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Expenditures on Complementary Health Approaches: United States, 2012

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Abstract

Objective—This report presents estimates of expenditures on complementary health approach use among the U.S. population. Estimates are presented for adults and children separately and combined, as well as stratified by type of approach and family income.

Methods—Combined data from 44,743 individuals aged 4 years and over, collected as part of the 2012 National Health Interview Survey, were analyzed for this report. Sample data were weighted to produce national estimates that are representative of the civilian noninstitutionalized U.S. population. Differences between percentages were evaluated using two-sided significance tests at the 0.05 level. Linear regression was used to assess trends in expenditures when stratifying by family income.

Results—An estimated 59 million persons aged 4 years and over had at least one expenditure for some type of complementary health approach, resulting in total out-of-pocket expenditures of \$30.2 billion. More was spent on visits to complementary practitioners (\$14.7 billion) than for purchases of natural product supplements (\$12.8 billion) or self-care approaches (\$2.7 billion). The mean per user out-of-pocket expenditure for visits to a complementary practitioner (\$433) was significantly more than for purchases of natural product supplements (\$368) or for self-care approaches (\$257). Adults had higher mean annual out-of-pocket expenditures for visits to complementary practitioners than children (\$442 and \$291, respectively). Total out-of-pocket expenditures and mean per user out-of-pocket expenditures for complementary health approaches increased significantly as family income increased. The mean per user out-of-pocket expenditure for complementary health approaches was \$435 for persons with family incomes less than \$25,000 and \$590 for persons with family incomes of \$100,000 or more.

Keywords: complementary and alternative medicine • out-of-pocket expenditures
• National Health Interview Survey

Introduction

Complementary health approaches comprise a diverse set of healing philosophies, therapies, and products (1,2). The continuing high use of complementary health approaches by adults (38.3%) (1) and children (11.8%) (2) in the United States has led to increased interest in identifying the costs associated with these approaches (3–12). Previous studies have estimated that U.S. adults spend between \$27 and \$34 billion in out-of-pocket expenditures per year on complementary health approaches (5,6,10). No prior analyses have: (a) provided nationally representative estimates on the out-of-pocket expenditures for children; (b) examined total expenditures across age groups; or (c) calculated mean out-of-pocket expenditures per user. In response to this lack of cost data, the Institute of Medicine (13) noted that new surveys were necessary to “provide much needed information about out-of-pocket costs... for individual therapies.”

This report is based on supplements on complementary health approaches administered as part of the Sample Adult and Sample Child questionnaires of the 2012 National Health Interview Survey (NHIS). Previous reports have described the prevalence of complementary



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health approach use by adults (1) and children (2). This report focuses on the out-of-pocket expenditures on complementary health approaches. Estimates of annual total out-of-pocket expenditures and per user out-of-pocket expenditures for complementary health approaches are presented, as well as data on the frequency of expenditures for these approaches by the U.S. public. This report also examines the relationship between family income and expenditures.

Methods

Data source

The statistics shown in this report are based on data from the 2012 NHIS Adult and Child Complementary and Alternative Medicine Supplement. The processes used to develop this supplement are described elsewhere (14). NHIS is conducted continuously by the National Center for Health Statistics. It is a multipurpose health survey of a nationally representative sample of the civilian noninstitutionalized household population of the United States. In the survey's Family component, basic health and demographic information is collected on all household members. Information is collected on one randomly selected adult aged 18 and over (the "sample adult") and on one randomly selected child aged 0–17 years (the "sample child") in each family. Information on the sample adult is self-reported, except in rare cases when the sample adult is physically or mentally incapable of responding. Information on the sample child is collected from an adult who is knowledgeable about the child's health, usually a parent. Interviews are conducted in the respondent's home using a computer-assisted personal interview questionnaire, with telephone follow-up permitted if necessary. Detailed descriptions of the NHIS sample design and survey questionnaires for specific years are available elsewhere (15,16). In 2012, information was collected on a total of 34,525 adults aged 18 and over (unconditional response rate of 61.2%) and 13,275 children under 18 years (unconditional response rate of 69.7%).

The 2012 Child Complementary and Alternative Medicine Supplement only included sample children aged 4–17 years ($n = 10,218$).

The complementary health approaches analyzed for this report include: acupuncture, Ayurveda, biofeedback, chelation therapy, chiropractic and osteopathic manipulation, energy healing therapy, diet-based therapies, guided imagery, homeopathic treatment, hypnosis, massage therapy, meditation, naturopathy, natural product supplements, progressive relaxation, qi gong, tai chi, yoga, movement therapies, craniosacral therapy, and traditional healers.

Calculation of estimates

All estimates and associated standard errors shown in this report (Tables 1–5) were generated using SUDAAN, a software package designed to account for a complex sample design such as NHIS (17). All estimates for adults were calculated using the sample adult sampling weights, and all estimates for children were calculated using the sample child sampling weights to represent the U.S. civilian noninstitutionalized population aged 4 years and over.

