Impact of Predoctoral Teaching Fellows on Osteopathic Medical Students: A Near-Peer Teaching Program Evaluation

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Abstract

Context

The Touro University California College of Osteopathic Medicine (TUCOM-CA) is one of many colleges of osteopathic medicine with osteopathic manipulative medicine (OMM) predoctoral teaching fellowship programs. OMM fellows serve as near-peer teachers for preclinical osteopathic medical students (OMS) at TUCOM-CA, with the objectives of increasing student satisfaction with and understanding of the OMM curriculum. Our aim was to assess whether the TUCOM-CA fellowship program has achieved these objectives.

Methods

All osteopathic medical students at TUCOM-CA were sent an electronic survey. The survey items queried: frequency of and type of interaction; impact on satisfaction with and understanding of the OMM curriculum; impact on confidence in using osteopathic manipulative treatment (OMT); valuation of OMT and intention to use OMT in future clinical practice. Frequencies, means and standard deviations were calculated, omitting "no basis for evaluation" responses. Two-tailed *Z*-tests of proportions were utilized for analysis of statistical significance, with significance set at 95% (*P*<.05).

Results

In total, 156 of 538 (29.0%) responses were received, and 150 had sufficient data to analyze. Respondents reported varied rates and modes of interaction with OMM fellows (OMM lab table-training [97.3%] to early clinical experiences [30.9%]). Response means for items regarding satisfaction with and understanding of the OMM curriculum fell between "strongly agree" and "agree" for all activities. Many respondents (82.5%-83.8%) reported that interaction with OMM fellows increased their confidence in using OMT. Additionally, respondents who were treated with OMT by OMM fellows reported significantly higher agreement with statements about clinical utility of OMT (Z=2.6, P<.05) and intention to use OMT in future practice (Z=2.3, P<.05).

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ORIGINAL RESEARCH

Disclosures: none reported.

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Conclusions

The majority of osteopathic medical students at TUCOM-CA reported significant agreement with the positive impact of interaction with OMM fellows on satisfaction with and understanding of the OMM curriculum. This supports the conclusion that the OMM predoctoral teaching fellowship program achieves its objectives to increase student satisfaction with and understanding of the OMM curriculum. The survey data also showed significantly stronger agreement with statements supporting valuation of OMT in clinical practice and intention to use OMT in the future, among respondents treated with OMT by OMM fellows.

Introduction

Different models of peer-assisted learning have been adopted in education at the university and graduate level with shown benefit to both the tutor and tutee.¹ One way that the Touro University California College of Osteopathic Medicine (TUCOM-CA) has implemented this is by starting an osteopathic manipulative medicine (OMM) predoctoral teaching fellowship (OMM fellowship) in 2007. Each year, TUCOM-CA selects 2 second-year medical students as OMM fellows who complete an additional year of training. Fellows spend a third of each academic year in the department of OMM during their third, fourth, and fifth years of medical school. They deliver OMM lectures; table-train, lead, and provide technical support in OMM lab sessions; mentor and tutor preclinical students; work with supervising clinicians participating in clinical osteopathic manipulative treatment (OMT); develop and complete scholarly activity; and offer OMT demonstrations for student volunteers.

Peer-assisted learning has been defined as "people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching."¹ As a subset of this grouping, near-peer programming is described as a "phenomenon whereby senior trainees teach more junior trainees."² Peerassisted learning is not a new practice and has been evolving in its definition and ways of pedagogical practice. Initially, it was viewed as a linear model where knowledge is transmitted from teacher to tutor and then tutor to learner. However, it has now been recognized that peer–tutor interaction is actually quite different than teacher–student interaction and has differing advantages and disadvantages. Increasingly it has been noted that not only does the tutee benefit from the interaction, but also the tutor.¹

Multiple studies of peer-assisted learning in undergraduate medical education have shown benefit for both near-peer teachers and learners, including development of professional attributes as well as knowledge and understanding.²⁻⁵ In one study, junior students were paired with senior medical students during a rotation in their medical training; surveys taken after the rotation showed that the junior medical students felt the senior medical students provided a nonthreatening learning environment as well as provided helpful feedback and acted as role models. The senior medical students reported that they had been able to consolidate their knowledge and develop their teaching skills during this experience. In addition, they expressed an interest in teaching in the future after this experience. This suggests that near-peer teaching may be beneficial to both the learner and teacher.⁵

