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Complementary and Alternative Medicine Use by U.S. Adults with Gastrointestinal Conditions: Results from the 2012 National Health Interview Survey

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Abstract

Objectives—Use of complementary and alternative medicine (CAM) has increased over the past two decades, and a growing body of evidence suggests that some CAM modalities may be useful in addressing gastrointestinal (GI) conditions. However, the overall patterns of CAM use for GI conditions remains unknown. We sought to elucidate the prevalence and patterns of CAM use among U.S. adults with GI conditions.

Methods—We used the 2012 National Health Interview Survey (n=34,525), a nationally representative survey of the civilian, non-institutionalized U.S. population, to estimate the prevalence of CAM use among adults with GI conditions (abdominal pain, acid reflux/heartburn, digestive allergy, liver condition, nausea and/or vomiting, stomach or intestinal illness, ulcer). We also examined the reasons for CAM use, perceived helpfulness, and disclosure of use to health care providers among individuals who specifically used CAM to address a GI condition. Prevalence estimates were weighted to reflect the complex sampling design of the survey.

Results—Of 13,505 respondents with a GI condition in the past year, 42% (n=5629) used CAM in the past year and 3% (n=407) used at least one CAM modality to address a GI condition. The top 3 modalities among those using CAM to address GI conditions were herbs and supplements, mind body therapies, and manipulative therapies. Of those using CAM to address a GI condition, 47% used 3 or more CAM therapies, and over 80% felt that it was helpful in addressing a GI

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Conflict of Interest

Potential competing interests: None.

Specific author contributions: M.L.D.: conceived the study, performed data analysis and interpretation, drafted the manuscript. R.B.D.: data analysis and interpretation, critically reviewed the manuscript. A.J.L. and G.Y. contributed to study design, data interpretation, critically reviewed the manuscript.

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condition and was important in maintaining health and well-being. Respondents told their health care provider about use of these therapies 70% of the time.

Conclusions—CAM was used by 42% of respondents with a GI condition in the past year. A small proportion use CAM specifically to address their GI condition, but the majority who do find it helpful. The most commonly used modalities in this group are herbs and supplements, mind body, and manipulative therapies.

Introduction

Use of complementary and alternative medicine (CAM) has increased in the U.S. over the past two decades (1, 2). Evidence suggests that specific modalities may be effective for addressing certain gastrointestinal (GI) conditions (3–6). However, the prevalence, patterns, and effectiveness of CAM for GI conditions remains incompletely characterized.

Among patients with Crohn's disease and ulcerative colitis CAM use ranges from 11–40% (7, 8), depending upon the population, year, and the modalities included in the definition of CAM. Other studies of convenience samples of patients with liver disease, functional bowel disorders, and other GI conditions found ranges of 20–52% (9–12). No large, nationally-representative studies have been published on CAM use among patients with GI conditions in the U.S.

The National Health Interview Survey (NHIS) gathers health-related data on the U.S. population and has previously been used to characterize CAM use among U.S. adults with several non-GI medical conditions (13–15). We used the 2012 NHIS data to examine the prevalence and patterns of CAM use among U.S. adults with GI conditions. We also examined disclosure to healthcare providers, reasons for use, and perceived helpfulness among adults specifically using CAM to address a GI condition.

Methods

Data Source

The National Health Interview Survey (NHIS) is a cross-sectional, face-to-face, survey conducted annually by the National Center for Health Statistics (NCHS) and the Centers for Disease Control (CDC) that gathers health-related data on the civilian, non-institutionalized U.S. population. The survey uses a complex, multi-stage sampling design and oversamples minorities to achieve population representation. Sampling weights are subsequently applied to the data to obtain statistically accurate estimates for the U.S. population. Every five years, the survey includes questions about CAM use. The 2012 NHIS includes 34,525 U.S. adults with a conditional response rate of 79.7% (16). The 2012 CAM supplement serially asked participants whether they saw a practitioner for, or used, a given CAM modality within the past 12 months. Respondents were asked to rank their top three CAM modalities and state whether they used these modalities to address one or more symptoms or health conditions. For each of the top three CAM modalities, the survey also asked about disclosure to healthcare providers, use of medical treatments, sources of information about CAM, and the reasons, motivations, perceived benefits, and perceived helpfulness of CAM use.

