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Chronic Constipation in the United States: Results From a Population-Based Survey Assessing Healthcare Seeking and Use of Pharmacotherapy

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OBJECTIVES: **Chronic idiopathic constipation (CIC) is characterized by unsatisfactory defecation and difficult or infrequent stools. CIC affects 9%–20% of adults in the United States, and although prevalent, gaps in knowledge remain regarding CIC healthcare seeking and medication use in the community. We recruited a population-based sample to determine the prevalence and predictors of (i) individuals having discussed their constipation symptoms with a healthcare provider and (ii) the use of constipation therapies.**

METHODS: **We recruited a representative sample of Americans aged 18 years or older who had experienced constipation. Those who met the Rome IV criteria for irritable bowel syndrome and opioid-induced constipation were excluded. The survey included questions on constipation severity, healthcare seeking, and the use of constipation medications. We used multivariable regression methods to adjust for confounders.**

RESULTS: **Overall, 4,702 participants had experienced constipation (24.0% met the Rome IV CIC criteria). Among all respondents with previous constipation, 37.6% discussed their symptoms with a clinician (primary care provider 87.6%, gastroenterologist 26.0%, and urgent care/emergency room physician 7.7%). Age, sex, race/ethnicity, marital status, employment status, having a source of usual care, insurance status, comorbidities, locus of control, and constipation severity were associated with seeking care ($P < 0.05$). Overall, 47.8% of respondents were taking medication to manage their constipation: over-the-counter medication(s) only, 93.5%; prescription medication(s) only, 1.3%; and both over-the-counter medication(s) and prescription medication(s), 5.2%.**

DISCUSSION: **We found that 3 of 5 Americans with constipation have never discussed their symptoms with a healthcare provider. Furthermore, the use of prescription medications for managing constipation symptoms is low because individuals mainly rely on over-the-counter therapies.**

SUPPLEMENTARY MATERIAL accompanies this paper at http://links.lww.com/AJG/B499, http://links.lww.com/AJG/B494, http://links.lww.com/AJG/B495, http://links.lww.com/AJG/B493, http://links.lww.com/AJG/B496, http://links.lww.com/AJG/B497, http://links.lww.com/AJG/B498

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INTRODUCTION

Chronic idiopathic constipation (CIC) is a functional gastrointestinal (GI) disorder that leads to difficult, infrequent, or incomplete defecation (1). CIC affects daily life, increases psychological distress, and impairs health-related quality of life (2). Moreover, CIC is common in the community and previous reports estimate its prevalence to range from 9% to 20% in the United States (3).

As a highly prevalent disease, CIC imparts a significant burden on the healthcare system. In 2010, 2.8 million ambulatory and emergency room visits centered on the evaluation and management of constipation (4). CIC also imposes a substantial economic burden; the annual direct cost ranges from $1,900 to $12,000 per patient (5–7). Patients also report that constipation symptoms interfere with 4 of 30 days and decrease productivity by 25%, which further increases the

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overall financial and societal costs associated with the disorder (5,8).

Despite the high prevalence and large economic burden associated with CIC, important gaps in knowledge remain. For example, it remains unclear what drives individuals with chronic constipation to seek or not seek professional medical care for management of their symptoms. There have also been few efforts to examine the use of over-the-counter (OTC) and prescription medications among individuals in the general community. In this descriptive study, we aimed to address these gaps in knowledge by surveying a large representative sample of Americans with chronic constipation to determine (i) the prevalence and predictors of individuals who have sought medical care for their constipation symptoms and (ii) the use of and satisfaction with OTC and prescription medicines for treating constipation.

METHODS

Study design and participant recruitment

We performed a cross-sectional, US population-based, online survey of individuals with chronic constipation between March 21 and March 28, 2018. Participants completed an online, self-administered questionnaire that was estimated to take 10–20 minutes to complete. This study was approved by the Cedars-Sinai Institutional Review Board (Pro47804).

To recruit a representative sample of Americans, we collaborated with Cint (www.cint.com), a survey research firm that partners with research panels across the United States. They use quotas for age, sex, and region of the country (Northeast, South, Midwest, and West) based on the latest US Census data to support recruitment of a population-based sample. Cint's platform also uses a reward system based on marketplace points, which we describe in detail elsewhere (9,10). Participants who fully completed our survey received points worth between $0.40 and $1.45; the actual amount of points awarded to each respondent was determined by the research panel's incentive policy.

Panelists who met the Cint US quota criteria were sent an email through the Cint research panels inviting them to complete an online survey. The email included a link to the survey along with the following text: "Based on the information stored in your [research panel] profile, we believe we have a survey that you will qualify & earn from. The survey takes approximately 10–20 minutes and if you successfully complete it, your account will be credited with [incentive]." Users who clicked the link were then brought to our survey home page which was labeled as a "National Health Survey."