Guidelines for implementing peer-assisted learning programs in undergraduate medical education include the development of objectives for learners and teachers, as well as process evaluation.⁶

The TUCOM-CA OMM fellowship provides a near-peer teaching program for osteopathic medical students (OMS) at TUCOM-CA, with objectives pertaining to both OMM fellows as near-peer teachers and the general population of OMS as near-peer learners. The program's objectives for the fellows are to develop osteopathic physicians who:

- Integrate osteopathic principles into clinical practice
- Utilize enhanced skills in osteopathic diagnosis and treatment
- Gain experience delivering academic curricular materials
- Become leaders and educators in the profession

The objectives for the general student body are to increase TUCOM-CA student satisfaction with and understanding of the OMM curriculum through interaction with the fellows.

As per Samantha Tyler, OMS V, who has been collecting information on current predoctoral fellowships, TUCOM-CA is one of 27 osteopathic medical schools with OMM fellowships as of August 2019. The aim of this study was to evaluate the success of the TUCOM-CA OMM fellowship program in attaining its objectives of increasing student satisfaction with and understanding of the OMM curriculum.

Methods

This study utilized a non-experimental design with online surveys (*Appendix 1*) sent to all TUCOM-CA OMS during the 2016-2017 academic year. The protocol was submitted to the TUCOM-CA Institutional Review Board which determined it to be exempt from formal review. The 43-item survey was delivered using Qualtrics software (Qualtrics, Provo, UT) and distributed via email in December 2016 using an anonymous link to the online survey. This was a general email sent to the class, and not specific to each individual student. A reminder email was sent 2 weeks after the initial email, and the survey was closed 4 weeks after the initial email.

Survey items included Likert-scale and open-ended queries. The survey included items regarding the respondents' interactions with the OMM fellows as well as the impact of these interactions on the respondents' understanding of and satisfaction with the OMM curriculum. Participants were not required to respond to every survey item.

Survey responses were exported from Qualtrics into Excel (Microsoft Corporation, Redmond, WA) for tabulation and analysis. Frequencies, means and standard deviations of responses were calculated for each survey item with a Likert scale, omitting "no basis for evaluation" responses. A histogram with confidence intervals was generated using Excel. Two-tailed Z-tests of proportions were utilized for analysis of statistical significance between groups for

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(continued on page 11)
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some portion of the data (Ausvet, http://epitools.ausvet.com.au) with significance set at 95% (*P*<.05).

Results

Surveys were sent to all 538 enrolled OMS in years I-IV, and 156 responses were received, a response rate of 29.0%. Six response sets were excluded for only answering anticipated graduation or no items at all, yielding a set of 150 responses used for final analysis. Participants were not required to respond to every survey item, thus percentages presented were calculated based on the number of responses submitted for that item.

The majority (109 [73.6%]) of the respondents were preclinical OMS I or OMS II students who typically would have had the opportunity for interaction with OMM fellows on campus at least

Table 2. OMS valuation of osteopathic manipulative treatment.

Table 1. Demographics of survey respondents.

Year of study	Response No. (%)			
OMS I	60 (40.5)			
OMS II	49 (33.1)			
OMS III	19 (12.8)			
OMS IV	20 (13.5)			

weekly. The demographics of the survey respondents are presented in *Table 1*.

When assessing the statement "OMT is a useful part of osteopathic clinical medicine," a majority (130 [87.3%]) of OMS strongly agreed or agreed, while only 5 respondents (3.3%) disagreed or strongly disagreed with the statement. A smaller majority (84 [56.4%]) of the OMS strongly agreed or agreed that they intend to use OMT in their own future clinical practice (*Table 2*). Of note, when comparing respondents who had never been treated with OMT by an OMM fellow, those who had been treated were significantly more likely to strongly agree with the statement "OMT is a useful part of osteopathic clinical medicine" (*Z*=2.6, *P*<.05). Additionally, those students who had been treated with OMT were significantly more likely to strongly agree or agree with the statement "I plan to use OMM/OMT in my clinical practice" (*Z*=2.3, *P*<.05) than those respondents who had never been treated by an OMM fellow (*Table 2*).