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Study Population

We defined adults with a GI condition as everyone who indicated the occurrence of one or more of the following on either the sample adult or CAM portions of the survey within the past 12 months: abdominal pain, acid reflux or heartburn, digestive allergy, liver condition, nausea and/or vomiting, ulcer, and stomach or intestinal illness. Each of these conditions was asked of all survey respondents except for the last category (stomach or intestinal illness) which was only asked of individuals using a CAM modality to address a health-related condition. We also identified a subpopulation of 407 adults who had used one or more of their top three CAM modalities specifically to address one or more of the GI conditions listed above.

Population Characteristics

The sociodemographic characteristics that we examined included sex, age, race, ethnicity, region of residence, education, marital status, income, and insurance status. We also examined perceived health status, BMI, and health behaviors such as smoking status, alcohol use, and physical activity (17). For the comorbidity score, subjects were given a point for heart disease (coronary heart disease, ever had a heart attack, other heart condition), hypertension, pulmonary disease (emphysema, COPD, asthma, or chronic bronchitis), mental health concern in the last 12 months (depression, anxiety, other mental health disorder), neurological issues (recurring headache, memory loss, stroke, other neurological problem), weak/failing kidneys, or ever diagnosed with cancer, diabetes, or arthritis.

Outcomes

Use of a CAM modality was defined as a positive response to use of a specific modality and/or visit to a practitioner of that modality within the past 12 months. Modalities were categorized into one of the following groups: herbs and non-vitamin non-mineral supplements, manipulative therapies (chiropractic, osteopathic manipulation, massage, craniosacral therapy), mind body therapies (hypnosis, biofeedback, meditation, imagery, progressive relaxation, and mind body exercise [yoga, tai chi, qi gong]), special diets (vegetarian or vegan, macrobiotic, Atkins diet, Pritikin diet, Ornish diet, or saw a practitioner for dietary counseling), movement therapies (Feldenkrais, Alexander technique, Pilates, Trager psychological integration), and other CAM modalities (acupuncture, ayurveda, chelation, energy healing, homeopathy, naturopathy, traditional healers). Use of vitamin and mineral supplements was excluded due to the high prevalence of use; teas were also not included. To sum the total number of CAM modalities used by each respondent we counted herb and supplement use only once; meditation, imagery, and progressive relaxation comprised a single category; mind body exercises were one category; and any special diets were counted only once.

We also assessed the reasons, motivations, perceived benefits, and perceived helpfulness of CAM use; disclosure to healthcare providers; and sources of information about CAM among individuals using these modalities to specifically address a GI condition. To determine whether having a GI condition was independently associated with CAM use, we conducted a

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logistic regression analysis adjusting for all of the sociodemographic and health factors in Table 1.

Statistical analyses

We used SAS v9.2, proc surveyfreq, and the population weights provided by the NCHS (16) to account for the complex sampling design of the survey and to obtain stastistically accurate estimates of percentages for the civilian, non-institutionalized U.S. population. Chi-square tests for differences in proportions were conducted. Logistic regression analysis was performed using SAS-callable SUDAAN v11.0. Following the recommendations of the NCHS, estimates with relative standard errors greater than 30% were suppressed due to their likely unreliability. We conducted a sensitivity analysis excluding nausea and/or vomiting from our definition of GI condition as this was one of the largest categories of respondents and may represent an acute illness or be construed as more of a symptom than an actual condition. This study was reviewed and granted exempted status by the Beth Israel Deaconess Medical Center Committee on Clinical Investigations as all data were de-identified.

Results

Sample Characteristics

Overall, 13,505 (39%) of the 34,525 adults surveyed reported at least one GI condition within the past year. The sociodemographic characteristics and health behaviors of adults with and without GI conditions differed significantly (Table 1). Compared to those without GI conditions, adults with GI conditions were more likely to be female, white, non-Hispanic, have a poorer perception of health status, a current or former smoker, have lower levels of physical activity, and greater illness burden.

CAM Use Among Adults With and Without GI Conditions

Of 13,505 respondents with a GI condition in the past year, 42% (n=5629) used CAM in the past year and 3% (n=407) used at least one CAM modality to address a GI condition. CAM use was prevalent across each of the GI conditions examined (Table 2), ranging from 38%–51%. For all conditions, the most commonly used CAM modality was herbs and dietary supplements (20–31%), followed by manipulative (15–25%) and mind body (11–23%) therapies. Each of the individual CAM modalities examined was used more often among adults with a GI condition compared to those without a GI condition (Table 3). The total number of CAM modalities used by U.S. adults within the past year varied widely, from 0–12 (Figure 1). Among those who used CAM specifically to address a GI condition, 47% used 3 or more CAM modalities. After adjusting for sociodemorgraphic and health factors, the odds ratio for CAM use among those who have a GI condition was 1.69 (95% CI 1.57 – 1.81; data not shown). We also performed a sensitivity analysis excluding nausea and/or vomiting from our definition of GI condition, and our results did not substantially change (data not shown).

