A Novel Methodology to Treat Obesity Using Technology

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Abstract

More than 72% of the U.S population is overweight or obese, and it is now rising in the pediatric population. Obesity rate has been on the rise despite hundreds of weight loss methods that have been recommended over the years (Fig1.)

Fig.1



The use of technology has proven to be a scalable method to aid in significant behavior change and reach more people. The traditional healthcare industry's predominant behavior change methodology has been the goals and tracking performance-based mindset, which has led to a plethora of mobile apps and technology that delivers this performative approach. The present study evaluated another methodology that can be delivered via technology, a new and innovative approach to help patients lose weight permanently. Early outcomes as a creative, more natural method to allow for sustainable behavior change using the Iterative Mindset (ITM) were presented.

Introduction

With the growing number of obesity-like chronic conditions, there needs to be a deviation from the current approach. The use of digital tools to support weight loss surgery can increase the chance of long term weight loss success. In weight loss surgery, adopting a healthy lifestyle consisting of good habits is the best way to reverse obesity and achieve sustainable results. This may be achieved by changing from the current performative mindset to an Iterative mindset which is more natural (r_4). The new behaviors will follow, and habits will form, leading to a more sustainable lifestyle change. While dealing with such a complex disease, technology will provide beneficial results to create a permanent behavioral change. The principal methodology currently used for behavior change in health technology apps is a Performance Mindset. Performance Mindset is defined as seeking to gain favorable judgments or avoid negative assessments of one's competence or ability. Regular tracking of food and physical activity is linked to increased maladaptive health behaviors, mindsets, and belief systems (r_5).

The Iterative Mindset is defined as a dynamic cycle between three variables: practice, assessment, and iteration (Figure 2). The potential for lasting (rather than temporary) change in Iterative Mindset comes from the emphasis on driving the individual toward continuous practice with automaticity of habits as the explicit purpose of the effort. This emphasis means that new behaviors are intended to become less effortful and more automatic over time without any need for continued rewards or explicit memory systems. Starting with practice, for a particular individual or timepoint, this cycle can move in either direction among the three variables and the cycle between two of the variables before continuing to the third. As individuals continuously practice a habit, they may also move into "iterating," which is a process of tweaking or adjusting the practice to be more accessible and more automatic. Iteration also shortens relapse as practice resumes more quickly. The assessment steps for behavioral changes include; a) an implicit appraisal of how well a practice fits into an individual's lifestyle/routines, as well as b) any reframing needed to judge all experience as progress and not failure.

Fig. 2

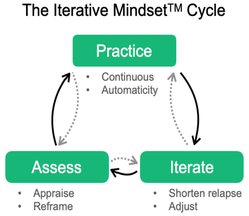
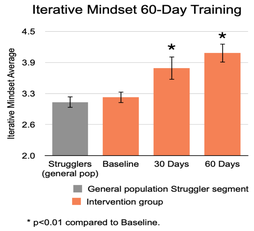


Fig. 3



In a recent observational study carried out in partnership with Walmart associates, Fresh Tri users successfully lost about 1 pound (0.45 kilograms) per week. In 60 days, the users lost 7.2 pounds (3.2 kilograms). According to the Self-Report Habit Index (SRHI), and the validated Iterative Mindset scale, habit formation and Iterative Mindset among participants was statistically significant. Other parameters linked to overall health and well-being, such as self-efficacy and resilience, also improved, which is currently not seen in any other digital weight loss application (Figure 3).

Methodology

A total of N= 2367 responses were analyzed to characterize the cohort based on collected demographic data. Ninety-one percent responded positively to trying to lose weight while on 9% has never tried or wanted to. Other surveys that were administered to this group to be reviewed was the Iterative Mindset instrument, and the general self-efficacy instruments. Subgroup analyses were conducted to understand the relative importance of each factor as listed in the tables below. Group differences were estimated using t tests for continuous variables and chi-square tests for categorical variables.

Results

A one-way ANOVA was conducted to determine if the iterative mindset score (ITM) was different for groups at different weight loss stages. Participants were classified into five groups: Succeeder (n = 421), Achiever (n = 456), Relapser (n = 852), Struggler (n = 424) and those who Never Tried (n = 214). Data is presented as mean ± standard deviation. ITM scores remained the same from the never tried (23.4 ± 3.9), to struggler (23.4 ± 3.9), and increased from relapsers (23.8 ± 3.8) to achievers (25.3 ± 3.6) to succeeders (25.5 ± 3.7), in that order. The Iterative Mindset ability (ITM score) was statistically significantly different for different levels across the weight loss journey, $F(4, 2354) = 31.4$, $p = .0001$. Fig 4 below represents the individual group differences that were statistically significant using Tukey's post hoc test. We also looked at the analytics in the digital app of the people who are using our Iterative Mindset approach to assess habit formation. Three hundred and fifty eight Fresh Tri users responded to the SRHI-quiz a peer-reviewed habit-formation assessment tool that measures automaticity -- to learn how strong their habit has become. The light blue indicates that the behavior practiced has become a strong habit (FIG 5).

Fig. 4

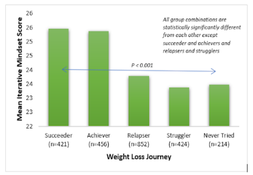
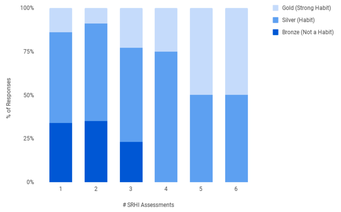


Fig. 5



Discussion

Fresh Tri is a digital application that is an easy-to-use behavior change technology that works by helping users adopt healthier lifestyle habits. The cutting-edge technology algorithm trains users on the Iterative Mindset™ methodology to adopt a permanent lifestyle change. The iterative mindset is a viewpoint where the practice is progress, and permanent change is done through a series of iterations or tweaks of natural behavior. The current performative approach applied in these methods risks repeating the diet industry trend of creating short-term change, high relapse rates, and harm to more vulnerable populations if it emphasizes Performance Mindset methods. While we have focused on its effect on sustained weight loss, Iterative Mindset shows promise as a superior methodology that can fuel perpetual healthy effort, protect from perceived failure, and increase adaptability and resilience.

Limitations to this study include the fact that this was not a randomized clinical trial using the digital application on bariatric surgery and obese patients. There were no quantitative health measures recorded in this study only self-reporting of the patients which can weaken the data. Future studies will include using this digital technology powered by the Iterative Mindset in a randomized clinical trial that looks at outcomes compared to the current more performative technologies that are available.

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