

Abstract

Introduction
Chronic gastrointestinal (GI) conditions are diverse and result in a wide range of digestive symptoms. We hypothesized that a digital digestive chronic care program that included longitudinal symptom tracking, personalized medical nutrition therapy, health coaching, and targeted education via a web-based app can lead to improvements in digestive symptoms.

Methods
Participants were eligible for a digital digestive chronic care program through their employment benefits. Upon enrollment, participants answered questions about their history and symptoms via a web-based app. A digestive symptom score was calculated (score range, 0-36) based on symptom severity (5 point scale: 0 no discomfort, 4 very severe discomfort) in nine digestive symptom domains (e.g., abdominal pain, constipation, diarrhea, bloating, reflux). Participants logged their digestive symptoms at baseline and during the course of their care, including during month 3, via the app to track clinical progress and guide subsequent interventions. Change in score was assessed at enrollment and month 3.

Results
A group of 659 ethnically and socially diverse participants provided symptom data (avg age: 43.2 years, 78% female, avg BMI 28, 36% Non-White). Of these, 89% reported symptom improvement at baseline and month 3, with an average decrease in symptom score of 64% (baseline avg; 7.6; month 3 avg: 2.7, p<0.0001). Ninety-one percent of participants who were scheduled with a dietitian or health coach reported symptom improvement compared to 78% of those who were not scheduled with these providers (p<0.001). Among participants who reported moderate or higher discomfort in at least one symptom domain (domain score of ≥2) at baseline, 93% reported symptom improvement with an average decrease in symptom score of 66% (n=538, baseline avg 8.7; month 3 avg 3.0, p<0.0001). Using the average of multiple symptom scores in the last month of evaluation vs. the last symptom score was associated with higher rates of symptom improvement (93% vs 89%, p=0.04).

Discussion
Participants enrolled in a digital digestive chronic care program showed significant reduction in digestive symptom severity at 3 months compared to baseline. Care that incorporated GI dietitians and health coaches was associated with higher rates of symptom reduction. Use of a digital app to collect digestive symptom data holds promise for tracking a member's clinical course. Further research is needed to determine the optimal digital symptom tracking process.

Introduction

In the US, the annual burden of gastrointestinal (GI) conditions is enormous, accounting for 105M ambulatory visits, 14M hospitalizations, 236K deaths, and \$142B in total healthcare expenditures.¹⁻⁴ Employees who report GI symptoms are more likely to miss work, be less productive, and quit their jobs than those who do not have chronic GI symptoms.^{5,6} The average annual cost per employee varies from \$13,948 for functional gastrointestinal disorders to \$62,735 for Crohn's disease.⁴

