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COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) AND ADOLESCENT BODY MASS INDEX (BMI): A NATIONAL POPULATION-BASED STUDY

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COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM) AND ADOLESCENT BODY MASS INDEX (BMI): A NATIONAL POPULATION-BASED STUDY

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Abstract

Background

Childhood obesity rates in the United States have remained around 17% since the 1990s - this figure translates to an estimated 12.7 million obese children. Maintaining a healthy weight through adolescence may limit subsequent health risks in adulthood. Complementary and alternative medicine (CAM) encompasses a variety of non-pharmacological treatments and lifestyle choices that have been utilized in addition to or in place of typical Western medicine. The relationship between adolescent Body mass index (BMI) and the use of complementary and alternative medicine has not been widely studied.

Objectives

The purpose of this study is to describe the relationship between adolescent BMI and the use of CAM modalities.

Methods

We performed cross-sectional secondary analyses of the CAM Supplement to the 2012 National Health Interview Survey, exploring the relationship between adolescent BMI and caregiver report of CAM use. The primary outcome of interest for all study aims was whether the referent teen had a BMI that was classified as overweight or obese according to CDC growth charts. Our primary predictor of interest was the use of any CAM treatment or treatment combination in the past 12 months. Logistic regression models accounted for family income, food security status, caregiver education level, child's age, activity limitations, and presence of chronic or acute conditions.

Results

Of the 4,653 adolescents between the ages of 12 and 17 included in the study, 4.1% were underweight, 60.3% had a normal BMI, 15.0% were overweight, and 20.6% were obese. Nearly half of respondents had used at least one CAM modality within the past year (n=2112, 46.6%). Females and teens from households with higher incomes were more likely to have used CAM in the past year. Compared to those who did not use CAM, teens who used 1 or more CAM modalities in the past 12 months had 0.72 times the odds of overweight or obesity, adjusting for covariates (95% CI: 0.63, 0.82). Respondents who reported use of modalities in the biologically-based therapies category were least likely to report elevated BMI, followed by manipulative and body-based modalities. Vitamin and mineral supplementation was the most highly utilized CAM modality followed by non-vitamin or herbal supplementation and yoga, tai chi, and qi gong.

Conclusions

Obesity prevention efforts may improve with the inclusion of biologically-based therapies into existing educational programs and future policy changes. More research is needed regarding a potential causal pathway in order to inform obesity prevention and intervention with CAM modalities.

Introduction

The prevalence of childhood obesity significantly increased in the United States during the 1980s and 1990s (1). Although childhood obesity rates in the United States have since remained relatively constant at around 17%, this figure translates to an estimated 12.7 million children currently living with obesity (2). Between 1990 and 2010, the worldwide prevalence of childhood obesity increased from 4.2% to 6.7% (3). Globally, an estimated 43 million children qualified as overweight or obese in the year 2010, and an additional 92 million were at risk of overweight at this time (3). Obese children have an increased likelihood of being obese as adults (4). Adult obesity is associated with higher risks of developing chronic diseases such as type II diabetes, hypertension, hypercholesterolemia, cardiovascular disease, gallbladder disease, sleep apnea, osteoarthritis, and certain types of cancers (5). Maintaining a healthy weight as a child may decrease these risks by reducing the child's likelihood of developing adult obesity and related diseases (5). Researchers are working to determine obesity and overweight risk factors. For example, some associations have been found between childhood obesity and single-parent households (6), parental obesity (7,8,9), and low household income (9,10). Certain ethnic minority groups also have higher incidences of obesity and overweight as evidenced by higher rates of overweight and obesity in Hispanic and non-Hispanic black child and adolescent populations (1,2). Body Mass Index is a numerical indicator of weight proportionality that is calculated by dividing weight in kilograms by height in meters squared (5). A child's BMI is a non-intrusive means of monitoring his or her weight status.

