fear or anxious repeatedly because of their automatic thinking process can have physical reaction like panic disorder. Thus, our app is dealing with this automatic thinking process to change its emotional and physical reactions. Our app makes people recognize their automatic thinking, evaluate it and re-recognize it. After this process, users can be aware of their problem and change it. The research question was posed to investigate whether our app can change the emotional reaction of users.

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[9] Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of consumer research*, *15*(3), 325-343.
[10] Barlow, D. H., Gorman, J. M., Shear, M. K., & Woods, S. W. (2000). Cognitive-behavioral therapy, imipramine, or their combination for panic disorder: A randomized controlled trial. *Jama*, *283*(19), 2529-2536.

RQ1 : Did the app contribute to lowering the depression?

RQ2 : Did the app contribute to lowering the anger?

RQ3 : Did the app contribute to lowering the anxious?

We set depression, anger, anxious as the key emotional reaction to check its change in our research questions because they are related emotional reactions to panic disorder.[11]
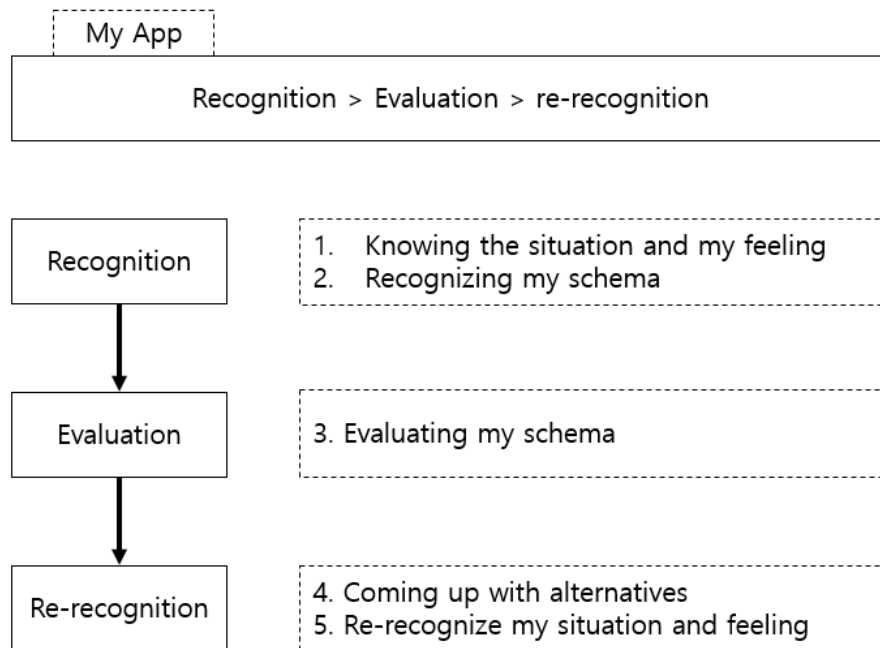
The model of our app follows 3 steps : recognition, evaluation, and re-recognition.

A. Recognition

Users first write down the situation that impacted to their emotions. After write who, when, where and what, users record 3 thoughts they came up with in that situation. For example, when user is angry because he thinks his girl friend deeply insulted him. He thought she tried to insult him, she hates him, and he wanted to revenge her. And then, based on CBT theory, users evaluate his though whether it is labeling, mind reading others, generalizing and catastrophic thinking.

B. Evaluation

Users evaluate their automatic thoughts by finding the evidences. They should find both evidences that their thought is true and false. With evidences, users can evaluate their thought rationally and they

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[11] Barlow, D. H., Craske, M. G., Cerny, J. A., & Klosko, J. S. (1989). Behavioral treatment of panic disorder. *Behavior Therapy*, *20*(2), 261-282.

get chances to change their automatic thinking process.