The steps for calculating out-of-pocket expenditures from the 2012 NHIS Adult and Child Complementary and Alternative Medicine Supplement are described elsewhere (10,11). In brief, for this analysis, the number of visits to a complementary alternative medicine practitioner was calculated using the midpoint of the interval containing the number of visits. These intervals were 2–5, 6–10, 11–15, and 16–20 times. For response categories "only one time" and "more than 20 times," the values 1 and 21 were used, respectively. To estimate the out-of-pocket costs per visit and the costs for the purchase of homeopathic medicine; yoga, tai chi, and qi gong classes; and relaxation technique materials, the continuous responses of "\$0–\$499" were retained and the response of "\$500 or more" was treated as \$500. To estimate how often natural product supplements and homeopathic medicines were purchased, the respondent's original answer of times per day, week, or month was converted

into times per year. The number of times a person took a yoga, tai chi, or qi gong class was calculated by using the midpoint of the interval containing the number of times the person took a class. These intervals were 2–11 times per year, 2–3 times per month, 2–3 times per week, and 4–6 times per week. Responses of daily, times per week, and times per month were then converted into times per year. Based on prior cognitive testing results of the 2012 NHIS Complementary and Alternative Medicine Supplement, few respondents reported buying natural product supplements as often as daily. Responses indicating purchases of natural product supplements of more than 365 times per year were therefore excluded from the analysis as presumed errors. The question and response categories for these recodes can be found in the 2012 NHIS Sample Adult and Sample Child Complementary and Alternative Medicine questionnaire located on the NHIS website at: http://www.cdc.gov/nchs/nhis/quest_data_related_1997_forward.htm. Persons with unknown information about complementary health approaches were excluded from the analysis. Also excluded were 15 individuals identified as having extreme values (top 0.1%) using SAS Proc Univariate.

The family income variable shown in Tables 4 and 5 is based on detailed family income for which item nonresponse is relatively high, as is common in large population surveys. To reduce biases associated with missing data, information on family income and personal earnings is imputed by NCHS analysts using multiple imputation methodology. Five ASCII data sets containing imputed values for the 2012 NHIS and additional documentation about the imputed income variables and files can be found at: <http://www.cdc.gov/nchs/nhis/2012imputedincome.htm>.

The Taylor series linearization method was chosen for estimation of standard errors. Prevalence estimates were compared using two-tailed z tests. Analysis of Variance (ANOVA) was used to assess overall differences in expenditures for complementary health approaches between adults and children. When a significant overall difference was observed, the Tukey post-hoc test was used to compare differences between

adults and children for three categories of complementary health approaches: visits to complementary practitioners, purchases of natural product supplements, and self-care approaches. Linear regression was used to assess whether increasing family income was associated with increasing expenditures on complementary health approaches. Significance for all statistical tests was set at 0.05 and assumed independence. Terms such as “greater than” and “less than” indicate a statistically significant difference. Terms such as “not significantly different” or “no difference” indicate there were no statistically detectable differences between the estimates being compared.

Strengths and limitations of the data

A major strength of NHIS data is that they were collected for a nationally representative sample of U.S. adults and children, thus allowing for the estimation of complementary health approach use for a wide variety of approaches. The large sample size also facilitates the investigation of the association between these approaches and a wide range of other self-reported characteristics included in NHIS, such as family income and age.

NHIS questions have several limitations. First, they are dependent on respondents’ memory and their willingness to report accurately. Second, the collection of survey data at a single point in time results in an inability to produce consecutive annual prevalence estimates and can reduce the ability to produce reliable prevalence estimates for small population subgroups, because doing so could require a larger sample and more than 1 year of data. Finally, the total costs per person for natural product supplements and homeopathy were calculated by multiplying the amount spent at the most recent purchase by the number of purchases a year. Because data were not available for the exact cost at each purchase, and the most recent purchase may not have been typical of the respondent’s usual purchase of complementary products, the estimates may contain errors.

Results

Out-of-pocket expenditures on complementary health approaches

- One in five individuals aged 4 years and over in the United States had one or more expenditures for complementary health approaches. This equates to approximately 59 million individuals ([Table 1](#)).
- A total of 55.2 million adults (23.5%) had at least one expenditure for some complementary health approach.
- A total of 4.1 million children (7.1%) had at least one expenditure for some complementary health approach.
- Children and adults were significantly more likely to have had at least one expenditure for purchases of natural product supplements (4.2% and 13.7%, respectively) than for either visits to a complementary practitioner (3.0% and 12.3%, respectively) or for self-care approaches (2.5% and 4.7%, respectively).

Out-of-pocket expenditures on complementary health approaches, by type of approach

- For individuals aged 4 years and over, \$30.2 billion was spent out-of-pocket on complementary health approaches. Of this amount, more was spent on visits to complementary practitioners (\$14.7 billion) than for purchases of natural product supplements (\$12.8 billion) or self-care approaches (\$2.7 billion) ([Figure 1](#), [Table 2](#)).
- Adults spent \$28.3 billion out-of-pocket on complementary health approaches. Adults had more out-of-pocket expenditures for visits to complementary practitioners (\$14.1 billion) than for either natural product supplements (\$12.0 billion) or self-care approaches (\$2.2 billion).
- Almost \$2 billion was spent out-of-pocket for children’s use of complementary health approaches.