Complementary and alternative medicine (CAM) encompasses a variety of non-pharmacological treatments, lifestyle choices, and modalities that have been utilized in addition to or in place of the pharmacological and surgical interventions typical of modernized Western medicine (11). In adults, supplementation of conventional lifestyle modification techniques with mind-body medicine was associated with a reduced number of cardiac events, less severe atherosclerosis, and lower systolic blood pressure values (12). Preliminary data also indicate that acupuncture may be an effective treatment for obesity in adults, though more evidence is needed to support this claim (13). Studies regarding the efficacy and safety of herbal supplement use in the treatment of obesity in adults are conflicting (14). However, the relationship between pediatric BMI and the use of complementary and alternative medicine in children has not been widely studied. It has been shown that lifestyle programs can reduce childhood and adolescent obesity within six to twelve months of participation, both with and without concurrent pharmacological obesity treatment (15). Research also suggests that decreased total fat intake is associated with lower weight in both children and adults (6), further indicating that non-pharmacological lifestyle interventions could have an effect on pediatric BMI. Patient and community education regarding CAM could have an impact on BMI and disease prevention both in childhood and throughout adult life. Our objective was to explore the relationship between CAM use and BMI in adolescents in an effort to inform pediatric weight management efforts.

Methods

Study Design:

We performed cross-sectional secondary analyses of the Complementary and Alternative Medicine (CAM) Supplement to the 2012 National Health Interview Survey, exploring the relationship between adolescent BMI and caregiver report of CAM use.

Database:

The 2012 CAM Supplement to the National Health Interview Survey (NHIS) was used to conduct cross-sectional analyses in order to describe the relationship between pediatric BMI and the use of CAM. The NHIS Survey is a national survey that has been conducted annually since 1957 by the National Center for Health Statistics in the Centers for Disease Control and Prevention with the purpose of providing a broad range of health status information on the United States civilian non-institutionalized household population. The NHIS and CAM supplement are performed face-to-face in the home of the respondent with follow-up conversations taking place over the phone as needed. A

total of 42,366 households were surveyed in 2012 across all 50 states and these households included 108,131 individuals. The NHIS CAM Supplement was first performed in 2007 and was expanded during the second iteration of the CAM Supplement in 2012 to include more information on new CAM modalities, costs, reasons for use, usual source of care including personal health care providers, and disclosure of CAM use to personal health care providers. The 2012 NHIS CAM Supplement contains a nationally representative sample of 10,218 children whose caregivers acted as survey respondents on their behalf (n=10,218).

Subject Selection:

Since weight and height were not collected for any sample children younger than 12 years, we restricted analyses to those adolescents between ages 12 and 17 for whom respondents reported both weight and height. No other exclusion criteria were applied.

Variables:

The primary outcome of interest for all study aims whether the subject child had a body mass index (BMI) that was classified as overweight/obese (yes/no) according to CDC growth charts. BMI was calculated based on the child's reported height and weight. Underweight was defined as being less than or equal to the 5th percentile for age and gender, overweight occurred between and 85th and 95th percentiles, and obesity was classified by having a BMI greater than or equal to the 95th percentile (1).

Our primary predictor of interest was the use of any CAM treatment or combination of treatments in the past 12 months. We then investigated whether specific categories of treatments were associated with weight status. CAM treatments were classified as follows: (1) Alternative medical systems/energy healing therapies (acupuncture, ayurveda, homeopathy, naturopathy, traditional healers), (2) Biologically-based therapies (chelation, herbal or non-vitamin supplements, vitamins/minerals, special diets), (3) Manipulative and body-based therapies (chiropractic or osteopathic manipulation, massage therapy, craniosacral therapy, movement or exercise techniques), (4) Mind-body therapies (biofeedback, hypnosis, meditation, guided imagery, progressive relaxation, yoga, tai chi, qi gong).

We selected those covariates for analyses hypothesized or previously shown to be associated with BMI. These included family income based on relation to federal poverty level, caregiver education level (less than high school, HS diploma or GED, more than HS), child's age, food security status (food secure or food insecure), activity limitations, as well as presence of chronic and acute conditions. Presence of chronic conditions was defined as children having one or more of 38 chronic conditions including but not limited to asthma, cerebral palsy, muscular dystrophy, autism spectrum disorder, diabetes, and sickle cell anemia. Acute conditions considered included a formal diagnosis of pneumonia, influenza, tonsillitis, or strep throat occurring within the past 12 months. Acute conditions also included caregiver report of fever lasting longer than a day, head or chest cold, three or more ear infections, or a sore throat not accounted for by strep throat or tonsillitis in the past 12 months.

Analyses

First, we described child and family characteristics for all children using Pearson's chi-square (or Fisher's exact test where appropriate) to compare characteristics across BMI categories and to explore exposure to CAM. We then tested associations between BMI category and CAM exposure, accounting for identified covariates using regression modeling. We estimated odds ratios using logistic regression to assess the independent contribution of CAM exposure on BMI status as reported in the survey. We first compared any exposure to CAM in the past 12 months with no CAM exposure, and second, each category of CAM exposure with none.

