Medical Education Original Article

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The effect of postgraduate osteopathic manipulative treatment training on practice: a survey of osteopathic residents

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Abstract

Context: Osteopathic medical students receive an abundance of training in osteopathic manipulative treatment (OMT) during their first 2 years of medical school and less during the second 2 years. Family Medicine residency programs often include significantly more OMT training during residency, but it is less frequently applied in other residencies.

Objectives: This survey was designed utilizing the theory of planned behavior to see whether specific training in osteopathic manipulative medicine (OMM) after osteopathic medical school was an influence in changing behavior, attitudes, and knowledge around OMT in osteopathic residents.

Methods: A total of 188 osteopathic medicine residents were invited to complete an anonymous cross-sectional online survey. The survey asked residents about their postgraduate OMT training and their knowledge, attitudes, norms, intentions, and behavior regarding OMT. Inferential statistics were utilized to determine whether significant differences existed by specialty and by type of training.

Results: Sixty residents (31.9% response rate) completed the survey. This response rate is consistent with previous online survey studies, but it may indicate that residents chose not to participate due to survey fatigue or a lack of interest in OMM. Overall, residents who completed postgraduate training reported significantly stronger positive attitudes about the value of OMT in patient care (t=3.956; p<0.001). Primary care residents talk to their patients about OMT and perform OMT more frequently than residents in surgical (p<0.01) and other subspecialties (p<0.01). Residents who completed postgraduate training (n=41) reported significantly more knowledge about the fundamental principles (p=0.04), benefits (p=0.03), and common techniques (p=0.01) of OMT, and rated their ability to perform OMT (p=0.001) higher than those who had not completed postgraduate training. Trained residents also talked to patients about OMT (p<0.001), referred patients for OMT (p=0.01), and performed OMT (p<0.001) more frequently. They also reported significantly stronger subjective norms (p=0.000; p<0.001), perceived behavioral control (p=0.02; p=0.004), positive attitudes (p=0.004; p=0.003), and intentions (p<0.001; p<0.001) regarding talking to patients and performing OMT, respectively. Residents who completed *in-person* training reported talking to their patients about OMT (p=0.002) and performing OMT (p=0.001) more frequently, and having more confidence in their ability to perform OMT (p=0.02). Residents who completed in-person training reported significantly stronger subjective norms (p<0.001; p<0.001), perceived behavioral control (p=0.001; p=0.002), positive attitudes (p=0.05; p=0.03), and intentions (p<0.001; p=0.001) regarding talking to patients about OMT and performing OMT, respectively. Residents who completed in-person training reported stronger subjective norms (p=0.05) related to referring patients for OMT.

Conclusions: Residents who complete postgraduate training perform OMT, talk to their patients about OMT, and refer patients for OMT more frequently. Residents who participate in training, particularly in-person training, have stronger subjective norms, perceived behavioral

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control, positive attitudes, and behavioral intentions regarding talking with patients about OMT and performing OMT. These variables are validated predictors of behavior, making them important outcomes for training to promote OMT in patient care.

Keywords: attitudes; behavior change; graduate medical education; OMT; post-graduate training.

With the full transition to single accreditation by Accreditation Council for Graduate Medical Education (ACGME) residency programs, osteopathic recognition and the education of allopathic and osteopathic resident physicians in osteopathic principles and practices (OPP) remains a new and exciting journey, filled with potential [1, 2]. Conceptually, the single accreditation opens opportunities for the expansion of OPP through the osteopathic recognition distinction whereby programs commit to teaching and accessing OPP in all graduate medical education (GME) programs [1]. However, osteopathic recognition has been embraced primarily by Family Medicine programs [1], leaving osteopathic physicians and educators in a difficult position to ensure that appropriate training opportunities in OPP are available across all specialties.

One of the unique aspects of osteopathic medical practice and education is the practice of osteopathic manipulative treatment (OMT) [3], or the use of manual diagnosis and treatment of dysfunction. However, according to the American Osteopathic Association's (AOA) nationwide survey, more than 75% of osteopathic physician participants reported utilizing OMT on fewer than 5% of their patients, citing barriers such as lack of time, lack of reimbursement, lack of support, and lack of knowledge and confidence [4]. The barriers and the lack of routine use of OMT in clinical and practice settings contribute to important concepts of OMT being lost by osteopathic students and residents [5, 6]. Further, the lack of clinical training sites that integrate OMT into practice reduces the likelihood of residents implementing OMT into their general practices after graduation and residency training [2, 6].

The nature of osteopathic medical education is such that medical students receive an abundance of training in OMT during their first 2 years of medical school and much less during the second 2 years. Continued exposure to OMT during clinical rotations may foster the use of OMT upon graduation [7]. In GME, Family Medicine programs integrate more OMT training during residency because it is an osteopathic examination requirement, but it is generally minimally applied in other residencies [8]. Educators have called for more OMT training in residency. Therefore, this survey was designed to determine whether specific training in osteopathic manipulative medicine (OMM) after osteopathic medical school was an influence in changing the behavior, attitudes, and patient education around OMT in osteopathic residents.