Similar amounts were spent out-of-pocket for children’s visits to complementary practitioners (\$0.6 billion), purchases of natural product supplements (\$0.8 billion), and self-care approaches (\$0.5 billion).

Mean annual per user out-of-pocket expenditures on complementary health approaches, by type of approach

- For individuals aged 4 years and over, the mean annual per user out-of-pocket expenditure for all complementary health approaches was \$510. The mean per user out-of-pocket expenditure for visits to a complementary practitioner (\$433) was significantly more than for purchases of natural product supplements (\$368) or for self-care approaches (\$257) ([Table 3](#)).
- Adults had higher mean annual out-of-pocket expenditures on visits to complementary practitioners (\$442) than purchases of natural product supplements (\$369) or self-care approaches (\$241).
- Adults had higher mean annual out-of-pocket expenditures for visits to complementary practitioners than children (\$442 and \$291, respectively). No difference between adults and children was observed for mean annual out-of-pocket expenditures on natural product supplements (\$369 and \$353, respectively) or self-care approaches (\$241 and \$372, respectively).

Total and mean annual per user out-of-pocket expenditures on complementary health approaches, by family income

- Total out-of-pocket expenditures for complementary health approaches increased significantly as family income increased ([Table 4](#)).
- Individuals with family incomes between \$50,000 and \$99,999 spent

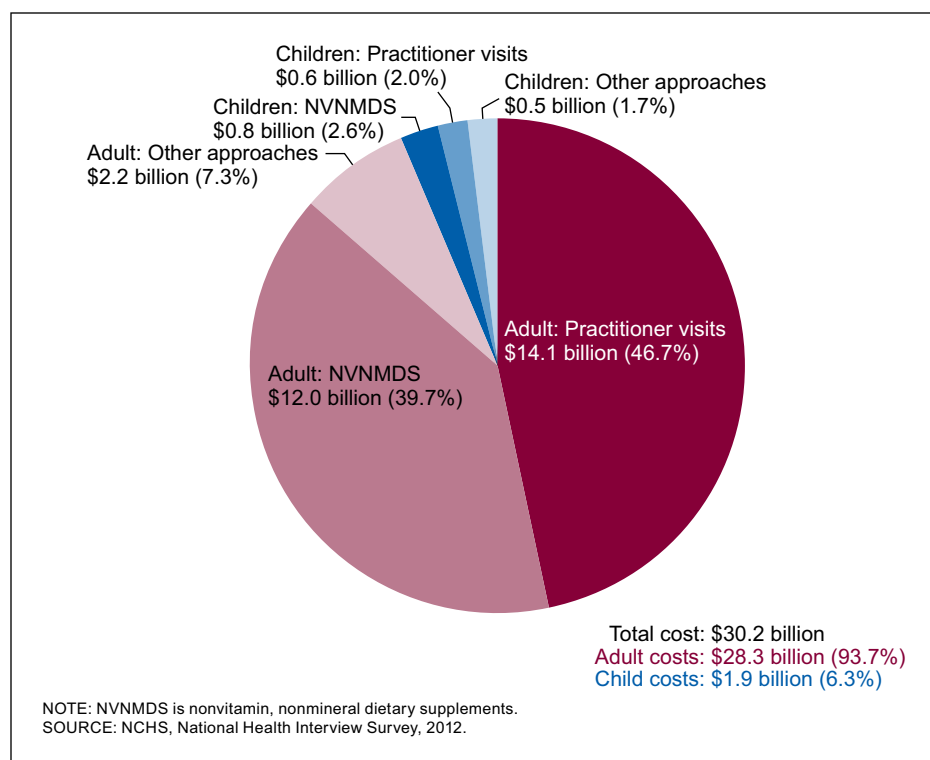


Figure 1. Out-of-pocket expenditures for complementary health approaches among children aged 4–17 years and adults aged 18 and over: United States, 2012

\$10.1 billion on complementary health approaches (33.6% of the total out-of-pocket expenditures), while those with family incomes of at least \$100,000 spent \$11.0 billion (36.6% of the total out-of-pocket expenditures).

- While the mean per user out-of-pocket expenditure for complementary health approaches was \$435 for persons with family incomes less than \$25,000, those with family incomes of \$100,000 or more had mean per user expenditures of \$590.

Total and mean per user out-of-pocket expenditures on complementary health approaches, by family income and type of approach

- Total out-of-pocket expenditures for visits to complementary practitioners increased significantly as family income increased (Table 5).
- Persons with family incomes of \$100,000 or more had more than four times the out-of-pocket expenditures for visits to complementary

practitioners than persons with family incomes less than \$25,000 (\$6.2 billion and \$1.3 billion, respectively).

- Mean per user out-of-pocket expenditures for visits to complementary practitioners increased significantly as family income increased.
- The mean per user out-of-pocket expenditure for visits to complementary practitioners was \$314 for persons with family incomes less than \$25,000 and \$518 for those with family incomes of \$100,000 or more.
- Total out-of-pocket expenditures for purchases of natural product supplements increased significantly as family income increased.
- Individuals with family incomes between \$50,000 and \$99,999 spent the most on natural products (\$4.1 billion). This was about twice the amount spent by those with family incomes below \$25,000 (\$1.9 billion).
- Family income level was not associated with the mean per user out-of-pocket expenditures for natural product supplements.