We used SAS 9.4 (SAS Institute Inc., Cary, NC) for all analyses. All analyses were weighted according to the sample design of the survey. We used previously described multiple imputation techniques to account for non-response for any analysis that included race/ethnicity, poverty level and parental education.

Results

Of the 4,653 adolescents between the ages of 12 and 17 participating in the study, 4.08% were considered to be underweight, 60.3% fell into a normal BMI range, 15.0% were considered overweight, and 20.6% were obese. Of the children studied, 51.1% were male and 49.0% were female with a combined mean age of 14.5 years (1.7 SD). 16.6% of survey respondents were from the Northeast, 20.3% were residents of the Midwest, 35.0% were from the South, and 28.2% were from the Western portion of the United States. 27.2% of respondents were Hispanic, 46.5% were White, non-Hispanic, 16.0% were Black, non-Hispanic, and 10.3% reported multi-ethnic, non-Hispanic status. 2012 Census Bureau data indicates that, at the time of the survey, 16.3% of U.S. citizens reported Hispanic ethnicity, 63.9% reported White, non-Hispanic ethnicity, 12.3% reported Black, non-Hispanic ethnicity, and 7.5% reported multi-ethnic, non-Hispanic status (16). This indicates that the study data used may be over-representative of the Hispanic, non-Hispanic Black, and multi-ethnic populations and under-representative of the White, non-Hispanic population. Poverty status was assessed using the federal poverty level (FPL): 19.1% of respondents had an income between 0-99% of the FPL, 24.2% had an income between 100-199% of the FPL, 29.7% had an income between 200-399% of the FPL, and 26.9% of respondents had an income that was considered to be 400% or more of the FPL. 82.7% of respondents reported high or moderate food security status, 10.1% reported low food security, 7.0% reported very low food security, and 0.1% of respondents had an unknown food security status. 10.2% of caregivers reported an education level below the high school level, 20.9% reported that they had obtained their high school diploma, and 68.9% reported educational status beyond high school. 42.4% of respondents denied the presence of chronic conditions in the child of interest while 57.6% of the children studied had been diagnosed with a chronic condition. 56.5% of respondents reported one or more acute conditions in the child of interest while 57.6% denied the presence of recent acute illnesses.

Nearly half of respondents had used at least one CAM modality within the past year (n=2112, 46.6%). Females in the sample were more likely to have used CAM in the past year than males ($p<0.01$) and children from households with higher incomes were also more likely to have used one or more CAM modalities within the past 12 months ($p<.01$). Similarly, those children who were identified as living in a food secure household were more likely to have used one or more CAM modalities in the past 12 months than those living with food insecurity ($p<.01$). White and multi-ethnic adolescents were more likely to have used one or more CAM modalities in the past year than Black or Hispanic study participants ($p<0.01$). Children with more educated caregivers ($p<0.01$) and children who were insured at the time of the survey ($p<0.01$) were also more likely to have used one or more CAM modalities in the past 12 months. Children with a personal health care provider were more likely than those without to have used one or more CAM modalities within the past 12 months ($p<0.01$). Children with one or more chronic conditions ($p<.01$) or acute conditions in the past 12 months ($p<.01$) were more likely to have used one or more CAM modalities within the past 12 months than those without any chronic or recent acute conditions. Children who had been diagnosed with emotional, behavioral, or mental (EMB) issues were more likely to have used one or more CAM modalities than those with no history of EMB issues ($p<.01$). There was no association between activity limitation ($p=0.28$) or U.S. region of residence ($p=0.33$) and any use of CAM within the past 12 months.

There appears to be an association between weight status and CAM use within the past 12 months in all four modality categories in the unadjusted analysis. Of all of the CAM modalities studied, those most frequently reported to have been utilized within the past 12 months were vitamin or mineral supplementation, herbal non-vitamin supplementation, and yoga, tai chi, or qi gong. CAM modalities that had not been reported as utilized by any of the study subjects within a year to the survey included acupuncture, ayurveda, traditional healers, craniosacral therapy, hypnosis, meditation, guided imagery, and progressive relaxation.

