

# Mind & Heart

## Theoretical Framework

Mind & Heart was created using the constructs of the Health Belief Model (HBM) and the Social Cognitive Theory (SCT) that have been proven to increase adherence to exercise among this population (Mo et al., 2016; Zechner et al., 2016). Perceived susceptibility and perceived severity (HBM) are addressed on the ‘Get Started’ page. Perceived benefits (HBM) and outcome expectations (SCT) are addressed on the ‘Importance of Exercise’ subpage. The ‘Exercises’ page contains videos of trainers exercising that individuals with SMI are told to follow and repeat, providing the target population with a tailored resource to exercise. As such, this page demonstrates the facilitation and observational learning constructs of the SCT. Additionally, because these videos are designed to show individuals with SMI exactly what exercises to do and how to perform these exercises by walking them through the whole exercise routine, it is expected to increase self-efficacy to exercise, a construct addressed by both HBM and SCT. Finally, tracking CRF through the ‘CRF’ and ‘My CRF Record’ page reflects self-regulation (SCT).

## Methods

Mind & Heart was developed with the input of mental health care and primary care providers, physical trainers, and individuals with SMI. Prior to development, a needs assessment was conducted among a small group of patients with SMI at a local mental health care facility, who stated that having a website with videos uploaded that they could follow along to and exercise would be the most beneficial aspect. They additionally requested private accounts for tracking progress on the website. As a result, Mind & Heart was developed to reflect just that. Discussions with local providers and physical trainers revealed that creating and uploading videos tailored to the population would be best, since individuals with SMI might benefit from different physical activity techniques than the general population. Therefore, as mentioned earlier, exercise videos specifically tailored to this population will be uploaded and made available on the website.

The vlog was created using iMovie, combining animations, still slides, as well as a screen recording of Mind & Heart navigation using Quicktime Player. The animation at the beginning of the vlog was created using Moovly, a video animation software. Finally, the Mind & Heart website itself was created using Wix, a cloud-based web development platform.

## User-centered Design

Once a preliminary version of the website was developed, it was shown to patients with SMI at a local mental health care facility and asked about their initial thoughts, comments, and suggestions for improvement. Changes were made to the website to reflect their input. One suggestion made by individuals with SMI was to break up large paragraphs of text into smaller sections and pages. As a result, the large amount of information on the Get Started page was broken up into small sentences and paragraphs of information split over multiple subpages.

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## Overview of the Problem and Target Population

Serious mental illness (SMI), which includes severe depression, bipolar disorder, schizophrenia, and schizoaffective disorders, affects four percent of American adults, or 9.8 million people (National Institute of Mental Health, 2015). Individuals with SMI on average die 15-20 years earlier than those without SMI with the majority of deaths related to cardiovascular disease (CVD) (Druss et al., 2011; Kisely et al., 2005; Leucht et al., 2007). Individuals with SMI are twice as likely to develop and three times more likely to die from cardiovascular disease (CVD), than those without SMI (Osborn et al., 2007). These inequalities can be attributed to a combination of factors including systemic issues, such as the separation of mental and primary care services, consequences of mental illness itself, and side effects of its treatment, such as increased weight gain and a lack of motivation to exercise. Compared to those without SMI, individuals with SMI are also less likely to have access or resources to go to a gym or pursue physical fitness goals (Kisely et al., 2005).

Numerous interventions have been implemented in attempt to address the increased CVD risk among this population. A systematic review of more than 24 studies that evaluated community-based exercise interventions found that the vast majority of interventions failed to improve the physical health of this population (Verhaeghe et al., 2011). An often-cited reason provided by participants for the failure of these interventions has been the implicit requirement of interacting with unfamiliar others as well as a lack of convenience associated with attending and participating in in-person interventions (Verhaeghe et al., 2011). Consequently, increasing attention has been directed towards fitness websites and apps, which improve convenience and reduce the amount of interaction required with unfamiliar others. However, existing fitness websites and apps, such as MyFitnessPal, Super Tracker, and Fitocracy, among others, neither cater specifically to this population, nor focus specifically on improving cardiovascular health. Additionally, these websites and apps use weight loss tracking as the primary measure of fitness progression. However, not only is it significantly more difficult for individuals with SMI to achieve significant reductions in weight, tracking weight has also been shown to lower self-esteem and increase depressive symptoms among individuals with SMI (Mcelroy, 2009). Therefore, weight loss tracking is not an appropriate measure of tracking fitness for this population.