Study population

All respondents who accessed the survey were first asked which of the following GI symptoms they had ever experienced (presented in random order): constipation, abdominal pain, bloat/gas, bowel incontinence, diarrhea, dysphagia, heartburn/reflux, nausea/vomiting, or none of the above. Only those who noted previous constipation, which was described as "hard, lumpy, or infrequent stools; straining," were allowed to continue with the survey. By having a "blinded" screening question naming 8 GI symptoms, we aimed to maximize the likelihood that respondents had, in fact, experienced constipation in the past and were not simply seeking compensation by participating in a survey.

Respondents who reported previous constipation were guided through the Rome IV irritable bowel syndrome (IBS), CIC, and opioid-induced constipation (OIC) questionnaires (1). Those who met the IBS or OIC criteria were ineligible for the study because the Rome IV states that individuals with CIC cannot have a concomitant diagnosis of IBS or OIC (1). Of note, we allowed individuals who did not meet the Rome IV CIC criteria to complete the study because those currently taking OTC or prescription medicines may not have met these criteria at the time of the survey; they could have been Rome IV-positive before starting such therapies. This allowed us to assess the global landscape for constipation healthcare seeking and medication use in the United States. However, we conducted an *a priori* subgroup analysis among those who met the Rome IV criteria for CIC.

Survey instrument

Eligible individuals who had experienced constipation and did not meet the Rome IV criteria for IBS or OIC proceeded through the remaining survey items; see Supplemental File 1, Supplementary Digital Content 1, http://links.lww.com/AJG/B499, for the survey instrument. They next completed questions on their constipation onset and severity as measured by the National Institutes of Health (NIH) Patient-Reported Outcomes Measurement Information System (PROMIS) questionnaire (11). The survey also assessed the extent that respondents believed constipation to be a severe health problem, locus of control, and perceived cause of constipation as determined through a free-text response.

Next, we examined whether individuals sought medical care for evaluation and management of their constipation symptoms. For those who reported seeking health care, we asked which provider(s) they met with to discuss their symptoms. We also assessed which diagnostic tests were performed specifically to evaluate their constipation. Afterward, the respondents reported which medications they were currently taking for the management of their constipation (see Outcomes section for details). For each therapy, the participants completed the abbreviated Treatment Satisfaction Questionnaire for Medication (TSQM-9) (12) and were asked whether they experienced any issues with each medicine. The survey concluded with demographic, socioeconomic, and medical, neurologic, and psychiatric comorbidity questions.

Outcomes

Our primary outcome was whether an individual sought health care for his or her constipation. This was determined by identifying those who answered "Yes" to "Have you ever discussed your constipation with a healthcare provider?" Our secondary outcome was the use of medications for managing constipation. All respondents were asked to "Select all treatments that you are currently using for your constipation"; answer options included OTC medicines (bisacodyl, docusate, fiber supplement, magnesium, polyethylene glycol 3350, and senna), prescription therapies (lactulose, linaclotide, lubiprostone, and plecanatide), "other," "unsure," and "none of the above."

Statistical analyses

All statistical analyses were performed in Stata 15.1 (StataCorp LP, College Station, TX), and a 2-tailed *P* value of less than 0.05 was considered statistically significant. We used bivariate analyses to compare individuals with chronic constipation who did vs did not seek health care for their symptoms and those who were vs were not taking medications. Specifically, we compared normally distributed continuous, non-normally distributed continuous, and categorical variables between the groups using the Student *t* tests, Mann-Whitney *U* tests, and χ^2 tests, respectively. For multivariable analyses, we used logistic regression models to identify predictive factors and to calculate odds ratios (ORs) and 95% confidence intervals. The regression analyses were performed on our outcomes of seeking health care for constipation and the current use of constipation medications. Both models adjusted for constipation-related factors, cognitions, sociodemographics, and medical, neurologic, and psychiatric comorbidity covariates collected through the survey.

Qualitative analyses. The survey included an open-ended question that enabled respondents to share their thoughts regarding the perceived etiology of their constipation: "In your own words, what do you think is the cause(s) of your constipation?" A summative content analysis was adopted to examine their perceived constipation etiologies and to assess the presence of each trigger in the data (13). We coded the free texts (word, sentence, and paragraph) and organized the codes into categories and subcategories.

RESULTS

Study population

A total of 66,279 individuals were invited through Cint to complete the survey, of whom 16,053 accessed the survey. We excluded those who did not provide consent (529, 3.3%), did not experience previous constipation (8,423, 52.5%), met the Rome IV criteria for IBS (1,430, 8.9%) or OIC (305, 1.9%), had missing data (390, 2.4%), or finished the survey too quickly (274, 1.7%). Therefore, the analytic sample included 4,702 respondents with chronic constipation. The demographics of the study cohort are listed in Table 1; comparison to the US population is shown in Table 1, Supplementary Digital Content 2, http://links.lww.com/AJG/B494.