Compared to those who did not use CAM, children who used 1 or more CAM modalities in the past 12 months had 0.72 (95%CI: 0.63, 0.82) times the odds of overweight or obesity, adjusting for family income, food security status, caregiver education level, child's age, as well as presence of chronic

or acute conditions. There was no evidence of association between the use of Alternative Medical Systems or Energy Healing Therapies in the past 12 months and normal BMI. Adjusting for family income, caregiver education level, child's age, food security status, and presence of activity limitations as well as acute or chronic conditions, children who used 1 or more biologically-based therapies, manipulative or body-based therapies, or mind-body therapies in the past 12 months had 0.80 (95%CI: 0.70, 0.92), 0.71 (95%CI: 0.52, 0.97), or 0.64 (95%CI: 0.44, 0.93) times the odds of overweight or obesity, respectively.

Discussion

There was an association between normal BMI and CAM usage in the multivariate analysis. The strongest correlation occurred between normal BMI and use of modalities within the biologically-based therapies category, followed by modalities that were included in the manipulative and body-based therapies category. Vitamin and mineral supplementation was by far the most highly utilized CAM modality followed by non-vitamin or herbal supplementation and then yoga, tai chi, and qi gong. Although there was a significant correlation between healthy weight and usage of vitamin and mineral supplementation, it is unclear at this time whether or not this association is causative in nature. More research is needed to determine if supplementation with vitamins and minerals either directly increases the likelihood of healthy weight or is simply associated with other contributing factors to a healthy weight such as a healthy diet and active lifestyle. Similar questions arise when examining the relationship between healthy BMI and either non-vitamin supplementation or yoga, tai chi, and qi gong. There was no definitive correlation between healthy BMI and modalities categorized as alternative medical systems or energy healing therapies, though this may have been influenced by the sparse number of respondents who reported usage of these types of therapies.

Limitations

There are many factors associated with weight status so we may have failed to account for other covariates not encountered in the available data. For instance, although there is a documented correlation between caregiver BMI and child's BMI (7,8,9), caregiver BMI was not considered in our analysis due to unavailability of caregiver data which was necessary for these calculations. The survey that we used had already been created and completed by the Census Bureau with the questions asked having been previously set by survey administrators prior to our retrieval of the resultant data. Even within the final dataset, there was an incomplete assessment of respondents in many categories, especially for many of the specific CAM modalities. There were many instances where data for specific modalities was not ascertained at the time of the survey and, as a result, many study subjects' responses were missing in several categories. Furthermore, we only utilized data regarding CAM usage during the 12 months prior to the survey administration. Any confirmation of usage before this point was not utilized due to the usage being too far removed from the period of study. This was done in order to limit recall bias but, consequently, removed data of CAM usage prior to this time period and may have contributed to a conservative estimate of CAM usage.

We did not have a representative sample based on census bureau data, particularly with regards to minorities. In spite of the fact that Asians, American Indians, and Pacific Islanders were all grouped into the "multi-ethnic, non-Hispanic" category, they were still underrepresented as a whole. This could have had an effect on our results since there is generally less obesity in these ethnic populations (2). However, in spite of our conservative estimates of both CAM usage and ethnic groups with a higher likelihood of normal weight status, we still found a correlation between CAM and healthy BMI. The NHIS intentionally oversamples minority populations in order to allow for more precise estimates of these populations (17). Also, it has been demonstrated that Hispanic, non-Hispanic Asian, and non-Hispanic Black populations are less likely to disclose CAM use to healthcare providers (18,19). Both oversampling of Hispanic and non-Hispanic Black populations as well as underreporting of CAM usage in minority groups serve to strengthen the associations found during our analyses.

Conclusions

A longitudinal study containing more data on individual CAM therapies is needed to further assess the relationship between weight status and CAM usage. For those therapies with little to no respondents reporting usage, an investigation into reasons for lack of use would be helpful to explore this area further. It would be helpful to know if certain modalities are not being utilized due to factors such as lack of interest, fear of malpractice or side effects, or treatment access issues such as cost or availability.

Our research raises interesting questions about causality which will need to be addressed in future studies. The data obtained from our study could support creation of a study examining associations between dietary supplementation or yoga, tai chi, and qi gong on weight status. Building on our work, results obtained from additional studies could help facilitate the creation of community outreach programs and interventions designed to educate the public regarding health concerns related to weight management. Additional findings in this area will help to guide future research and policy regarding pediatric public health concerns related to weight management.

