EDUCATION
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ORIGINAL ARTICLE

The influence of curricular and extracurricular learning activities on students' choice of chiropractic technique

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Objective: Surveys for the National Board of Chiropractic Examiners indicate that diversified chiropractic technique is the most commonly used chiropractic manipulation method. The study objective was to investigate the influences of our diversified core technique curriculum, a technique survey course, and extracurricular technique activities on students' future practice technique preferences.
Methods: We conducted an anonymous, voluntary survey of 1st, 2nd, and 3rd year chiropractic students at our institution. Surveys were pretested for face validity, and data were analyzed using descriptive and inferential statistics.
Results: We had 164 students (78% response rate) participate in the survey. Diversified was the most preferred technique for future practice by students, and more than half who completed the chiropractic technique survey course reported changing their future practice technique choice as a result. The students surveyed agreed that the chiropractic technique curriculum and their experiences with chiropractic practitioners were the two greatest bases for their current practice technique preference, and that their participation in extracurricular technique clubs and seminars was less influential.
Conclusions: Students appear to have the same practice technique preferences as practicing chiropractors. The chiropractic technique curriculum and the students' experience with chiropractic practitioners seem to have the greatest influence on their choice of chiropractic technique for future practice. Extracurricular activities, including technique clubs and seminars, although well attended, showed a lesser influence on students' practice technique preferences.

Key Indexing Terms: Manipulation, Chiropractic; Education; Curriculum.

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INTRODUCTION

As a healthcare profession, chiropractic has been influenced strongly throughout the course of its 120-year history by highly influential and opinionated individuals, especially with regard to philosophy and adjustive procedures. These persons include the "founder" of chiropractic, D.D. Palmer, and his son, B.J. Palmer (developer of the meric technique and Hole-in-One or upper cervical technique), Clarence Gonstead (developer of the Gonstead technique), Arlan Fuhr (developer of the Activator technique), James Cox (developer of the Cox flexion-distraction technique), Clay Thompson (developer of the Thompson terminal point technique), George Goodheart (developer of applied kinesiology [AK]), Major Bertrand deJarnette (developer of the Sacro-Occipital Technique [SOT]), and many others. One of the consequences of this historical background of personalities is the effect their legacies have on current chiropractic education and practice. Educational programs at many chiropractic colleges, including technique curricula, have been influenced by 1 or more of these personalities and their present-day advocates.[1] The challenges for each college faculty have been, and are, to provide a curriculum that incorporates the essential contributions from these historical personalities along with the elements based on current evidence and to assess the effectiveness of that curriculum in preparing today's practitioner.

Some chiropractic students may perceive deficiencies in their educational program when the techniques developed by these legendary personalities are excluded or deemphasized. These students may believe that these pioneers represent a truer form of chiropractic and/or a more systematic approach to assessment and treatment of chiropractic patients than generic techniques. Students may react by seeking out technique experts at extracurricular seminars and through participating in campus technique clubs. These student behaviors may lead some faculty to speculate on the influence of these extracurric-

ular activities versus that of the curriculum in determining graduates' practice preferences.

A search of the literature revealed a few articles that have investigated correlations between chiropractic students' preclinical education, including technique education, and the procedures they use during internship and while in practice.[2–6] In addition, the National Board of Chiropractic Examiners has surveyed doctors of chiropractic 3 times within the past 20 years regarding their practice methods and preferences, including choice of chiropractic manipulative therapy. The most recent of these survey results, published in 2005,[7] indicates that diversified is the most commonly used technique, followed by Activator, Thompson, Gonstead, Cox flexion-distraction, SOT, and AK. These preferences may have several bases, including the efficacy of the technique, its emphasis in the doctor's chiropractic education, and extracurricular exposure to students through clubs and seminars on and off campus.

The primary technique taught in the doctor of chiropractic (DC) degree program at our institution is diversified. This technique is taught through a sequence of courses in the 2 years (6 trimesters) before the clinical internship. At the time of this study, a chiropractic technique survey course provided a formal introduction to approximately 10 additional commonly used technique systems (e.g., Activator, Thompson, Gonstead, Cox, SOT, AK, Hole-in-One, Logan Basic). This course was taught in trimester 7 (of a total of 10), a transitional trimester at the end of the preclinical education and beginning of the clinical internship. There also are several extracurricular technique clubs (e.g., Activator, AK, Gonstead, SOT) on our campus in which many students participate, and various technique seminars on or off campus are attended by our students. In addition, our institution recently modified the DC curriculum to include several technique electives, and these eventually may influence our students' practice technique preferences.

