

The Effectiveness of E-Health Solutions

Target User, Competition, and Physicians Opinions

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Introduction

In my last research paper, I briefly explored the characteristics of an effective e-health application. The goal of this paper is to define the intended user and buyer of Maddy and evaluate the apps currently available for iOS and Android. This paper will also explore Physicians opinions on chatbots and attempt to answer the question, “who would actually be willing to buy Maddy and at what price point.”

Defining the User

Based on my understanding of Maddy, it is a chatbot that is meant to be as a tool to check-in with patients regarding their mental state and to remind them to take their medication. To be the most effective chatbot, eventually Maddy will need to go beyond simple language processing. The way humans communicate, is complex, and a chatbot will never be able to understand the complexities of human nature. However, if Maddy is built alongside the target user and mental health experts, it could help teach it to identify slang and nuances in human behavior. This cannot be done without identifying the target user. The slang and references that are common to a 15-year-old may not be the same as the slang and references that are known by a 50-year-old. As mental illness and trauma impacts people of all age groups, cultures and backgrounds, it is vital that the target user is clearly defined.

Based on my research, I believe the target age range of the user should be people aged 18-30. I choose this range for a few reasons. Adolescents under the age of 18 also suffer from mental illness and are treated by medical professionals. However, most of their care is overseen by a parent or guardian. Designing an app to be used by children under 18 could also lead to legal issues that can be avoided by providing a disclosure which states Maddy is meant to be used by people aged 18 and older. For example, in the U.S, cases of sexual abuse involving minors are required to be reported to the proper authorities. If minors use Maddy and isn't equipped with the proper tools to report the case to the authorities, the organization could face legal issues. My research also shows that 75% of all mental illnesses are diagnosed by age 24. This means that by 24, most people with mental health issues are being treated with medication, talk therapy or both. While 24 may seem like the best age to cap the desired user age range at, it's important to note that not everyone who goes to a therapist has a severe mental illness. Depression and anxiety are normal feelings, and some people simply need additional help to learn how to cope with those emotions and feelings. High levels of depression and anxiety are very common during phases of major change. Some examples include people who have recently had a baby, are going through college, or recently come back from serving in the military. This age group generally falls in the 18-30-year-old age range. I chose the cut off age at 30, because if a standard script of responses which incorporates modern slang is used, people older than thirty may not understand. Additionally, this age group is also the most likely to seek professional help. This is an extremely important factor to keep in mind when defining age group because the intended buyer of Maddy is healthcare organizations and professionals.

In later stages of development, it may be helpful to offer different versions of Maddy based on self-reported information the user provides. For example, if the user says they are a 21-year-old female, Maddy's script would be different than if the user reported they were a 34-year-old male. This would require additional partnership with users across all demographics.

Chatbots in Healthcare

E-healthcare is rapidly becoming mainstream due to its ability to provide fast, convenient and cost-effective healthcare services to consumers. While there are a vast number of apps available for both iOS and Android, there are significantly fewer apps which target mental health using a chatbot. Early research has shown that chatbots are useful in helping in areas diagnostic support, cognitive behavioral therapy (CBT), and in promoting an increase in physical activity. Most of these apps are piloted on a messenger service (Facebook, Telegram, WeChat) and but few chatbots are developed into apps available for iOS or Android. Chatbots are also infamous for being poorly adopted by physicians and poor adhered too. While its purely speculative, critics assume there aren't many active chatbots in the field of mental health for one of two reasons; either humans aren't ready to receive mental healthcare using AI or chatbots aren't equipped to properly enter the mental health space.

With the exception of Florence chat, the apps that are mentioned below are free to install on both iOS and Android platforms. Some of the apps profit by instituting a pay to upgrade feature or pay to access special features in their application, including, but not limited to: talking to a counselor/human, unlocking coping strategies, mood trackers, etc. Below is a basic description of each chatbots that have been created to help provide coping strategies for individuals with mental health.

Payment Model: Free	Payment Model: Free	Reviews and Critiques
<p><u>Wysa</u></p> 	<p>Wysa is a smartphone app which uses AI to anonymously chat with people to help them better cope with daily stressors and a variety of behavioral and mental issues.</p> <p>Payment Model: In App Purchases</p>	<p>The biggest qualm with Wysa is that it becomes obvious that Wysa is a bot once things start to feel like a loop. However, its constant availability is the chatbots highest rated quality</p>
<p><u>InnerHour</u></p> 	<p>Innerhour combines AI, journaling and mood assessments to help patients suffering from depression develop better coping skills. They also have an option to connect with a therapist for rates starting at \$35/hr. for video, chat or in person.</p> <p>Payment Model: In App Purchase</p>	<p>This app automatically assumes you're using it because you are sad. It's great to use when you're sad, but there's no real way to track your progress when you're happy or okay again.</p>

<p><u>Woebot</u></p> 	<p>Woebot is a chatbot which uses AI to guide users through exercises to manage negative thoughts and feelings using principals of Cognitive Behavioral Therapy</p> <p>Payment Model: Free</p>	<p>Woebot is considered the most effective tool at helping college aged people reduce depression. It is highly engaging and provides a good sense of therapeutic persuasiveness and alliance. Overall, there are positive responses to the app. My favorite feature is that the AI makes it clear that it is a robot and not a person.</p>
<p><u>Youper</u></p> 	<p>Youper is another AI chatbot that is designed to help identify, track, and process their feelings. After answering a few of Youper's questions, the bot suggests exercises to help improve your mood or keep you in a state of happiness</p> <p>Payment Model: Free</p>	<p>Youper doesn't offer any options to provide a personalized description of how you're feeling. While this provides decent guidelines for someone getting into the habit of recording their moods, it can eventually get a bit frustrating.</p>
<p><u>Florence Chat</u></p> 	<p>Florence is an AI chatbot that is offered through kik, messenger and skype. This AI offers a health tracker feature, a find a doctor feature and a pill reminder feature.</p> <p>Payment Model: Free</p>	<p>Florence AI is the most like Maddy. Florence is a more general health chatbot while Maddy would target mental health. Florence also doesn't have any connection to therapist. Based on my understanding, it can help you find a doctor, but it doesn't send the doctor any reports.</p>

