

Research

Use of Chiropractic or Osteopathic Manipulation by Adults Aged 50 and Older: An Analysis of Data from the 2007 National Health Interview Survey

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ABSTRACT

Purpose: to describe the characteristics of older adults who use chiropractic or osteopathic (C/OM) manipulation and the reasons for which they seek care.

Methods: Data from the National Health Interview Survey (NHIS) 2007 for adults aged 50 years and over were analyzed assessing the use of C/OM. National population estimates were generated using the complete NHIS survey design structure (clustering, stratification and weighting). Odds ratios (OR) and 95% confidence intervals (CI) were calculated using binary logistic regression models to assess the likelihood of respondents reporting having seen a practitioner for C/OM within the past 12 months as a function of practice- and respondent-related characteristics.

Results: 10.0% of the sample sought C/OM care in the past 12 months. C/OM users were less likely to be aged 65 or older (OR, 0.71; CI, 0.59- 0.86); to be Hispanic compared to white, non-Hispanic (OR, 0.65; CI, 0.45- 0.94); to have Medicare coverage; and to have received a flu shot within the past 12 months (OR, 0.81; CI, 0.67- 0.97). There were no significant differences in reported health status or in having a primary care physician. Back problems (56.0%) neck problems (13.8%) and other musculoskeletal complaints accounted for 87.6% of conditions; 10.7% of conditions were unspecified, and 1.7% were nonmusculoskeletal. 46.0% of respondents agreed that they sought care for C/OM for general wellness or disease prevention, 15.8% to improve energy, and 11.7% to improve immune function.

Conclusion: C/OM was the most commonly used provider-based complementary therapy for respondents aged 50 and older within the last 12 months, most commonly for musculoskeletal conditions but often for general wellness or disease prevention.

Key words: chiropractic; complementary and alternative health care; older adults

INTRODUCTION

The United States (US) Census Bureau estimates that nearly 20% of the population will be age 65 or older by 2030.¹ Musculoskeletal conditions, particularly spine-related pain, are one of the leading causes of disability in older adults.² Complementary and alternative medicine (CAM) was utilized by almost 4 in 10 adults in the US by 2007,³ and chiropractic care is the most commonly used CAM therapy for back pain.⁴ Since there is substantial evidence that chiropractic care is effective in treating musculoskeletal pain in general,⁵ it is not surprising that older adults comprise a substantial proportion of chiropractic patients, with 15.4% age 65 and older, and 22.8% ages 51-64.⁶ In addition, development of chronic spinal pain is highly co-morbid with a variety of conditions associated with premature morbidity and mortality,⁷⁻⁹ as well as poorer outcomes related to cardiac rehabilitation.¹⁰

An analysis of 2007 National Health Interview Survey (NHIS) data described characteristics of adults who use CAM in the U.S.³ However, in their analysis by age group, only the general category of “manipulative and body-based therapies,” which includes chiropractic or osteopathic manipulation (C/OM), massage

and movement therapies, was used. The purpose of this study was to provide a more specific description of the characteristics and demographics of older adults who use chiropractic or spinal manipulation, the conditions for which they use the therapy, whether or not they informed their primary care doctor of this use, along with exploration of various interactions related to this care.

METHODS

This study was a secondary data analysis of the NHIS 2007 data set, the most recent one to include a section on CAM.¹¹ The ASCII data sets of the NHIS 2007 Person file, Adult Alternative Medicine files, as well as the Adult Core Sample (ACS), were imported into the Statistical Analysis System, version 9.2 (SAS Institute Inc, Cary, NC) and merged into a single data set. Only observations (respondents) having records in the Adult Alternative Medicine file and variables relevant to answer the research questions were retained. These included adults aged 50 years or older. The variables retained included socio-demographic variables such as age, gender, race/ethnicity, geographic location and citizenship status of the respondents; level of education, and whether or not the respondent saw a practitioner for chiropractic and osteopathic manipulation, as well as other CAM therapists, within the past 12 months. Most of the imported variables were re-categorized or re-coded to address the specific aims of this study. The study was approved by both the research committee and the institutional review board of the institution at which the analysis was performed.