Our purpose in this study was to investigate the influence of curricular and extracurricular technique experiences on our students' future practice technique plans. Our hypothesis was that our students' technique learning experiences within the curriculum have the greater influence on their future practice technique preference.

METHODS

This study was approved by the institutional review board of the Southern California University of Health Sciences. A survey was developed and administered to chiropractic students in the 2nd and 3rd trimesters (1st year students), 5th and 6th trimesters (2nd year students), and 8th trimester (3rd year students) of the DC program. First, 4th, 7th, and 10th trimester students were not included in the study as none of these cohorts was enrolled at the time of survey administration, as the institution admits cohorts only twice a year. The 9th trimester students were excluded because they were not attending classroom sessions on campus. The survey included questions on demographic factors, extracurricular technique activities, practice technique preferences, the basis for practice technique choices, and the influence of the chiropractic technique survey course. The survey was pretested for face validity before its administration through a review process conducted by technique department faculty members, which included several recent graduates of our institution, and the research department at our university. This pilot testing and the research department review resulted in no substantive changes to the survey instrument. The survey was distributed during technique department courses, was anonymous, and participation was voluntary. Completion of the survey indicated the respondent's consent to participate in the study. Double verification of data entry was performed by 2 independent research assistants to help avoid errors. All data were analyzed using SPSS for Windows version 21 (IBM Corp., Armonk, NY). The data were analyzed using descriptive and inferential, Pearson χ^2, statistics. Inferential statistical analyses were used to assess statistical significance of the survey data when sufficient sample sizes were available.

RESULTS

A total of 164 students participated in the study (78% of those eligible) with the following distribution: 76 1st year students (82% of those eligible), 60 2nd year students (77% of those eligible), and 28 3rd year students (74% of those eligible).

The survey indicated that the SOT club was the most highly and consistently attended campus technique club (Fig. 1) with 38% of 1st year, 42% of 2nd year, and 43% of 3rd year students participating. The AK (1st year, 22%; 2nd year, 22%; 3rd year, 14%) and Gonstead (1st year, 28%; 2nd year, 22%; 3rd year, 14%) clubs were the next most attended and almost equal in the percentage of participants from each year, yet the percentage of participation in these 2 clubs decreased from the 1st to the 3rd year (Fig. 1). The Activator club (1st year, 5%; 2nd year, 12%; 3rd year, 4%) had the lowest percent participation each year. Despite these differences in attendance by club and year, there was no statistically significant relationship between students' year of study and the technique club that they attended, χ^2_{SOT} (2, $n = 164$) = 0.27, $p = .88$; $\chi^2_{Activator} = 3.87$, $p = 0.14$; $\chi^2_{Gonstead} = 2.17$, $p = 0.34$; $\chi^2_{AK} = 0.86$, $p = 0.65$. In addition the percent of respondents who reported attending at least 1 club while enrolled at the college was 51% of 1st year, 57% of 2nd year, and 54% of 3rd year students. These differences were not statistically significant, χ^2 (2, $n = 164$) = 0.39, $p = .82$.

The percentage of students attending technique seminars on or off campus increased in each succeeding year (Fig. 2). Among 1st year students, 17% reported attending no seminars, 43% reported attending 1 to 3 seminars, 32% reported attending 4 to 6 seminars, 8% reported attending 7 or more, and none reported attending more than 10. By the 3rd year all of the students reported attending at least 1 seminar, 39% reported attending 7 or more, and 21% reported attending more than 10. This progression in seminar attendance was statistically significant, χ^2 (8, $n =$

