Incorporating a Mandatory Osteopathic Manipulative Medicine (OMM) Curriculum in Clinical Clerkships: Impact on Student Attitudes Toward Using OMM

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**Context:** As the osteopathic medical profession grows and enrollment in osteopathic graduate medical education falls, it is important to ensure that all osteopathic medical students receive adequate training in osteopathic manipulative medicine (OMM).

**Objective:** To determine if incorporating mandatory exposure to OMM into third- and fourth-year clinical clerkships favorably influences osteopathic medical students’ comfort with the use of OMM.

**Methods:** All participants attended a 1-hour mandatory didactic lecture and a 3-hour practical clinic every week as part of their rotations at Wilson Memorial Medical Center. The authors distributed 2 hardcopy questionnaires to each subject: the first survey before rotations began and the second at the end of rotations. The survey comprised 7 clinical situations to which students used a visual analog scale ranging from “comfortable” to “uncomfortable” to describe their personal comfort with using OMM in each situation. Students’ responses before and after rotations were compared using the paired t test.

**Results:** Sixty-eight students had rotations at the clinic; 50 students completed both questionnaires. The study demonstrated a statistically significant increase in comfort level of 17.9% (P < .001) after the rotations.

**Conclusions:** Students’ reported levels of comfort with OMM increased after they underwent formal OMM education. Incorporating exposure to an OMM curriculum may help instill a greater sense of identity as a future osteopathic physician and may influence participation in an osteopathic residency.

**The American Association of Colleges of Osteopathic Medicine projects that in the 2016-2017 academic year, more than 5000 osteopathic physicians will graduate from colleges of osteopathic medicine (COMs)—a 62% increase over 2007 data.** Additionally, since 2005, 8 new COMs, branch campuses, and additional locations have been established in the United States. Because of this drastic increase, the unique tenets of osteopathic medicine must be closely reexamined to ensure that OMM is not being diluted.

**As the practice of osteopathic medicine flourishes in the United States, some may question whether the profession has maintained its distinctiveness in adhering to the original principles of Andrew Taylor Still, MD, DO. Progress certainly dictates change, notably to more pharmacopoeia-oriented practices, but physicians concerned with the future of the profession may be wary that osteopathic medicine is being referred to as a “lost art,” as “rhetoric,” and even as a “paradox.” It may be necessary to find ways to preserve the discipline’s distinctiveness.**

The American Association of Colleges of Osteopathic Medicine projects that in the 2016-2017 academic year, more than 5000 osteopathic physicians will graduate from colleges of osteopathic medicine (COMs)—a 62% increase over 2007 data. Additionally, since 2005, 8 new COMs, branch campuses, and additional locations have been established in the United States. Because of this drastic increase, the unique tenets of osteopathic medicine must be closely reexamined to ensure that OMM is not being diluted.

Although the increase in the number of COM graduates heightens the profession’s visibility, the doctor of osteopathic medicine degree should represent a distinct philosophy. Because of the many similarities between osteopathic and allopathic medical education, it is important to examine at what point a student becomes characteristically osteopathic. According to Veit, “The best interest of students ... is engaging actively, especially as residents, with the continuum of osteopathic education.” Therefore, students mature into osteopathic physicians primarily during osteopathic graduate medical education.

Recent growth of the osteopathic medical profession coupled with the problem of a less clearly defined identity prompted the present study. As Shannon and Teitelbaum observed, “the simultaneous movement away from osteopathic medicine’s traditionally separate training and practice systems, when coupled with its rapid growth, has created a sense of crisis as to its future.” The concepts behind osteopathic medicine are guided by numerous principles, but the
use of osteopathic manipulative treatment (OMT) is considered by many to be a distinguishing characteristic of osteopathic physicians.\textsuperscript{3,5,6} Seminal advocates of osteopathic medicine, such as Gevirtz,\textsuperscript{7} have emphasized the use of OMM as central to being an osteopathic physician.