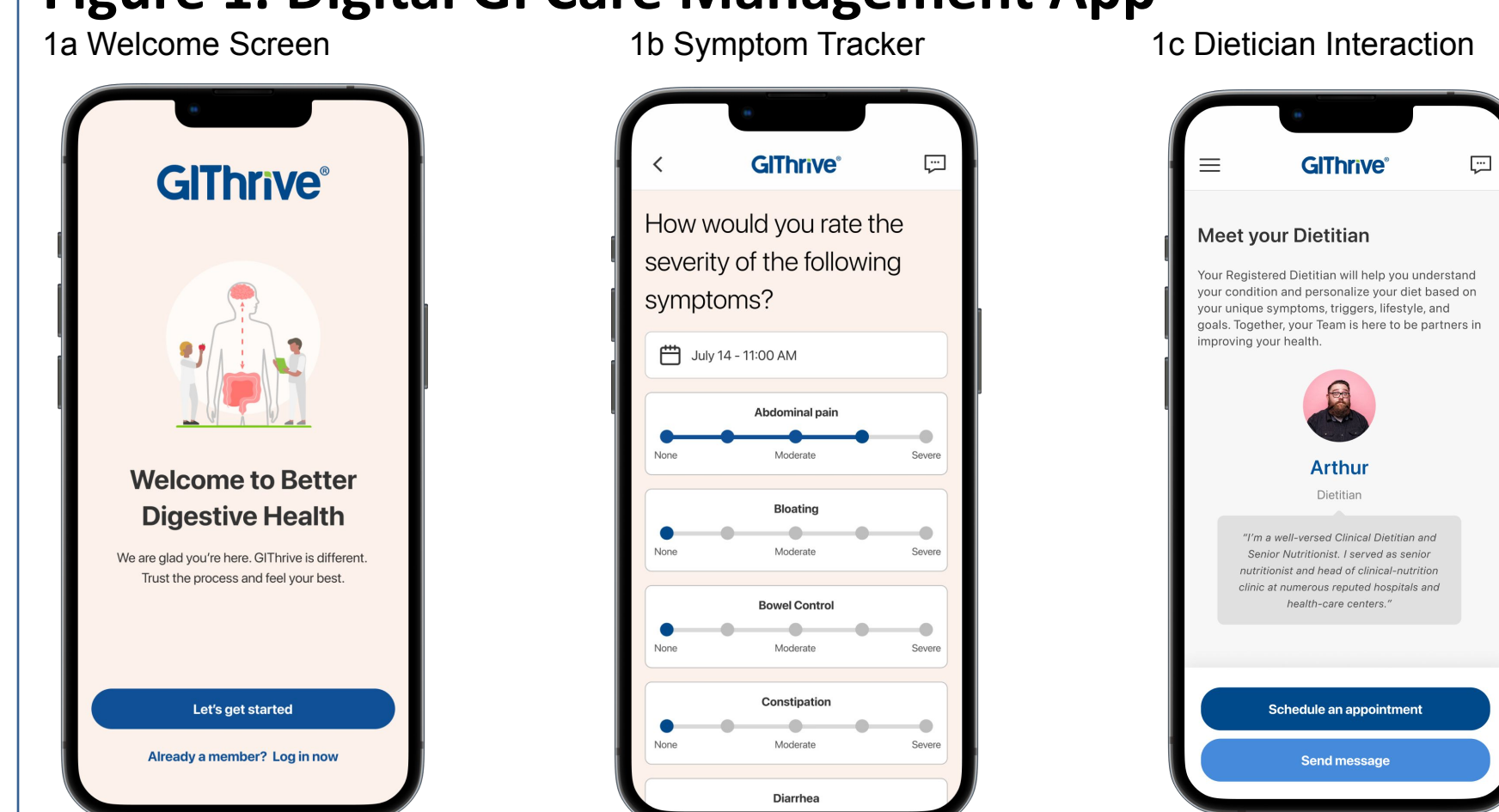
We hypothesized that a digital digestive chronic care program that included longitudinal symptom tracking, personalized medical nutrition therapy, health coaching, and targeted education via a web-based app can lead to improvements in digestive symptoms.

Methods and Materials

Recruitment
Adult participants were eligible for a digital digestive chronic care program called GITHrive through their employment benefits. Those enrolled between Jan 2022 and May 2023, who provided data on their GI symptoms at more than one time point between days 60 and 90 were eligible to participate.

Data Collection
At enrollment, participants answered questions about their history and symptoms via a web-based app. GI symptom score (range, 0-36) calculated based on symptom severity (5 point scale: 0 no discomfort, 4 very severe discomfort) for 9 GI symptoms: abdominal pain, constipation, diarrhea, bloating, reflux, gas, nausea, vomiting, loss of bowel control. Participants tracked GI symptoms at baseline and during the course of their care via the app (Figure 1). Change in score was assessed at enrollment and month 3. We compared means using t-tests.

Figure 1. Digital GI Care Management App



Intervention
The digital program has four key components:

- **Symptom Tracking:** the app guides users with diet and lifestyle interventions to promote symptom reduction
- **Personalized Medical Nutrition Therapy:** delivered 1:1 by RDs; topics include diet, SIBO, food intolerances
- **Health coaching:** 1:1 coaching to help with goals related to their GI conditions including self-monitoring, CBT, sleep
- **Targeted education:** Courses, articles, recipes, weekly webinars on a variety of GI-related topics.

Protocol considered exempt by WCG IRB.

Results

659 ethnically and socially diverse participants provided symptom data (avg age: 43.2 years, 78% female, avg BMI 28, 36% Non-White) (Table 1).

Table 1. Baseline Characteristics of Participants

Characteristic	Result
Age	43.2 yrs (SD 11.5 yrs)
% Female	78%
Avg BMI	28 kg/m ² (63.5% overweight or obese)
Race/ethnicity	White/Caucasian 63.6% Asian/Pacific Islander 13.4% African American/Black 7.4% Hispanic 6.4% Multiple 7.4%
Avg baseline symptom score (0-36)	7.6 (SD 4.3)

89% participants reported symptom improvement between baseline and month 3, with an average decrease in symptom score of 64% (baseline avg; 7.6; month 3 avg: 2.7, p<0.0001) (Figure 2).