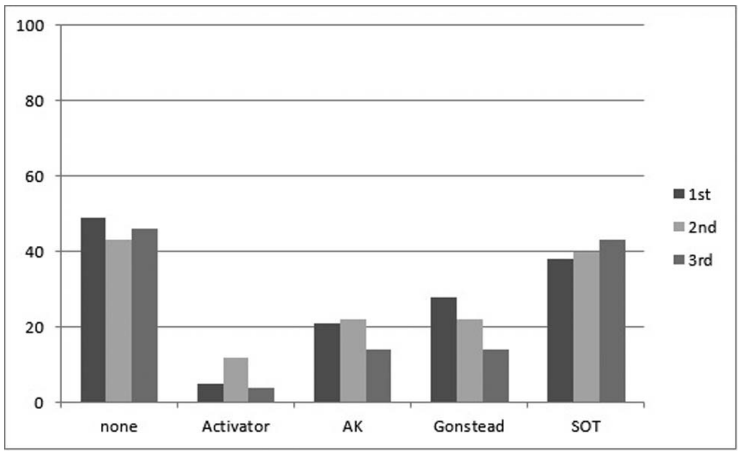

Figure 1 - Percent attending technique clubs by year in program.

164) = 25.15, $p = .001$. In addition more students each year (17% of 1st year, 25% of 2nd year, and 39% of 3rd year) indicated that attendance at seminars had changed their choice of technique club participation. Whether these differences were statistically significant could not be determined due to the small sample sizes. In addition, students who reported attending clubs also were those who were more likely to attend seminars. This relationship was statistically significant for students who attended the SOT (χ^2 [4, $n = 164$] = 18.28, $p = .001$), Gonstead (χ^2 [4, $n = 164$] = 22.59, $p < .0001$), and AK (χ^2 [4, $n = 164$] = 25.13, $p < 0.0001$) clubs, but not for those who attended the Activator club (χ^2 [4, $n = 164$] = 6.51, $p = 0.164$), regardless of the student's year in the program.

With regard to the influence of the chiropractic technique survey course on 3rd year students' preferences for club attendance and practice plans, 39% indicated that it had changed their club attendance, and 61% indicated that it had changed their future practice technique plan. However, no statistical significance could be determined for these results due to the small sample sizes.

The most preferred technique to use in students' future practice was diversified, ranging from 66% of 1st year to 71% of 3rd year students (Fig. 3). The other techniques included in the survey showed more variability from 1st to 3rd year students. For example, preference for Activator and Cox techniques increased, whereas preference for AK, Gonstead, and SOT decreased over the 3 years. In addition, those students who attended any technique club were more likely to indicate a preference for future practice techniques other than diversified. This correlation associated with club attendance was statistically significant for those students who indicated a future preference for the following techniques only: Activator (χ^2 [1, $n = 164$] = 6.52, $p = 0.011$), AK (χ^2 [1, $n = 164$] = 4.22, $p = 0.040$), Cox (χ^2 [1, $n = 164$] = 5.54, $p = 0.019$), and SOT (χ^2 [1, $n = 164$] = 29.50, $p < 0.001$).

The students chose the basis for their technique preferences for their future practice as: (1) chiropractic technique curriculum (50%–57%), (2) technique clubs (11%–33 %), (3) technique seminars (18%–33%), and (4) DC practitioners (47%–61%; Fig. 4). The technique curriculum and DC practitioners held the same level of influence through the students' 3 years of study, while the clubs and seminars had diminishing influence as the students advanced. Whether these differences were statis-

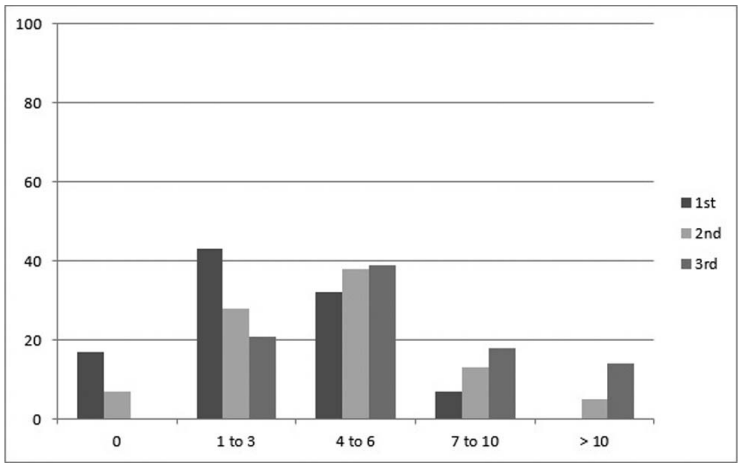

Figure 2 - Number of technique seminars attended by year in program.

