ORIGINAL RESEARCH

THE SUPPLY AND DEMAND OF CHIROPRACTORS IN THE UNITED STATES FROM 1996 TO 2005

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Context • The chiropractic profession is the largest, most established complementary and alternative medical (CAM) profession in the United States. The use of unconventional healthcare in the United States has increased in recent years, yet little is known about the market for specific CAM professions such as chiropractic.

Objective • To evaluate the market for US chiropractors between 1996 and 2005.

Design, Setting, and Participants • We conducted a descriptive study of the chiropractic profession from 1996 to 2005 using data from the Medical Expenditure Survey, the National Center for Education Statistics, and the US Bureau of Labor Statistics.

Main Outcome Measures • The amount and proportion of outpatient healthcare expenditures on chiropractic care in the United States, total chiropractors, number of chiropractors per adult population (>18 years), graduates from chiropractic schools, and professional income of chiropractors.

Results • From 1996 to 2005 the proportion of outpatient US healthcare expenditures spent on chiropractic care increased from 2.15% to 3.26%. The total number of US chiropractors increased from 43 663 to 52 687 in 2004, but growth slowed between 2002 and 2004, resulting in a decrease in the number of chiropractors per 10 000 US adults. Between academic years 1996 and 2001, chiropractic schools graduated about 3700 students each year; however, between 2001 and 2003, the annual number of chiropractic graduates decreased by 28%. Between 1998 and 2005, the inflation-adjusted median self-reported annual income of employed chiropractors fell from $76 598 to $67 200.

Conclusion • From 1996 to 2005, relative expenditures on chiropractic care increased; however, the number of chiropractic graduates, the rate of growth of chiropractors, and the incomes of chiropractors have declined. Future research is needed to investigate why national expenditures on chiropractic care have increased despite an apparent decrease in the supply of US chiropractors. (*Altern Ther Health Med*. 2009;15(3):36-40.)

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The chiropractic profession has emerged from humble beginnings and marginalization to become the most high-profile provider-based constituent of the complementary and alternative medicine (CAM) healthcare market today. In the United States there are currently over 85 000[1] active chiropractic licenses representing more than 53 000 practictioners.[2] The confluence of professional regulation in all 50 states and inclusion of chiropractic benefits in private, military, and government healthcare insurance plans have moved chiropractic into the mainstream healthcare system.[3] Given chiropractic's long-standing focus on patient-centered care[4] and new initiatives directed toward evidence-based practice's[5] alignment with current healthcare reform efforts, it is possible that chiropractic could become even more integrated into mainstream healthcare over time.

During the 1980s and 1990s, CAM use in the United States expanded rapidly.[6] Studies conducted in the 1990s reported that approximately one-third of the adult population used CAM.[7-9] A cross-sectional study in 2002 found that 64% of respondents had used at least one CAM therapy in the previous 12 months.[10] The early reports of high CAM use[8] sparked interest among the policy-making, medical,[11] and research communities, resulting in an influx of research interests and dollars. This heightened interest led to a higher level of legitimacy on many fronts and the advent of new CAM educational opportunities for medical students[12] and physicians.[13]

Though the CAM market seems to be continuing to grow, it is unclear how the chiropractic market has changed. Treatment of musculoskeletal conditions by the medical, osteopathic, and physical therapy professions[14] and expansion by other CAM professions such as acupuncture and massage therapy have potential to affect chiropractic's growth. Studies using representative samples of the US population found that in 1990, 10% of the nation's

adults used chiropractic, and a follow-up study in 1997 found that 11% did.[7,8] Larger, more generalizable studies conducted in 1999 and 2002 found that 7.5% of the US population saw a chiropractor.[10,15] Currently, this is the best estimate of chiropractic use in the United States.

In the 1990s, the number of graduating chiropractors doubled to 4400 per year, and there were approximately 40000 to 50000 chiropractors (70000 licenses) practicing in the US.[1,16] In 2001, the number of US chiropractic licenses was projected to exceed 120000 by 2015.[17] The profession's early growth resulted in an increasing proportion of overall healthcare expenditures in the United States relating to chiropractic care in the 1980s and 1990s.[6,18] In more recent years, the proportion of US expenditures may have stagnated, raising concern that there may be an oversupply of chiropractors in the United States.

Oversupply of chiropractors in a market of questionable demand has been reported recently in Ontario, Canada.[19] To examine the market for chiropractic in the United States, we extracted data on US healthcare expenditures, number of chiropractors, recent graduates of chiropractic schools, and the annual self-reported salaries of US chiropractors.