C. Re-recognition

When users figure out that their automatic thoughts are irrational with lack of evidences, they have to come up with alternatives which are valid. On the assumption that their best friend is in the same situation, users persuade them to think reasonably. Lastly, they re-recognize their situation and feelings.
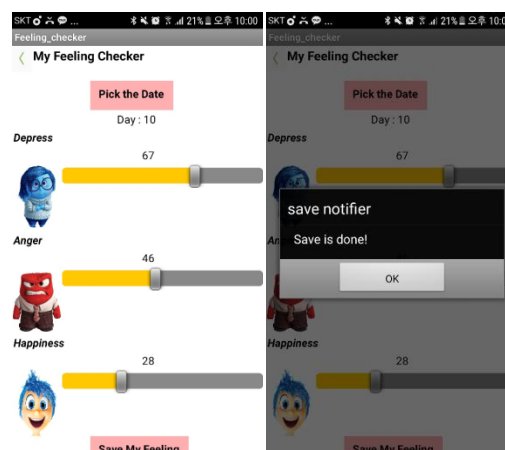

2. Focuses

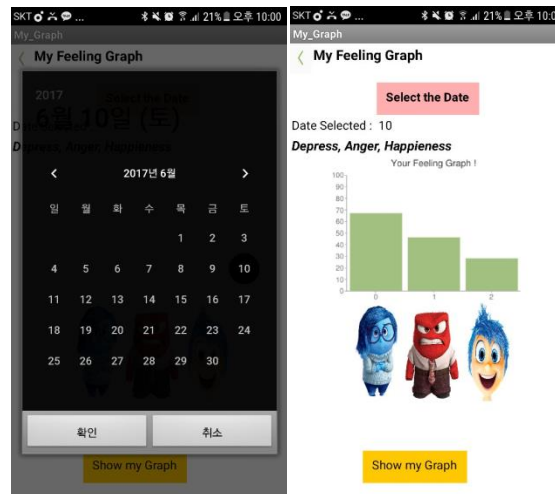I. Important App inventor feature

A. Main
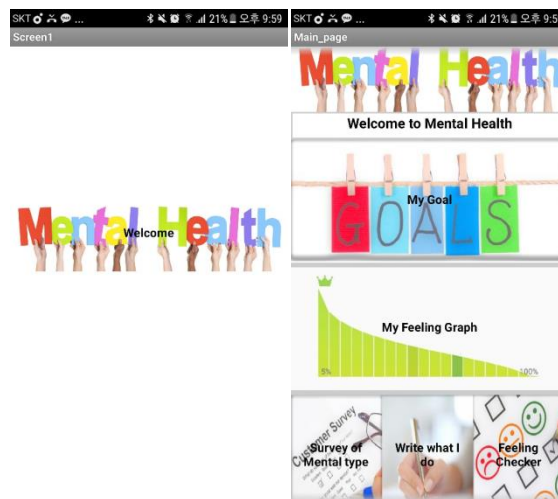
B. Feeling checker

Users can check everyday feeling with this function. They select the date and record their feelings with easy-looking slide bars. When they click 'save' button, the notice will alert to inform the process is done.

C. Feeling graph

Users can check the level of their feelings with bar graph. After they select the date, they can easily compare the level of three feelings easily.

D. Write what I think

Users write what they did and how they felt. Also they evaluate whether their automatic thought has validity by verifying the evidences. By doing so, users can aware the situation rationally, and assess whether their feelings are exaggerated or not. For example, when user is angry because he thinks his girl friend deeply insulted him. As he follow the steps and fill in the text in our app, he can figure out her behavior is not to insulting him but she just wanted him to know she is sulk.

E. See what I wrote
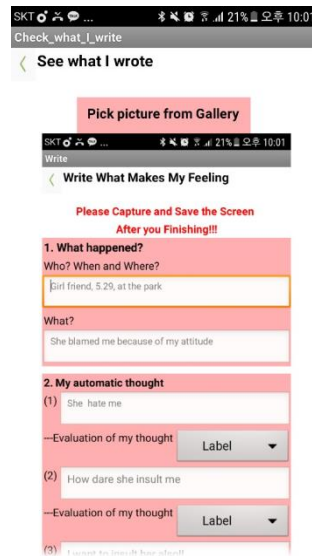
With App inventor2, it's hard to save the memo when the user exit the app. Thus, users should capture the screen after they finish writing contents. Our app provides the feature of selecting the pictures from gallery and see that pictures in our app. Users click 'See what I wrote' button and select the pictures of their record, and app shows the pictures.

F. Panic disorder test
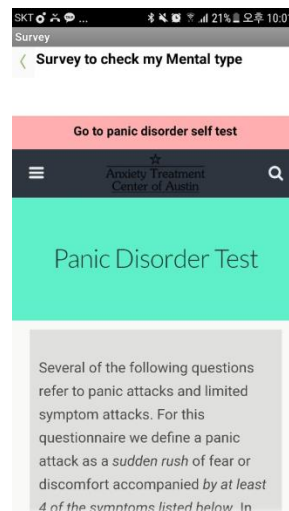
Users can test whether they have panic disorder or not. When they click 'go to self test', it links to the self panic disorder test site.