Variables

In the NHIS 2007, participants were asked whether they had seen a practitioner for C/OM in the past 12 months. A separate variable in the ACS queried whether or not the respondent had specifically seen or talked to a chiropractor. Responses considered valid for this analysis were “yes” or “no” for each of these variables. Other responses such as “unknown,” “not certain” or no responses were coded as missing and eliminated from the analysis. The variable “saw practitioner for C/OM” constituted the main outcome variable. However, a supplemental outcome variable was defined for an affirmative response

to, “currently using C/OM” if a respondent indicated in the ACS that they saw/talked to a chiropractor or indicated they saw a practitioner for chiropractic or osteopathic manipulation in the CAM sample. Respondents were also questioned on the specific health conditions for which they saw the practitioner, as well as whether they had sought care for general health reasons, including, in separate questions, “general wellness or disease prevention,” “to improve or enhance energy,” and “to improve or enhance immune function.”

Data were also collected for a number of demographic variables that might predict the use of chiropractic and/or osteopathic manipulation in general for patients in the U.S. Information on race/ethnicity was collected by a method consistent with the procedures used by the Census Bureau to create the Modified Race Data Summary File used for population control;¹² these categories were: Whites (non-Hispanics), Blacks, Hispanic, Asian, and Others.

Age was a continuous variable that included entry from 50 years. NHIS collected data in clusters of geographic locations that included Northeast, Midwest, South, and West regions of the US. Level of education was recorded as separate variables and were re-coded as, less/equal to 8th grade; some high school/high school graduate/GED recipient, college education(including technical/vocational)/ degree (associate/bachelors), and graduate education/master’s, professional, or doctoral degree. For each of the variables above, responses that did not fit into the defined categories were coded as missing.

Data Analysis

Data analyses were performed using the Statistical Analysis System (SAS) software, version 9.2 (SAS institute Inc, Cary, NC). National population estimates (NPE) were generated using the complete NHIS survey design structure (clustering, stratification and weighting), for all variables, and included weighted percents and standard errors. Odds ratios (OR) and 95% confidence intervals (CI) were calculated using binary logistic regression models to assess the likelihood of respondents reporting having seen a practitioner for chiropractic or osteopathic manipulation within the past 12 months, which is a categorical outcome variable. The demographic variables listed above under “Variables” were the independent variables in the model. For this analysis, age was dichotomized as <65 years and =65 years,

in order to compare respondents who were and were not Medicare eligible. The statistical significance of each assessment was evaluated based on the 5% level of significance.

RESULTS

The sample size for the CAM sample of respondents aged 50 and older was 10,104 (NPE= 89,624,166), which represented 41.2% of the entire sample. Of these, 818 (NPE 7,716,833), 8.6% of the sample, stated they sought care for C/OM in the past 12 months. In the ACS, 847 (NPE 7,854,044), 8.8% stated they saw a DC in the past 12 months. Comparing these two subsets yielded an additional 158 people (NPE 1,228,211) who indicated in ACS that they saw DC but did not indicate they sought C/OM in the CAM sample. Combining these with the rest of the CAM sample resulted in 976 respondents (NPE 8,945,044) using chiropractic and/or C/OM in the past 12 months, which represents 10.0% of adults aged 50 and older. For purposes of comparison with other professions, we used the 8.6% figure because we did not analyze the other professions' datasets to identify additional subsets.

However, using either the CAM-sample only data (8.6%) or the combined sample data (10.0%), C/OM was the most commonly reported CAM therapy for which respondents had visited a practitioner (**Table 1**). Massage (6.6% current use) and acupuncture (1.6% current use) were the next most commonly used; all other practitioner-provided therapies on which respondents were questioned each represented no more than 0.5% each (Table 1). The median number of visits for C/OM in 12 months was 3, the mean 3 and the mode 2 (min 1, max 6). With respect to cost per visit, approximately 25% of respondents reported no cost, and 5% of those who reported a cost, reported less than \$7 per visit. Assuming that only those reported costs of at least \$10 per visit were related to full out-of-pocket payment, the mean cost per visit for respondents reporting = \$10 per visit was \$42 (median, \$30, mode \$30, minimum \$10, maximum \$500).