METHODS

Data Sources

We obtained information on the amount and proportion of outpatient healthcare expenditures on chiropractic care in the United States between 1996 and 2005 from the Medical Expenditure Panel Survey (MEPS).[20] The MEPS is a nationally representative survey of the US population that began in 1996 and is conducted annually by the Agency for Healthcare Research and Quality (formerly the Agency for Health Care Policy and Research). The survey uses a nationally representative sample of households selected from the prior year's National Health Interview Sample to generate national estimates of healthcare expenditures by the US population.[21] Between 1996 and 2005, the MEPS household panel asked respondents whether they used chiropractic care, and, if so, how much they used. For each year, MEPS statisticians converted utilization data to expenditures. Sample sizes for the years 1996 to 2005 ranged from a low of 21 571 to a high of 32 737 in 2005; response rates ranged from a high of 78% in 1996 to a low of 66.5% in 2005.

We obtained data on the supply of chiropractors from the National Employment Matrix[2] and the Integrated Postsecondary Education Data System (IPEDS),[22] a branch of the National Center for Education Statistics.

The National Employment matrix is compiled biennially as part of the Employment Projections program by the US Bureau of Labor Statistics (BLS). The data for the matrix come from multiple BLS databases, including the Occupational Employment Statistics survey (data identifying employed workforce patterns and salaries), the Current Employment Statistics Program (data on total wage in each industry), and the Current Population Survey (data on self-employed and second jobs). For this study, we obtained estimates of the total number of US chiropractors for years 1996, 1998, 2000, and 2004 directly from the bureau (written communication, Tom DiVincenzo, September 2008).

Using US Census Bureau data that provided the number of adults (18 years and older) in the United States,[23,24] we generated the number of chiropractors per 10 000 US adult population from 1996 to 2004. We limited our analysis to the adult population aged 18 years and older because that population uses approximately 80% to 90% of all chiropractic services each year.[25,26]

Accredited postsecondary schools in the US are required to report data on total enrollment and graduates to the IPEDS annually. We accessed the Digest of Education Statistics from the IPEDS database to obtain the number of graduates of US chiropractic schools in each academic year between 1996 and 2005.[22] IPEDS reports total graduates per academic year (July 1 through June 30) for different doctoral-level occupations as part of their annual "Completions Survey"; for instance, the data point for 2001 represents graduates from July 1, 2000, to June 30, 2001. This is important to note, as chiropractic schools vary in number of graduating classes per year. We also obtained the numbers of graduates from osteopathic and podiatric medicine schools from IPEDS for the same time period to be used as comparison groups in our analysis.

According to the National Employment Matrix from 1996 to 2004, 33% to 44% of US chiropractors were employed.[2] The only reliable source of income data available was from the Occupational Employment Statistics,[27] which are accrued data from employers of chiropractors. Though the Annual Social and Economic Supplement to the Current Population Survey (CPS, a monthly survey conducted by the US BLS)[27] captures annual income data from both employed and self-employed chiropractors, the sample sizes obtained are extremely small (15-20 surveys). We therefore used the Occupational Employment component of the US BLS database, recognizing that this limited our analysis of incomes to employed chiropractors. The yearly sample size consisted of approximately 2000 employers of chiropractors, and the response rate ranged between 75% and 85% between 1998 and 2005. The data was projected to represent 11 540 employed chiropractors in 1998 to 25 470 in 2005.

Statistical Analyses

We conducted a descriptive analysis of the datasets. We converted annual salary and healthcare expenditure data to 2005 dollars using the Consumer Price Index (CPI), obtained from the BLS for 1996 to 2005.[28]

RESULTS

The Proportion of Healthcare Expenditures Consumed by Chiropractic

The real US total expenditures on outpatient healthcare services nearly doubled from 1996 to 2005 (in 2005 dollars), a net increase of $94.4 billion (Figure 1, left y-axis). During the same time period, the amount of outpatient healthcare expenditures on chiropractic care increased from $2.8 to $7.3 billion, an increase from 2.15% to 3.26% of the total amount spent in the

