

## Background

- Recurrent headaches (HA) are common among adolescents and account for a substantial amount of health care use and cost.
- Adolescents who experience HA are four times more likely to miss two or more weeks of school and have two or more emergency room visits<sup>1</sup>.
- Experience of HA is commonly accompanied by co-occurring conditions which impact symptoms, functional impairment, and treatment response.<sup>2</sup>
- Adolescents are the most common users of complementary and alternative medical (CAM) therapies, such as biologically based and mind-body therapies.<sup>3</sup>
- Little is known about the population-based prevalence of HA with other chronic co-occurring conditions and the relationship of CAM use with conventional care in adolescents with HA.

## Objectives

To identify the population based prevalence and patterns of CAM use in youth with HA and evaluate associations with co-occurring health problems and associations with use and expenditures for conventional medical care.

## Data and Methods

Data from two nationally representative surveys were used:

### 1) Five 2007 National Health Interview Survey (NHIS) Data Files:

- Family;
  - Imputed Income;
  - Person;
  - Sample Child and
  - Child Complementary and Alternative Medicine (CAM) Supplement
- 9,417 children included in the final sample; 4,263 adolescents (10-17 years old) included, representing 33.2 million US adolescents
  - Key variables: (a) CAM use (39 modalities); (b) frequent or severe HA, including migraine; (c) recurring headaches, other than migraine grouped together; (d) presence of other chronic and non-chronic health problems (43 of which were categorized as chronic)

### 2) 2008 Medical Expenditures Panel Survey (MEPS) Panel 13 Data File

- Linked NHIS data file was merged to the Panel 13 2008 MEPS for conventional medical care expenditures assessment
- NHIS/MEPS linked file contains 2,411 sample children, including 1,070 adolescents
- All data weighted to represent the US population of adolescents
- Weights constructed by adjusting MEPS Panel 13 weights to reflect NHIS probabilities of selection for sub-sampling of children<sup>4</sup> and then adjusted weights ranked by age, sex, race/ethnicity and US geographic region

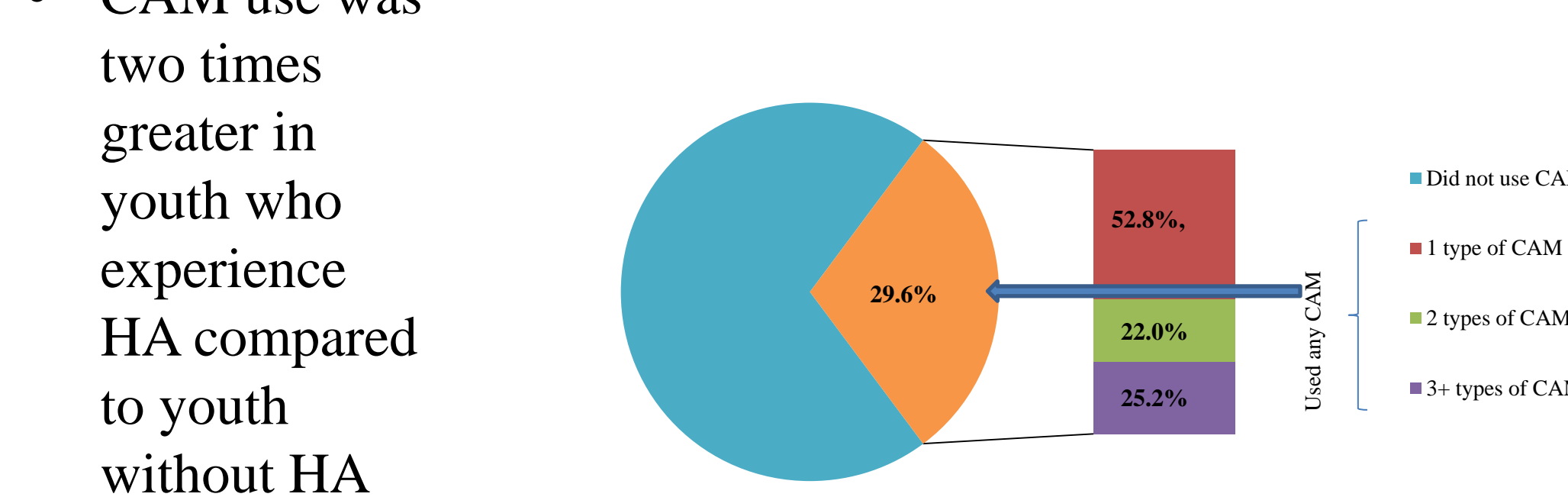
### Analytic methods:

- Standardized t-tests and chi-square tests to evaluate statistical significance of observed differences within and across groups
- Logistic regression analyses used to assess associations between CAM use and experience of HA (with or without other chronic health conditions, etc.); demographic and other health related variables adjusted for
- Standard two-part regression model used to estimate health care expenditures, controlling for child's age, sex, race/ethnicity, US geographic region, and family income
- SPSS 19.0 with Complex Samples used for all analyses

## Results: Prevalence of Recurrent Headache and CAM use in adolescents

- 10.6% or 3.52 million adolescents were estimated to have experienced HA in the past 12 months
- 29.6% of adolescents with HA (representative of 1.03 million adolescents in US) used one or more CAM modality in the past 12 months (Figure 1)

Figure 1. CAM Use Prevalence and Number of CAM Modalities Used Among Adolescents With Headache, Data Source: 2007 NHIS



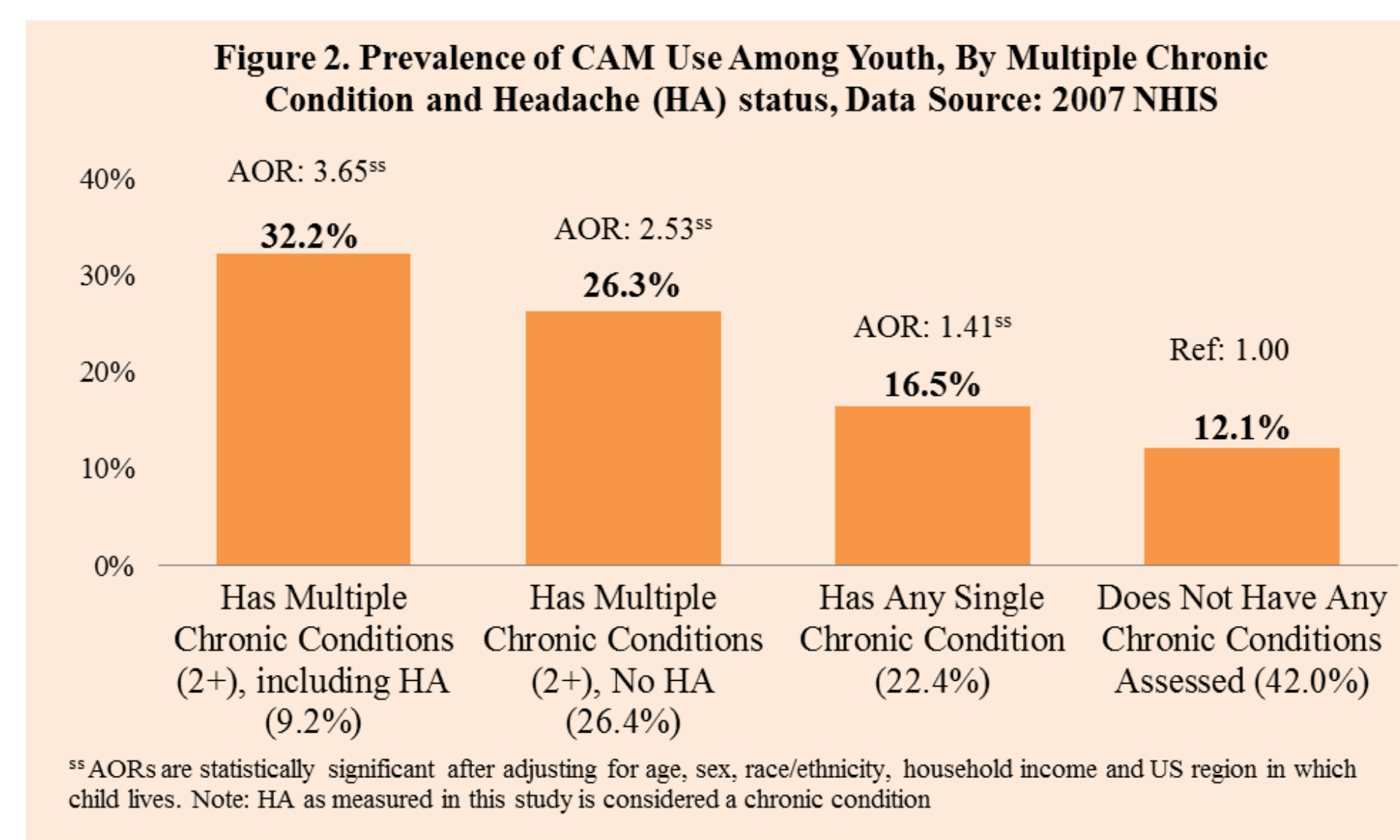
- Nearly half of adolescent with recurrent HA and who use CAM used more than one type of CAM modalities