Table 1. National population estimates (NPE) and percentages of the CAM therapies ever used by adults aged 50 and older, and within last 12 months, as reported in the National Health Interview Survey (NHIS) 2007.*

CAM	Ever Used		Within Last 12 Months	
	NPE	Percent(SE)	NPE	Percent (SE)
Chiro/osteo manipulation ¹	25,254,283	28.2 (0.7)	7,716,833	8.6 (0.4)
Massage	14,289,343	16.0 (0.5)	5,902,174	6.6 (0.3)
Acupuncture	7,658,795	8.6 (0.4)	1,457,663	1.6 (1.2)
Energy healing therapy	1,417,004	1.6 (0.2)	524,502	0.5 (0.08)
Naturopathy	1,677,184	1.9 (0.2)	396,976	0.4 (0.08)
Homeopathy	569,440	0.6 (2.4)	329,427	0.4 (0.07)
Hypnosis	3,155,811	3.6 (0.2)	264,340	0.3 (0.07)
Biofeedback	1,862,548	2.0 (0.3)	149,148	0.2 (0.05)
Chelation therapy	518,465	0.6 (0.1)	91,725	0.1 (0.04)
Ayurveda	479,410	0.6 (0.1)	55,070	0.06 (0.03)

* Respondents could select more than one, or none, of the categories so percentages do not total 100%.

¹An additional 1,228,211 adults aged 50 years or over noted in the adult core sample that they saw or talked to a chiropractor within the past 12 months, thus bringing the usage of chiropractic/osteopathic manipulation within a period of 12 months to an NPE of 8,945,044 (10.0%).

Demographics

As shown in **Table 2**, adults aged 50 years and older who reported using C/OM within the past 12 months were predominantly between the ages of 50-59 (48.5%); female (55.8%); college-educated (60.3%); living in the Midwest (32.3%); non-Hispanic white (89.6%) and married (66.1%). Nearly all (94.3%) had some type of health insurance coverage. Although the largest proportion (38.3%) spent \$500-\$1,999 on medical expenditures in the past 12 months, 29.8% spent less than \$500. Only 37.1% reported having a primary care physician; less than half (45.7%) reported having a flu shot within the past 12 months. The majority (71.0%) said their health was about the same as it had been 12 months ago.

Table 2. National population estimates (NPE) for demographic information of adults aged 50 years and older using chiropractic or osteopathic manipulation in the past 12 months as reported in the National Health Interview Survey (NHIS) 2007.

	NPE	Percent(SE)
Geographic Region		
Midwest	2489257	32.3 (1.7)
West	2037732	26.4 (1.3)
South	1857180	24.1 (1.2)
Northeast	1332664	17.3 (1.1)
Age (years)		
50 – 59	3742716	48.5 (1.8)
60 - 69	2346929	30.4 (1.4)
70 - 79	1128165	14.6 (1.2)
= 80	499023	6.5 (0.9)
Sex		
Female	4304662	55.8 (1.9)
Male	3412171	44.2 (1.9)
Race/ethnicity		
Non-Hispanic White	6915205	89.6(0.9)
Non-Hispanic Black	283033	3.7(0.5)
Hispanic	257560	3.3(0.4)
Non-Hispanic Asian	164299	2.1(0.5)
Non-Hispanic, all other race groups	96736	1.3(0.4)
Marital status		
Married	5083302	66.1 (1.4)
Divorced	1207088	15.7 (1.1)
Widowed	937134	12.2 (1.1)