Symptom improvement was equivalent for participants of all racial/ethnic groups (Figure 3), ages, genders, and BMIs.

Greater Symptom Improvement in Some Key Groups

Participants with Most Severe Symptoms
93% of those who reported moderate or higher discomfort in 1 or more symptom domains (domain score of ≥2) at baseline, reported symptom improvement with an average decrease in symptom score of 66% (n=538, baseline avg 8.7; month 3 avg 3.0, p<0.0001).

Importance of Care Team
91% participants scheduled with a dietitian or health coach reported symptom improvement compared to 78% of those who were not scheduled with these providers (p<0.001).

Using the average of multiple symptom scores in the last month of evaluation vs. the last symptom score was associated with higher rates of symptom improvement (93% vs 89%, p=0.04).

Discussion

Participants had significant reductions in GI symptom severity at 3 months compared to baseline. Participants of a wide variety of ages, genders, and races engaged with the program and benefitted similarly. This is an important finding since non-white populations have higher rates of some GI conditions (e.g., constipation) but historically lower rates of screening for GI conditions (e.g., colorectal cancer), and worse outcomes.⁷⁻⁹

Care that incorporated GI dietitians and health coaches was associated with higher rates of symptom reduction.

Use of a digital app to collect digestive symptom data holds promise for tracking a member's clinical course. Further research is needed to determine the optimal digital symptom tracking process and to validate this tool.

Conclusions

Given challenges with access to GI specialty care, a digital GI chronic care program provides a promising tool for increasing access for populations with chronic GI symptoms, especially populations that have historically had poorer access to GI care.