As herbs and other non-vitamin, non-mineral dietary supplements are the most commonly used CAM modality by the U.S. population, we examined the patterns of use of the most

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common dietary supplements (Table 4). Consistent with our findings in Table 3, adults with GI conditions were more likely to use both GI-specific (e.g., probiotics, digestive enzymes) and non-GI-specific (e.g., glucosamine, cranberry) supplements.

CAM Use Among Those Specifically Addressing a GI Condition

Figure 2 illustrates the reasons for, and perceived benefits of, CAM use for GI conditions. Over 80% of respondents using CAM to address a GI condition felt that it was helpful in addressing the GI-related problem and in maintaining health and well-being (Figure 3).

In addition to using CAM, many respondents in this population also received prescription (48%) and/or over-the-counter (47%) medications to address one of their top three most important health conditions. Respondents told their personal health care provider about 70% of the top three CAM modalities that they were using for GI conditions. Among those who did not disclose CAM use, the most common reasons were that the provider didn't ask (51%) and that they didn't think the provider needed to know (44%).

CAM modalities for GI conditions were most frequently recommended by family (38%), physicians (33%), and friends (30%) and the most common sources of information on these therapies were print material such as books, magazines, and newspapers (35%) and the internet (34%).

Discussion

CAM use is more common among adults with GI conditions (42%) compared to adults without GI conditions (28%). The adjusted odds ratio for CAM use among adults with GI conditions was 1.69. The most commonly used modalities among U.S. adults with GI conditions include herbs and supplements, manipulative therapies, and mind body therapies. Moreover, 47% of those who specifically used at least one of their top three CAM modalities to address a GI condition used three or more modalities. The majority felt that CAM was helpful in addressing a GI condition and in maintaining health and well-being.

An increased frequency of CAM use among U.S. adults with medical conditions has also been found for adults with arthritis (13) and neurological conditions (15), but not for adults with cardiovascular disease (14). Prior studies have found an association between CAM use and female gender, higher levels of education and income, and the presence of other medical conditions (2, 11). While these associations were also present in our population, after adjusting for these and other factors, having a GI condition was still significantly associated with CAM use.

We found the prevalence of CAM use among U.S. adults with GI conditions is similar to prior reports (7, 8, 10, 11), however, given that we did not include the use of prayer or vitamins and minerals in our analysis as several prior reports do, our estimates likely reflect a somewhat higher prevalence of CAM use in comparison. Nonetheless, the majority of CAM use among U.S. adults with GI conditions is not specifically targeted to address GI conditions.

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A novel feature of our analysis is that we identified a subpopulation of individuals who specifically used CAM to address a GI condition. Within this population, the most common reasons for, and perceived benefits of, CAM use were related to general health and well-being and to a sense of self-efficacy.

Our study has several limitations. NHIS data are based upon self-report and thus subject to misclassification and recall bias. Our definition of GI conditions is limited to those that were included in the survey. Thus, we may be missing a substantial number of individuals with small or large bowel disease, such as inflammatory bowel diseases and irritable bowel syndrome, chronic pancreatitis, and biliary diseases who did not respond to the questions about abdominal pain or nausea and/or vomiting. Furthermore, the severity and duration of GI-related disease could not be ascertained in this population, those using CAM to cope with symptoms related to a GI condition or side effects of a medication for a GI condition (e.g., depression, fatigue) are not captured, and NHIS only assesses in more detail the top three CAM modalities used by respondents. These factors may have resulted in an underestimation of both the overall use and condition–specific use of CAM among adults with GI conditions. However, we also cannot distinguish one-time CAM users from frequent users. In addition, there are a variety of special diets that are now popular among some GI patients (e.g., gluten-free, low FODMAP) that are not assessed on the NHIS. We tried to capture these populations by including visits to practitioners for special diets, which may also include visits to traditional nutritionists. Nonetheless, we may still have underestimated the prevalence of use of special diets in this population.

In conclusion, we found that 42% of adults with a GI condition who completed the survey used CAM within the past year, and at least 7% of them used CAM to specifically address a GI condition. In the latter population, 47% used three or more CAM modalities in the past year and over 80% of CAM therapies used for GI conditions were perceived to be helpful. Further study of this population may provide clues for promising therapies worthy of further study, while enhancing communication between doctors and patients on this topic may promote better clinical use of evidence-based CAM therapies.