Constipation characteristics and perceived etiologies

Overall, the average time since onset of constipation was 7.6 years, and we found that 4,372 participants (93.0%) experienced constipation symptoms within the past week, as measured by the NIH PROMIS. The average NIH PROMIS severity score on a T-scale was 53.7 ± 8.0. Subjectively, 19.0% reported that constipation was not a severe health issue at all, whereas 9.2% stated it was a very severe problem. We noted that 1,128 respondents (24.0%) met the Rome IV CIC criteria; their demographics are shown in Table 2, Supplementary Digital Content 3, http://links.lww.com/AJG/B495.

Table 2 shows the descriptions of the study cohort's constipation symptoms, stratified by the Rome IV CIC status. Those who met the Rome IV criteria for CIC had longer duration of symptoms, higher PROMIS constipation scores, lower locus of control, and were more likely to consider constipation to be a severe health problem when compared with those who did not meet the criteria.

Figure 1, Supplementary Digital Content 4, http://links.lww.com/AJG/B493, shows a word cloud generated from the qualitative content analysis detailing the various constipation triggers reported by respondents. Food intake was the most common cause: *"I don't get enough fiber and I eat too much junk food."* Lack of fluid intake was also cited as a main trigger (e.g., *"not drinking enough water"*). Medication, particularly those used for pain, was the next most prevalent etiology: *"This is mostly caused by the pain medication I take to treat my chronic pain"* (note: those who met the

Table 1. Demographics of the study population

Variable	Study cohort (N = 4,702)
Mean (SD) age, yr	46.4 (15.9)
Sex	
Female	2,477 (52.7)
Male	2,225 (47.3)
Race/ethnicity	
Non-Hispanic white	3,602 (76.6)
Non-Hispanic black	321 (6.8)
Latino	340 (7.2)
Non-Hispanic Asian	229 (4.9)
Other	210 (4.5)
Educational attainment	
Less than high school	231 (4.9)
High school degree	726 (15.4)
Some college education	1,430 (30.4)
College degree	1,655 (35.2)
Advanced graduate degree	660 (14.0)
Marital status	
Never married	1,088 (23.1)
Divorced, separated, or widowed	710 (15.1)
Married or in a long-term relationship	2,904 (61.8)
Employment status	
Unemployed[a]	1,980 (42.1)
Employed or full-time student	2,722 (57.9)
Total household income, $	
0–50,000	2,055 (43.7)
50,001–100,000	1,683 (35.8)
100,001–200,000	679 (14.4)
≥200,001	117 (2.5)
Prefer not to say	168 (3.6)
US region	
Northeast	894 (19.0)
South	1,676 (35.6)
Midwest	1,096 (23.3)
West	1,036 (22.0)
Has usual source of care	3,288 (69.9)
Has health insurance	4,291 (91.3)
Has comorbidity that affects the GI tract[b]	1,806 (38.4)
Has neurologic condition[c]	323 (6.9)
Has psychiatric condition[d]	1,779 (37.8)

Data are presented as n (%), unless stated otherwise.

GI, gastrointestinal.

[a] Includes those who reported being unemployed, unable to work owing to a disability, on leave of absence from work, retired, or a homemaker.

[b] Includes gastroesophageal reflux disease, Crohn's disease, ulcerative colitis, celiac disease, cirrhosis, gallstones, irritable bowel syndrome, pancreatitis, peptic ulcer disease, diabetes, thyroid disease, and fibromyalgia.

[c] Includes cerebrovascular accident, Parkinson disease, myasthenia gravis, multiple sclerosis, and spinal cord injury.

[d] Includes anxiety disorder, attention deficit hyperactivity disorder, bipolar disorder, depression, obsessive–compulsive disorder, panic disorder, post-traumatic stress disorder, and schizophrenia.

Table 2. Characteristics of the study cohort's constipation symptoms

Variable	Entire study cohort (N = 4,702)	Did not meet the Rome IV CIC criteria (n = 3,574)	Met the Rome IV CIC criteria (n = 1,128)	*P* value[a]
Time since onset of constipation (yr)	7.6 (9.5)	7.3 (9.4)	8.8 (9.4)	<0.001
NIH PROMIS constipation score (T-score)[b]	53.7 (8.0)	52.1 (7.9)	59.1 (5.4)	<0.001
Extent to which constipation is considered a severe health problem, n (%)				
1 (not at all)	894 (19.0)	821 (23.0)	73 (6.5)	<0.001
2	1,100 (23.4)	886 (24.8)	214 (19.0)	
3	1,397 (29.7)	1,010 (28.3)	387 (34.3)	
4	879 (18.7)	595 (16.7)	284 (25.2)	
5 (very much)	432 (9.2)	262 (7.3)	170 (15.1)	
Locus of control (1–5 scale; 1 = disagree and 5 = agree)[c]				
Avoiding constipation complications is largely a matter of good fortune	2.44 (1.21)	2.39 (1.21)	2.61 (1.22)	<0.001
No matter what I do, I'll probably develop constipation complications	2.44 (1.16)	2.28 (1.11)	2.94 (1.15)	<0.001
If it's meant to be, my constipation won't get too bad	2.48 (1.15)	2.47 (1.17)	2.54 (1.11)	0.03
When my constipation gets bad, it's usually unavoidable	2.65 (1.22)	2.52 (1.20)	3.09 (1.18)	<0.001
No matter what I do, my constipation is likely to get bad	2.21 (1.13)	2.05 (1.08)	2.72 (1.14)	<0.001
Most things that affect my constipation are usually unavoidable	2.43 (1.18)	2.32 (1.17)	2.79 (1.16)	<0.001
Sought healthcare for constipation, n (%)	1,768 (37.6)	1,215 (34.0)	553 (49.0)	<0.001
Currently on constipation treatment, n (%)	2,246 (47.8)	1,563 (43.7)	683 (60.5)	<0.001

Data are presented as mean (SD), unless stated otherwise.