Because the use of OMM appears to be in decline, it is essential to establish osteopathic core values in students at COMs. In a study conducted by Johnson and Kurtz,\textsuperscript{2} more than half of the osteopathic physicians reported using OMT on their patients less than 5\% of the time, and a quarter of respondents reported that they did not use OMT at all. As noted by Shubrook and Dooley,\textsuperscript{8} “Many osteopathic students are abandoning use of OMT even before they graduate from a college of osteopathic medicine.” Johnson and Kurtz\textsuperscript{2} cited the following barriers to the practice of OMT: “a lack of role models, lack of suitable facilities, declining confidence in the practitioners’ abilities, and inadequate clinical trainings.” If this description is true, additional training during clinical years should increase students’ confidence in their ability to use OMT in their profession.

We believed that instituting an OMM curriculum during the third and fourth years of osteopathic medical school would allow students to observe in-hospital role models who consistently practice OMT in both outpatient and inpatient populations. In providing an OMM curriculum during this critical point in osteopathic medical students’ education, we sought to determine whether the additional OMM exposure during clerkship years would influence a student’s comfort with the use of OMM. Based on the findings of Johnson and Kurtz,\textsuperscript{2} as previously described, we hypothesized that students would have increased comfort with OMM use.

Methods

During the 2008 and 2009 calendar years, osteopathic medical students representing 9 COMs around the country—primarily from the New York College of Osteopathic Medicine (NYCOM), the Lake Erie College of Osteopathic Medicine, the Touro University College of Osteopathic Medicine, the University of New England College of Osteopathic Medicine, and the Kansas City University of Medicine and Biosciences—were asked to complete 2 surveys. The first survey was collected before each student began a rotation at Wilson Memorial Medical Center (WMMC). A second, identical survey was collected after each student completed the rotation. Students filled out both surveys regardless of the rotation being completed because all rotations at WMMC have an OMM component. The present study was exempt from institutional review board approval.

Rotations

Rotations at WMMC began with each student being assigned to an OMM practical session, consisting of a minimum of 3 hours per week of direct patient care in the clinic with an OMM faculty member or a third-year family medicine osteopathic resident. In addition, all students attended 1 hour per week of OMM lectures on osteopathic medical principles, treatment, and philosophies. Although students completed different rotations (eg, surgery, psychiatry, medicine, and pediatrics), all were exposed to osteopathic medicine and techniques for their specific rotations, emphasizing the potential use of OMT in most fields of medicine. Each student completed at least 4 weeks of rotations at WMMC.

Surveys

The 2-page questionnaire consisted of 7 distinct scenarios designed to determine a student’s level of comfort in performing OMT. The scenarios were designed by 2 osteopathic physicians who actively practice OMT: Brian Jones, DO, and Michael Tunick, DO. They identified common clinical situations in which the use of OMT would be appropriate, narrowing the selection to 7 scenarios in which COM graduates are expected to be comfortable performing OMT. Scenarios included patients with acute low back pain, L5-S1 disk herniation, tension headaches, sinusitis, pneumonia, back pain accompanying pregnancy, and a poor sucking reflex in an infant (Figure 1). To indicate their comfort level with performing OMT, students used a visual analog scale, which was a continuous scale that allows for any possible response in the range between its 2 extremes—in this case “not comfortable” and “very comfortable.” A space was provided at the top of the survey for the student’s initials, year in school (ie, third- or fourth-year osteopathic medical student), and date of survey completion.

Prerotation surveys were returned to the student coordinator before the start of rotations, and postrotation surveys were returned to the administrative assistant after completion of the rotation. This return system was used to minimize potential bias based on students’ potential desires to please faculty members. Because the researchers received the surveys only after pairing and removal of students’ names, no data could be analyzed until both surveys were completed.

The researchers hand-converted responses to each question from the pre- and postrotation surveys into a proportion from the visual analog scale (the ratio of edge-to-mark length to edge-to-edge length) to regularize the data. For each subject, the difference between post- and prerotation proportions was calculated for each question. Because the overall increase in comfort was of principle interest, the averages of the differences across the 7 scenarios for each subject were analyzed. Paired \( t \) tests were used to analyze the data for 2 reasons: (1) the data were paired, allowing each study participant to have a data point before and after treatment, and (2) the null hypothesis was that the differences were greater than 0.