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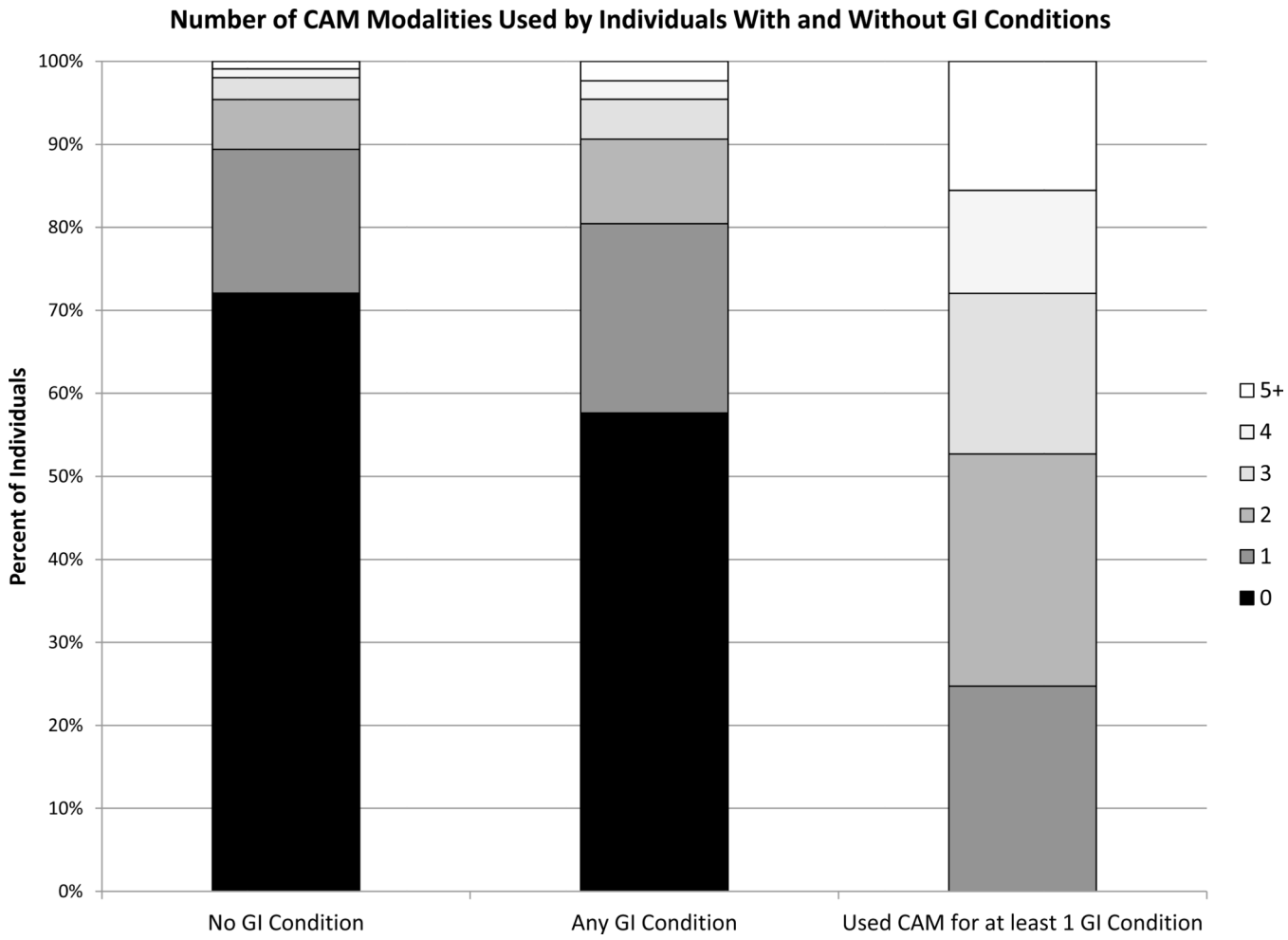

Figure 1.

Number of CAM modalities used by individuals with and without GI conditions. The stacked bar graph illustrates the percentage of survey respondents who used 0, 1, 2, 3, 4, or 5 or more CAM modalities. The three populations shown are those individuals with no GI condition (n=21020), individuals with one or more GI conditions (n=13505), and individuals who used at least one of their top three CAM modalities to address a GI condition (n=407).