CIC, chronic idiopathic constipation; NIH PROMIS, National Institutes of Health Patient-Reported Outcomes Measurement Information System.

[a] *P* value obtained from Student *t* test, Mann-Whitney *U* test, or χ^2 test, depending on the nature of data (i.e., continuous or categorical, normally distributed or non-normally distributed) between those who did or did not meet the Rome IV CIC criteria.

[b] Higher score corresponds to more severe symptoms.

[c] Higher score corresponds to lower locus of control.

Rome IV OIC criteria were excluded but those on pain medicines who did not meet such criteria remained eligible). Many respondents believed that their constipation was caused by multiple factors such as food, dehydration, medications, stress, and lack of exercise: *"Generally I am pretty aware and do things I should do like eating right and exercise. I walk three miles every day but sometimes the schedule gets thrown off and that's when I notice changes."*

Healthcare seeking behavior for constipation

Of the 4,702 participants with chronic constipation, 1,768 (37.6%) had ever discussed their constipation with a healthcare provider. Respondents had consulted at any point with primary care providers (87.6%), gastroenterologists (26.0%), and urgent care/emergency room physicians (7.7%) regarding their symptoms.

Table 3 shows the findings from the regression analysis on healthcare seeking for constipation. Those who were male (OR 1.21), non-Hispanic black (OR 1.46), other race/ethnicity (OR 1.68), and divorced, separated, or widowed (OR 1.40) were more likely to have sought health care for their symptoms. Individuals with a usual source of care (OR 3.39), health insurance (OR 1.97), medical (OR 2.24), neurologic (OR 1.66), or psychiatric comorbidities (OR 1.25), lower locus of control (OR 1.24), and more severe constipation symptoms (OR 1.05) also had higher odds for seeking care. Conversely, those who were older (OR 0.993) or employed or a full-time student (OR 0.81) were significantly less likely to have sought care. We found no associations with education level, total household income, or the US region.

Diagnostic studies. Among those who sought health care for their constipation (n = 1,768), 946 (53.5%) underwent diagnostic procedures to evaluate their symptoms. Colonoscopy (806, 45.6%) was the most common test; 72.0% (n = 331) and 36.3% (n = 475) of those who did (n = 460) or did not (n = 1,308) consult with a gastroenterologist, respectively, reported undergoing a colonoscopy. This was followed by barium enema (184, 10.4%) and flexible sigmoidoscopy (145, 8.2%). MRI defecography (69, 3.9%), defecogram (53, 3.0%), SmartPill (43, 2.4%), anorectal manometry (34, 1.9%), and Sitzmarks study (27, 1.5%) were ordered less often.

Table 3. Predictors of having sought health care for constipation (N = 4,702)

Variable	Sought healthcare for constipation (n = 1,768)	OR (95% CI)[a]
Age (yr)	—	0.993 (0.988–0.998)
Sex		
Female	914 (36.9)	Reference
Male	854 (38.4)	1.21 (1.05–1.39)
Race/ethnicity		
Non-Hispanic white	1,324 (36.8)	Reference
Non-Hispanic black	140 (43.6)	1.46 (1.13–1.90)
Latino	144 (42.4)	1.18 (0.91–1.54)
Non-Hispanic Asian	63 (27.5)	0.78 (0.56–1.09)
Other	97 (46.2)	1.68 (1.23–2.31)
Educational attainment		
Less than high school	96 (41.6)	Reference
High school degree	281 (38.7)	1.00 (0.72–1.41)
Some college	536 (37.5)	0.96 (0.70–1.32)
College degree	597 (36.1)	0.93 (0.67–1.28)
Advanced graduate degree	258 (39.1)	1.11 (0.78–1.58)
Marital status		
Never married	355 (32.6)	Reference
Divorced, separated, or widowed	305 (43.0)	1.40 (1.11–1.77)
Married or in a long-term relationship	1,108 (38.2)	1.09 (0.92–1.31)
Employment status		
Unemployed	812 (41.0)	Reference
Employed or full-time student	956 (35.1)	0.81 (0.69–0.94)
Total household income, $		
0–50,000	758 (36.9)	Reference
50,001–100,000	645 (38.3)	1.16 (0.99–1.36)
100,001–200,000	264 (38.9)	1.10 (0.88–1.37)
≥200,001	48 (41.0)	1.43 (0.93–2.20)
Prefer not to say	53 (31.5)	1.07 (0.74–1.56)
US region		
Northeast	357 (39.9)	Reference
South	638 (38.1)	0.92 (0.77–1.11)
Midwest	382 (34.9)	0.83 (0.68–1.01)
West	391 (37.7)	0.98 (0.80–1.20)
Usual source of care		
No	247 (17.5)	Reference
Yes	1,521 (46.3)	3.39 (2.87–4.00)
Health insurance status		
Uninsured	76 (18.5)	Reference
Insured	1,692 (39.4)	1.97 (1.48–2.62)
Has comorbidity that affects GI tract		
No	803 (27.7)	Reference
Yes	965 (53.4)	2.24 (1.95–2.58)