There are various activities in which OMM fellows interact with other OMS. All preclinical OMS attend required OMM labs, where fellows act as table trainers, so as expected, the most common interaction was in this capacity (97.3%). However, a majority of OMS interacted with the OMM fellows in voluntary activities as well, though participation ranged from 30.8% to 90.5%. These included formalized activities OMM fellows are required to under-

(continued on page 12)

	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)	Total				
OMT is a useful part of osteopathic clinical medicine										
All respondents	59 (39.6)	71 (47.7)	14 (9.4)	3 (2.0)	2 (1.3)	149				
Received OMT from OMM fellow ^a	44 (47.8)	39 (42.4)	7 (7.6)	1 (1.1)	1 (1.1)	92				
Never received OMT from OMM fellow ^a	14 (25.9)	30 (55.6)	7 (13.0)	2 (3.7)	1 (1.9)	54				
I plan to use OMM/OMT in my clinical practice										
All respondents	34 (22.8)	50 (33.6)	48 (32.2)	10 (6.7)	7 (4.7)	149				
Received OMT from OMM fellow ^b	25 (27.2)	34 (37.0)	26 (28.3)	4 (4.4)	3 (3.3)	92				
Never received OMT from OMM fellow ^b	8 (14.8)	16 (29.6)	20 (37.0)	6 (11.1)	4 (7.4)	54				

^aZ-test of proportional significance shows percent of "strongly agree" responses among those receiving OMT from fellows is significantly highter (P<.05) than among those not receiving.

^bZ-test of proportional significance shows percent of "strongly agree" and "agree" responses among those receiving OMT from fellows is significantly higher (P<.05) than among those not receiving.



(continued from page 11)

take, such as tutoring and review sessions for OMM examinations, as well activities fellows elect to pursue, including volunteering at early clinical experiences such as free clinics in which preceptors oversee provision of OMT to patients from the community by OMS (*Figure1*).

Most students strongly agreed or agreed that table training assistance (135 [93.1%]), fellow-led review sessions (106 [77.4%]), and tutoring (58 [72.5%]) increased their satisfaction with the OMM curriculum (Table 3, Items 1-3). Additionally a high proportion of respondents strongly agreed or agreed that table training assistance (139 [95.9%]), fellow-led review sessions (121 [87.7%]), and tutoring by fellows (61 [80.0%]) helped them prepare for course exams, while fellow-led lectures (111 [78.7%]), OMT treatment (85 [85.9%]), and working with fellows in early clinical experiences (46 [79.3%]) increased their understanding of the OMM curriculum (Table 3, Items 4-9). Additionally, a large majority of respondents (117 [84.2%]) strongly agreed or agreed that labs taught by OMM fellows effectively improved their skills in the application of OMM (Table 3, Item 10). Response means were calculated for the same items (Figure 2). All of the means fell between 1 (strongly agree) and 2 (agree), and within the range of each respective confidence interval (Figure 2).

In addition to preparation for exams, working with the fellows can help improve OMS confidence in their OMT skill set and overall wellness. A high proportion (47 [82.5%]) of respondents strongly agreed or agreed that working with OMM fellows in early clinical experiences increased their confidence in using OMT. Similarly, most (83 [83.8%]) respondents strongly agreed or agreed that being treated with OMT by an OMM fellow increased their confidence in using OMT *(Table 3, Items 11-12)*. Among those respondents who had received OMT from an OMM fellow, most (76

(continued on page 14)

Table 3. Survey item response frequencies.