According to the theory of planned behavior [9], a person's attitude, perceived behavior control, and subjective norms are all significant predictors of behavioral intentions and, in turn, actual behavior [9]. Attitudes refer to whether an individual has positive or negative feelings toward the value of the behavior (i.e., performing OMT is beneficial). Perceived behavioral control refers to whether an individual feels capable of performing the behavior (i.e., performing OMT is difficult). Subjective norms refer to an individual's perceptions of social norms and whether other people they consider to be important think they should perform the behavior (i.e., most people think I should perform OMT). Intentions, the strongest predictor of behavior, refer to whether an individual intends to perform a behavior (i.e., I plan to perform OMT). In the current study, we hypothesize that residents who complete postgraduate OMT training will report stronger attitudes, perceived behavioral control, subjective norms, and intentions regarding three target behaviors:

H1 Residents who complete postgraduate OMT training will report stronger attitudes, perceived behavioral control, subjective norms, and intentions regarding: (A) talking to patients about OMT; (B) performing OMT; and (C) referring patients to OMT, than residents who do not complete postgraduate training.

Given that these variables are significant predictors of actual behavior, we also hypothesize:

H2 Residents who complete postgraduate OMT training will report greater frequency of: (A) talking to patients about OMT; (B) performing OMT; and (C) referring patients to OMT.

Knowledge also plays a significant role in shaping attitudes, therefore we also examined whether residents who complete postgraduate OMT training report greater knowledge of fundamental principles, benefits, and techniques of OMT.

H3 Residents who complete postgraduate OMT training will report greater knowledge of the fundamental principles, benefits, and techniques of OMT than residents who do not complete postgraduate training.

Finally, we also explored whether training modality (in-person vs self-directed) or specialty (primary care vs specialty care) significantly affected the study variables:

RQ1 Are there significant differences in knowledge, subjective norms, attitudes, perceived behavioral

control, intentions, or actual behavior regarding OMT based on training modality?

RQ2 Are there significant differences in frequency of: (A) talking to patients about OMT; (B) performing OMT; and (C) referring patients to OMT based on specialty?

Methods

The study was reviewed and approved by the Ohio University Institutional Review Board (#18-X-357). The research team is made up of osteopathic medical education faculty (SW, AK) and staff (KN, BM). In February 2019, we sent an email to all osteopathic residents (n=188) in 14 residency programs affiliated with Ohio University, inviting them to participate in an anonymous online Qualtrics survey about osteopathic principles and practices. One of the residencies had attained osteopathic recognition at the time of the survey. We conducted *a priori* sample size calculations utilizing G*Power [10], a statistical power analysis program, to determine the intended sample size of 55 residents to achieve 95% power for *t*-tests (suggested sample size=42) and one-way analyses of variance (ANOVAs, suggested sample size=54) with medium effect sizes (0.5). The email invitation included a link to the online informed consent document. After reading the consent form, participants were asked if they agreed to participate. Participants who provided consent and agreed to participate were redirected to the online Qualtrics survey. The survey remained opened through the end of March 2019, and eligible residents received two reminder e-mails. The research team also emailed program directors to inform them of the survey and mention it to their residents during weekly didactics. Participants did not receive compensation.

Instrument

The survey included five sections: demographics, training in and knowledge of OMT, and attitudes, perceived behavioral control, subjective norms, and intentions regarding each of the three target behaviors (talking to patients about OMT, performing OMT, and referring patients to OMT). In the first section of the survey, residents were asked about demographic variables including specialty and year in training. In the next section on training and knowledge, they were asked if they completed any OMT training after medical school. If they responded "yes," they were asked what type of training. The options included reading journal articles, reading manuals, watching webinars, attending in-person training hosted by Ohio University, attending in-person training at osteopathic medicine conferences (i.e., Ohio Osteopathic Association, American Association of Colleges of Osteopathic Medicine), or shadowing an OMT specialist. There was also an option for "Other," which included a free text box for them to describe other training modalities. Finally, they were asked to indicate how many hours of postgraduate OMT training they completed. Residents were then asked to rate their knowledge about the fundamental principles of OMT, the benefits of OMT, and the most common techniques.

Finally, residents completed three sections focused on the behaviors of interest: (A) talking about OMT with patients; (B) performing OMT on patients; and (C) referring patients for OMT. In each section, residents completed validated subscales measuring the subjective norms, perceived behavioral control, behavioral intentions, and attitudes about the target behavior [11]. These scales have been utilized widely in health behavior research and are considered valid measures of each concept. We also measured actual behavior by asking residents how frequently they talk to patients about OMT, refer patients for OMT, and perform OMT on patients.