Table 3. *(continued)*

Variable	Sought healthcare for constipation (n = 1,768)	OR (95% CI)[a]
Has neurologic condition		
No	1,572 (35.9)	Reference
Yes	196 (60.7)	1.66 (1.27–2.15)
Has psychiatric condition		
No	963 (32.9)	Reference
Yes	805 (45.3)	1.25 (1.09–1.44)
Locus of control (1–5 scale)[b]	—	1.24 (1.14–1.36)
NIH PROMIS constipation score (T-score)[c]	—	1.05 (1.04–1.06)

Data are presented as n (% of row).

CI, confidence interval; GI, gastrointestinal; NIH PROMIS, National Institutes of Health Patient-Reported Outcomes Measurement Information System; OR, odds ratio.

[a] The logistic regression model adjusted for all covariates in the table.

[b] Higher score corresponds to lower locus of control.

[c] Higher score corresponds to more severe symptoms.

Subgroup analyses—individuals with Rome IV-positive CIC. Among the 1,128 participants who met the Rome IV criteria for CIC, 553 (49.0%) had discussed their constipation with a healthcare provider. In Table 3, Supplementary Digital Content 5, http://links.lww.com/AJG/B496, we present the results from the regression analysis conducted among this subgroup.

Use of constipation treatments

In the overall cohort, 2,246 (47.8%) indicated that they were currently taking medication for their constipation (note: 221 did not know the name of the treatment or were on other treatments). Among those on a known treatment (n = 2,025), 1,893 (93.5%) were only on OTC medicine(s), 27 (1.3%) were only taking a prescription medicine(s), and 105 (5.2%) were on both OTC and prescription therapies. Table 4 shows the proportion of respondents taking each individual medicine. Fiber supplements were the most commonly used therapy, followed by magnesium, docusate, polyethylene glycol 3350, senna, and bisacodyl. Lactulose was the most commonly prescribed medication, followed by linaclotide, lubiprostone, and plecanatide.

Several variables were associated with participants taking medication (Table 5). Older individuals (OR 1.01), non-Hispanic

Table 4. Prevalence of individual OTC and prescription therapies and associated TSQM ratings (n = 2,246)

OTC therapy	n (%)	TSQM-9 satisfaction[a]	TSQM-9 effectiveness[a]	TSQM-9 convenience[a]
Fiber supplement	1,250 (55.7)	62.4 ± 20.4	58.8 ± 18.1	69.5 ± 19.2
Magnesium	399 (17.8)	60.5 ± 21.4	58.8 ± 17.2	67.9 ± 18.4
Docusate	355 (15.8)	58.6 ± 20.9	57.6 ± 18.2	74.3 ± 19.1
Polyethylene glycol 3350	281 (12.5)	61.5 ± 22.1	61.7 ± 17.8	71.8 ± 18.5
Senna	271 (12.1)	61.3 ± 20.5	60.7 ± 17.9	71.7 ± 18.2
Bisacodyl	233 (10.4)	57.2 ± 20.6	61.1 ± 18.9	71.1 ± 17.7
Prescription therapy	**n (%)**	**TSQM-9 satisfaction[b]**	**TSQM-9 effectiveness[b]**	**TSQM-9 convenience[b]**
Lactulose	75 (3.3)	60.4 ± 19.6	59.2 ± 20.2	65.4 ± 20.3
Linaclotide	27 (1.2)	68.5 ± 22.4	65.8 ± 22.0	69.1 ± 19.0
Lubiprostone	26 (1.2)	65.7 ± 21.9	61.5 ± 21.4	70.9 ± 22.0
Plecanatide	17 (0.8)	65.1 ± 18.4	63.4 ± 14.8	64.1 ± 18.0

Data are presented as mean ± SD, unless stated otherwise.

TSQM-9 is rated on a 0–100 scale, where higher scores correspond with improved satisfaction, effectiveness, and convenience.

OTC, over-the-counter; TSQM-9, abbreviated Treatment Satisfaction Questionnaire for Medication.

[a] Because it can be difficult to interpret the individual medication TSQM scores for those taking multiple therapies, these scores represent the average ratings from those only on one OTC constipation medicine: fiber supplement, n = 777; magnesium, n = 146; docusate, n = 145; polyethylene glycol 3350, n = 112; senna, n = 90; bisacodyl, n = 72.