Single/never married	349384	4.5 (0.5)
Separated	112316	1.5 (0.2)
Insurance coverage (respondents could select more than one category)		
Any coverage	7265325	94.3 (0.8)
Medicare	2691533	34.9 (1.7)
Medicaid	250282	3.2 (0.4)
Paid for by self/family	207848	76.8 (3.8)
Paid for by employer	171435	63.3(4.4)
Has a primary care physician	84985	37.1(7.6)
Family medical expenditures (past 12 mo)		
Zero	343619	4.5 (0.6)
Less than \$500	1930155	25.3 (1.4)
\$500 - \$1,999	2914235	38.3 (1.8)
2,000 - \$2,999	929124	12.2 (1.0)
3,000 - \$4,999	776357	10.2 (1.3)
\$5,000 or more	723717	9.5 (0.8)
U. S. citizen	7622340	98.8(0.2)
Education		
1-8 grade	260569	3.4 (0.8)
Some high school/high school/GED	2793990	36.3 (1.7)
College/graduate level	4643127	60.3 (1.8)
Flu shot past 12 m	3524315	45.7 (1.7)
Health, compared with 12 m ago		
Better	1443556	18.8 (1.2)
Worse	791547	10.3 (1.1)
About the same	5463301	71.0 (1.5)

Viewing only the subset of this sample aged 65 and older, 7.0% of respondents had used C/OM within the past 12 months; adding those from the ACS subsample of the same age group who reported using chiropractic yielded a total of 8.7%.

Compared to the sample of the same age group who had not used C/OM within the past 12 months, the group of respondents who had used it were less likely to be aged 65 or older (OR, 0.71; CI, 0.59- 0.86); less likely to be Hispanic compared to white, non-Hispanic (OR, 0.65; CI, 0.45- 0.94), although other racial and other demographics differences were not significant. Those using C/OM were less likely to have Medicare coverage than those who did not use it (OR, 0.70; CI, 0.58- 0.85). Those using C/OM were also less likely to have received a flu shot within the past 12 months (OR, 0.81; CI, 0.67- 0.97). There were no significant differences in reported health status or in having a primary care physician.

Reasons for Seeking Care for Chiropractic/Osteopathic Manipulation

The specific conditions for which respondents most often sought care for C/OM are shown in **Table 3**. Back problems (56.0%) neck problems (13.8%) and other musculoskeletal complaints accounted for 87.6% of conditions; 10.7% of conditions were unspecified, and 1.7% were nonmusculoskeletal.

Table 3. Specific conditions for which United States adults aged 50 years and older sought care for chiropractic or osteopathic manipulation within the last 12 months, as reported in the National Health Interview Survey (NHIS) 2007.

Specific condition	NPE	Percent(SE)
Back pain or problem	3,659,933	56.0 (1.7)
Neck pain or problem	902,292	13.8 (1.3)
Other (unspecified)	699,013	10.7 (1.1)
Joint pain or stiffness/other joint condition	533,828	8.2 (0.8)
Arthritis	312,345	4.8 (0.9)
Other musculoskeletal (each is < 1%)	313,252	4.8 (0.8)
Non-musculoskeletal (each is < 0.05%)	112,926	1.7 (0.5)

As shown in **Table 4**, 46.0% of respondents agreed that they sought care for C/OM for “general wellness or disease prevention, with 15.8% reporting its use to “improve or enhance energy,” and 11.7% to “improve or enhance immune function.”

Table 4. Non-specific health-related reasons for seeking care for chiropractic or osteopathic manipulation within the last 12 months, as reported in the National Health Interview Survey (NHIS) 2007.*

Reason for seeking care	NPE	Percent(SE)
General wellness or disease prevention	3,534,235	46.1 (2.0)
Improve or enhance energy	1,207,852	15.8 (1.2)
Improve or enhance immune function	893,836	11.7 (1.1)

* Respondents could select more than one, or none, of the categories so percentages do not total 100%.

When asked to select from a list of referral sources read to them, the recommendation of family, friends or coworkers was the most frequently chosen reason for seeking C/OM care (36.6%) (**Table 5**). Feeling that medical treatments did not help was second most common (26.0%), followed by recommendation by a health care provider (18.7%); 6.3% felt that medical treatments were too expensive.