		Response, Count (%)							
	Survey item	Strongly agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly disagree (5)	Total		
Satisf	action								
1	Table training assistance from OMM Fellows during OMM labs increased my satisfaction with the OMM curriculum	77 (53.1)	58 (40.0)	9 (6.2)	1 (0.7)	o (o)	145		
2	Fellow-led review sessions increased my satisfaction with the OMM curriculum	52 (38.0)	54 (39.4)	25 (18.2)	4 (2.9)	2 (1.5)	137		
3	Tutoring by OMM Fellows increased my satisfaction with the OMM curriculum	33 (41.3)	25 (31.3)	20 (25.0)	2 (2.5)	0(0)	80		
Understanding									
4	Table training assistance from OMM Fellows during OMM labs helped me prepare for OMM exams	81 (55.9)	58 (40.0)	5 (3.4)	1 (0.7)	0(0)	145		
5	Fellow-led review sessions helped me prepare for OMM exams	58 (42.0)	63 (45.7)	15 (10.9)	1 (0.7)	1 (0.7)	138		
6	The lectures taught by OMM Fellows effectively improved my understanding of OMM	46 (32.6)	65 (46.1)	27 (19.1)	3 (2.1)	0 (0)	141		
7	Being treated by an OMM Fellow increased my understanding of OMM	42 (42.4)	43 (43.4)	13 (13.1)	1 (1.0)	0(0)	99		
8	Tutoring by OMM Fellows helped me prepare for OMM exams	34 (42.5)	27 (33.8)	17 (21.3)	2 (2.5)	0(0)	80		
9	Working with an OMM Fellow in my early clinical experience increased my understanding of OMM	28 (48.3)	18 (31.0)	12 (20.7)	0 (0)	0(0)	58		
10	The labs taught by OMM Fellows effectively improved my skills in the application of OMM	51 (36.7)	66 (47.5)	20 (14.4)	2 (1.4)	0(0)	139		
Confic	lence and wellness								
11	Working with a Fellow in my early clinical experiences increased my confidence in utilizing OMM	30 (52.6)	17 (29.8)	10 (17.5)	0 (0)	0(0)	57		
12	Being treated by a Fellow increased my confidence in utilizing OMM	36 (36.4)	47 (47.5)	16 (16.2)	o (o)	0(0)	99		
13	Being treated by a Fellow was an important part of my wellness during my pre-clinical years in medical school	43 (43.0)	33 (33.0)	20 (20.0)	4 (4.0)	o (o)	100		
Mento	orship and accessibility								
14	Advising from OMM Fellows effectively helped prepare me for my clinical rotations	13 (19.7)	32 (48.5)	20 (30.3)	1 (1.5)	0(0)	66		
15	Advising from OMM Fellows effectively helped me develop my study plan for standardized board exams	9 (15.0)	24 (40.0)	24 (40.0)	3 (5.0)	0(0)	60		
16	Working with a Fellow in my early clinical experiences motivated me to learn more about OMM	28 (48.3)	20 (34.5)	10 (17.2)	o (o)	0(0)	58		
17	I felt more comfortable asking OMM Fellows for help in lab than I did asking faculty	35 (24.0)	49 (33.6)	47 (32.2)	13 (8.9)	2 (1.4)	146		
18	I felt more comfortable seeking OMT treatment from a Fellow than from faculty	43 (42.2)	27 (26.5)	26 (25.5)	6 (5.9)	0 (0)	102		

Satisfaction

- 1. Table-training assistance from OMM Fellows during OMM labs increased my satisfaction with the OMM curriculum
- Fellow-led review sessions increased my satisfaction with the OMM curriculum
- 3. Tutoring by OMM Fellows increased my satisfaction with the OMM curriculum

Understanding

- Table-training assistance from OMM Fellows during OMM labs helped me prepare for OMM exams
- 5. Fellow-led review sessions helped me prepare for OMM exams
- 6. The lectures taught by OMM Fellows effectively improved my understanding of OMM
- 7. Being treated by an OMM Fellow increased my understanding of OMM
- 8. Tutoring by OMM Fellows helped me prepare for OMM exams
- Working with an OMM Fellow in my early clinical experience increased my understanding of OMM
- 10. The labs taught by OMM Fellows effectively improved my skills in the application of OMM

^a "No basis for evlauation" responses were excluded from analysis. ^b Whisker plots represent 95% confidence intervals for each mean.

(continued from page 12)

[76.0%]) reported that it was an important part of their wellness during their preclinical years of training *(Table 3, Item 13)*.

As discussed in the introduction, one aspect of peer-assisted learning is mentorship and creating a comfortable learning environment. More than two-thirds (45 [68.2%]) of respondents strongly agreed or agreed that advising from OMM fellows effectively prepared them for clinical rotations, while more than half (33 [55.0%]) strongly agreed or agreed that advising from OMM fellows helped them develop a study plan for standardized board examinations *(Table 3, Items 14-15)*. Approximately half of the respondents (84 [59.8%]) indicated that they were more comfortable asking OMM fellows than faculty members for table training assistance in labs, as well as more comfortable seeking OMT from fellows than faculty (70 [68.6%]) (with a response of "strongly agree" or "agree") *(Table 3, Items 17-18)*.