## Results: CAM use in adolescents with HA

- Compared to youth with HA who did not use CAM, adolescents with HA who use CAM were more likely to be older (41.3% vs. 32.1% age 16-17), white (73.4% vs. 54.4%) and to live in homes with higher incomes (26.7% vs. 19.7% above 400% FPL), to have private health insurance (69.5% vs. 55.0%), and higher maternal education (71.9% vs. 55.8% more than high school) compared to youth with HA who do not use CAM

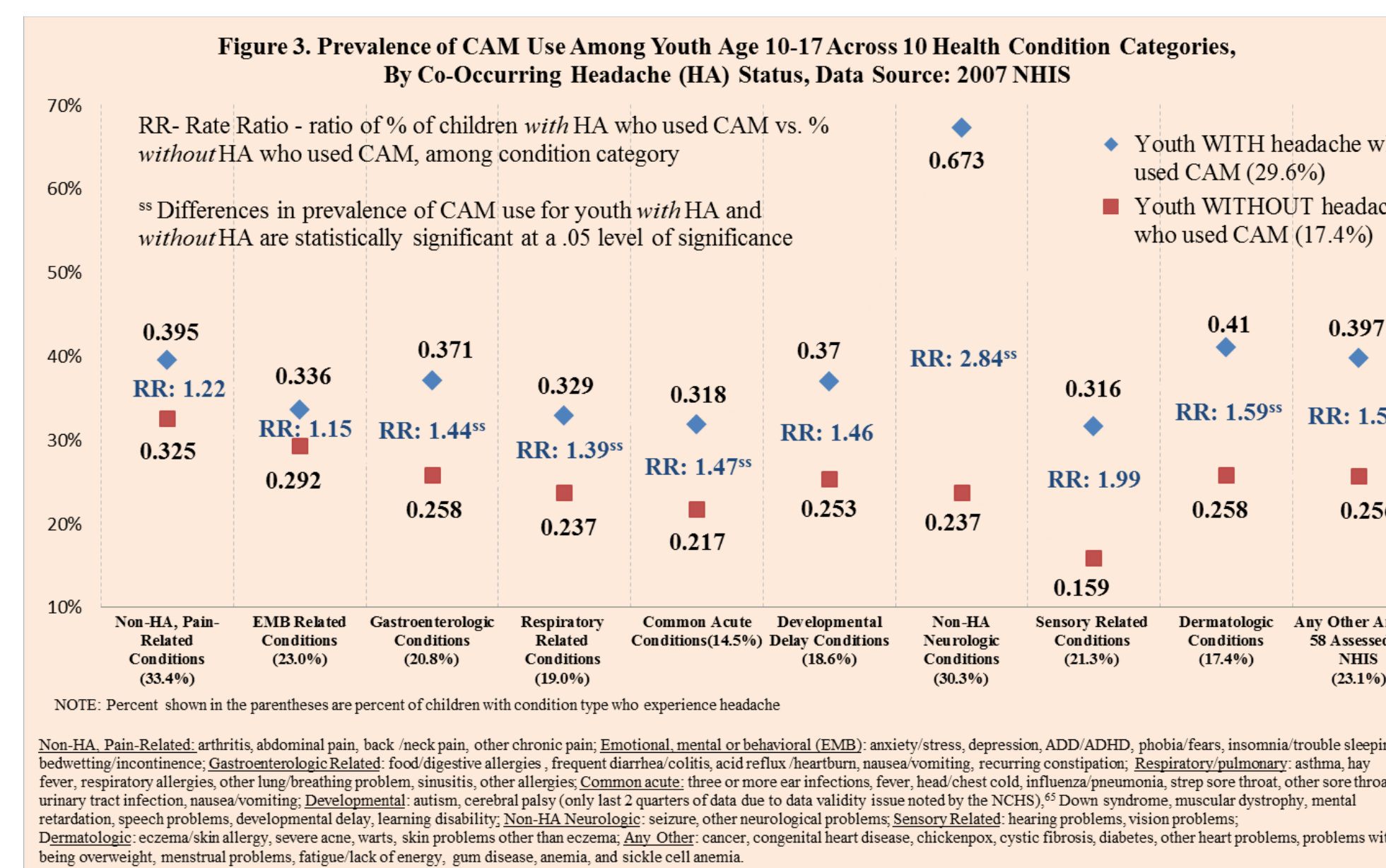
Commonly used CAM modalities by youth with HA:	CAM types <sup>5</sup> :
<ul style="list-style-type: none"> <li>vitamins/minerals (past 30 days) - 14.3%</li> <li>herbal supplements - 9.8%</li> <li>deep breathing exercises - 8.7%</li> <li>chiro/osteopathic manipulation - 5.4%</li> <li>yoga, tai chi, or qi gong - 5.0%</li> <li>meditation - 3.1%</li> <li>massage - 2.8%</li> </ul>	<ul style="list-style-type: none"> <li>biologically based therapies - 16.2%</li> <li>mind-body therapies - 13.3%</li> <li>manipulative/body-based therapies - 7.4%</li> <li>alternative medical system/energy healing therapies - 4.7%</li> </ul>
<ul style="list-style-type: none"> <li>Higher rates of CAM use among adolescents with headache than without</li> </ul>	<ul style="list-style-type: none"> <li>Biologically-based therapies: chelation, herbal supplements, specific vitamins/minerals used in past 30 days, special diets (Vegetarian, Macrobiotic, Atkins, Pritikin, Ornish, Zone, South Beach)</li> <li>Mind-body therapies: biofeedback, meditation, guided imagery, progressive relaxation, deep breathing exercises, hypnosis, yoga, tai chi, qi gong, support group meeting, and stress management class</li> <li>Manipulative and body-based therapies: chiropractic or osteopathic manipulation, massage and movement therapies (Feldenkrais, Alexander technique, Pilates, Trager psychophysical integration)</li> <li>Alternative Medical System/Energy healing therapies: acupuncture, ayurveda, homeopathic treatment, naturopathy, traditional healers (Curander, Espiritista, Hierbero or Yerbero, Shaman, Botanica, Native American healer or Medicine man, Sobador) and energy healing<sup>16</sup></li> </ul>
<ul style="list-style-type: none"> <li>More easily accessible CAM modalities and where professional care is not essential were more commonly used than therapies requiring professional interventions.</li> </ul>	

