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## ORIGINAL ARTICLE

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### Patient characteristics upon initial presentation to chiropractic teaching clinics: *A descriptive study conducted at one university*

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**Objective:** The purpose of this study was to compare demographics and chief complaints of the new patient population at our institution's fee-for-service clinics to the patient population of practicing chiropractors in the United States. We also compared the prevalence of obesity and hypertension to reference standards for the adult population.

**Methods:** Patient data were obtained from the electronic health records. All records identified as new patients during October 2013 were included. Variables of interest were clinic site, patient demographics, blood pressure, body mass index (BMI), chief complaint, and ICD-9 codes. Descriptive statistics were computed and compared to reference standards from previous reports.

**Results:** During October 2013, there were 224 new patients that entered the clinics. The average patient was a 31- to 50-year-old white male. Our clinic patients differed from those seen by US chiropractors in the distribution of all demographic variables. For adult patients, 31.4% were overweight, 29% were obese, and 8% stage 1 or 2 hypertension.

**Conclusion:** New patients in the fee-for-service teaching clinics appear to be dissimilar to those of US practicing chiropractors in several important demographics, characteristics, and types of complaints. The new patients had lower levels of overweight, obesity, and hypertension compared to US reference standards.

**Key Indexing Terms:** Chiropractic; Community Health Centers; Demographics; Education

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### INTRODUCTION

Clinical experiences providing students the opportunity to diagnose and manage patients are an important component of chiropractic clinical education. While students are encouraged to recruit diverse patients from a variety of community locations, they often have little control over who these patients will be when the patients arrive at the fee-for-service clinics managed by the college. This may result in gaps in student clinical experiences with respect to what they will encounter when they become practitioners. Therefore, it is important to be aware of and address possible shortcomings in students' clinical experiences. *The 2013 Standards for Doctor of Chiropractic Programs and Requirements of the Council on Chiropractic Education (CCE)*<sup>1</sup> states that the chiropractic program clinical competency requirements are met through supervised student experiences. Therefore, to ensure a well prepared primary care chiropractic physician upon graduation, it is essential that interns have rounded clinical education opportunities.

Several articles have addressed the characteristics of

chiropractic teaching clinic patients.<sup>2-5</sup> In the most recent study, Hodges et al<sup>4</sup> addressed nonmusculoskeletal versus musculoskeletal cases seen in a chiropractic student clinic compared to those seen among practitioners based on the *Practice Analysis of Chiropractic 2010*.<sup>6</sup> They noted that a greater percentage of nonmusculoskeletal conditions were seen in the student clinic in comparison with those among practicing chiropractors.<sup>4</sup> In contrast, a study conducted by Lishchyna and Mior<sup>3</sup> that compared an external teaching clinic to surrounding chiropractic field practitioners, found similarities in patient demographics and clinical characteristics. Key components to both studies were the importance of providing students with a variety of cases during clinical learning opportunities that would prepare them for future practice. The purpose of this study was to compare the new patient population at our chiropractic college's fee-for-service clinics to the patient population of US chiropractors in terms of demographics and chief complaints, and to the US adult population in terms of the prevalence of the common risk factors of obesity and hypertension.

## METHODS

This study was approved by the Logan University institutional review board prior to data collection. All data were obtained exclusively from the electronic health record (EHR) system used at all of the institution's fee-for-service clinics. All records identified as new patients presenting to the institution's 4 fee-for-service teaching clinics from October 1 through October 31, 2013, were included in the study. New patients were identified by CPT code in the EHR. There were no exclusions.

Variables of interest available in the EHR were clinic site, patient demographics (sex, age, and race/ethnicity), blood pressure, and body mass index (BMI), chief complaint, and ICD-9 codes. For this study, only 1 chief complaint (the one listed first) and the primary ICD-9 code (listed first in the record) were included in the analysis. The code listed first was selected because interns are taught to enter the primary ICD-9 code first. Because of limitations of the EHR software, reports that included these variables had to be printed out from the electronic record and key entered. No patient identifiers were entered into the database. Chief complaints were coded by the data entry clerk prior to data entry. All data were key entered in an SPSS version 22 (IBM Corporation, Armonk, NY) database by one data entry clerk, double-entered by another, and then verified using an SPSS double-entry verification program.