- No relationship was observed between family income and either total or mean out-of-pocket expenditures on self-care approaches.

Discussion

Using data from the 2012 NHIS, it is estimated that the civilian noninstitutionalized U.S. population aged 4 years and over spent about \$30.2 billion out of pocket on visits to complementary practitioners and on purchases of related products, classes, and materials. This equates to 1.1% of total health care expenditures in the United States (\$2.82 trillion) and to 9.2% of out-of-pocket health care expenditures (\$328.8 billion) (18). Of this, the public had \$12.8 billion in out-of-pocket expenditures for the purchase of natural product supplements, which is approximately 24% of the amount the public had in out-of-pocket expenditures for prescription drugs in 2012 (\$54.1 billion) (18). The public also had \$14.7 billion in out-of-pocket expenditures on visits to complementary practitioners, which is 29.6% of the amount in out-of-pocket expenditures for conventional physician services (\$49.6 billion) (18).

Substantially more was spent on complementary health approaches for adults (\$28.3 billion) than for children (\$1.9 billion). Several factors may account for this difference. First, there are more adults than children in the general population. Based on the 2010 Census, 76% of the general population were adults and 18% were children aged 4–17 years (19). Also, adults were more likely than children to use complementary health approaches (1,2). Third, as shown in Table 1, the percentage of children with an expenditure for complementary health approaches was about one-third that seen in adults (7.1% and 23.5%, respectively). When children do have an expenditure, the per person costs for visits to complementary practitioners is substantially less than expenditures for adults (Table 3). Finally, adults and children may use complementary health approaches for different reasons, which could account for the differences in expenditures between these groups. For instance, while 82.1% of adults

used chiropractors for a specific health condition (20), only about 58% of children used chiropractors to treat a specific health condition (21), with the remainder seeing a chiropractor for “wellness care” (22). It may be that visits for specific health conditions resulted in higher out-of-pocket costs because of increased use of diagnostic procedures by complementary practitioners, including radiographic imaging (23).

It has been previously determined that prevalence rates for the use of complementary health approaches increased as family income increased (24). This analysis shows that out-of-pocket expenditures on complementary health approaches also increased as family income increased. In particular, those with the highest family income had more than four times higher mean per user out-of-pocket expenditures for visits to complementary practitioners than those with the lowest family income. These data are not unexpected given that most individuals do not have health insurance coverage for visits to complementary practitioners (25), and costs per visit can be \$100 or more (10), making it difficult for those with lower incomes to afford such care.

Out-of-pocket expenditures made by adults were previously reported using data from the 2007 NHIS (10,11). However, the 2007 survey varied from the 2012 NHIS in several ways that have been previously documented (14), including only a partial overlap in the list of complementary health approaches examined and the use of different questions to elicit data on out-of-pocket expenditures. Thus, it is not appropriate to make direct comparisons between the calculated expenditures in the two surveys. However, globally, in both years, substantial numbers of Americans spent billions of dollars out of pocket on these approaches, an indication that users believe enough in the value of these approaches to pay for them.

In summary, the 2012 NHIS data indicate that the U.S. public spent billions of dollars out of pocket on complementary health approaches. These expenditures, although a small fraction of total health care spending in the U.S., constitute a substantial part of out-of-pocket health care costs and

are comparable to out-of-pocket costs for conventional physician services and prescription drug use.

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Table 1. Frequencies and percentages of expenditures on complementary health approaches in the last 12 months for children aged 4–17 years and adults aged 18 and over, by type of expenditure: United States, 2012

Type of expenditure	Aged 4 years and over			Child			Adult		
	Weighted <i>n</i> (millions)	Weighted percent	Standard error	Weighted <i>n</i> (millions)	Weighted percent	Standard error	Weighted <i>n</i> (millions)	Weighted percent	Standard error
Any complementary health approach ¹	59.3	20.3	0.31	4.1	7.1	0.33	55.2	23.5	0.35
Practitioner visits ²	34.0	³ 10.5	0.22	2.1	3.0	0.24	28.9	³ 12.3	0.25
Natural product supplements ⁴	34.8	⁵ 11.7	0.25	2.3	⁵ 4.2	0.23	32.1	⁵ 13.7	0.29
Self-care approaches ⁶	10.4	4.2	0.13	1.3	2.5	0.20	11.0	4.7	0.16

¹Includes visits to complementary approach practitioners, purchases of natural product supplements, and costs associated with self-care approaches.

²Includes visits to practitioners of acupuncture, Ayurveda, homeopathy, naturopathy, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, energy healing therapy, and craniosacral therapy; visits to traditional healers; instructors of yoga, tai chi, and qi gong; teachers of movement therapies; and classes for mind-body therapies.

³Significantly different from self-care approaches using the *z* test (*p* < 0.05).

⁴Includes acai pills or gelpcaps, bee pollen (or other bee products), chondroitin, co-enzyme Q10 (CoQ10), cranberry pills or capsules, digestive enzymes (lactaid), echinacea, fish oil (or omega 3, DHA, or EPA fatty acid), garlic supplements, ginkgo biloba, ginseng, glucosamine, green tea pills or EGCG pills, melatonin, milk thistle (silymarin), methylsulfonylmethane, probiotics or prebiotics, SAM-e, saw palmetto, valerian, and other herbs or nonvitamin supplements.