[b] Because of the low prevalence of prescription constipation therapy use, these scores reflect the average from those either only on a prescription medicine(s) or combination (i.e., OTC and prescription) therapy.

Table 5. Predictors of current use of a medication to treat constipation (N = 4,702)

Variable	Currently using a medication to treat constipation (n = 2,246)	OR (95% CI)[a]
Age (yr)	—	1.01 (1.01–1.02)
Sex		
Female	1,156 (46.7)	Reference
Male	1,090 (49.0)	1.05 (0.92–1.20)
Race/ethnicity		
Non-Hispanic white	1,682 (46.7)	Reference
Non-Hispanic black	189 (58.9)	1.74 (1.35–2.24)
Latino	180 (52.9)	1.28 (1.00–1.64)
Non-Hispanic Asian	89 (38.9)	0.89 (0.66–1.21)
Other	106 (50.5)	1.23 (0.91–1.66)
Educational attainment		
Less than high school	109 (47.2)	Reference
High school degree	333 (45.9)	0.98 (0.71–1.34)
Some college	710 (49.7)	1.17 (0.87–1.59)
College degree	796 (48.1)	1.10 (0.82–1.49)
Advanced graduate degree	298 (45.2)	0.97 (0.69–1.35)
Marital status		
Never married	475 (43.7)	Reference
Divorced, separated, or widowed	344 (48.5)	0.96 (0.77–1.20)
Married or in a long-term relationship	1,427 (49.1)	1.03 (0.88–1.21)
Employment status		
Unemployed	945 (47.7)	Reference
Employed or full-time student	1,301 (47.8)	1.19 (1.03–1.37)
Total household income, $		
0–50,000	942 (45.8)	Reference
50,001–100,000	850 (50.5)	1.22 (1.05–1.41)
100,001–200,000	332 (48.9)	1.14 (0.93–1.40)
≥200,001	57 (48.7)	1.20 (0.80–1.81)
Prefer not to say	65 (38.7)	0.95 (0.68–1.34)
US region		
Northeast	417 (46.6)	Reference
South	835 (49.8)	1.15 (0.97–1.37)
Midwest	517 (47.2)	1.06 (0.88–1.28)
West	477 (46.0)	1.02 (0.84–1.24)
Usual source of care		
No	531 (37.6)	Reference
Yes	1,715 (52.2)	1.50 (1.30–1.73)
Health insurance status		
Uninsured	150 (36.5)	Reference
Insured	2,096 (48.8)	1.31 (1.04–1.66)
Has comorbidity that affects GI tract		
No	1,239 (42.8)	Reference
Yes	1,007 (55.8)	1.27 (1.11–1.45)

Table 5. ***(continued)***

Variable	Currently using a medication to treat constipation (n = 2,246)	OR (95% CI)[a]
Has neurologic condition		
No	2,035 (46.5)	Reference
Yes	211 (65.3)	1.51 (1.17–1.95)
Has psychiatric condition		
No	1,332 (45.6)	Reference
Yes	914 (51.4)	1.10 (0.96–1.26)
Locus of control (1–5 scale)[b]	—	1.20 (1.11–1.31)
NIH PROMIS constipation score (T-score)[c]	—	1.07 (1.06–1.08)

Data are presented as n (% of row).

CI, confidence interval; GI, gastrointestinal; NIH PROMIS, National Institutes of Health Patient-Reported Outcomes Measurement Information System; OR, odds ratio.

[a] The logistic regression model adjusted for all covariates in the table.

[b] Higher score corresponds to lower locus of control.

[c] Higher score corresponds to more severe symptoms.

black (OR 1.74), and Latino individuals (OR 1.28), as well as those who were employed or full-time students (OR 1.19), were more likely to be on treatment. Those with a usual source of care (OR 1.50), insurance (OR 1.31), medical (OR 1.27) or neurologic (OR 1.51) comorbidity, lower locus of control (OR 1.20), and more severe constipation symptoms (OR 1.07) also had higher odds of currently taking medication. On the whole, we did not see associations with sex, education level, marital status, household income, US region, and psychological comorbidities.

Subgroup analyses—individuals with Rome IV-positive CIC. Among the 1,128 participants who met the Rome IV criteria for CIC, 683 (60.5%) were taking a medicine to treat their constipation (note: 66 did not know the name of the treatment or were on other treatments). Of those on a known treatment (n = 617), 572 (92.7%) were only on OTC medicine(s), 7 (1.1%) were only taking a prescription medicine(s), and 38 (6.2%) were on both OTC and prescription therapies. Individuals with Rome IV-positive CIC reported taking the following medicines: fiber supplements (384, 62.2%), magnesium (138, 22.4%), docusate (122, 19.8%), polyethylene glycol 3350 (100, 16.2%), senna (88, 14.3%), bisacodyl (83, 13.5%), lactulose (23, 3.7%), linaclotide (12, 1.9%), lubiprostone (9, 1.5%), and plecanatide (6, 1.0%). Table 4, Supplementary Digital Content 6, http://links.lww.com/AJG/B497, shows the results from the regression analysis on pharmacotherapy use.