### Data Analysis

All 4 clinics were combined in the database, although each was identified. Comparison of the demographics of the 4 clinics, using zip codes, indicated that they were similar (available in the public domain at [www.zip-codes.com](http://www.zip-codes.com)). Chief complaints were sorted into categories consistent with those used by the *Practice Analysis of Chiropractic 2010*, for purposes of comparison. Descriptive statistics were computed using SPSS version 22. Because the reference samples were from the *Practice Analysis of Chiropractic 2010* data, the statistical significance of comparisons could not be computed. Chief complaints and age were categorized to be congruent with the categories used in the *Practice Analysis of Chiropractic 2010* for purposes of comparison.<sup>6,7</sup> Because the *Practice Analysis of Chiropractic 2010* did not include the same variables found in the 2005 edition, both editions were used for making comparisons. The BMI and blood pressure were categorized according to current standards.<sup>8-10</sup>

## RESULTS

### Demographics

A total of 224 new patients presented to the institution's fee-for-service teaching clinics in the month of October 2013. There were 122 patients in the main clinic and 21, 33, and 48 in each of the 3 satellite clinics. Table 1 summarizes the sex, race/ethnicity, and age of the 224 patients; for comparison, population standards published in the *Practice Analysis of Chiropractic 2010*

are provided as well. The mean age was 37.3 years (range, 2 mo–88 years). The average patient was a white male with an age between 31 and 50 years. Our clinic patients differed from the *Practice Analysis of Chiropractic 2010* data of US chiropractors in the distribution of all demographic variables (Table 1), due to a higher prevalence of males, a younger population, and a much higher prevalence of white patients in our clinics.

### Patient Characteristics

The BMI was recorded for 154 of the 188 patients aged 18 and older (82%). Of these, 31.4% were overweight (BMI, 25–29.9) and 29% were obese (BMI, 30+), compared to 35.7% of US adults being obese.<sup>11</sup> Of the adults, 89% (167/188) had blood pressure recorded. Of these, 8% (15) had blood pressure classified as stage 1 or 2 hypertension (systolic pressure > 139 mm Hg or diastolic > 89 mm Hg), compared to 33% of US adults being hypertensive.<sup>12</sup>

### Chief Complaint

As shown in Table 2, nearly all chief complaints were musculoskeletal, with low back and lower extremity complaints accounting for over half. Our patients' complaints differed from those of US chiropractors in several categories, most notably our institution's patients had more lower extremity complaints, but fewer complaints related to headache/facial problems, wellness, and nonmusculoskeletal problems (other nonmusculoskeletal, chest, and abdomen were combined for our clinics).

### ICD-9 Codes

Table 3 provides the distribution of ICD-9 codes, by region. Low back-related diagnostic codes were used most frequently (33.5%), with soft tissue codes next (25.0%). Table 4 compares the chief complaints to the ICD-9 codes. The categories for lower extremity, mid-back and soft tissue showed the most disparity between reported chief complaint and primary ICD-9 code.

## DISCUSSION

Students begin their outpatient clinical internship in year 3 of our chiropractic program. The demographics of the students who comprise the intern population are 66% male and 91% white–non-Hispanic. Through a lottery-based process, students are assigned to the clinic where they will complete their internship. The fee-for-service clinics are located in suburbs of a large metropolitan area. The definition, “fee-for-service” clinic, also includes first responders (police officers, firefighters, emergency medical ambulance technicians, and returning military soldiers since 9/11) who receive complimentary chiropractic care. Two of the clinics include a sports and rehabilitation center where athletic injuries are managed. In addition to the fee-for-service clinics included in the current study, interns also have limited opportunities to manage and treat patients at an adult rehabilitation center, patients at two free community service facilities located in the downtown region of the metropolitan area, physically disabled

**Table 1 - Patient Demographics (n = 224)**

	n	%	Practice Analysis <sup>a</sup>
Sex			
Female	106	47.3	60.7
Male	118	52.7	39.3
Total	224	100	100
Race/ethnicity			
White	190	84.8	56.7
African-American	16	7.1	14.0
Asian	5	2.2	9.0
Hispanic	5	2.2	14.4
Native American	0	0	5.3
Other	2	.9	0.6
Missing/refused	6	2.7	
Total	224	100	100
Age in y			
	n	%	%
0-5	4	1.8	7.7
6-17	27	12.1	9.4
18-30	66	29.5	15.7
31-50	65	29.0	29.0
51-64	34	15.2	22.8
65+	23	10.3	15.4
Missing	5	2.2	
Total	224	100	100

<sup>a</sup> All data under "Practice Analysis" are from the *Practice Analysis of Chiropractic 2010*<sup>6</sup> report except for race/ethnicity, which was only available in the 2005<sup>5</sup> report.

patients at an integrated healthcare center, and active duty military and veterans at two military facilities. These additional sites provide opportunities to diagnose and treat a more diverse patient population, in terms of demographics and complaints. However, rotations through these additional sites are not required and, therefore, they were not included in this study.

Our findings suggest that the demographic and clinical characteristics of new patients at the fee-for-service teaching clinics are dissimilar in many respects to those seen in chiropractic practices throughout the United States. It is important to note that the information in this

discussion is focused on the dissimilarities rather than the similarities. This was done intentionally to identify the gaps that may need to be filled to provide interns a wide variety of clinical opportunities. We used the 2005 and 2010 *Practice Analysis*<sup>6,7</sup> as bases for comparison of patient demographics and complaints. The majority (60.7%) of chiropractic patients in the United States are female, while the opposite was true in our teaching clinics. While there is a discrepancy, our results demonstrate that students do have adequate opportunities to work with patients of both sexes.