⁵Significantly different from both practitioner visits and self-care approaches using the *z* test (*p* < 0.05).

⁶Includes homeopathic medicine and self-help materials (e.g., books, CDs, videotapes) for acupuncture, Ayurveda, homeopathy, naturopathy, traditional healers, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, yoga, tai chi, qi gong, energy healing therapy, and craniosacral therapy.

NOTE: Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: NCHS, National Health Interview Survey, 2012.

Table 2. Annual out-of-pocket expenditures on complementary health approaches for children aged 4–17 years and adults aged 18 and over, by type of expenditure: United States, 2012

Type of expenditure	Aged 4 years and over		Child		Adult	
	Out-of-pocket expenditures (billions) (95% CI)	Percent of total	Out-of-pocket expenditures (billions) (95% CI)	Percent of total	Out-of-pocket expenditures (billions) (95% CI)	Percent of total
Any complementary health approach ¹	30.2 (28.4, 32.0)	100.0	1.9 (1.3, 2.5)	100.0	28.3 (26.6, 30.0)	100.0
Practitioner visits ²	14.7 (13.8, 15.6)	48.8	0.6 (0.5, 0.7)	31.9	³ 14.1 (13.2, 15.0)	49.9
Natural product supplements ⁴	12.8 (11.5, 14.1)	42.4	0.8 (0.5, 1.1)	43.1	⁵ 12.0 (10.8, 13.2)	42.4
Self-care approaches ⁶	2.7 (1.9, 3.5)	8.8	0.5 (0.1, 0.9)	25.0	2.2 (1.5, 2.9)	7.7

¹Includes visits to complementary approach practitioners, purchases of natural product supplements, and costs associated with self-care approaches.

²Includes visits to practitioners of acupuncture, Ayurveda, homeopathy, naturopathy, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, energy healing therapy, craniosacral therapy; visits to traditional healers; instructors of yoga, tai chi, and qi gong; teachers of movement therapies; and classes for mind-body therapies.

³Significantly different from natural product supplements and self-care approaches using the ANOVA Tukey post-hoc test (*p* < 0.05).

⁴Includes acai pills or gelpcaps, bee pollen (or other bee products), chondroitin, co-enzyme Q10 (CoQ10), cranberry pills or capsules, digestive enzymes (lactaid), echinacea, fish oil (or omega 3, DHA, or EPA fatty acid), garlic supplements, ginkgo biloba, ginseng, glucosamine, green tea pills or EGCG pills, melatonin, milk thistle (silymarin), methylsulfonylmethane, probiotics or prebiotics, SAM-e, saw palmetto, valerian, and other herbs or nonvitamin supplements.

⁵Significantly different from self-care approaches using the ANOVA Tukey post-hoc test (*p* < 0.05).

⁶Includes homeopathic medicine and self-help materials (e.g., books, CDs, videotapes) for acupuncture, Ayurveda, homeopathy, naturopathy, traditional healers, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, yoga, tai chi, qi gong, energy healing therapy, and craniosacral therapy.

NOTES: CI is confidence interval. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: NCHS, National Health Interview Survey, 2012.

Table 3. Mean per user out-of-pocket expenditures on complementary health approaches for children aged 4–17 years and adults aged 18 and over, by type of expenditure: United States, 2012

Type of expenditure	Aged 4 years and over		Child		Adult		Child compared with adult
	Weighted number of users with an expenditure (millions)	Mean per user out-of-pocket expenditures (dollars) (95% CI)	Weighted number of users with an expenditure (millions)	Mean per user out-of-pocket expenditures (dollars) (95% CI)	Weighted number of users with an expenditure (millions)	Mean per user out-of-pocket expenditures (dollars) (95% CI)	<i>p</i> value ¹
Any complementary health approach ²	59.3	510 (478, 542)	4.1	455 (308, 601)	55.2	514 (483, 545)	<i>p</i> > 0.05
Practitioner visits ³	34.0	⁴ 433 (406, 460)	2.1	291 (231, 351)	28.9	⁴ 442 (414, 470)	<i>p</i> < 0.01
Natural product supplements ⁵	34.8	⁶ 368 (331, 405)	2.3	353 (211, 495)	32.1	⁶ 369 (330, 408)	<i>p</i> > 0.05
Self-care approaches ⁷	10.4	257 (220, 334)	1.4	372 (96, 648)	11.0	241 (184, 298)	<i>p</i> > 0.05