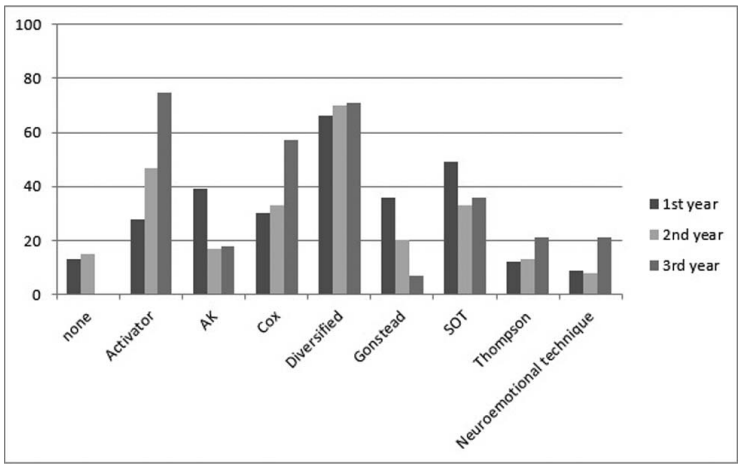

Figure 3 - Percent planning to use technique in future practice by year in program.

tically significant could not be determined due to small sample sizes.

DISCUSSION

A literature search revealed a few articles that have investigated correlations between chiropractic students' preclinical education, including technique education, and the procedures they use during internship and while in practice.[2–6]

Leone[2] surveyed the 1988 to 1993 graduates of 2 Texas chiropractic colleges regarding their frequency of use of 9 different treatment procedures. A statistically significant correlation was found between the use of 4 of the procedures – Activator, Thompson, Gonstead, and Cox flexion-distraction – and the number of hours of instruction in these procedures at the respective colleges. There also was a trend towards more use of diversified technique by graduates of the college that predominantly taught this approach.

Saranchuk and Watkins[3] surveyed 1993 to 1998 graduates from Canadian Memorial Chiropractic College (CMCC) regarding how their chiropractic education had prepared them for professional practice. The authors asked survey respondents to assess the value of course content and time allocated for instruction and the amount of "unnecessary" repetition. They found that graduates highly valued most of their education, including "applied chiropractic" and learning spinal manipulative skills, that the time allocated for instruction was appropriate and that there was no unnecessary repetition associated with their education.

Mykietiuk et al.[4] sought to determine the technique systems being used in practice by chiropractors in 5 Canadian provinces. They limited their random survey by only selecting responses from post-1980 graduates of CMCC who had been instructed solely in the diversified technique. They found that 86% of their respondents primarily practice diversified technique; however, 88% also reported practicing at least 1 other technique not taught at CMCC and presumably learned by the practitioners through attendance at seminars before or after graduation. The study reported that the only other

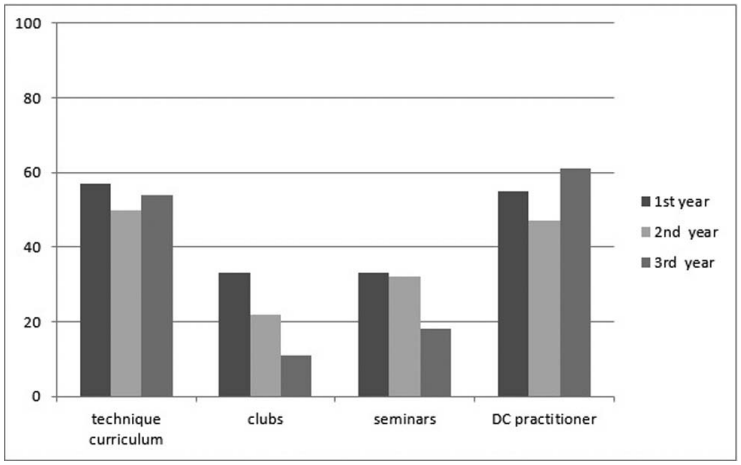

Figure 4 - Percent curriculum and extracurriculum influence on future practice technique plan by year in program.