## Results: CAM use in adolescents with HA and co-occurring chronic conditions (CC)



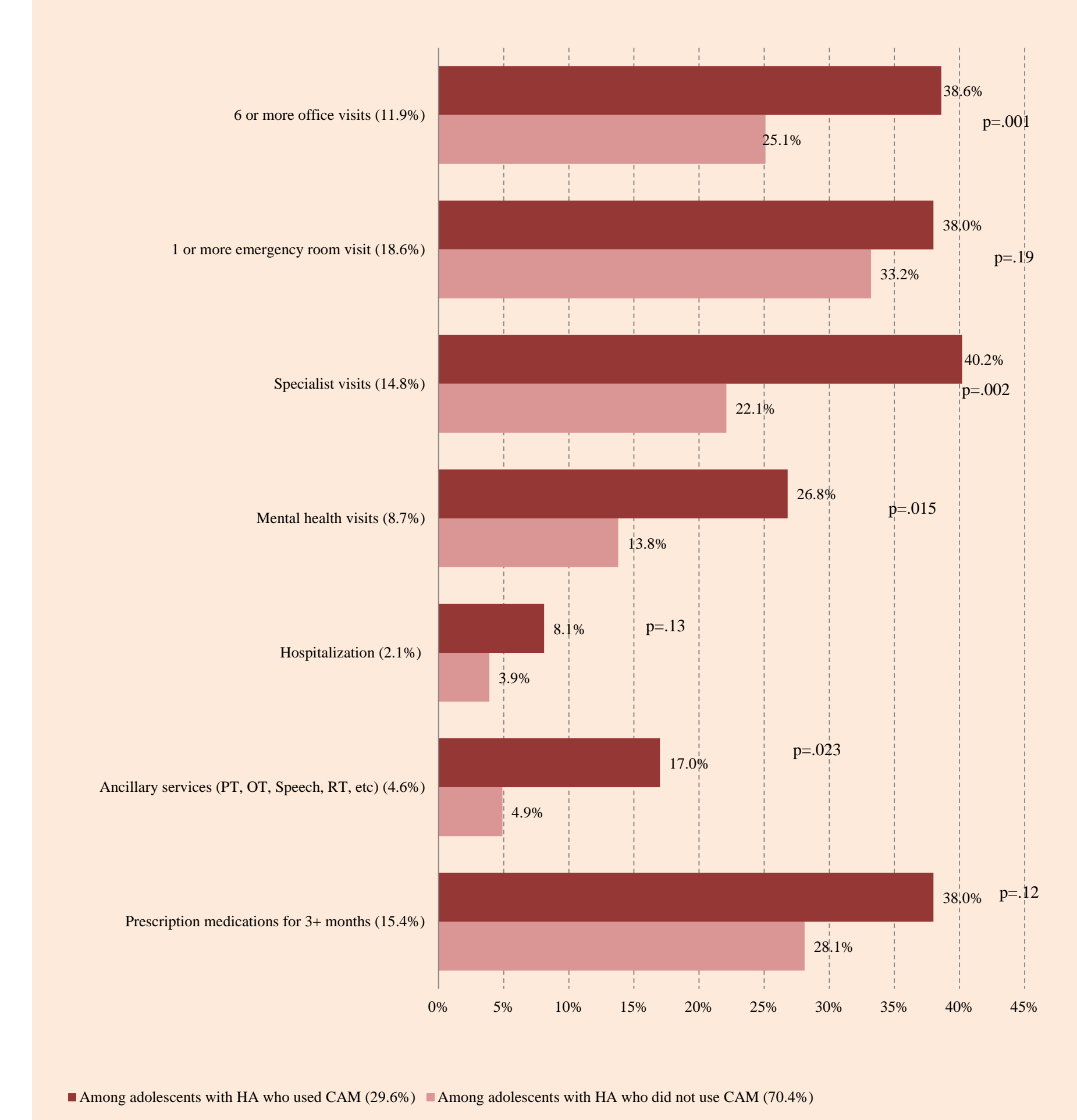
- Youth with HA who used CAM were significantly more likely than their non-CAM using counterparts to:
  - Experience at least one of the other 43 chronic conditions assessed in the NHIS (94% vs. 83.3%)
  - Have experienced difficulties with emotions, concentration or behavior (19.5% vs. 12.6%), school attendance (22.1% vs. 7.7% missing 2+ weeks), and functioning in daily activities (25.4% vs. 14.5%)