II. Prove RQ

This paper sought to undertake evaluations that would provide evidence for our research questions with survey. 10 people who are interested in mental health participated in the evaluation for 3 days. Prior to the start of each evaluation, we undertook qualify questions to ensure that each participants are interested in mental health. The survey for check is consisted with feeling of 3 emotions, questions for check the effects. First one is 'Is this app helpful to recognize my thought and feelings rationally? ". And second one is "What other effects do you think this app has?". The last one is "What the positive or negative things in the app?". Survey is attached in the appendix.

III. Usability test

We used PSSUQ[12] to evaluate the usability of our app. 1-8 questions from PSSUQ are used which indicate the SYSUSE and 7-27 questions and question for positive and negative side of our app interface from Questionnaire for User Interface Satisfaction are used. Usability test form is attached in the appendix.

3. **Implication Issues**

Ten participants took part in the survey and two is in their 40s and the others are 20s. The participants are consisted of six females and five males.

Because of the constraint of the time, experiment period is a day for each participant. The participants are required to come up with one impressing event. Then they checked their level of emotions of depression, anger and anxious and followed the scenarios of the app.

<The scenario of the app>

① Open the app and go to 'Feeling checker'. Pick the date and record your feeling. Click save button.

② Go back to main menu and open 'My feeling Graph'. Pick the date and touch 'show my graph'. Click the empty screen when error message occur. Touch the 'show my graph' button again.

③ Go back to main menu and open 'write what I did'. And write down the answer about the questions. Capture the Screen and click 'Read what I wrote' button. Select the picture and read it.

After using the app, the participants checked their level of emotions again. Also, they were asked the other effects of the app in the survey paper and interviewed about the entire satisfaction and limitation. By doing so, we can get the data of how effective the app to lower the level of depression, anger and anxious which are related to our RQs.

4. Implications

I. Practical Implications

The average of the score of SYSUSE is 20, which is consisted of question number 1 to 8 in PSSUQ. The questions that got low score are about quickness and easiness. Some participants were complained that the app was taking long time to complete and some words were hard to understand, such as 'labeling', 'catastrophic thinking' which were technical terms used in CBT.

<Average Score of the questions of 1 to 8 in PSSUQ>
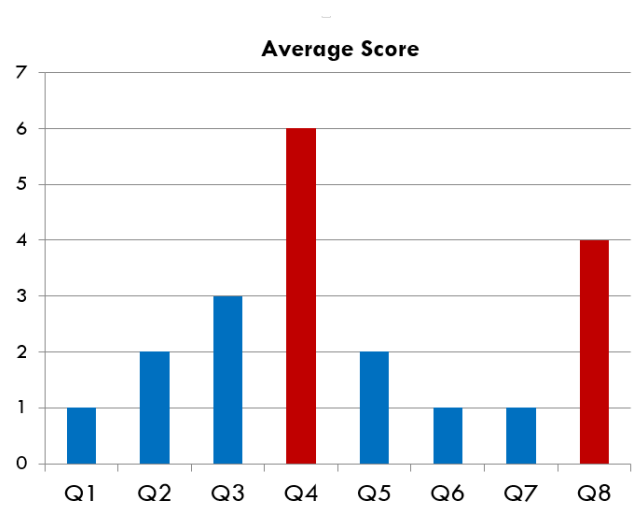
Q4 : I was able to complete the tasks and scenarios quickly using this system.

Q7 : It was easy to learn to use this system.

II. Academic Implications

The table below implicates that how much the emotion decreased after using the app. The users checked the level of emotions with 5 skirt scales. Because we use only 10 samples, It's hard to say the results of research questions. However, it shows that the anxiety is reduced the most and depression is following it. Because the average difference between before and after using the app, it's likely that the research question 3 has high possibility to be proved.

	Depression	Anger	Anxiety
1	-3	-1	
2	-1	-3	-2
3		-1	
4		-1	-1
5			-3
6			-1
7	-2		-4
8	-1		-5
9			-2
10	-1		-2
Sum	8	6	20
Average	0.8	0.6	2.0

5. Further Study Issue

I. Lack of motive and Short period of experiment

This app didn't have features enough to motivate the others. Although one participant said this app had the hedonic motivation, it's not enough to attract people must to use the app regularly.

The experiments were proceeded in a day for each participants. We can check the effect of this app when we lengthen the period to at least a week.