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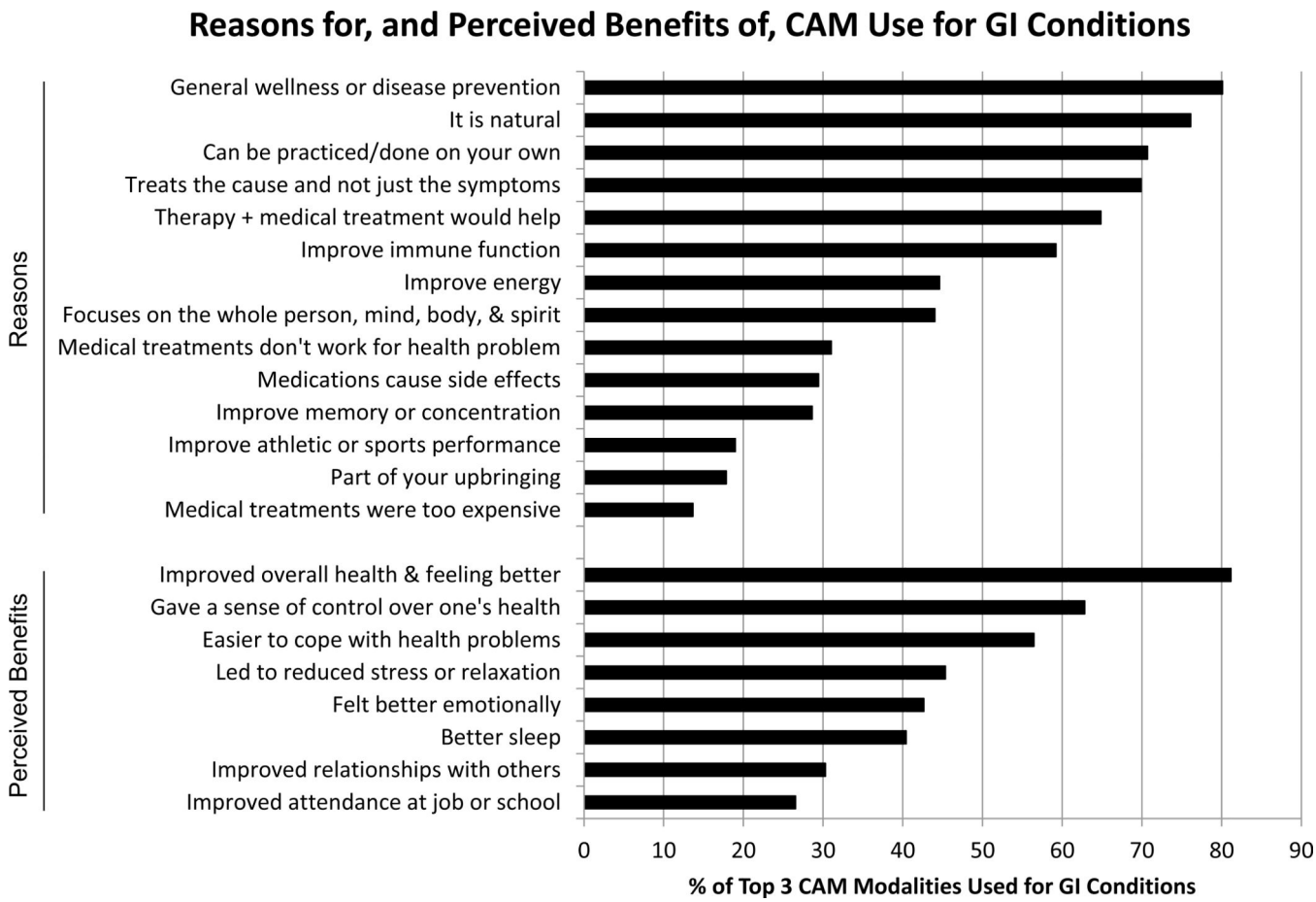

Figure 2.

Reasons for, and perceived benefits of, CAM use for GI conditions. Shown in descending order are the percent of the top 3 CAM modalities used to address GI conditions that were used for the reasons cited, or benefits experienced, by respondents (n=407).