Subjective Norms. Each section included four items to measure residents' subjective norms, or perceptions of whether peers and important others think they should engage in the behavior [9]. The items included statements such as, "It is expected of me to talk to my patients about using OMT." Each statement included a 5-point response scale indicating their level of agreement. We calculated the mean score of all four items for analysis; a higher score represents stronger subjective norms.

Perceived Behavioral Control. Each section included two items to measure residents' perceived behavioral control, or perceived ability to perform the target behavior [9]. The items included statements such as, "I am confident that I can talk to my patients about using OMT." Each statement included a 5-point response scale indicating their level of agreement or the degree of difficulty. We calculated the mean score of both items for analysis; a higher score represents stronger perceived behavioral control.

Behavioral Intentions. Each section included three items to measure whether residents intend to perform the behavior [9]. The items included statements such as, "I plan to talk with my patients about OMT." Each statement included a 5-point response scale indicating their level of agreement. We calculated the mean score of all three items for analysis; a higher score represents stronger behavioral intentions.

Attitudes. Each section included four statements measuring residents' attitudes (i.e., favorable or unfavorable evaluations of performing the target behavior) [9]. The residents rated the target behavior on a semantic differential scale of 1 to 7 utilizing a series of four dichotomous pairs: good/bad, harmful/beneficial, pleasant/unpleasant, and worthless/useful. We reverse-coded the negatively worded statements and then calculated the mean score of all three items for analysis, so a high score represented a more positive attitude.

Residents were also asked to provide a global rating of the value of OMT in patient care and as it relates to their specialty. Each statement included three response options: OMT has "no place," "a limited role," or "an important role."

Data analysis

Data were entered into SPSS 27 [IBM Corp., Armonk, NY], a statistical software, for analysis. The first author (AK) conducted descriptive and inferential statistics (*t*-tests and ANOVAs) to address the hypotheses and research questions. Descriptive statistics were calculated to summarize sample demographics, indicate completion of postgraduate OMT training, and calculate mean scores for each behavior (frequency of talking about OMT with patients, referring patients to OMT, and performing OMT on patients). An ANOVA was utilized to explore any differences by specialty in these three target behaviors. Next, mean scores were calculated for knowledge, subjective norms, perceived behavioral control, attitudes, behavioral intentions, and the perceived value of OMT. Finally, a series of *t*-tests were utilized to explore whether differences exist in these variables

Table 1: Summary of *t*-tests (training vs. no training).

	Training M, SD	No training M, SD	*t, df*	p-Value
How would you rate your knowledge about…				
…the fundamental principles of OMT?	3.66 (1.11)	3.00 (1.16)	2.112 (58)	**0.04**
…the benefits of OMT?	3.83 (1.05)	3.16 (1.07)	2.297 (58)	**0.03**
…the most common techniques of OMT?	3.66 (1.11)	2.84 (1.26)	2.541 (58)	**0.01**
How would you rate your ability to perform OMT?	3.41 (1.16)	2.37 (0.96)	3.422 (58)	**0.001**
How frequently do you…				
…talk to your patients about using OMT?	2.85 (0.99)	1.42 (0.61)	5.812 (58)	**0.00**
…refer your patients for OMT?	2.27 (1.10)	1.53 (0.77)	2.656 (58)	**0.01**
…perform OMT on your patients?	2.95 (1.05)	1.26 (0.45)	6.715 (58)	**0.00**
Talking to patients about OMT				
Subjective norm	3.33 (1.23)	1.46 (0.66)	6.223 (58)	**0.00**
Perceived behavioral control	4.06 (1.11)	3.34 (1.03)	2.390 (58)	**0.02**
Attitude	5.99 (1.56)	4.64 (1.54)	3.016 (53)	**0.00**
Intentions	3.97 (1.30)	2.26 (1.41)	4.909 (58)	**0.00**
Performing OMT on patients				
Subjective norm	3.37 (1.40)	1.50 (0.74)	5.324 (57)	**0.00**
Perceived behavioral control	3.85 (1.26)	2.78 (1.26)	3.024 (57)	**0.00**
Attitude	6.02 (1.52)	4.62 (1.61)	3.108 (53)	**0.00**
Intentions	3.89 (1.41)	1.93 (0.95)	5.415 (57)	**0.00**
Referring patients for OMT				
Subjective norm	2.82 (1.12)	1.65 (0.86)	3.730 (52)	**0.00**
Perceived behavioral control	3.46 (1.26)	2.84 (0.79)	1.803 (52)	0.08
Attitude	5.65 (1.63)	5.00 (1.54)	1.365 (52)	0.18
Intentions	3.06 (1.40)	2.78 (1.06)	0.728 (53)	0.47

OMT, osteopathic manipulative treatment; SD, standard deviation. Bold values are statistically significant at the p = .05 level.

between residents who completed postgraduate OMT training and those who did not, and residents who completed in-person training and those who completed self-directed training (i.e., journal articles, webinars, etc.).