Results

Of 68 students rotating at WMMC in the years studied, 50 students completed both the pre- and postrotation surveys. The
1. A 42-year-old man presents with acute onset of back pain. He states that he was outside shoveling snow 3 days ago when all of sudden his left lower back “gave out.” He has no history of previous back pain. He has been taking ibuprofen 600 mg 3 times a day with only mild relief. He could not go to work because of the pain. He states that the pain is only located in his left lumbar area and left hip. The pain does not radiate down his legs and does not cause any bladder or bowel dysfunction.

2. A 28-year-old woman presents to the OMM clinic after falling on the ice 2 months ago. She states that ever since she fell, she has been experiencing pain in her right lumbar area. The pain radiates down the back of her thigh to her knee and goes down the front of her shin to her first and second toes. She states that it is worse when she sits and thus prefers to stand during the interview. She was involved in a car accident 2 years ago and ever since has had back pain. She has been referred to the OMM clinic after not improving with acetaminophen and hydrocodone and a muscle relaxant. A magnetic resonance image shows a L5-S1 disk herniation.

3. A 37-year-old woman presents to the OMM clinic with headaches associated with neck, shoulder, and upper thoracic pain for several months. She states that she is having marital troubles with her husband, she has a big project due at work, and she has very large credit card debt. Her primary care physician has recommended counseling but she has not gone because “I have no time to go.” She states that her headaches start in the back of her neck and then it feels like her head is in a vice. She has no photophobia or visual disturbances. She gets little relief with over-the-counter medications. Her right neck hurts more than the left and it hurts to raise her right hand above her head to brush her hair.

4. Your allopathic partner in the family practice clinic has referred a 22-year-old man to the OMM clinic for evaluation of sinusitis. The patient complains of a 1-month history of nasal congestion with yellowish-green discharge and right-sided cheek pain. He has no fever, chills, or cough. He states he gets this every year around this time. He has tried nasal sprays, nasal steroids, antihistamines, and antibiotics with little relief. He currently refuses a computed tomography scan of his sinuses.

5. You are paged by an emergency physician at 3 am to admit a 73-year-old man with shortness of breath, a temperature of 101.2°F, and an oxygen saturation of 89% on room air. When he ambulates, his oxygen saturation goes into the low 80s. On 2L oxygen by means of nasal cannula, his saturations are 93%. He has no cardiac history, his echocardiogram shows normal sinus rhythm, he is usually very active, and he has no history of tobacco use. Results of a chest radiographic scan shows a right lower lobe infiltrate.

6. As her pregnancy has progressed, your 28-year-old primigravida, nullipara woman at 32 weeks gestational age has complained of increased bilateral lower back pain and right hip pain. There is no radiation of pain down either leg. Her pregnancy has been completely unremarkable. She has no history of trauma to her back. She went to a chiropractor 3 years ago who relieved her back pain with “cracking.”

7. While you are up on maternity seeing a patient of yours, a midwife asks you to evaluate the newborn of the patient she delivered 2 days ago. The delivery of this child was complicated with an extended second stage of labor of 20 hours. Then, at the time of birth, there was a shoulder dystocia which was fixed with a woodscrew maneuver. Since birth, the child has not breast or bottle fed. He is very fussy and irritable. He has a very poor suck reflex. His head has significant molding from the labor. Otherwise, the rest of the physical examination, including the neurologic examination, is unremarkable.

Figure 1. Survey questions given to third- and fourth-year osteopathic medical students before and after rotations with a required osteopathic manipulative medicine (OMM) curriculum. Students were asked to indicate how comfortable they were treating each patient with OMM by drawing a perpendicular line on a scale from not comfortable to comfortable.

final analysis was performed on the average difference in the 7 scenarios for each subject, with an overall sample size of 50 students. A histogram of overall differences is shown in Figure 2. From this analysis, compared with prerotation levels, the comfort levels in a majority of participants increased after rotations. The mean (standard deviation) increase was 17.9% (17.1%). This increase was statistically significant (t(49)=7.41; 99% confidence interval, 12.3%-23.5%; P<.001). In other words, we are 99% confident that there was at least a 12.3% average increase in comfort level with performing OMM in the tested scenarios.