- Odds of CAM use were 3.65 times higher for adolescents with HA and other CC compared to those without any of these (Figure 2)
- CAM use is higher in adolescents with HA who also experience emotional, mental or behavioral (EMB) or another pain-related conditions compared to those with HA and neither EMB or other (non-HA) pain-related conditions
- Across 10 condition groups assessed, adolescents with HA were 1.15 to 2.84 times more likely to use CAM than youth with these conditions who did not experience HA (Figure 3)



## Results: Conventional health care utilization and CAM use

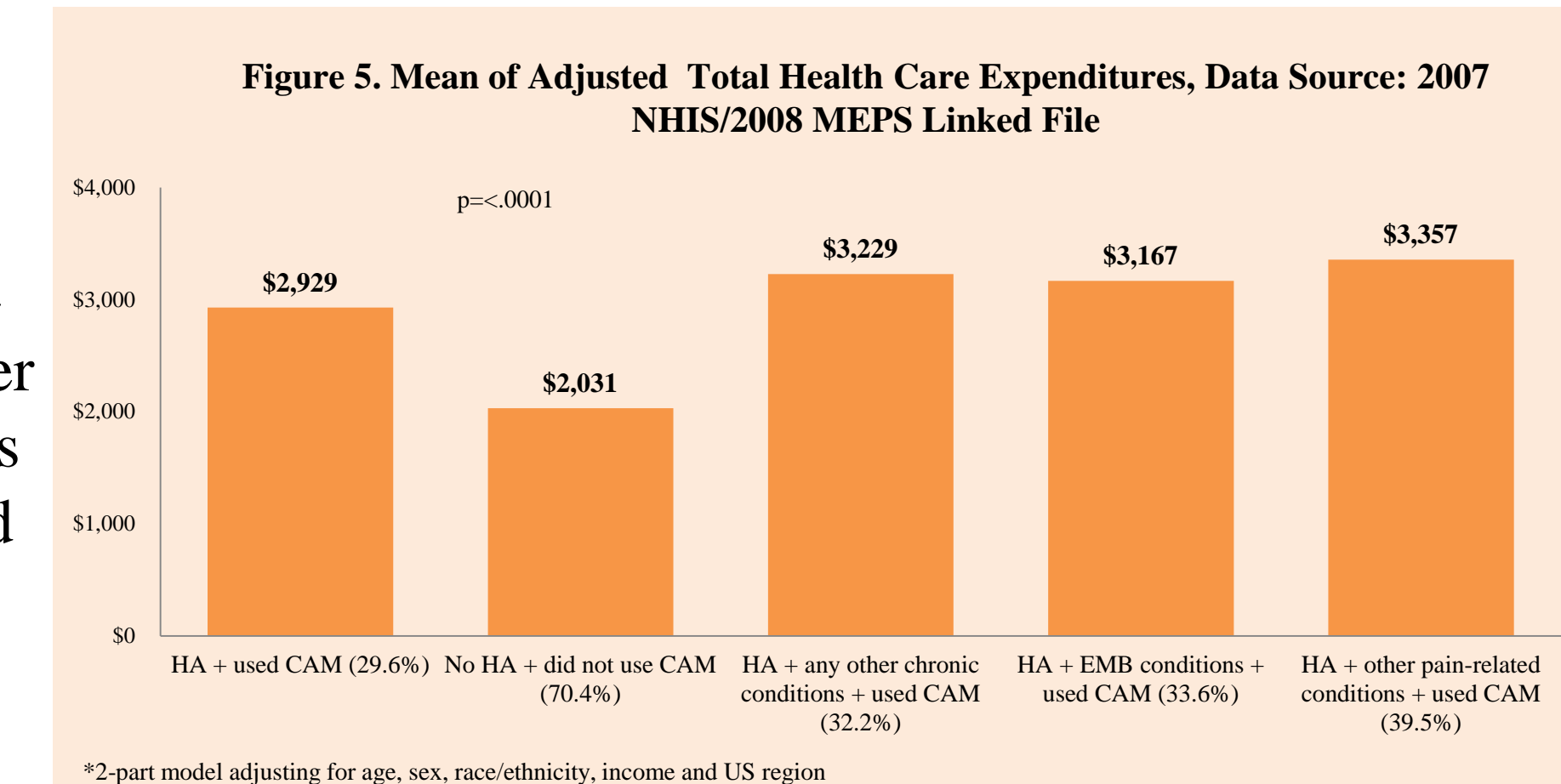
Figure 4. Conventional Care Use Among Adolescents With Recurrent Headache, Data Source: 2007 NHIS