¹Based on *t* test.²Includes visits to complementary approach practitioners, purchases of natural product supplements, and costs associated with self-care approaches.³Includes visits to practitioners of acupuncture, Ayurveda, homeopathy, naturopathy, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, energy healing therapy, and craniosacral therapy; visits to traditional healers; instructors of yoga, tai chi, and qi gong; teachers of movement therapies; and classes for mind-body therapies.⁴Significantly different from both natural product supplements and self-care approaches using the ANOVA Tukey post-hoc test (*p* < 0.05).⁵Includes acai pills or gelpcaps, bee pollen (or other bee products), chondroitin, co-enzyme Q10 (CoQ10), cranberry pills or capsules, digestive enzymes (lactaid), echinacea, fish oil (or omega 3, DHA, or EPA fatty acid), garlic supplements, ginkgo biloba, ginseng, glucosamine, green tea pills or EGCG pills, melatonin, milk thistle (silymarin), methylsulfonylmethane, probiotics or prebiotics, SAM-e, saw palmetto, valerian, and other herbs or nonvitamin supplements.⁶Significantly different from self-care approaches using the ANOVA Tukey post-hoc test (*p* < 0.05).⁷Includes homeopathic medicine and self-help materials (e.g., books, CDs, videotapes) for acupuncture, Ayurveda, homeopathy, naturopathy, traditional healers, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, yoga, tai chi, qi gong, energy healing therapy, and craniosacral therapy.

NOTES: CI is confidence interval. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: NCHS, National Health Interview Survey, 2012.

Table 4. Total and mean per user out-of-pocket expenditures on complementary health approaches for children aged 4–17 years and adults aged 18 and over, by family income: United States, 2012

Family income	Weighted <i>n</i> (millions)	Total out-of-pocket expenditures (billions) ¹ (95% CI)	Percent of total out-of-pocket expenditures	Mean per user out-of-pocket expenditures (dollars) ¹ (95% CI)
\$0–\$24,999	8.0	3.5 (2.8, 4.2)	11.6	435 (345, 525)
\$25,000–\$49,999	12.4	5.5 (4.7, 6.3)	18.3	448 (382, 514)
\$50,000–\$99,999	20.1	10.1 (9.2, 11.0)	33.6	505 (458, 552)
At or above \$100,000	18.6	11.0 (9.7, 12.3)	36.6	590 (520, 660)

¹*p* value, test for trend, (*p* < 0.01). Based on linear regression with expenditures as the dependent variable and family income as the independent variable.

NOTES: CI is confidence interval. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: NCHS, National Health Interview Survey, 2012.

Table 5. Total and mean per user out-of-pocket expenditures on complementary health approaches for children aged 4–17 years and adults aged 18 and over, by family income and type of approach: United States, 2012

Family income	Practitioner visits ¹			Natural product supplements ²			Self-care approaches ³		
	Weighted <i>n</i> (millions)	Total out-of-pocket expenditures (billions) ⁴ (95% CI)	Mean per user out-of-pocket expenditures (dollars) ⁴ (95% CI)	Weighted <i>n</i> (millions)	Total out-of-pocket expenditures (billions) ⁴ (95% CI)	Mean per user out-of-pocket expenditures (dollars) ⁵ (95% CI)	Weighted <i>n</i> (millions)	Total out-of-pocket expenditures (billions) ⁵ (95% CI)	Mean per user out-of-pocket expenditures (dollars) ⁵ (95% CI)
\$0–\$24,999	4.0	1.3 (1.1, 1.5)	314 (267, 361)	4.9	1.9 (1.2, 2.1)	389 (256, 522)	1.4	0.3 (0.1, 0.5)	231 (65, 397)
\$25,000–\$49,999	6.1	2.1 (1.8, 2.4)	351 (300, 402)	8.0	2.9 (2.3, 3.5)	362 (281, 443)	2.1	0.5 (0.2, 0.8)	240 (79, 401)
\$50,000–\$99,999	11.9	5.1 (4.5, 5.7)	430 (382, 478)	11.6	4.1 (3.4, 4.7)	355 (306, 404)	3.6	0.9 (0.5, 1.3)	252 (117, 369)
At or above \$100,000	11.9	6.2 (5.5, 6.9)	518 (456, 580)	10.3	3.9 (2.6, 4.5)	377 (307, 447)	3.3	0.9 (0.4, 1.4)	284 (125, 439)

¹Includes visits to practitioners of acupuncture, Ayurveda, homeopathy, naturopathy, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, energy healing therapy, and craniosacral therapy; visits to traditional healers; instructors of yoga, tai chi, and qi gong; teachers of movement therapies; and classes for mind-body therapies.²Includes acai pills or gelpcaps, bee pollen (or other bee products), chondroitin, co-enzyme Q10 (CoQ10), cranberry pills or capsules, digestive enzymes (lactaid), echinacea, fish oil (or omega 3, DHA, or EPA fatty acid), garlic supplements, ginkgo biloba, ginseng, glucosamine, green tea pills or EGCG pills, melatonin, milk thistle (silymarin), methylsulfonylmethane, probiotics or prebiotics, SAM-e, saw palmetto, valerian, and other herbs or nonvitamin supplements.³Includes homeopathic medicine and self-help materials (e.g., books, CDs, videotapes) for acupuncture, Ayurveda, homeopathy, naturopathy, traditional healers, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, yoga, tai chi, qi gong, energy healing therapy, and craniosacral therapy.⁴*p* value, test for trend, (*p* < 0.001). Based on linear regression with expenditures as the dependent variable and family income as the independent variable.⁵Not significant (*p* > 0.05).

NOTES: CI is confidence interval. Estimates are based on household interviews of a sample of the civilian noninstitutionalized population.

SOURCE: NCHS, National Health Interview Survey, 2012.