**Technology Solution: Mind & Heart** (<https://reshmaroy512.wixsite.com/mindandheart>)

Mind & Heart is a website that serves as an exercise platform specifically for individuals with SMI. This website therefore serves as a technology solution to address this lack of fitness tools tailored to this population. The website will have a variety of different workout videos, that can be done without exercise equipment, including cardio and strength training exercises, uploaded by physical trainers who have received psychoeducation. Therefore, the videos will include 'mental health' segments in between exercises, such as deep breathing exercises and repeating positive affirmations, which have been shown to not only make exercise more enjoyable and easier to get through, but also increases the likelihood of committing to fitness goals (Callaghan, 2004). Individuals with MI will be able to monitor their progress towards improving their cardiovascular health, by tracking and recording their cardiorespiratory fitness through the 6-Minute Walk Test (6MWT) directly through the website.

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<b>Flesch Reading Ease score: 73.9 (text scale)</b> Flesch Reading Ease scored your text: <u>fairly easy to read.</u> [f]   [a]   [r]
<b>Gunning Fog: 8.1 (text scale)</b> Gunning Fog scored your text: <u>fairly easy to read.</u> [f]   [a]   [r]
<b>Flesch-Kincaid Grade Level: 6.2</b> Grade level: <u>Sixth Grade.</u> [f]   [a]   [r]
<b>The Coleman-Liau Index: 9</b> Grade level: <u>Ninth Grade</u> [f]   [a]   [r]
<b>The SMOG Index: 6.3</b> Grade level: <u>Sixth Grade</u> [f]   [a]   [r]
<b>Automated Readability Index: 6.1</b> Grade level: <u>10-11 yrs. olds (Fifth and Sixth graders)</u> [f]   [a]   [r]
<b>Linsear Write Formula : 6.6</b> Grade level: <u>Seventh Grade.</u> [f]   [a]   [r]

Figure 1. Scores of Mind & Heart on readability tests.

Additionally, the particularly important text on the website, such as how often to exercise and when to measure CRF, are provided in a different colored font and underlined for emphasis. A bright and vivid color scheme was used on the preliminary website to make it seem more appealing and exciting to the target audience.

However, patients initially described the website as “daunting” and “unsettling,” and suggested using a milder color scheme of grays and pastel colors, using brighter colors only on menus, action buttons, and the home page to attract more users. Finally, the preliminary website was described as fairly difficult to read and understand.

Therefore, all informative script and descriptions provided on the website were rewritten and made substantially easier to read. The current version was described as easy to read by patients. Additionally, the readability of the current version was also analyzed using 7 different readability tests (Figure 1) and found to be written at a sixth-grade reading level and fairly easy to read.

## Methods & Barriers to Dissemination

This website will be disseminated to individuals with SMI primarily through mental health and primary care providers. One barrier to dissemination may revolve around reaching a sufficient number of providers. In order to address this issue, in addition to reaching out to providers through individual contact, they will also be contacted through their social media accounts, hospital and mental health care facility social media accounts, and through health professional associations. Providers will then be requested to suggest or refer patients to the Mind & Heart website as well as share a link to the website on their social media accounts if possible.

Additionally, mental health care organizations, such as the National Alliance on Mental Illness and the Substance Abuse & Mental Health Association will be informed about Mind & Heart and asked to share it to health care providers, public health practitioners, and other relevant persons by providing a link to Mind & Heart on the organization websites.

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All of these methods of dissemination will be employed in the hopes that Mind & Heart will reach as many providers and health care facilities and thus individuals with SMI as possible. Nevertheless, whether referred patients will actually use the website remains an issue and is highly dependent on provider-patient relationships. However, because this would be beneficial to patients, and is thus likely to be well suggested to patients by providers, patient uptake may be high, or at least moderate.

Another barrier to disseminating through providers is that Mind & Heart may not reach individuals with SMI who do not seek treatment through the healthcare system due to affordability, access, and other problems. To help address this issue, links to Mind & Heart will also be posted on online mental health support groups, forums, and associated websites that are used by many who are not treated through the healthcare system. Additionally, by posting on these online communities, more patients treated through the healthcare system could also be reached.