II. Usability

Some participants were complained that the app was taking long time to complete and some words were hard to understand, such as 'labeling', 'catastrophic thinking' which were technical terms used in CBT. We can add some explanation about each technical words and reduce the number of questions in

writing task.

<center><Reference></center>

[1] Keller MB et al, Remission and relapse in subjects with panic disorder and panic with agoraphobia, J Nerv Ment Dis, 1994

[2] Robins LN et al, Psychiatric Disorders in America : The Epidemiologic Catchment Area Study, New York : The Free Press, 1991

[3] Anxiety and depression association of America, 2017.6.2, https://www.adaa.org/understanding-anxiety/panic-disorder-agoraphobia

[4] 보건의료빅데이터개방시스템, http://opendata.hira.or.kr/op/opc/olapMfrnIntrsIlnsInfo.do

[5] Health at a glance 2015, http://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2015_health_glance-2015-en

[6] OECD health data, 2014.9

[7] Dong A news, 2009, http://news.donga.com/3/all/20090413/8719394/1

[8] NYU Langone Medical Center, 2015, http://www.mobihealthnews.com/48273/survey-58-percent-of-smartphone-users-have-downloaded-a-fitness-or-health-app

[9] Sheppard, B. H., Hartwick, J., & Warshaw, P. R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. *Journal of consumer research*, *15*(3), 325-343.

[10] Barlow, D. H., Gorman, J. M., Shear, M. K., & Woods, S. W. (2000). Cognitive-behavioral therapy, imipramine, or their combination for panic disorder: A randomized controlled trial. *Jama*, *283*(19), 2529-2536.

[11] Barlow, D. H., Craske, M. G., Cerny, J. A., & Klosko, J. S. (1989). Behavioral treatment of panic disorder. *Behavior Therapy*, *20*(2), 261-282.

<Appendix 1 >

Survey of the app

■   **Basic information**

1.   Your age?

2.   Your gender?

3.   Are you using apps about health? (Y/N)

■   **Please Following this**

④   Open the app and go to 'Feeling checker'. Pick the date and record your feeling. Click save button.

⑤   Go back to main menu and open 'My feeling Graph'. Pick the date and touch 'show my graph'. Click the empty screen when error message occur. Touch the 'show my graph' button again.

⑥   Go back to main menu and open 'write what I did'. And write down the answer about the questions. Capture the Screen and click 'Read what I wrote' button. Select the picture and read it.

■   **Usability Test (Please write down 1-10. 1 : Strongly disagree, 10 : Strongly agree)**

1.   Overall, I am satisfied with how easy it is to use this system

2.   It was simple to use this system

3.   I could effectively complete the tasks and scenarios using this system

4.   I was able to complete the tasks and scenarios quickly using this system

5.   I was able to efficiently complete the tasks and scenarios using this system

6.   I felt comfortable using this system

7.   It was easy to learn to use this system

8.   I believe I could become productive quickly using this system

■   **Behavior Change**

1.   How do you feel before using the app?

(1) Anger

1	2	3	4	5

(2) Depression

1	2	3	4	5

(3) Anxiety

1	2	3	4	5

2. How do you feel after using the app?

(4) Anger

1	2	3	4	5

(5) Depression

1	2	3	4	5

(6) Anxiety

1	2	3	4	5

3. Was the app helpful to recognize your thought and feelings rationally?

(Please check the level of you agree on the question statement)

1	2	3	4	5	6	7	8	9	10

4. What do you think the other effects of this app are?

(1)

(2)

<Appendix 2>

Examples in 'Write What I did'

1. **What happened?**

   (who? When? Where? What?)

   Girl friend, 5.29, at the park

   She blamed me because of my attitude

2. **My automatic thought and Evaluation**

   (1) She hates me – Generalizing

   (2) How dare she insult me – Mind Reading others

3. **The evidence of my thought**

   (1) <u>The evidence of my thought is true</u>

   She yelled at me and hit me

   (2) <u>The evidence of my thought is false</u>

   She wanted me to change my attitude because she still love me

4. **What is my alternative thought?**

   (1) She still love me and her expectation is high

   (2) She didn't insult me. but   she just feel sad about me

5. **If your best friend is in the same situation, what are you going to say to comfort him or her?**

   I understand you are hurt, but   it's hypersensitivity reaction. Go to her house and tell her I love you

6. **Re - evaluation of your thought. Did it change? How do you feel now?**

   Feel better. I recognize my thought can be wrong