In order to help manage obesity, avoid weight fixation, and prevent eating disorders, it is recommended that healthcare providers maintain focus on family-based interventions and healthy lifestyle choices (20). Increased knowledge and awareness of the relationship between CAM use and BMI will assist both healthcare providers and caregivers in selecting CAM modalities that will be effective and obtainable for families of children at risk for or living with obesity.

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Figures and Tables

Table 1: Demographic Information and Reported CAM Use Frequencies among US Adolescents, 2012 NHIS CAM Supplement

	Underweight		Healthy Weight		Overweight		Obese		Total		Pr (MH)
	n	%	n	%	n	%	n	%	n	%	
Sex											
Male	110	57.90%	1357	48.30%	375	53.80%	534	55.70%	2376	51.10%	
Female	80	42.10%	1450	51.70%	322	46.20%	425	44.30%	2277	48.90%	0.0013
Poverty Status											
0-99% FPL	35	18.40%	440	15.70%	167	24.00%	246	25.70%	888	19.10%	
100-199% FPL	35	18.40%	607	21.60%	184	26.40%	302	31.50%	1128	24.20%	
200-399% FPL	55	28.90%	865	30.80%	205	29.40%	259	27.00%	1384	29.70%	
400% FPL or above	65	34.20%	895	31.90%	141	20.20%	152	15.80%	1253	26.90%	<.0001
Food Security Status											
Food Secure (High or Marginal)	161	84.70%	2412	85.90%	547	78.50%	730	76.10%	3850	82.70%	
Low Food Security	20	10.50%	237	8.40%	84	12.10%	131	13.70%	472	10.10%	
Very Low Food Security	9	4.70%	156	5.60%	65	9.30%	97	10.10%	327	7.00%	
Unknown	0	0.00%	2	0.10%	1	0.10%	1	0.10%	4	0.10%	
Missing									0		<.0001
Race/Ethnicity											
Hispanic	37	19.50%	673	24.00%	226	32.40%	328	34.20%	1264	27.20%	
White, non-Hispanic	102	53.70%	1432	51.00%	280	40.20%	350	36.50%	2164	46.50%	
Black, non-Hispanic	31	16.30%	390	13.90%	129	18.50%	197	20.50%	747	16.10%	
Multiple, non-Hispanic	20	10.50%	312	11.10%	62	8.90%	84	8.80%	478	10.30%	0.0026
Caregiver Education Level											
Less than High School Diploma	12	6.30%	224	8.00%	92	13.20%	146	15.20%	474	10.20%	
High School Diploma or GED	31	16.30%	506	18.00%	170	24.40%	264	27.60%	971	20.90%	
More than High School	147	77.40%	2074	74.00%	434	62.40%	548	57.20%	3203	68.90%	<.0001
Chronic Conditions											
No Chronic Conditions	69	36.30%	1290	46.00%	271	38.90%	342	35.70%	1972	42.40%	
1 or More Chronic Conditions	121	63.70%	1517	54.00%	426	61.10%	617	64.30%	2681	57.60%	<.0001
Acute Conditions in the Past 12 Months											
One or More Acute Conditions	101	53.20%	1649	58.70%	378	54.20%	502	52.30%	2630	56.50%	
No Acute Conditions	89	46.80%	1158	41.30%	319	45.80%	457	47.70%	2023	43.50%	0.0021
Any CAM Use, Last 12 Months											
One or More	102	55.10%	1375	50.30%	291	42.90%	344	36.80%	2112	46.60%	
No CAM Use	83	44.90%	1361	49.70%	388	57.10%	592	63.20%	2424	53.40%	<.0001

Table 2: CAM Type and BMI Associations among US Adolescents, 2012 NHIS CAM Supplement

	Underweight		Normal BMI		Overweight		Obese		Total	
	n	%	n	%	n	%	n	%	n	%
Alternative Medical Systems/Energy Healing Therapies										
Used in Past 12 Months	3	1.6	69	2.5	16	2.4	11	1.2	99	2.2
Did Not Use in Past 12 Months	182	98.4	2664	97.5	663	97.6	924	98.8	4433	97.8
Missing									121	
Biologically-based Therapies										
Used in Past 12 Months	99	53.5	1266	46.3	271	39.9	327	35	1963	43.3
Did Not Use in Past 12 Months	86	46.5	1467	53.7	408	60.1	607	65	2568	56.7
Missing									122	
Manipulative and Body-based Therapies										
Used in Past 12 Months	9	4.9	203	7.4	33	4.9	26	2.8	271	6
Did Not Use in Past 12 Months	176	95.1	2533	92.6	646	95.1	910	97.2	4265	94
Missing									117	
Mind-body Therapies										
Used in Past 12 Months	10	5.4	140	5.1	27	4	15	1.6	192	4.2
Did Not Use in Past 12 Months	175	94.6	2593	94.9	652	96	919	98.4	4339	95.8
Missing									122	