Table 5. Reasons adults aged 50 years and older selected treatment with chiropractic or osteopathic manipulation as reported in the National Health Interview Survey (NHIS) 2007.*

Reason	NPE	Percent(SE)
Recommended by family, friends, co-workers	2810749	36.6 (1.8)
Medical treatments did not help	1993490	26.0 (1.5)
Recommended by a health care provider	1430959	18.7 (1.4)
Medical treatments were too expensive	483703	6.3 (0.7)

* Respondents could select more than one, or none, of the categories so percentages do not total 100%.

For respondents who did not use C/OM, reasons they selected from the list they were read, for not using it are summarized in **Table 6**. The majority of respondents' reason for not using C/OM specifically was that they didn't need it (53.4%); 22.6% said they either did not have any reason (as stated by 19.4%) or hadn't thought about it (3.2%). Fewer based their reason on negative experience such as it didn't work in the past (11.4%); it cost too much (6.3%); or they had side effects (1.0). Very few based their reason on being told by a health care provider not to use it (1.5%) or that science had shown it doesn't work (0.6%).

Table 6: Reasons adults aged 50 years and older did not use chiropractic or osteopathic manipulation as reported in the National Health Interview Survey (NHIS) 2007.

Reason	NPE	Percent(SE)*
Didn't need it	9318694	53.4(1.6)
No reason	3393930	19.4(1.2)
It didn't work for me before	1992316	11.4(1.3)
It costs too much	1103256	6.3(0.6)
I never thought about it	555704	3.2(0.5)
Health care provider told me not to use it	259598	1.5(0.3)
I had side effects last time	173064	1.0(0.3)
Medical science has not shown it works	113230	0.6(0.2)

* Responses do not total 100%; 3.2% were missing, falling in the categories "some other reason/refused/don't know."

Comanagement and concurrent treatment

Concerning the presenting complaints for which they were receiving C/OM care, 50.4% were also receiving conventional medical treatment, and 58.4% of respondents told their conventional medical practitioner that they were using C/OM. Prescription medications were also used by 27.7%, and 24.2% used non-prescription medications (**Table 7**).

Table 7. Comanagement for the complaint for which adults aged 50 years and older used chiropractic/osteopathic manipulation as reported in the National Health Interview Survey (NHIS) 2007.

Treatment used simultaneously with manipulation	NPE	Percent(SE)
Told their conventional medical practitioner about use	4,460,240	58.6 (1.6)
Conventional medical treatment	3,281,981	50.4 (2.0)
Prescription medication	1,803,062	27.7 (1.6)
Non-prescription medication	1,576,019	24.2 (1.6)
Physical therapy	1,164,818	17.9 (1.2)
Surgery	408,836	6.3 (0.8)
Mental health counseling	65,304	1.0 (0.3)

* Respondents could select more than one, or none, of the categories so percentages do not total 100%.

DISCUSSION

There are several limitations inherent in the use of this secondary data set. First, self-report data are limited not only by respondents' recall bias but also by the possibility of their misunderstanding the questions. An indication that this may have been the case is that 1.4% of respondents reported on the ACS survey that they used chiropractic, but did not report that they used chiropractic or osteopathic manipulation on the CAM sample. This may indicate that they did not understand the different terminology used in the two questionnaires. A second limitation of the NHIS questionnaire is that it is possible that the format and content of the questions may have biased the responses. For example, respondents were asked for the specific health problems or conditions for which they used C/OM. Apparently conditions that did not appear on the extensive list were coded "other," and so we were unable to identify them. Since this accounted for 10.7% of the health problems reported, this is a substantial loss of information. Furthermore, the wording of this question predisposes respondents to think in terms of illness and symptoms, possibly biasing them against reporting its use for wellness or prevention. The responses of those who used C/OM for this purpose might not be captured in this question. Evidence of this point is that 46.1% of respondents responded affirmatively to the question, "Did you use C/OM... for general wellness or general disease prevention?" It is important that aspects of positive health that were inquired about in this survey, such as this question and the question on