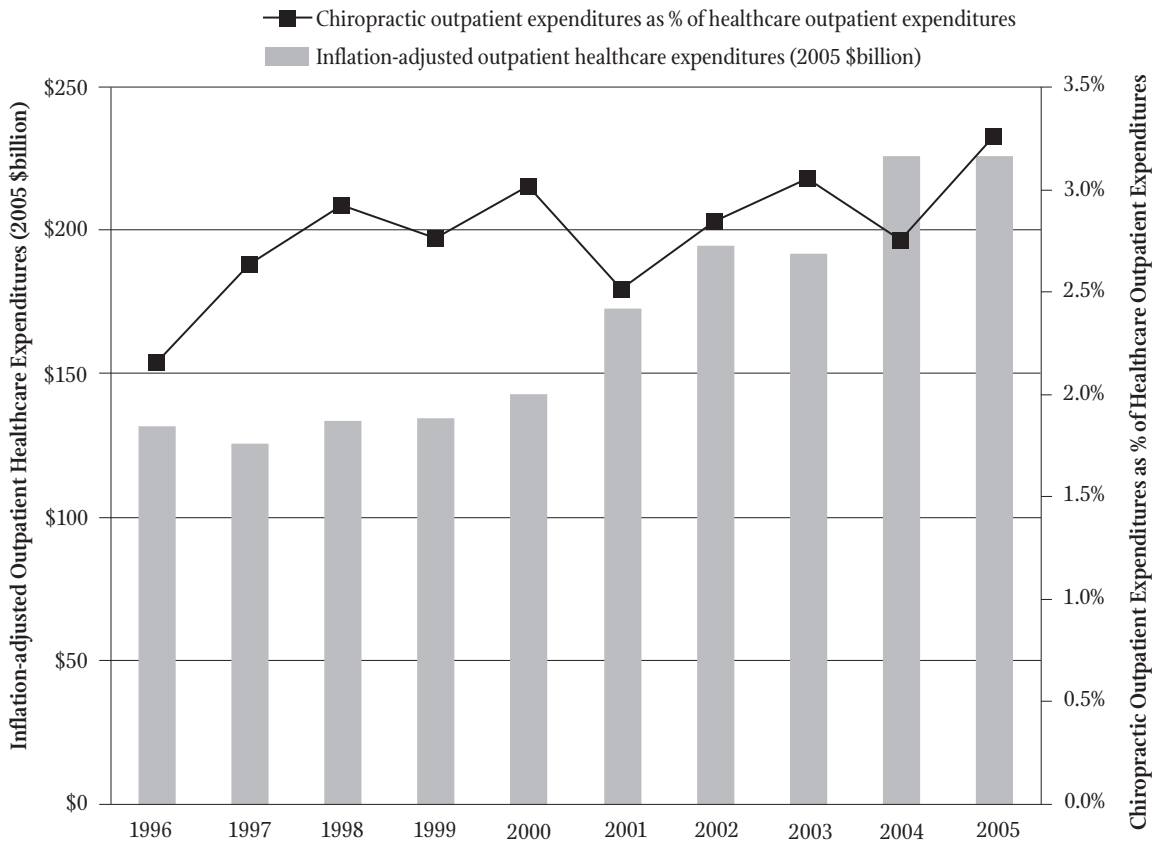

FIGURE 1 US Chiropractic Outpatient Expenditures per Total Healthcare Outpatient Expenditures, 1996 to 2005

United States on outpatient healthcare services (Figure 1, right y-axis). Though the proportion of the healthcare dollars that chiropractic consumed over the 10-year period examined fluctuated, on average, the absolute proportion of the outpatient healthcare dollar that was spent on chiropractic increased by 0.11% each year.

The US Chiropractic Workforce

The total number of chiropractors in the United States increased from 43 663 in 1996 to 52 687 in 2004, a net increase of 9024 chiropractors (Figure 2, left y-axis). After 4 years of more rapid growth between 1996 and 2000, however, increases in the number of US chiropractors have been minimal. The ratio of US chiropractors per adult population (18 years and older) increased from 2.19 chiropractors/10 000 US adults in 1996 to 2.39 chiropractors/10 000 US adults in 2004, a relative increase of 9% (Figure 2, right y-axis). Since 2000, the number of chiropractors per 10 000 US adults has been relatively stable, except for in 2002, when a number of chiropractors left the field.

Graduates of US Chiropractic Schools

From 1996 to 2001 the number of graduates from US chiropractic schools remained relatively stable at approximately 3700 graduates per year (Figure 3). Between academic years 2001 and 2003, the numbers of graduates of chiropractic schools dropped by 1078 (28%) and continued to decrease slightly through 2005. In contrast, the number of graduates of schools of osteopathy has risen by 46%, from 1895 in 1996 to 2762 in 2005. On the other hand, over the time period examined, the annual number of graduates of podiatric medical schools declined by 47%, from 650 in 1996 to 343 in 2005.