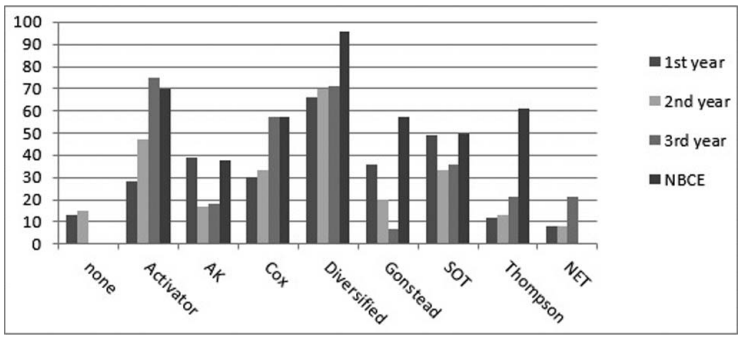

Figure 5 - Technique preferences of students and practicing doctors of chiropractic. NBCE indicates data from National Board of Chiropractic Examiners.

technique practiced by more than 50% of the respondents was Activator.

Vermet et al.[5] assessed vertical integration between chiropractic students' preclinical education in lumbopelvic diagnostic and therapeutic procedures and their use of these procedures during clinical internship at the CMCC. In this study, the authors surveyed the interns' supervising clinicians to determine the use of these procedures. The study concluded that there was considerable vertical integration, including between the teaching and practice of the spinal manipulative technique.

Gleberzon and Stuber[6] performed a random survey of practicing chiropractors in the Province of Ontario, Canada, regarding their use of diagnostic and therapeutic procedures. The authors found that the most common adjustive procedures performed by the majority of practitioners were diversified (91%) and Activator (54%). The majority of the respondents (75%) in this study were graduates from CMCC where diversified is the primary technique taught. Other techniques, including Thompson, upper cervical, Cox flexion-distraction, Gonstead, SOT, and AK, were each used by a 3rd or less of the responding practitioners.

Our results indicated that our students have similar preferences for chiropractic technique as has been reported by the NBCE Job Analysis Survey of 2005[7] (Fig. 5), by Mykietiuk et al.[4] in their survey of chiropractors in 5 Canadian provinces, and by Gleberzon and Stuber[6] in their survey of Ontario, Canada, chiropractors. Diversified technique reportedly is used by more than 85% of practicing chiropractors[4,6,7] and Activator technique by more than 50%,[4,6,7] and they are similarly the 1st and 2nd choices of our students. This outcome is consistent with teaching the diversified technique as our core curriculum technique and with the students' survey responses that the curriculum and their experience with chiropractic practitioners are the 2 greater bases influencing their technique practice choices.

Many of our students participate in extracurricular technique club activities and technique seminars during their 3-1/3 years in the chiropractic program. Anecdotally, we have observed that the students who attend clubs and seminars often are very enthusiastic about particular techniques that they have been exposed to through these activities. This observation made us wonder whether these interests are continued into practice. At the time of our survey, there were 4 chiropractic technique clubs on our campus: Activator, AK, Gonstead, and SOT. All campus clubs, including the 4 technique clubs, are student-driven, supervised by a full-time faculty advisor (a licensed chiropractor), and sanctioned by the Associated Student Body Interclub Council and the university Department of Student Affairs. The technique clubs typically meet weekly on campus during the lunch hour to discuss and practice specific technique procedures. These clubs also occasionally invite outside practicing chiropractors certified in the particular technique to speak at club meetings and to demonstrate procedures.

Seminars featuring chiropractic technique occur frequently on or near our campus. Many of these events are organized by our university, including a Visiting Scholars Program and an annual Extravaganza. These events are free to our students and faculty. Some seminars are sponsored by chiropractic political organizations, such as the California Chiropractic Association, the International Chiropractic Association, or the American Chiropractic Association. These events generally are free or provided at reduced cost to our students and faculty. Some seminars are provided by other chiropractic colleges or by specific technique organizations and participants are charged a fee to attend. The presenters at seminars featuring chiropractic techniques typically are certified experts in and often advocates for a particular technique. Their presentations include information on the technique as well as a performance demonstration of the technique on a volunteer "patient."