enhancing energy and the immune system, be given equal attention to symptom-oriented care. A final, and very important, limitation of this data set is that chiropractic manipulation and osteopathic manipulation were combined in a single question. The chiropractic and osteopathic professions are not the only health professions using manipulation; physical therapy, in particular, has been increasing its use of manipulation recently. Furthermore, the scopes of practice of chiropractic and osteopathy, along with their coverage by insurance plans, are quite distinct. Also, both these professions provide far more than manipulation. Both professions can provide counseling on health behavior and use of most of the other CAM therapies as well; osteopathic scope of practice also includes drugs and surgery. Patients may have difficulty with a question that requires them to restrict their response only to the manipulation feature of chiropractic or osteopathic care.

This study indicates that C/OM may not be used as exclusively for musculoskeletal problems as most research would indicate. It is important to note that nearly half of respondents also used it for general wellness or disease prevention, 15.8% to improve energy, and 11.7% to improve immune function. With the growing emphasis on wellness and prevention, it is critical that future research include these aspects of C/OM along with its current emphasis on management of musculoskeletal pain.

Chiropractic compared to other forms of medical and manipulative therapy

A 2007 study reported on regular use of chiropractic care by adults aged 70 and older.¹³ Investigators wanted to know if chiropractic was a regular component of care in this age group. Although the annual use of chiropractic was only 4.5% in this population, about half (48%) of those having had at least one visit to a chiropractor in the previous 4 year period had seen only a chiropractor during the previous calendar year. About thirty percent had seen the provider in at least three different calendar years as well. This seems to indicate that for some older adults, regular use of chiropractic is the norm; it is possible that they comprise part of the population who considers manipulative care for overall well-being. We find this to be of interest in light of responses found in our research related to purpose of care. It is also of note that our analysis of the NHIS data indicated that 8.7% of people aged 65 and older has used C/OM within the past 12 months, a much higher proportion than the 4.5% reported 2007.¹³

Liliedahl and colleagues¹⁴ compared costs of care in patients with common back conditions who had initial care with either a doctor of chiropractic or a medical/osteopathic provider. When care was

initiated with a chiropractor, overall costs of treatment for lower back pain was significantly lower in 6 diagnostic categories, indicating that routine care by chiropractors may be different than the routine care rendered by physicians or osteopaths. Having data available specific to chiropractic manipulative therapy use within national sampling frames would better define variability related to costs of care and results of treatment.

Additional evidence is available on Health Related Quality of Life (HRQoL) scores and use of manipulative and body-based therapies in general.¹⁵ Adults aged 55 and older within the 2002 NHIS and 2003 Medical Expenditure Panel Survey (MEPS) indicated a better functional status, better physical HRQoL, and better mental-health related quality of life over a 12 month follow-up when they had utilized manipulation. No other CAM system or form of care was predictive of these HRQoL changes in the study. This may further explain the rationale for manipulation as care for overall wellness documented in the current assessment, and this should be of significant interest to those wanting to understand mechanisms of action in manipulative therapy as well as its use in primary or secondary prevention.

CONCLUSION

Our analysis of the NHIS data, in which we identified a subgroup of respondents who reported use of chiropractic in the ACS but not in the CAM sample, indicated that a higher proportion of Americans in this age group, 10% (9 million), used chiropractic and/or C/OM than in analyses including younger or older age groups.^{3,13} C/OM was therefore the most commonly used provider-based CAM therapy. Most of the time patients were seeking care for back problems and other musculoskeletal conditions but nearly half (46%) reported using it for general wellness and disease prevention.

The substantial proportion of respondents using C/OM for wellness and prevention indicates a need for more investigation into the provision of clinical preventive services by CAM providers. Future surveys, including the NHIS, might produce more useful information by separating questions by profession rather than procedure, since a number of professions utilize not only manipulation but other therapies, and usually provide patients with a “package” of care rather than a single procedure.

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