Annual Incomes of Employed US Chiropractors

The US Department of Labor Statistics started recording the income of employed chiropractors in 1997. The first complete dataset available for chiropractors was reported for 1998. Our analysis revealed that the real mean annual income of employed chiropractors (in 2005 dollars) remained relatively stable from $80 780 in 1998 to $82 060 in 2005 (Figure 4). The real median income of employed chiropractors decreased by 12% from $76 598 per year in 1998 to $67 200 in 2005.

DISCUSSION

Between 1996 and 2005, the relative proportion of outpatient national healthcare expenditures on chiropractic care grew 52%, from 2.15% to 3.26%; most of that growth occurred between 1996 and 1998. Between 1996 and 2004, the number of US chiropractors increased by 21%, from 43 663 to 52 687; however, a similar

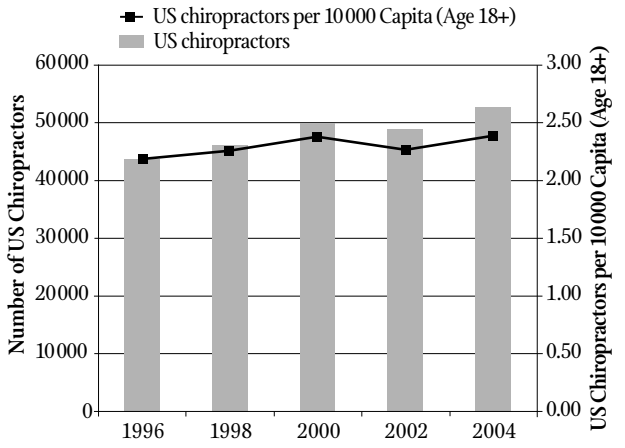

FIGURE 2 Total US Chiropractors and US Chiropractors per US Population (age 18+), 1996 to 2004

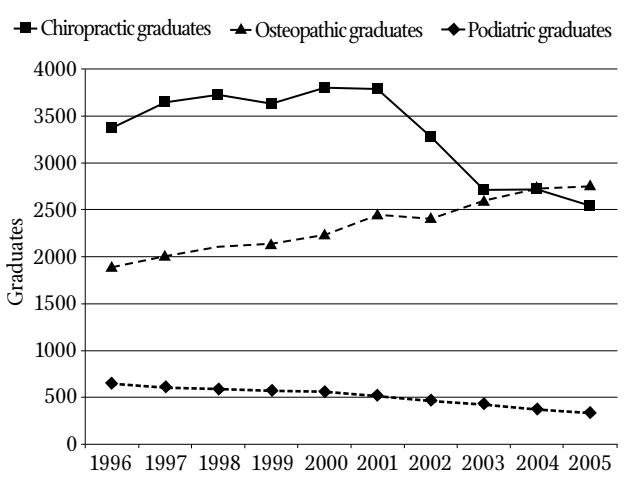

FIGURE 3 Graduates from US Chiropractic, Osteopathy, and Podiatric Medical Schools, Academic Years 1996 to 2005

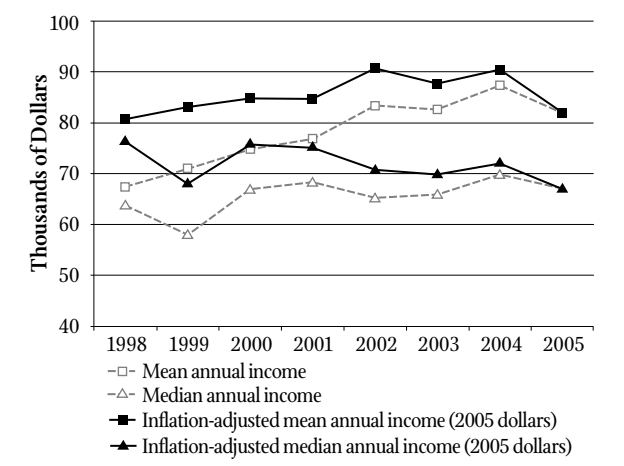

FIGURE 4 Nominal and Inflated Adjusted Mean and Median Annual Incomes of Employed Chiropractors, 1998 to 2005

pattern of a rapid increase in the late 1990s followed by a relative plateau in more recent years has been observed. In light of the dramatic decreases in the annual number of chiropractic school graduates and the stagnant number of chiropractic licenses over the recent past that we found, it is doubtful that the chiropractic workforce will reach 120 000 active licenses in 2015 as was previously projected.[17] One reason the chiropractic workforce might be experiencing lower-than-expected growth is that the field has become less financially rewarding, as demonstrated by the 12% decline in median real annual incomes that we found among employed chiropractors between 1998 and 2005.