Satisfaction with constipation treatments

Overall, when comparing the average TSQM-9 scores between those only on OTC medications with those taking prescription therapies, we found no differences in their ratings for satisfaction (OTC 60.8 ± 21.3 vs prescription 63.3 ± 20.5; $P = 0.21$), effectiveness (OTC 59.6 ± 18.6 vs prescription 62.3 ± 18.5; $P = 0.12$), and convenience (OTC 69.9 ± 19.2 vs prescription 67.9 ± 19.2; $P = 0.26$). Table 4 and Table 5, Supplementary Digital Content 7, http://links.lww.com/AJG/B498, list the TSQM ratings and issues (does not treat symptoms, takes too long to work, high out-of-pocket costs, causes bothersome diarrhea, and causes sudden urge to defecate) reported by respondents, respectively, for each individual medicine.

DISCUSSION

In this large national survey, we found that nearly two-thirds of community-based individuals with constipation have never discussed their symptoms with a healthcare provider. Moreover, only half of individuals are currently taking a therapy for their constipation and most rely on OTC options.

In our study, only 38% of respondents reported ever discussing their constipation symptoms with a healthcare provider, consistent with the range of 22%–43% seen in other studies (14–18). Not surprisingly, having a usual source of care, insurance, comorbidities, and more severe symptoms are significant predictors of healthcare seeking (14,15,18). Men are also 21% more likely to seek care for constipation than women. This finding possibly reflects differential willingness between men and women to discuss constipation symptoms with a provider. Of note, this is in contrast to studies conducted outside of the United States that found that women are more likely than men to seek such care (15,17,18). We also noted differential healthcare seeking among the racial/ethnic groups. When compared with non-Hispanic white people, non-Hispanic black individuals and those in the other group are 46% and 68% more likely to seek care for constipation, respectively. The reasons behind these differences are unclear but likely reflect cultural factors in reporting specific symptoms to healthcare providers.

We found that the locus of control—the extent to which individuals believe they can control events that affect them (19,20)—is associated with constipation healthcare seeking. Namely, those with lower locus of control (i.e., believe symptoms are driven by others, chance, or fate) are more likely to consult with providers regarding their symptoms. However, individuals experiencing this maladaptive cognition may be resistant to both undergoing indicated diagnostic testing and accepting and adhering to treatments, thereby undercutting treatment success and reducing patient satisfaction. Although there are limited data examining the impact of this GI cognition on CIC outcomes, Lackner et al. (21) found that patients with IBS with lower locus of control are less likely to rapidly respond to cognitive behavioral therapy. Therefore, for providers to engage in an optimized, tailored approach with each patient, it is important to screen for this maladaptive cognition, which can be done by asking "How much control do you think you have over your constipation?" (20,22,23). On the other hand, those with higher locus of control are less likely to seek medical care for their constipation. These individuals may be comfortable self-managing their symptoms using OTC therapies, lifestyle modifications, advice from pharmacists, insurance company nurse call lines, or the Internet. Additional research examining why constipated individuals choose not to seek medical care and other sources of information they are leveraging is warranted.

Among those who sought care, 54% reported previous diagnostic testing. Colonoscopy was the most commonly performed test; 46% of health seekers specifically underwent the procedure to evaluate their constipation. Although we did not ask the respondents about alarm features or have access to their medical records to confirm the "true" indication for the procedure, this suggests potential overuse of endoscopy in the evaluation of constipation. This is an issue because the diagnostic yield of colonoscopy for constipation is limited (24,25). Pepin and Ladabaum noted that in 234 individuals undergoing lower endoscopy solely for constipation, no cancers were found and only 3% had advanced lesions (25). The American Society for Gastrointestinal Endoscopy states that colonoscopy should not be performed in the initial evaluation of constipated patients without alarm features or suspicion of organic disease (26). The high usage of endoscopy and other tests seen in our study, in combination with the high prevalence of constipation (3), further reinforces the significant impact of constipation on population health and healthcare costs and emphasizes that efforts to reduce unnecessary testing are needed.

Regarding constipation treatments, nearly half of the respondents are currently taking a medicine to treat their symptoms, which falls within the range previously reported (14%–72%) (15,18,27–30). However, because 93% of our overall cohort reported constipation symptoms in the past week, this suggests that there are numerous individuals who are symptomatic but not on treatment. There are many potential reasons for this finding. For example, some individuals, particularly those with intermittent constipation symptoms, may consider constipation a "nuisance" that does not require pharmacotherapy. In fact, 19% of our cohort reported that their constipation was not at all a severe health problem. In addition, some individuals may not be aware of all the effective OTC and prescription therapies available for managing constipation. The low use of medications could also be related to our finding that participants most often reported food and decreased water intake as the etiologies for their symptoms; many individuals may choose to engage solely in lifestyle changes rather than use pharmacotherapy. Further studies systematically assessing how and the degree to which individuals engage in lifestyle modifications for managing their constipation are needed.