As you'll notice based on the descriptions, none of these apps are connected to a therapist. These apps are purely designed to help people manage their health or cope with feelings of anxiety and depression. Many of them also offer a disclaimer which tells users that this is not meant to be used as an alternative to traditional therapy. However, aside from suicide help hotlines provided during crisis modes, none of these apps even offer help to finding a therapist or linking people with resources to help them find one. One app that I didn't mention that does connect people to therapist is an app called TalkSpace. TalkSpace uses AI to test patients to find out the severity of their problem before matching them with a therapist who then handles their care. TalkSpace would be an indirect competitor to Maddy. I also believe that analyzing TalkSpace's business model would be good to potentially understand pricing models.

Maddy under Enlight Evaluation

Maddy's primary competitive advantage is being a resource to help medical professionals better monitor their patient's care using AI. The apps listed above already allow patients to monitor their own mental health. That market is saturated, and the potential profit is low because many of the apps that already exist are offered for free. Maddy would enhance the working alliance between the therapist and the patient, while adding an additional element of support to both the patient and therapist. However, to pass the Enlightenment Evaluation, Maddy must be persuasive. Woebot, Wysa and InnerHour are extremely good at therapeutic persuasiveness. Analyzing their speech patterns and how they interact with the user may be helpful as Maddy continues to be developed.

Because Maddy will begin as a mental health chatbot on Telegram first, the other characteristics of an effective e-health app can temporarily be ignored. But, Maddy must be engaging to the user, therapeutically persuasive and create a clear sense of a working or therapeutic alliance.

Physicians Opinions on Chatbots

Understanding the way medical professionals view chatbots is integral in deciding who the product should be sold to. For example, if medical professionals don't believe chatbots will ever work, it will be difficult to convince them to pay for Maddy and even more difficult to convince patients to use Maddy. A survey was sent to 100 randomly selected medical professionals to test their feelings about chatbots. The results showed that of the 100 professionals surveyed:

- **30%** of participants have used a chatbot
- **58%** don't know if their patients use chatbot for health-related reasons
- **42%** believe that chatbots hold some importance
- **44%** would prescribe chatbots to patients

It is important to acknowledge that while these results look promising, there are many biases that can be present during a survey. However, for my research, it serves as an adequate resource to get a basic understanding of what physicians think about chatbots. What I found the most interesting about this report is that while most physicians have a generally positive outlook on chatbots and the benefits they could provide, more than half (53%) of physicians agree that there are many challenges that come with using chatbots. Not only do most physicians believe that chatbots cannot properly assess emergencies, but 76% of physicians agree that chatbots cannot effectively care to the full extent for a patient need.

These results follow the general sentiment that chatbots can be useful in the healthcare industry. For an app to be the most effective in the healthcare space, it must be used in tandem with care from a licensed healthcare professional. I believe that Maddy should be marketed to therapist, clinics and hospitals. As I previously mentioned, there are many apps which currently market themselves to patients. Most apps are free to download with upgrade options that are subscription based. Entering a saturated market will yield minimal profits. The patient also lacks incentive to purchase Maddy. Not only would they be paying for the therapist and medication, but then they would also have to pay an additional fee to use Maddy. If they truly want to monitor their mood, they can download Wysa or Woebot, which is free. If they need a reminder to take their medicine, they can set a free reminder on their phone. It's also important to remember that TalkSpace also exist. TalkSpace offers virtual therapy with a live person through an app. Patient's pay for a subscription to the app that is significantly cheaper

than traditional in person therapy, and therapist are also able to monitor their patient's care. Through this model, the patient is paying. An important question to ask if it is decided that it is best for the patient to pay is, what value is being added? How is Maddy different than TalkSpace? Why should the patient pay extra for Maddy's services?

Maddy as a chatbot should continue to be built for the use of people with mental illness. However, I propose a secondary screen, or management platform should be sold to various medical professionals and their offices. Maddy would ask questions throughout the day to check how patients are feeling or coping with their mental illness and to ensure the patient is taking their medication. Their responses could then be logged or recorded in a "journal" feature. All these services should remain free for the patient to encourage people to download the app or use the chatbot at all. Maddy/Enosh could then ask a basic question such as "Would you like me to send this report to your health care provider?" The patient would have the option to share or keep it to themselves. In a way, it's like creating a social media platform for patients and their medical professional. Like all social media platforms, its free for the consumer (patient in this case).

This model is still beneficial for medical professionals because it allows them to monitor their patients care without the added time of calling to make sure the patient is journaling, taking medicine or functioning as normal. 62% of medical professionals also agree that bots are best suited for organization and planning services.

Conclusion and Next Steps

The primary goal of this paper was to communicate my findings on potential users and buyers of Maddy as well as explore physicians' opinions on chatbots. I believe that the target users should be defined as people aged 18-30 years old. There is competition in the chatbot in the general/mental healthcare space. However, if Maddy is used as a tool by healthcare professionals to better monitor their patient's care, it would set Maddy apart from the AI currently available. Next, I will present my findings to Professor Amit Baumel and document his advice.

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