Discussion

Significant results included an increased satisfaction with and understanding of the OMM curriculum, resulting from interaction with and near-peer learning opportunities provided by OMM fellows *(Table 3, Items 1-3, 7, 9)*. Rates of exposure to different modes of interaction with fellows varied from 30.8% for early clinical



experiences to 97.3% for table training, yet average agreement was strong and uniform that each mode of interaction increased satisfaction with or understanding of the OMM curriculum (*Figures 1 and 2*). These data support the conclusion that the OMM fellowship program is successfully meeting its objectives of increasing student satisfaction with and understanding of the OMM curriculum at TUCOM-CA.

The findings also suggest that as a near-peer teaching program, the OMM fellowship potentially has long-term effects on the OMS at TUCOM-CA. Previous studies have reported correlation between increased exposure to OMT and higher levels of agreement with osteopathic philosophy statements and intention to use OMT.^{7,8} It also has been proposed that clinical exposure to OMT during the didactic years is an effective way to encourage students to later use OMT clinically.⁷⁻⁹ This survey yielded similar findings, with a significantly higher proportion of respondents strongly agreeing with statements about clinical utility of OMT as well as intention to use OMT in future practice among students who had received OMT from OMM fellows (Table 2). Additionally, students reported increased confidence in using OMT after being treated with OMT by fellows and as a result of working with fellows in early clinical experiences. These data suggest that the OMM fellows may offer a novel means of increasing confidence levels among OMS, which

(continued on page 15)

previously had been noted after completion of elective clinical rotations in OMM.⁹

In addition, students who received OMT from OMM fellows indicated that this was an important component of their wellness during their first 2 years of training. This finding may constitute preliminary evidence that receiving OMT during medical training promotes wellness among OMS.

Osteopathic medical schools are in the position of having longstanding near-peer teaching programs with potentially significant impact on medical student training. However a systematic literature review of medical students as peer tutors identified a range of peer-assisted teaching programs that did not include those at osteopathic medical schools.³ To date, fellowship programs at osteopathic medical schools have not been evaluated in the literature, and thus have not entered into the broader conversation about peer-assisted learning programs in medical education. As the first published study framing OMM fellowships as a model for nearpeer teaching, this study may benefit the community of medical educators by introducing the experience of osteopathic near-peer teaching programs.

Some limitations of the study include the sample that elected to respond to the survey. Those who responded might have done so because they felt strongly about OMT or the OMM fellowship program which may have biased the results. A more complete sample of the student group would decrease this concern. The notice of the survey was delivered via email listserv instead of via individual email addresses which may have decreased the response rate.

In future studies measuring the benefits of OMM fellowship at TUCOM-CA, the survey could be repeated for subsequent classes to assess programmatic change over time and to validate the findings reported here. The reliability of future studies could be enhanced by improving sampling methods to increase the response rate. In addition, the performance on board exams, particularly the osteopathic principles and practices subdiscipline, could be compared to the time and type of interaction the student had with the OMM fellows.

Near-peer learning programs have been shown to impact near-peer teachers as well as learners²⁻⁵ and may also affect collaborating professional educators. Therefore, a new direction of future inquiry could be to evaluate the impact of the program on fellows themselves, as well as on faculty and staff.

Finally, to identify best practices in OMM predoctoral fellowships, the survey could be administered at other colleges of osteopathic

medicine. Studying some of the 26 other fellowship programs of varied sizes and structures could enhance the understanding of the efficacy of different program designs, evaluation systems, and objectives.

Conclusion

This project demonstrates that OMS at TUCOM-CA report significant agreement with the positive impact of interaction with OMM fellows on satisfaction with and understanding of OMM curriculum. This supports the conclusion that the OMM predoctoral teaching fellowship program achieves its objectives to increase student satisfaction with and understanding of the OMM curriculum. Additionally, the survey data show significantly stronger agreement with statements supporting valuation of OMT in clinical practice and intention to use OMT in the future among respondents treated with OMT by OMM fellows. Consistently strong agreement with statements about understanding and satisfaction was found among respondents for all interactions with fellows.

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(continued from page 15)

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