Of those on pharmacotherapy, the majority are only taking OTC medicines (94%). Fiber supplements are the most commonly used product by a large margin, followed by magnesium and docusate. Previous studies have also shown that fiber is the most frequently used therapy (27,28), whereas others have differed (29). For example, Müller-Lissner et al. (29) conducted a survey in 10 European countries and found that bisacodyl is the most commonly used therapy, followed by polyethylene glycol and senna. As for prescription therapies, very few respondents are taking these medicines (6%), with lactulose being the most common (3.3%), followed by linaclotide (1.2%), lubiprostone (1.2%), and plecanatide (0.8%). This is lower than the rates found in the BURDEN-CIC study by Harris et al. (27), who reported that 16% of those with CIC are on prescription treatments. However, they included polyethylene glycol 3350 and senna in the prescription category along with lubiprostone and linaclotide (note: plecanatide was not available at the time of the study) and they did not comment on the prevalence for each medicine (27). To our knowledge, our study is the first in the United States to determine the use of each individual pharmacotherapy option for CIC and the first to include plecanatide.

The reason for the low rate of use of prescription medications in the management of CIC noted in our study is likely multifactorial. From the patient perspective, many may view constipation as a symptom that can be solely managed by OTC medication and they may be reticent to escalate to prescription therapies. Supporting this notion is the finding by Harris et al. (27) that almost half of all patients with CIC use an average of 3 OTC products before seeking help from a healthcare provider. From the providers' side, there may be a lack of knowledge regarding the available medicines, especially the newer prescription options. Some providers, particularly those in primary care, may be hesitant to recommend prescription medicines for constipation, instead preferring to defer to gastroenterologists. This issue, combined with our finding that only 26% of those who sought care have seen a gastroenterologist for their symptoms, may be contributing to the low use of prescription therapies. Given these missed opportunities for using evidence-based, effective therapies for managing constipation, further research to better understand the barriers faced by both patients and healthcare providers as well as continued efforts for improving awareness and education are warranted.

Our study has several strengths. First, this is one of the largest population-based studies evaluating people with chronic constipation. By gathering data on over 4,700 participants, more than 1,100 of whom met the Rome IV CIC criteria, we shed light on the demographics and healthcare utilization of those with chronic constipation in the community setting. Second, we systematically evaluated the current use of and satisfaction with the available OTC and prescription medications used to treat constipation. Unlike studies that focus on data from claims databases or patients presenting to healthcare systems, we analyzed the use and efficacy of these medications among those in the general population, many of whom are self-treating and have not consulted with a healthcare provider.

There are limitations to our survey. First, there is risk of recall bias because the symptom, healthcare seeking, and medication data were self-reported. However, the recall period for the PROMIS constipation questionnaire is only one week and it has been widely validated as part of an NIH consortium (11,31–33). Recall bias is also less of a concern for the medication questions because we asked about participants' current use of the various therapies. Previous research found high concordance between medicines documented in ambulatory medical records and patient survey data (34). As for healthcare seeking, previous studies note that patients tend to underreport their healthcare utilization (35–37); therefore, we may have underestimated the rates of healthcare seeking for constipation and diagnostic testing. Second, given our study's cross-sectional design, we could not quantify the improvement in constipation symptoms experienced by those on therapy; this is an area worthy of further study, particularly in the community setting. Third, there are potential issues related to generalizability. The survey was only administered online, and our results may not extend to those who do not possess basic computing skills or lack regular access to the Internet. However, at the time of the survey in 2018, nearly 90% of Americans were actively using the Internet (38). Finally, participation bias is possible because Cint provided a small financial incentive for those who completed the survey. However, previous research reveals that incentives do not affect the quality of survey responses (39–42) and the demographics of our study cohort largely match those of the US population.

In conclusion, 3 of 5 community-dwelling Americans with chronic constipation have never discussed their symptoms with a healthcare provider. Yet, among those who sought care, we noted that nearly half reported undergoing colonoscopy to evaluate their symptoms, despite its limited diagnostic yield. We also found that most individuals rely on OTC therapies for managing their symptoms and that the use of prescription medicines is very low. Because chronic constipation is highly prevalent with a significant economic burden, further research is needed to better understand why most individuals do not seek care, despite having a treatable condition. Additional research is also needed to determine the patient- and provider-related barriers to using evidence-based, effective prescription medicines for treating constipation.

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CONFLICTS OF INTEREST

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Study Highlights

WHAT IS KNOWN

- ✓ Chronic constipation is a common and costly disorder that significantly affects health-related quality of life.
- ✓ Comparatively less is known about healthcare seeking behaviors in relation to constipation and the use of medicines for treating constipation among the general population.

WHAT IS NEW HERE

- ✓ In this population-based study of community-dwelling Americans, we found that only 37.6% of those with constipation have discussed their symptoms with a healthcare provider.
- ✓ We also found that 47.8% of respondents are currently taking medications to manage their constipation, most of whom rely on OTC therapies.

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