Cross-sectional surveys conducted between 1990 and 2002 suggested that the number of US adults who receive chiropractic services may have decreased from 10% in 1990 to 1997[7,8] to 7.5% in 1999 to 2002.[10,15] Nevertheless, it is impossible to know whether the utilization of chiropractic has actually declined or whether the observed rates in 1990 and 1997 were less accurate than the 1999-2002 rates due to smaller sample sizes and differing methodology. Our analysis found that despite a possible reduction in numbers of adults using chiropractors, the total amount and the proportion of outpatient healthcare expenditures have increased during the same period. This suggests that the expenditures on chiropractic care per patient could have increased. We were not able to determine whether the increase was fostered by higher expenditures per visit, a greater number of visits per patient, or a combination of the two. That the real median annual income of employed chiropractors has declined suggests that the greater number of licensed chiropractors are generating less overall revenue than in the past, possibly suggesting an oversupply of chiropractors in the current healthcare marketplace.

In comparison to doctors of osteopathy, the number of graduates of chiropractic and podiatry schools has decreased dramatically, with most of the decrease among chiropractic schools occurring between academic years 2001 and 2003. A portion of the marked decrease in chiropractic graduates may be the result of the 2002 revocation of chiropractic accreditation at Life University (a chiropractic school responsible for supplying 15% of the nation's chiropractic graduates).[29] Given that Life University was retroactively reaccredited in 2003 and that they continued to report graduate rates per year to IPEDS (written communication, Samuel Barbett, September 2008), the more likely explanation is that significantly fewer students enrolled in chiropractic colleges between 1997 and 1999. A decrease in matriculation during the late 1990s may be due to absorption of potential chiropractic students into other CAM professions, as acupuncture and massage therapy programs experienced significant growth during this period of time.[18]

While the decrease in the number of chiropractors who graduate from chiropractic schools each year is likely to be a concern for academic chiropractic institutions that have large fixed costs and fewer students matriculating, this decline in graduates might benefit chiropractors in the workforce by reducing competition for patients and thereby improving chiropractors' incomes.

Many chiropractic schools seem to have responded to the declining number of chiropractic students by expanding their academic programs to include acupuncture, massage, and other master's level degrees.[30-33] Some schools have obtained university status and since changed their descriptions from "chiropractic college" to "university of health sciences."[31-33]

Our study has several limitations. First, our analysis was limited to data reflecting the chiropractic market between 1996 and 2005. Since then, it is possible that patient utilization, matriculation in chiropractic schools, and chiropractors' ability to generate incomes have changed. Second, we were unable to determine either the number of hours that chiropractors worked or the number of patients they saw each year; in addition, we were unable to estimate the average expenditure per chiropractic visit or chiropractic episode of care or employed chiropractors' hourly incomes. Therefore, our explanation of our findings is somewhat limited and broad. Further work, including the examination of chiropractic school matriculants' characteristics, demographics of the chiropractic workforce, chiropractor's work effort, and particularly the annual incomes of self-employed chiropractors, is needed. Finally, we used the number of US chiropractors as a measure of the supply of US chiropractors that was based on projections from the National Employment Matrix.[2] We also obtained information on the number of US chiropractic licenses granted per year from the Federation of Chiropractic Licensing Boards.[1] Because chiropractors can have multiple licenses in multiple states, we did not include an examination of these data; however, the ratio of active licenses per US chiropractor for 1996, 1998, 2000, and 2004 was stable between 1.62 and 1.73, suggesting that the number of chiropractors provided by the National Employment Matrix was fairly accurate. Finally, our study used national data estimates; we cannot comment on regional variation in the supply or use of chiropractic services.

Although the chiropractic profession has increased its share of the US outpatient healthcare expenditures between 1996 and 2005, how the profession has done so in the face of fewer chiropractors entering the workforce is unclear. Additional competition from other CAM providers who also treat musculoskeletal conditions conservatively and from doctoral-level physical therapists[34] who are trained in spinal manipulation may result in increased supplier-driven demand for chiropractic. This would potentially affect both the proportion of healthcare expenditures on chiropractic care and chiropractors' salaries. Further research is needed to examine the impact of these changes and the expansion of other professions that compete within the same market.

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