FPL - Federal Poverty Level. In 2012, the FPL for a family of 4 was \$23,050

CAM - Complementary and Alternative Medicine

BMI - Body Mass Index

Table 3: Multivariable Logistic Regression Model - Associations with Overweight/Obese BMI and any use of CAM among US Adolescents, 2012 NHIS CAM Supplement

	<u>Odds Ratio</u>	<u>95% Wald Confidence Limits</u>
<u>Family Characteristics</u>		
Household Income		
<i>400% FPL or above (ref)</i>	-	
200-399% FPL	1.51	[1.26 , 1.81]
100-199% FPL	1.89	[1.56 , 2.30]
0-99% FPL	1.94	[1.57 , 2.41]
Caregiver Education		
<i>More than High School (ref)</i>	-	
High School Diploma or GED	1.43	[1.22 , 1.68]
Less than High School	1.57	[1.26 , 1.95]
Food Security		
<i>secure (ref)</i>	-	
insecure	1.24	[1.05 , 1.47]
<u>Adolescent Characteristics</u>		
Age (continuous measure)	0.90	[0.86 , 0.93]
Chronic Conditions		
<i>none (ref)</i>	-	
One or more chronic conditions	1.48	[1.28 , 1.70]
Acute Conditions		
<i>none (ref)</i>	-	
One or more acute conditions	1.23	[1.08 , 1.41]
Activity Limitations		
<i>none (ref)</i>	-	
Any	1.31	[1.06 , 1.6120]
<u>Use of Complementary and Alternative Medicine</u>		
<i>none (ref)</i>	-	
Any	0.72	[0.63 , 0.82]
<p>FPL - Federal Poverty Level. In 2012, the FPL for a family of 4 was \$23,050 CAM - Complementary and Alternative Medicine BMI - Body Mass Index</p>		

Table 4: Multivariable Logistic Regression Model - Associations with Overweight/Obese BMI and specific CAM subtypes among US Adolescents in the past 12 months, 2012 NHIS CAM Supplement

		<u>Odds Ratio</u>	<u>95% Wald Confidence Limits</u>
<u>Family Characteristics</u>			
Household Income	<i>400% FPL or above (ref)</i>	-	
	200-399% FPL	1.47	[1.23 , 1.77]
	100-199% FPL	1.96	[1.60 , 2.39]
	0-99% FPL	1.97	[1.57 , 2.47]
	Caregiver Education		
	<i>More than High School (ref)</i>	-	
	High School Diploma or GED	1.39	[1.18 , 1.65]
	Less than High School	1.53	[1.22 , 1.93]
Food Security	<i>secure (ref)</i>	-	
	insecure	1.24	[1.04 , 1.49]
<u>Adolescent Characteristics</u>			
Age (continuous measure)		0.90	[0.87 , 0.94]
Chronic Conditions	<i>none (ref)</i>	-	
	One or more chronic conditions	1.54	[1.33 , 1.78]
Acute Conditions	<i>none (ref)</i>	-	
	One or more acute conditions	1.24	[1.08 , 1.42]
Activity Limitations	<i>none (ref)</i>	-	
	Any	1.29	[1.04 , 1.61]
<u>Use of Complementary and Alternative Medicine</u>			
	<i>none (ref)</i>	-	
	1 or more alternative medical system or energy healing therapies	0.93	[0.57 , 1.52]
	One or more biologically based therapies	0.80	[0.70 , 0.92]
	One or more manipulative or body-based therapies	0.71	[0.52 , 0.97]
	One or more mind-body therapies	0.64	[0.44 , 0.93]

FPL - Federal Poverty Level. In 2012, the FPL for a family of 4 was \$23,050

CAM - Complementary and Alternative Medicine

BMI - Body Mass Index

Figure 1: Specific CAM Modalities and adolescent BMI Associations, 2012 NHIS CAM Supplement