**Table 2 - Chief Complaints (n = 224)**

Complaint	Frequency	% of 224	Practice Analysis %
Low back	70	31.3	23.6
Lower extremity	47	21.0	8.8
Neck	37	16.5	18.7
Mid-back	22	9.8	11.5
Upper extremity	19	8.5	8.3
Headache/facial	16	7.1	12.0
Wellness	4	1.8	8.0
Nonmusculoskeletal	3	1.3	2.5
Other musculoskeletal	3	1.3	0
Chest	1	0.5	3.8
Abdominal	0	0	2.8
Missing	2	.9	0
Total	224	100	100

**Table 3 - Primary ICD-9 Codes (n = 224)**

Region	Code	Definition	n	%
<b>Low back</b>			<b>75</b>	<b>33.5</b>
	724.20	Lumbago	24	
	739.30	Nonallopathic lesions, lumbar	14	
	724.80	Other symptoms referable to back	7	
	847.20	Sprains and strains, lumbar	5	
	724.50	Backache, unspecified	5	
	739.50	Nonallopathic lesion, pelvic	4	
	739.40	Nonallopathic lesion, sacral	3	
	722.10	Lumbar intervertebral disc	3	
	846.10	Sprains and strains, sacroiliac	2	
	724.90	Other unspecified back disorders	2	
	724.40	Thoracic/lumbosacral neuritis/radiculitis	2	
	724.30	Sciatica	2	
	724.02	Spinal stenosis, lumbar	1	
	722.93	Intervertebral disc disorders, lumbar	1	
<b>Soft tissue</b>			<b>56</b>	<b>25.0</b>
	729.10	Myalgia	49	
	728.85	Muscle spasm	3	
	726.90	Unspecified enthesopathy	1	
	710.90	Connective tissue disease	1	
	729.40	Fasciitis	1	
	719.50	Joint stiffness	1	
<b>Neck</b>			<b>33</b>	<b>14.7</b>
	739.10	Nonallopathic lesions, cervical	16	
	723.00	Spinal stenosis, cervical	9	
	723.10	Cervicalgia	4	
	353.00	Brachial plexus lesions	2	
	722.40	Degeneration cervical intervertebral disc	1	
	847.00	Sprains and strains, neck	1	
<b>Lower extremity</b>			<b>20</b>	<b>8.9</b>
	739.60	Nonallopathic lesion, lower extremities	6	
	729.50	Pain in limb	4	
	719.46	Joint pain, lower leg	2	
	719.47	Joint pain, ankle and foot	2	
	728.71	Plantar fascial fibromatosis	2	
	843.90	Sprains and strains, hip and thigh	2	
	726.64	Enthesopathy, knee	1	
	924.20	Contusion, ankle and foot	1	
<b>Upper extremity</b>			<b>14</b>	<b>6.3</b>
	719.41	Joint pain, shoulder	6	
	719.45	Joint pain, hand	2	
	719.43	Joint pain, forearm	1	
	726.10	Enthesopathies, shoulder	1	
	739.70	Nonallopathic lesion, upper extremities	1	
	831.04	Dislocation of shoulder	1	
	840.40	Sprains and strains, rotator cuff	1	
	840.90	Sprains/strains, shoulder	1	
<b>Head/facial</b>			<b>13</b>	<b>5.8</b>
	346.01	Migraine	6	
	307.81	Tension headache	3	
	784.00	Headache	3	
	339.10	Tension type headache	1	
<b>Mid-back</b>			<b>10</b>	<b>4.5</b>
	739.20	Nonallopathic lesion, thoracic	7	
	739.80	Nonallopathic lesion, rib cage	2	
	737.30	Scoliosis/kyphoscoliosis	1	

**Table 3 - Continued.**

Region	Code	Definition	n	%
<b>Nonmusculoskeletal</b>			<b>1</b>	<b>.4</b>
	787.70	Colic	1	
<b>Missing</b>			<b>2</b>	<b>.9</b>
Total			224	100

Racial diversity appears to be lacking in our patient population, with a large majority (84.8%) being white. Although this is explainable by the fact that the clinics are located in areas with predominantly white populations (data available in the public domain at <http://www.zip-codes.com>), it indicates a disparity with the US population in general. In comparison to the 2005 *Job Analysis*<sup>7</sup> field practitioners in the United States treat a more diverse population of patients; 14.0% African-American and 14.4% Hispanics compared to 7.1% and 2.2% in our fee-for-service teaching clinics. Opportunities to work with a more racially diverse population of patients is available at 2 of our free community clinics, which are located in the metropolitan area where the general population is only 45.9% white (data available in the public domain at <http://quickfacts.census.gov/qfd/states/29/2913600.html>). Increasing such opportunities will help prepare interns for an increasingly diverse population in the United States.<sup>5</sup>

Compared to the *Practice Analysis of Chiropractic 2010*,<sup>6</sup> our fee-for-service teaching clinics see fewer very young patients (0–5 years, 1.8% vs 7.7%) and fewer older patients (51–65, 25.5% vs 38.2%).