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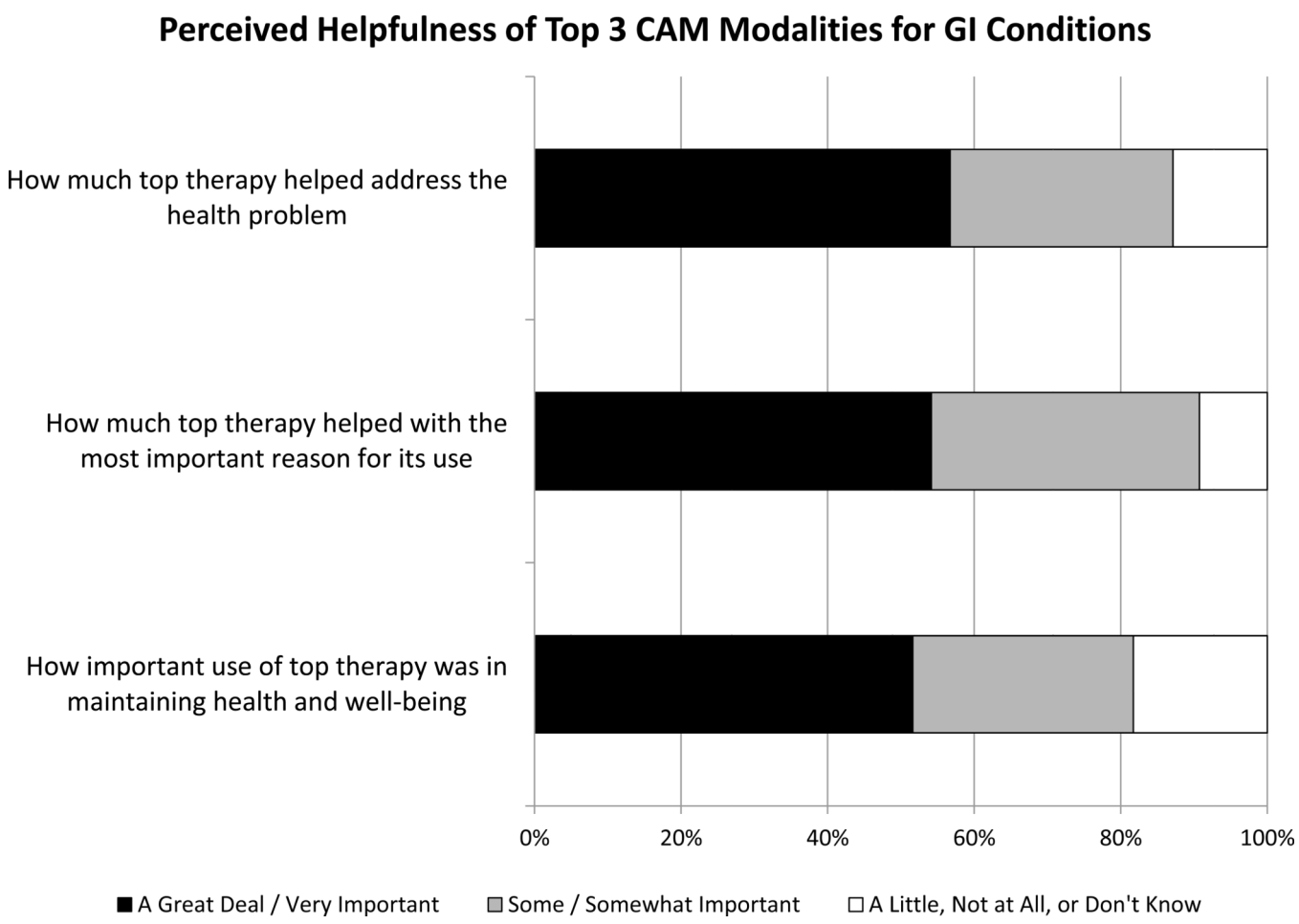

Figure 3.

Perceived helpfulness of Top 3 CAM modalities for GI Conditions. Survey respondents (n=407) were asked 1) How much did the therapy help address the health problem, 2) How much did the therapy help with the most important reason for its use, and 3) How important was use of the therapy in maintaining health and well-being. Most important reasons for use included 18 possible choices (general wellness/disease prevention; improve energy, immune function, athletic performance, memory or concentration; eat healthier, more organic foods; cut back or stop drinking alcohol, smoking cigarettes; exercise more regularly; and the 8 perceived benefits listed in Figure 2).