- Youth experiencing HA who used CAM had significantly higher use of conventional medical care (CMC) compared to youth experiencing HA who did not use CAM (Figure 4), these rates were higher if they had co-occurring EMB or other pain-related conditions
- Problems accessing CMC was 1.3 times higher among adolescents with HA who used CAM than those with HA who did not use CAM, however, the difference was not statistically significant due to small sample size (40.6% vs. 30.6%; p=0.10)
- CMC access problems were reported higher among adolescents with HA who used CAM if they also experienced EMB problems (49.3%) or other pain-related conditions (51.3%)

## Results: Medical care expenditures and CAM use

- The total health care and out-of-pocket expenditures were significantly higher among adolescents with HA who used CAM than those who did not use CAM (Figure 5)



## Discussion and Conclusions

- Adding to clinic-based studies, this study provides a nationally representative population-based profile of CAM use among children who experience recurrent HA.
- While findings are consistent with clinically focused studies showing relatively higher CAM use among youth with HA, due to the range of variables available in data uses, this study adds to these studies by also examining how co-occurring conditions, functional difficulties and conventional medical care use are associated with CAM use among youth with HA.
- Findings point to the continued examination of health insurance coverage for CAM modalities and addressing potential disparities in access to evidence-based approaches that are potentially beneficial.
- Low rates of certain types of CAM modalities with the greatest evidence of benefit<sup>7</sup> among all youth with HA may suggest a potential underuse of CAM modalities overall (e.g. some mind-body therapies).
- Overall findings on higher conventional medical care use and expenditures among CAM users point to the need to include integrative medical care providers in overall care coordination activities occurring through various medical home efforts in the US.
- Findings could also suggest CAM use is more likely among youth who have unmet needs for conventional care or poorer quality of conventional care.
- With improved communication between health care providers, parents and youth, everyone can learn more about the potential benefits from using the many self-care approaches included in CAM, as well as the possibility of reducing often costly medical interventions.
- In addition, these discussions may also reveal the importance of medications and other treatments to help youth with headaches who often experience headaches on a weekly basis and who miss a large number of school days and repeatedly use the emergency room.
- Care coordination and integration of care should also include CAM therapies. Coordination begins with communication between parents, youth and providers about the use of CAM.
- The study findings suggest the importance of integrating CAM into conventional care.

### Limitations:

- This study was based on national cross-sectional survey data and did not address questions that can only be answered in prospective controlled trials (e.g., whether CAM use is beneficial or harmful) or longitudinal studies (e.g. impact of CAM on health across time).
- A survey in which parents answer retrospectively on behalf of youth may not detect the entire range and extent of CAM use among youth.
- It did not include all types of care that some might consider complementary care, such as prayer and home remedies and did not ask about the intensity and frequency of CAM use or severity of HA. In addition to demographic factors and co-occurring conditions, CAM use might be influenced by disease severity or local variations in availability of CAM therapies.
- Although state licensure for CAM practitioners varies state by state, the sample was insufficient to conduct analyses on a state-by-state level and examine associations with variations in state policies and health insurance practices across states.
- The linked MEPS-NHIS file does allow for basic evaluation of whether children experience care reflective of having a medical home due to sample size limitation.

## References

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