Technical Notes

Sample design

The National Health Interview Survey (NHIS) is a cross-sectional household interview survey of the U.S. civilian noninstitutionalized population. Data are collected continuously throughout the year in all 50 states and the District of Columbia. NHIS uses a multistage clustered sample design to produce national estimates for a variety of health indicators. Information on basic health topics is collected for all household members, if necessary by proxy, from one adult family member. Additional information is collected for one randomly selected adult and one randomly selected child in each family. Self-response is required for the Sample Adult questionnaire, except in rare cases where sample adults are physically or mentally incapable of responding for themselves. Interviews are conducted in the home using computer-assisted personal interview techniques, with telephone interviewing permitted for follow-up if necessary. Starting in 2006, the sample design included Asian persons in the oversampling of minority populations in NHIS. Previously, only households with non-Hispanic black and Hispanic persons were oversampled.

Sample size and response rate

In 2012, NHIS interviews were completed in 42,366 households, which yielded 108,131 persons in 43,345 families; the household response rate was 77.6%. The Sample Adult questionnaire was completed for 34,525 adults. The final response rate (which takes into account household and family nonresponse) for the 2012 Sample Adult files was 61.2% (12). The Sample Child questionnaire was completed for 13,275 children. The final response rate (which takes into account household and family nonresponse) for the 2012 Sample Child files was 69.7% (12).

Tests of significance

Statistical reliability and hypothesis tests

Statistical tests performed to assess the significance of differences in prevalence estimates were two-tailed tests. The test statistic used to determine statistical significance of the difference

$$Z = \frac{|X_a - X_b|}{\sqrt{S_a^2 + S_b^2}}$$

between two percentages was where X_a and X_b are the two percentages being compared, and S_a and S_b are the SUDAAN-calculated standard errors of those percentages.

Two-tailed t tests were used to assess the significance of differences in continuous data, such as expenditures. Linear regression was used to assess trends.

The critical value used for all two-sided tests at the 0.05 level of significance was 1.96. No adjustments were made for multiple comparisons.

Relative standard error

Standard errors, produced by using the SUDAAN statistical package, are shown for all percentages in the tables. Estimates with a relative standard error (RSE) greater than 30% and less than or equal to 50% should be used with caution as they do not meet standards of reliability or precision. Estimates with an RSE greater than 50% are not shown. RSEs are calculated as follows:

$$RSE = (SE/Est)100$$

where SE is the standard error of the estimate, and Est is the estimate (percentage).

Definition of selected terms

Definition of terms related to broad categories of complementary health approaches

All complementary health approaches—Includes visits to complementary approach practitioners, purchases of natural product supplements, and costs associated with self-care approaches (see definitions that

follow). For more information about specific health approaches, visit the National Center for Complementary and Integrative Health website at: <https://www.nih.gov/about-nih/what-we-do/nih-almanac/national-center-complementary-integrative-health-nccih>.

Visits to complementary approach practitioners—Includes visits to practitioners of acupuncture, Ayurveda, homeopathy, naturopathy, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, energy healing therapy, and craniosacral therapy; visits to traditional healers; instructors of yoga, tai chi, and qi gong; teachers of movement therapies; and classes for mind-body therapies (see definitions that follow for details on specific approaches).

Natural product supplements—Includes acai pills or gelsecaps, bee pollen (or other bee products), chondroitin, co-enzyme Q10 (CoQ10), cranberry pills or capsules, digestive enzymes (lactaid), echinacea, fish oil (or omega 3, DHA, or EPA fatty acid), garlic supplements, ginkgo biloba, ginseng, glucosamine, green tea pills or EGCG pills, melatonin, milk thistle (silymarin), methylsulfonylmethane, probiotics or prebiotics, SAM-e, saw palmetto, valerian, and other herbs or nonvitamin supplements (see definitions that follow for details on specific approaches).

Self-care approaches—Includes homeopathic medicine and self-help materials (e.g., books, CDs, videotapes) for acupuncture, Ayurveda, homeopathy, naturopathy, traditional healers, chelation therapy, natural product supplements, special diets, chiropractic, massage, movement therapies, biofeedback, mind-body therapies, hypnosis, yoga, tai chi, qi gong, energy healing therapy, and craniosacral therapy.

Definition of terms related to individual complementary health approaches

Acupuncture—A family of procedures involving stimulation of anatomical points on the body by a variety of techniques. American practices of acupuncture incorporate medical traditions from China, Japan, Korea, and other countries. The acupuncture technique that has been most studied scientifically involves penetrating the skin with thin, solid, metallic needles that are manipulated by the hands or by electrical stimulation.

Alternative provider or practitioner—Someone who is knowledgeable about a specific alternative health practice. This person provides care or gives advice about its use and usually receives payment for their services. For some practices, the provider may have received formal training and has been certified by a licensing board or related professional association. For example, a practitioner of biofeedback (biofeedback therapist) has usually received training in psychology and physiology and may be certified by the Biofeedback Certification Institute of America.