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Table 1

Characteristics of adults with and without GI conditions

	No GI condition, n=21020, n(%)^	Any GI condition, n=13,505, n(%)^	Chi square p value
Estimated U.S. Population Size*	N=143,408,789	N=91,511,881	
Sex			<.0001
Female	11005 (48.3%)	8247 (57.5%)	
Male	10015 (51.7%)	5258 (42.5%)	
Age			0.0008
18–29	3956 (22.1%)	2464 (20.8%)	
30–44	5540 (26.2%)	3330 (24.7%)	
45–64	7008 (34.0%)	4845 (36.3%)	
≥ 65	4516 (17.6%)	2866 (18.2%)	
Race			<.0001
White	15265 (77.7%)	10674 (84.0%)	
Black	3530 (13.4%)	1789 (9.5%)	
American Indian/Alaskan Native	204 (0.8%)	145 (0.9%)	
Asian	1644 (6.7%)	539 (3.2%)	
Other	377 (1.5%)	358 (2.3%)	
Hispanic	4036 (16.9%)	1823 (11.7%)	<.0001
Region			<.0001
Northeast	3719 (19.7%)	2055 (15.9%)	
Midwest	4185 (21.3%)	3008 (25.0%)	
South	7658 (36.6%)	4878 (36.2%)	
West	5458 (22.5%)	3564 (22.9%)	
Marital Status			<.0001
Married/Living with Partner	10376 (59.8%)	6677 (61.0%)	
Widowed	1937 (5.7%)	1348 (6.5%)	
Divorced	3393 (10.7%)	2446 (12.3%)	
Never Married	5259 (23.7%)	3011 (20.2%)	
Education			0.32
< High School	3389 (14.1%)	2098 (13.6%)	
High School or equivalent	5516 (26.3%)	3422 (26.0%)	
> High School	12009 (59.0%)	7938 (60.0%)	
Family Income			<.0001
< $34,999	8392 (30.1%)	5960 (34.0%)	
$35,000 – $74,999	6039 (29.6%)	3879 (30.6%)	
$75,000 – $99,999	2071 (12.1%)	1179 (10.6%)	
≥$100,000	3206 (21.6%)	1873 (19.7%)	
Unknown/Undefined	1312 (6.6%)	614 (5.1%)	

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	No GI condition, n=21020, n(%)^	Any GI condition, n=13,505, n(%)^	Chi square p value
Insurance Status			<.0001
Uninsured	3994 (17.9)	2162 (15.3)	
Medicare	4733 (18.3)	3488 (22.2)	
Medicaid	1395 (6.0)	1125 (7.2)	
Private	10155 (54.5)	6122 (51.0)	
Other	667 (3.0)	572 (4.0)	
Perceived Health Status			<.0001
Excellent	6432 (33.1)	2426 (20.4)	
Very Good	6872 (33.3)	3872 (30.4)	
Good	5532 (25.0)	4104 (29.4)	
Fair	1790 (7.1)	2209 (13.9)	
Poor	385 (1.6)	885 (5.7)	
BMI			<.0001
< 20	1156 (5.5)	681 (5.1)	
20–25	6653 (32.0)	3630 (26.7)	
25–30	7131 (33.8)	4346 (32.8)	
30–35	3303 (15.7)	2411 (17.8)	
> 35	1939 (8.7)	1920 (13.9)	
Unknown	838 (4.2)	517 (3.7)	
Smoking Status			<.0001
Current	3560 (16.0)	2876 (20.9)	
Former	4220 (20.1)	3364 (25.0)	
Never	13081 (63.1)	7155 (53.4)	
Unknown	159 (0.8)	110 (0.8)	
Alcohol Use			<.0001
None	8002 (35.6)	4849 (33.6)	
Light	8485 (42.2)	5782 (44.5)	
Moderate	3062 (15.4)	1854 (14.6)	
Heavy	998 (4.5)	761 (5.5)	
Unknown	473 (2.3)	259 (1.8)	
Physical Activity			<.0001
Low	7122 (31.5)	4783 (33.4)	
Moderate	3586 (17.6)	2644 (20.3)	
High	10090 (49.7)	5942 (45.3)	
Unknown	222 (1.2)	136 (1.0)	
Comorbidity Score			<.0001
0	10060 (50.3)	2979 (24.0)	
1	5443(26.0)	3152 (24.6)	
2–3	4434(19.6)	4747 (34.5)	

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	No GI condition, n=21020, n(%)^	Any GI condition, n=13,505, n(%)^	Chi square p value
4+	1083 (4.2)	2627 (16.9)	

^ n=number of individuals responding in the survey; (%) = weighted percent estimate for the U.S. population

* The complex sampling design of the NHIS allows for estimation of the U.S. population