According to our survey results, students' participation in clubs remains fairly constant over the years of their education at slightly over 50%, while attendance at seminars increases progressively over that same time period, such that by the time of graduation, every student will have attended at least 1 seminar. Furthermore, students who participate in clubs were determined to be more likely to attend seminars. In addition, students' participation in technique seminars appeared to affect their choice of technique club to attend; however, our survey did not ask respondents to indicate how their choice was affected. We speculated that students who attended seminars featuring a particular technique would be more likely to join and participate in the campus technique club

featuring that same technique. In support of this view, our survey results indicated that students who participated in more clubs and attended more seminars, as opposed to those who did not, were more likely to indicate a future practice preference for Activator, AK, Cox, or SOT, and 3 of these techniques are represented by technique clubs on our campus. Despite this difference between these 2 populations of students, diversified and Activator were the only 2 techniques preferred by the majority of the respondents.

To our knowledge, there are no published results on the effects of extracurricular technique clubs on students' future practice technique choices. We did note that Glebezon and Stuber[6] wrote in their discussion section that these clubs have existed at CMCC and might have some influence on their students; however, in their study they did not attempt to assess this influence and, in fact, stated that it may not be possible to evaluate.

The 2 most preferred student choices of bases for their future practice technique preference were our core chiropractic technique education and experience with a chiropractic practitioner. Our core chiropractic curriculum comprises 7 consecutive trimesters of instruction. It begins with joint and soft tissue assessments, followed by joint and soft tissue manipulative procedures, and ending with special populations and specialized chiropractic procedures. This curriculum totals more than 500 hours of formal instruction, including more than 400 contact hours in technique lab, which may explain why the core curriculum has such a great influence on students' choice of future practice technique. By comparison, Leone,[2] in her study, reported that 1 of the schools had 300 hours of diversified instruction, while the other had 60 hours. Since our survey for this study was completed, our chiropractic curriculum has been changed to include selective courses in various chiropractic techniques. This change was supported by the results from many informal student surveys.

The 2nd most preferred choice of basis for students' future practice technique preference was their experience with a chiropractic practitioner. The role of "chiropractic practitioner," however, was not defined in our survey and might have been construed by students to be a family member who was a practitioner, a practicing doctor who mentored a prospective student before admission, a current practicing doctor of a student patient, a current practicing doctor supervising an intern, a clinical internship faculty doctor of a student patient, and/or a clinical internship faculty doctor supervising an intern. Thus, we are unable to determine which of these possibilities, or others, the respondents may have been considering when they made this selection on the survey.

At the beginning of their clinical internship in the 3rd year, our students took a chiropractic technique survey course which introduced them to a number of techniques other than diversified. The results of our survey indicated that this course changed students' technique club participation and their future practice preferences. However, in our survey we did not ask how students' club participation or future practice preferences changed. We presume that some students stopped attending some clubs and started attending other clubs and that some students decided not to prefer some other techniques for future practice and some decided to prefer other techniques instead or in addition to their preferences before taking the course. The apparent outcomes from students' participation in the technique survey course further supports our hypothesis that our students' technique learning within the curriculum has a greater influence on their future practice preference than any extracurricular activity. In addition, as curricular revision proceeds with the addition of more technique selective courses and other changes, we predict that these changes will likely influence students' practice preferences as well.

There are limitations to our study. This study was retrospective, and, thus, there may be recollection bias. Although the survey instrument used in the study was pilot tested by chiropractic technique department faculty and reviewed by research department faculty for face validity before its administration to students, the meaning of certain words and phrases, such as "chiropractic practitioner," may have been interpreted variously by the respondents. Another limitation was that our survey instrument did not inquire as to how or why the student respondents changed their technique and/or club preferences.

CONCLUSION

Overall this study's results show that our chiropractic technique curriculum and the students' experience with chiropractic practitioners appear to have the greatest influence on the chiropractic techniques that they plan to use in their future practices. Extracurricular activities, including technique clubs and seminars, although well attended, seem to have a lesser influence on students' practice technique preferences. Future studies involving more chiropractic colleges will provide more generalizable data.

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Author Contributions

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