## **Next steps**

The needs assessment and discussions conducted during the preliminary stages and development were conducted among a small group of mental health and primary care providers, physical trainers, and patients with SMI from local health facilities. Throughout this process as well as during the evaluation of the preliminary and current versions of Mind & Heart, input was obtained from a small number of patients with SMI at a local mental health facility. Therefore, before finalizing the website, obtaining input from more providers, trainers, and patients, from a more diverse group of health care facilities, as well as the input of individuals with SMI not treated through the healthcare system, would be beneficial.

The current version of the website is still a prototype with proxy videos, instead of videos tailored to this population. From discussions with local physical trainers, several expressed interest in working with healthcare providers and individuals with SMI to create exercise videos that cater to this population to specifically improve their cardiovascular health. Therefore, next steps would include organize meetings among physical trainers, health care providers, and members of the target population to help initiate this process.

Finally, once the website is finalized based on the input of these stakeholders, it will be important to arrange for Mind & Heart to be evaluated to determine the utility of its application and whether it is successful by program evaluators. Evaluation methods, beyond being able to analyze the number of clicks and duration of stay per video on each account, and recorded CRF, additional evaluation processes could be built into the website before dissemination. After this process is completed, and necessary permits and approvals have been obtained, the website would be ready to be disseminated using the aforementioned procedures. Once the target population begins to use the website, additional research will be conducted among users to determine what works best, what needs to be changed, and what can be done to improve the website and increase user participation and retention.

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## References

- Callaghan, P. (2004). Exercise: a neglected intervention in mental health care? *Journal of Psychiatric and Mental Health Nursing*, 11(4), 476-483. doi:10.1111/j.1365- 2850.2004.00751.x
- Druss, B. G., Zhao, L., Von Esenwein, S., Morrato, E. H., & Marcus, S. C. (2011). Understanding excess mortality in persons with severe mental illness: 17-year follow up of a nationally representative US survey. *Med Care*, 49(6), 599-604.
- Kisely, S., Smith, M., Lawrence, D., & Maaten, S. (2005). Mortality in individuals who have had psychiatric treatment: population-based study in Nova Scotia. *Br J Psychiatry* 187: 552– 558.
- Leucht, S., Burkhard, T., Henderson, J., Maj, M., & Sartorius, N. (2007). *Physical illness and schizophrenia: A Review of the Evidence*. Cambridge: Cambridge University Press.
- Mcelroy, S. L. (2009). Obesity in Patients With Severe Mental Illness. *The Journal of Clinical Psychiatry*,70(Suppl 3), 12-21. doi:10.4088/jcp.7075su1c.03
- Mind & Heart. <https://reshmaroy512.wixsite.com/mindandheart>
- Mo, P., Mark, W., Chong, E., & J., Lau. (2016). Physical Activity in People With Mental Illness: Application of the Health Belief Model. *J Sport Exerc Psychol*, 38(2), 203-208.
- National Institute of Mental Health. SAMHSA National Survey on Drug Use and Health. (2015). A New Look at Racial/Ethnic Differences in Mental Health. Retrieved from <https://www.nimh.nih.gov/news/science-news/2015/a-new-look-at-racial-ethnic-differences-in-mental-health.shtml>
- Osborn, D. P. J., Levy, G., Nazareth, I., Petersen, I., Islam, A., & King, M. (2007). Relative risk of cardiovascular and cancer mortality in people with mental illness. *Arch Gen Psychiatry*, 64, 242–249. doi: 10.1001/archpsyc.64.2.242
- Verhaeghe, N., Maeseneer, J. D., Maes, L., Heeringen, C. V., & Annemans, L. (2011). Effectiveness and cost-effectiveness of lifestyle interventions on physical activity and eating habits in persons with severe mental disorders: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 8(1), 28. doi:10.1186/1479-5868- 8-28
- Zechner, M. R., & Gill, K. J. (2016). Predictors of physical activity in persons with mental illness: Testing a social cognitive model. *Psychiatric Rehabilitation Journal*, 39(4), 321- 327. doi:10.1037/prj0000191