Our clinic population appeared to have a somewhat lower prevalence of obesity than the general US population (29% vs 35.7%),<sup>11</sup> and a much lower prevalence of hypertension (8% vs 33%).<sup>12</sup> However, in the case of hypertension, it is possible that patients presenting at our clinics already had their hypertension under control; it was beyond the scope of this study to identify medication use.

It also may be due to the younger age of our clinic population.

Chief complaints among our fee-for-service teaching clinic patients also differed in several aspects compared to the *Practice Analysis of Chiropractic 2010*.<sup>6</sup> Most notable was the higher prevalence of lower extremity complaints. Although looking at the chief complaints by ICD-9 code yielded a somewhat different distribution there still was a disparity between these clinics and the distribution of complaints shown in the *Practice Analysis of Chiropractic 2010*.

Within our fee-for-service teaching clinics, the percent of patients presenting for wellness care is considerably lower at 1.8% than the 8.0% reported in the *Practice Analysis of Chiropractic 2010* of field practitioners.<sup>6</sup> This may be due partly to our study including only new patients rather than those patients who initially presented with a complaint and then became wellness patients. It also may be due to differing definitions of “wellness” among practitioners and academic institutions. Currently, we are developing classroom exercises using standardized patients to teach students to provide patients with health promotion, disease prevention, and wellness information to bridge this gap.

First time patients presenting with nonmusculoskeletal conditions appeared to be less frequent than those reported in the *Practice Analysis of Chiropractic 2010* (1.3% vs 2.5%).<sup>6</sup> This clearly is at odds with the findings of some other studies.<sup>3,4</sup> While neither of the percentages makes up a substantial part of chiropractic practice (either teaching clinics or field practices), students are taught to

**Table 4 - Primary ICD-9 Codes Compared to Chief Complaints**

	Chief Complaint <sup>a</sup>		ICD-9 Code	
	n	%	n	%
Low back	70	31.3	75	33.5
Lower extremity	47	21.0	20	8.9
Neck	37	16.5	33	14.7
Mid-back	22	9.8	10	4.5
Upper extremity	19	8.5	14	6.3
Headache/facial	16	7.1	13	5.8
Soft tissue	4	1.8	56	25.0
Wellness	4	1.8	0	0
Nonmusculoskeletal	3	1.3	1	0.4
Missing	2	0.9	2	0.9
Total	224	100	224	100

<sup>a</sup> The chief complaint categories shown in Table 1 for “other musculoskeletal” (1.3%) and “chest” (0.5%) were combined into “soft tissue” to better compare chief complaint categories to ICD-9 categories.

diagnose and manage nonmusculoskeletal conditions. Therefore, it is important for students to have clinical opportunities to implement such teachings. One way to increase these opportunities is through clinical simulation using standardized patients presenting with a nonmusculoskeletal diagnosis mimicking musculoskeletal symptoms. These opportunities can assist in bridging the gap between teaching clinic opportunities and what field practitioners are managing.

### Limitations

This study had several limitations. First, it was limited by the information available in the EHR system and the difficulty of accessing the information that was available. Second, it was limited by being secondary data; we could not verify the accuracy of the primary data. Related to this limitation is that the ICD-9 code listed first by interns may not actually have been the primary diagnosis; it is impossible to verify this. Third, it is possible that the selected month was not typical, and that analysis of a longer interval, or several different intervals, would yield different results. Fourth, it is possible that our categorization of chief complaints may have differed from those constructed for the *Practice Analysis of Chiropractic 2010*, thus affecting the comparisons made. A related limitation is that we could not do statistical comparisons between our data and the *Practice Analysis of Chiropractic 2010* data. Finally, the reader is cautioned that these results may not be generalized to patient populations of other chiropractic institutions.

### CONCLUSION

New patients in our fee-for-service teaching clinics appear to be dissimilar to those of US chiropractic practices in several important demographics, characteristics, and type of complaints. Our patients also had a lower prevalence of overweight, obesity, and hypertension when compared to reference standards. Continued efforts and monitoring of patient demographics are needed to provide interns adequate diversity of experience to ensure that they are well prepared for practice.

### CONFLICTS OF INTEREST

There were no external sources of funding for this study and no conflicts of interests were declared.

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