After converting data to percentages and examining the overall differences by question number, we found that the statistically significant increase in comfort level was also a practical increase—Figure 3 shows that for every scenario, the comfort level increased after OMM rotations.

Comment
Students’ levels of comfort with OMM use were favorably influenced by the incorporation of required didactic and practical sessions during the third and fourth years of osteopathic medical school. Our data indicate an overall average 17.9% increase in comfort with using OMM in field scenarios (P<.001). This improvement indicates an increase in confidence for these future osteopathic physicians, which we believe should lead to increased future competence.

Few osteopathic medical students believe they are exposed to sufficient opportunities to use their osteopathic palpatory skills and OMT during their 14 required clinical rotations. In one study, only 36% reported having the opportunity to use osteopathic palpatory skills in more than 5 of their required rotations, and only 28% had the opportunity to use OMT.9 As Shannon and Teitelbaum6 asked, “How
likely will graduates be to develop and use these skills in their care of patients if they do not receive a continuum of clinical education by osteopathic physicians who are teaching and utilizing those skills in their own care of patients? As the profession continues to grow and more students are admitted to COMs each year, it is striking to discover that the more recent the date of graduation from a COM, the lower the reported use of OMT. 

Despite their lack of exposure to OMT, osteopathic medical students have been noted to have an increasing or continued interest in pursuing OMM in the third and fourth years of osteopathic undergraduate training. In fact, Gamber et al demonstrated that only 6.6% of osteopathic medical students lack interest in OMT. The lack of comfort with using manipulative modalities arises from seeing patients in unfamiliar settings and inexperience with using OMT in older patients, younger patients, or patients who are sicker than those seen in ambulatory clinics. Based on our observations, osteopathic physicians avoid using OMT in these situations at least partially because of the systematic failure of their osteopathic medical educational curricula to provide a broader range of exposure.

In addition to core competencies adopted by the osteopathic medical profession, there has been a noted “need for residents to demonstrate and apply knowledge of accepted standards in OMT appropriate to their specialty.” At WMMC, as may be the case with a handful of other osteopathic medical facilities, OMT is integrated into every rotation. This creates an atmosphere in which students are encouraged to become competent with OMM and remain dedicated to the philosophy of osteopathic medicine through lifelong learning.

To this end, training in OMM is vital throughout undergraduate and graduate medical education. Although some factors are beyond the influence of educational background, Gevitz points out that the less distinct a student’s osteopathic medical education is from allopathic medical education, the less distinctively osteopathic his or her practice is likely to be as a physician; consequently, many graduates identify more closely with allopathic medical practices and institutions than with osteopathic ones. Similarly, osteopathic physicians receiving postdoctoral training outside traditional osteopathic programs are less likely to use OMT; residents trained in programs accredited by the Accreditation Council for Graduate Medical Education in both family and specialty medicine reported less frequent OMT use than their colleagues in family and specialty medicine programs approved by the American Osteopathic Association.

Based on the results of the present study, increased exposure to OMM appears to correlate positively with the choice to pursue an osteopathic residency rather than an allopathic one, as seen in data for students from NYCOM, WMMC’s major affiliate. In both 2008 and 2009, a post hoc analysis of the data revealed that a higher percentage of NYCOM students who rotated at WMMC participated in an osteopathic residency (osteopathic match) (79% in 2008 and 64% in 2009),

Figure 2. Histogram showing osteopathic medical students’ average overall differences in comfort using osteopathic manipulative medicine for 7 patient scenarios.
Limitations

We did not directly examine students’ competency of OMM performance, but we suspect that comfort with OMM is directly related to usage and, to some extent, proficiency. Measuring competency is a difficult task: students in a given rotation represent different schools, each presenting distinct methods and skills. Even within a school, performance will vary based on individual instructor and student. Because of this variation in performance among students within the same school and from school to school, mastery of the evaluator’s technique is less indicative of future proficiency in the field than is an individual’s comfort level. Self-evaluation provides an indication of comfort in using OMM and desire to use OMT techniques in the future.