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Table 2

GI conditions and frequency of modalities used

	Herbs & Supplements[#]	**Manipulative Therapy**	**Mind Body**	**Special Diet**	**Movement Therapy**	**Other**	**Any CAM**
GI Condition (n)[^]	**n(%)**[^]	**n(%)**[^]	**n(%)**[^]	**n(%)**[^]	**n(%)**[^]	**n(%)**[^]	**n(%)**[^]
Abdominal Pain (n=3516)	826 (24.3)	686 (19.6)	628 (18.7)	169 (5.1)	99 (2.9)	293 (8.6)	1540 (44.8)
Acid Reflux / Heartburn (n=7903)	1689 (21.5)	1392 (17.5)	967 (12.4)	265 (3.4)	124 (1.7)	454 (5.5)	3055 (38.8)
Digestive Allergy (n=1425)	416 (30.7)	337 (25.2)	308 (23.1)	94 (7.5)	59 (5.3)	172 (12.4)	708 (50.9)
Liver Condition (n=513)	111 (21.7)	73 (14.8)	69 (11.1)	20 (3.2)	*	39 (7.7)	196 (38.1)
Nausea/Vomiting (n=6741)	1602 (24.2)	1394 (20.6)	1372 (20.2)	312 (4.5)	226 (3.5)	486 (6.9)	3113 (46.6)
Ulcer (n=676)	130 (19.5)	118 (18.2)	101 (15.6)	22 (3.1)	*	46 (7.4)	262 (39.6)

[#]Does not include vitamin or mineral supplements

[^]n=number of individuals responding in the survey; (%) = weighted percent estimate for the U.S. population

*Number suppressed because relative standard error is over 30% and estimate is unreliable

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Table 3

Most commonly used modalities for individuals with and without GI conditions

Modality	**No GI condition, n=21020, n(%)^**	**Any GI condition, n=13505, n(%)^**	**Used CAM for GI condition, n=407, n(%)^***
Any CAM	5887 (27.9)	5629 (42.4)	407 (100)
Herbs & Supplements#	2922 (13.6)	3052 (23.0)	316 (79.5)
Meditation/Imagery/Progressive Relaxation	643 (2.9)	972 (7.2)	138 (35.8)
Mind Body Exercise	1678 (8.1)	1527 (11.7)	125 (30.4)
Massage	1429 (6.7)	1522 (11.3)	107 (27.5)
Chiropractic/Osteopathic Manipulation	1492 (7.3)	1501 (11.2)	113 (25.8)
Homeopathy	308 (1.5)	410 (3.2)	90 (25.9)
Special Diet	489 (2.2)	538 (4.0)	81 (18.8)
Naturopathy	98 (0.4)	178 (1.2)	46 (11.6)
Acupuncture	285 (1.2)	319 (2.2)	35 (7.7)
Movement Therapy	353 (1.7)	325 (2.6)	31 (7.9)

^n=number of individuals responding in the survey; (%) = weighted percent estimate for the U.S. population

*Explicitly used at least one of their top three CAM modalities for at least 1 GI condition

#Does not include vitamin or mineral supplements

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Table 4

Herbs andsupplements most commonly used by individuals with and without GI conditions[#]

Herbs & Supplements	No GI condition, n=21020, n(%)[^]	Any GI condition, n=13505, n(%)[^]	Used CAM for GI condition, n=407, n(%)[^*]
Fish Oil	1884 (8.9)	1882 (14.3)	182 (47.2)
Probiotics or Prebiotics	348 (1.6)	546 (4.3)	165 (45.3)
Digestive Enzymes (Lactaid)	135 (0.6)	304 (2.1)	108 (26.1)
Other Herbs and Supplements[#]	599 (2.7)	689 (5.2)	102 (24.9)
Glucosamine	585 (2.7)	583 (4.6)	54 (16.7)
Cranberry	230 (1.0)	375 (2.6)	53 (13.4)
Echinacea	417 (1.9)	458 (3.3)	52 (13.1)
Melatonin	321 (1.5)	469 (3.4)	46 (13.1)
Ginseng	312 (1.3)	360 (2.6)	52 (12.7)
CoQ10	327 (1.5)	338 (2.5)	49 (12.4)
Garlic	269 (1.1)	294 (2.0)	42 (11.2)
Milk Thistle (Silymarin)	130 (0.6)	178 (1.2)	41 (10.6)
Bee Pollen	170 (0.8)	157 (1.2)	33 (9.6)
Chondroitin	287 (1.4)	315 (2.4)	32 (9.5)
Green Tea	202 (0.9)	265 (1.9)	37 (8.5)
Ginkgo	253 (1.0)	250 (1.8)	31 (7.1)

[^] n=number of individuals responding in the survey; (%) = weighted percent estimate for the U.S. population

[*] Explicitly used at least one of their top three CAM modalities for at least 1 GI condition.

[#] Does not include vitamin or mineral supplements