Ayurveda—A system of medicine that originated in India several thousand years ago. In the United States, Ayurveda is considered a type of complementary and alternative medicine and a whole medical system. As with other such systems, it is based on theories of health and illness and on ways to prevent, manage, or treat health problems. Ayurveda aims to integrate and balance the body, mind, and spirit (thus, some view it as “holistic”). This balance is believed to lead to contentment and health and to help prevent illness. However, Ayurveda also proposes treatments for specific health problems, whether they are physical or mental. A chief aim of Ayurvedic practices is to cleanse the body of substances that can cause disease, and this is believed to help reestablish harmony and balance.

Biofeedback—A technique that uses simple electronic devices to teach clients how to consciously regulate bodily functions, such as breathing, heart rate, and blood pressure, to improve overall

health. Biofeedback is used to reduce stress, eliminate headaches, recondition injured muscles, control asthma attacks, and relieve pain.

Chiropractic manipulation—A form of health care that focuses on the relationship between the body’s structure, primarily of the spine, and function. Doctors of chiropractic, who are also called chiropractors or chiropractic physicians, use a type of hands-on therapy called manipulation (or adjustment) as their core clinical procedure.

Craniosacral therapy—Practitioners of this body-based therapy use light touch and manipulation focused on the skull and spine, with the intent of sensing and removing what they refer to as blockages or imbalances that may be contributing to a health condition.

Energy healing therapy—Involves the channeling of healing energy through the hands of a practitioner into the client’s body to restore a normal energy balance and, therefore, health. Energy healing therapy has been used to treat a wide variety of ailments and health problems and is often used in conjunction with other alternative and conventional medical treatments.

Guided imagery—Used for healing or health maintenance and involves a series of relaxation techniques followed by the visualization of detailed images, usually calm and peaceful in nature. If used for treatment, the individual will visualize their body free of the specific problem or condition. Sessions are typically 20 to 30 minutes in length, and may be practiced several times a week.

Homeopathy—A system of medical practices based on the theory that any substance that can produce symptoms of disease or illness in a healthy person can cure those symptoms in a sick person. For example, someone suffering from insomnia may be given a homeopathic dose of coffee. Administered in diluted form, homeopathic treatments are derived from many natural sources, including plants, metals, and minerals. Practitioners of homeopathy receive formal training in the diagnosis and treatment of health conditions based on homeopathic principles.

Hypnosis—An altered state of consciousness characterized by increased responsiveness to suggestion. This hypnotic state is attained by first relaxing the body, then shifting attention toward a narrow range of objects or ideas as suggested by the hypnotist or hypnotherapist. The procedure is used to affect positive changes and to treat numerous health conditions including ulcers, chronic pain, respiratory ailments, stress, and headaches.

Massage—Therapists manipulate muscle and connective tissue to enhance function of those tissues and promote relaxation and wellbeing.

Meditation—Refers to a group of techniques, most of which started in Eastern religious or spiritual traditions. In meditation, a person learns to focus their attention and suspend the stream of thoughts that normally occupy the mind. This practice is believed to result in a state of greater physical relaxation, mental calmness, and psychological balance. Practicing meditation can change how a person relates to the flow of emotions and thoughts in the mind.

Naturopathy—An alternative medical system based on the belief that there is a healing power in the body that establishes, maintains, and restores health. Practitioners work with the patient with a goal of supporting this power through treatments such as nutrition and lifestyle counseling, dietary supplements, medicinal plants, exercise, homeopathy, and treatments from traditional Chinese medicine.

Natural product supplements—Nonvitamin, nonmineral dietary supplements are taken by mouth and contain a dietary ingredient intended to supplement the diet other than vitamins and minerals. Examples include herbs or herbal medicine (as single herbs or mixtures), other botanical products such as soy or flax products, and dietary substances such as enzymes and glandulars. Among the most popular are echinacea, ginkgo biloba, ginseng, feverfew, garlic, kava kava, and saw palmetto. Garlic, for example, has been used to treat fevers, sore throats, digestive ailments, hardening of the arteries, and other health problems and conditions.

Osteopathic manipulation—A full-body system of hands-on techniques to alleviate pain, restore function, and promote health and wellbeing.

Progressive relaxation—A technique used to relieve tension and stress by systematically tensing and relaxing successive muscle groups.

Qi gong—An ancient Chinese discipline combining the use of gentle physical movements, mental focus, and deep breathing directed toward specific parts of the body. Performed in repetitions, the exercises are normally performed two or more times a week for 30 minutes at a time.

Tai chi—A mind-body practice that originated in China as a martial art. A person doing tai chi moves his or her body slowly and gently, while breathing deeply and meditating (tai chi is sometimes called “moving meditation”). Many practitioners believe that tai chi helps the flow throughout the body of a proposed vital energy called “qi.” A person practicing tai chi moves his or her body in a slow, relaxed, and graceful series of movements. It can be practiced independently or in a group. The movements make up what are called forms or routines.

Traditional healer—Someone who employs any one of a number of ancient medical practices that are based on indigenous theories, beliefs, and experiences handed down from generation to generation, often orally. The methods employed by each type of traditional healer have evolved to reflect the different philosophical backgrounds and cultural origins of the healer.

Yoga—Combines breathing exercises, physical postures, and meditation to calm the nervous system and balance the body, mind, and spirit. Usually performed in classes, sessions are conducted once a week or more.

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