Reliance on self-evaluation of OMM alone is not meant to support the belief that osteopathic medicine is based solely on OMT techniques; the philosophy behind this practice of medicine certainly has many components and virtues. However, OMT represents a didactic component of the osteopathic medical curriculum and is 1 aspect of the practice that makes osteopathic physicians unique. It is assumed that role modeling and discussion of the principles, philosophies, and practice of osteopathic medicine are included in this training along with OMT techniques.

In this unavoidably nonblinded study, we used self-reported data, which carry a potential for expectation bias. Because all participants were in the experimental group compared with all NYCOM students (51.7% in 2008 and 45.8% in 2009). Because only about 8% of NYCOM students have rotations at WMMC (25 of 297 in 2008), only a rudimentary analysis was performed. There are too many additional confounding variables to attribute this increase solely to a required OMM curriculum at WMMC, but it may validate the observed influence of an OMM curriculum on students’ desires to pursue an osteopathic residency. Future research may prove that increased exposure to OMT does have this effect.

This potential increase in preference for an osteopathic “Match” would affect the osteopathic medical profession in the long run, because studies have shown that the entering of young osteopathic physicians into allopathic residencies “truncates the reinforcement of basic osteopathic concepts and similarly inhibits the opportunity to practice and cultivate their OMT skills.” If a more positive attitude toward OMM is correlated with an increased interest in pursuing an osteopathic residency, it is likely that the distinct skills traditionally possessed by osteopathic physicians can be salvaged. One long-term goal of the osteopathic medical profession is to increase the number of advocates for OMM in hospitals and maximize extant role models for osteopathic physicians. Even when education must be outsourced to allopathic programs, COMs should ensure that there are practicing osteopathic physicians within the walls of these institutions when they are training osteopathic medical students.
involving exposure to the OMM curriculum, they may have had a tendency to overstate comfort levels. To minimize this bias, all surveys were returned to 2 independent parties with no other involvement in the project and no role in grading the subjects. Because of this added degree of separation and ensured anonymity from the researchers, participants were under less direct pressure to perform to an expected standard. Although it is impossible to eliminate expectation bias altogether, we believe that limiting interaction with the researchers should substantially reduce it.

Some loss in data occurred because of our method of collection; 18 surveys were incomplete for pairing (ie, missing a pre- or postrotation survey) and were excluded from the analysis. The present study’s findings should pave the way for further research into adopting an OMM curriculum in the third and fourth years of osteopathic medical school, but the study was limited by its relatively small sample size. To maximize the sample, we did not control for the amount of time students rotated at WMMC. Regardless of the number of rotations completed at WMMC, each student returned a postrotation survey before the exit interview with the director of medical education. Further research must be conducted to determine whether length of exposure to OMM affects the level of comfort with each OMT scenario.

The present study included only students rotating at WMMC, which also introduced a certain bias. Some students may have chosen the rotation because of an interest in OMM, predisposing them to more interest in performing OMT. However, because only the differences between the students’ pre- and postrotation attitudes were analyzed, the effect of this bias should be negligible. More interestingly, students who claimed to be the least proficient in OMT before their rotations had the greatest increase in comfort level after their rotations. The average increase in comfort for the lowest prerotation quartile was 30.5%, compared with 7.2% for the highest quartile.

Conclusion
In this age of evidence-based medicine, many OMT techniques must still be evaluated for their efficacy and reliability. However, if students are not well enough educated in the principles of osteopathic medicine and new osteopathic physicians are not motivated by these principles, there will not be enough researchers with the skills and knowledge to conduct this research. Osteopathic medicine must remain equal to, albeit separate from, allopathic medicine, its practice reinforcing the foundations and philosophies that have been instilled in osteopathic medical students.

In the present study, we demonstrated that additional OMM training in rotations improves a student’s confidence in using OMM. Incorporation of OMM in clinical years is pivotal to maintaining the distinctive identity that osteopathic physicians have fought to preserve. It is time for all COMs to offer distinctive educational experiences to their students, acknowledging their students’ desires to attend a school offering osteopathic medical education. Students’ overall attitudes and confidence in their abilities most likely determine both their desire to participate in an osteopathic residency and their integration of OMM into future practices. Efforts to preserve the uniqueness of osteopathic medicine must begin in COMs.

References