Figure 2. Change in Total Symptom Score

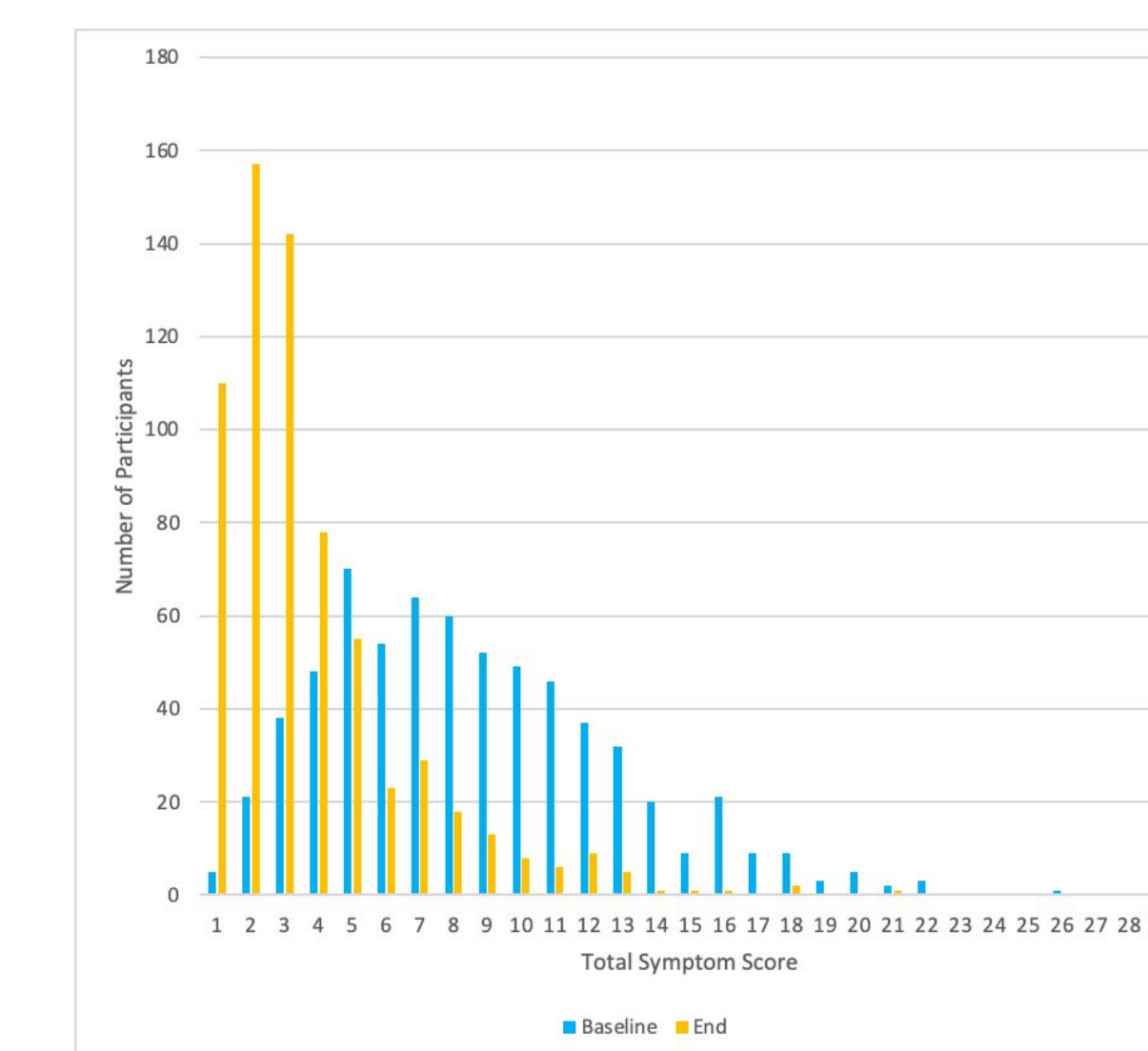
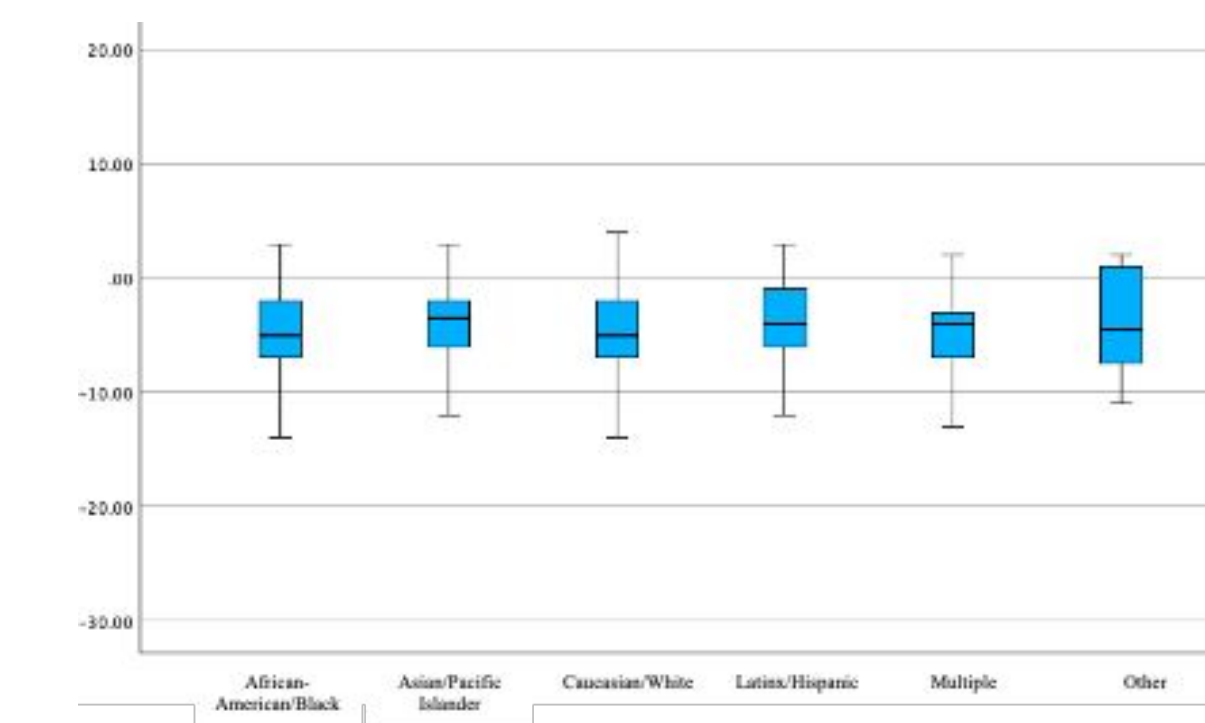


Figure 3. Symptom Improvement in All Races



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