Results

Sixty residents completed the online survey (31.9% response rate). This sample was considered sufficient given our *a priori* sample size calculations utilizing G*Power to achieve 95% power for *t*-tests (suggested sample size=42) and ANOVAs (suggested sample size=54) with medium effect sizes (0.5). Participants represented approximately 14 different residency programs (five residents chose not to identify their program). Thirty (50.0%) of the residents were in primary care specialties (internal medicine, family medicine, and pediatrics), eight (13.3%) were in surgical specialties (general surgery, orthopedic surgery, plastic surgery), six (10.0%) were in obstetrics and gynecology, and sixteen (26.7%) represented other subspecialties (psychiatry, emergency medicine, radiology, etc.). The sample included PGY1 (n=20; 33.3%), PGY2 (n=15; 25%), PGY3 (n=15; 25%), PGY4 (n=7, 11.7%), and PGY5 (n=3; 5.0%) residents.

Forty-one (67.2%) residents reported completing OMT training after medical school. Among those residents, 26 (63.4%) represented primary care specialties, 1 (2.4%) represented a surgical specialty, 5 (12.2%) represented obstetrics and gynecology, and 9 (22.0%) represented other subspecialties. Overall, residents who completed training reported significantly more positive attitudes about the value of OMT in patient care (t=3.96; p<0.001). The *t*-tests (Table 1) revealed that residents who completed training reported significantly stronger subjective norms (t=6.22; p=0.000), perceived behavioral control (t=2.39; p=0.02), positive attitudes (t=3.02; p=0.004), and intentions (t=4.91; p<0.001) regarding talking to patients, and stronger subjective norms (t=5.32; p<0.001), perceived behavioral control (t=3.02; p=0.004), positive attitudes (t=3.11; p=0.003), and intentions (t=5.42; p<0.001) regarding *performing OMT*. In terms of the target behavior *referring patients for OMT*, trained residents only reported increased subjective norms (t=3.73; p<0.001). Thus, H1a and H1b were supported. No significant difference existed between trained and untrained residents regarding perceived behavioral control, attitude,

Table 2: Summary of *t*-tests (in-person vs. self-directed).

Item	*In-person* (n=30)	*Self-directed* (n=11)	*t, df*	p-Value[a]
How would you rate your knowledge about…				
…the fundamental principles of OMT?	3.87 (1.01)	3.09 (1.22)	−2.063 (39)	**0.05**
…the benefits of OMT?	4.03 (0.93)	3.27 (1.19)	−2.154 (39)	**0.04**
…the most common techniques of OMT?	3.77 (1.04)	3.36 (1.29)	−1.032 (39)	0.31
How would you rate your ability to perform OMT?	3.67 (1.03)	2.73 (1.27)	−2.432 (39)	**0.02**
How frequently do you…				
…talk to your patients about using OMT?	3.13 (0.94)	2.09 (0.70)	−3.351 (39)	**0.00**
…refer your patients for OMT?	2.27 (1.20)	2.27 (0.78)	0.015 (39)	0.99
…perform OMT on your patients?	3.27 (0.94)	2.09 (0.83)	−3.639 (39)	**0.001**
Talking to patients about OMT				
Subjective norm	3.82 (0.95)	1.97 (0.80)	−5.759 (39)	**0.00**
Perceived behavioral control	4.38 (0.87)	3.18 (1.25)	−3.477 (39)	**0.001**
Attitude	6.27 (1.38)	5.11 (1.83)	−2.014 (35)	**0.05**
Intentions	4.41 (1.01)	2.75 (1.26)	−4.354 (39)	**0.00**
Performing OMT on patients				
Subjective norm	3.92 (1.10)	1.88 (1.02)	−5.378 (39)	**0.00**
Perceived behavioral control	4.20 (0.99)	2.90 (1.46)	−3.244 (39)	**0.00**
Attitude	6.33 (1.31)	5.15 (1.78)	−2.219 (36)	**0.03**
Intentions	4.32 (1.18)	2.72 (1.34)	−3.694 (39)	**0.001**
Referring patients for OMT				
Subjective norm	3.01 (1.10)	2.18 (0.98)	−2.012 (36)	**0.05**
Perceived behavioral control	3.66 (1.17)	2.83 (1.44)	−1.75 (36)	0.09
Attitude	5.85 (1.52)	5.10 (1.87)	−1.258 (36)	0.22
Intentions	3.11 (1.36)	2.89 (1.58)	−0.419 (36)	0.68

OMT, osteopathic manipulative treatment. [a]Bold values are statistically significant at the p = .05 level.

or intentions in regard to referring patients for OMT. Therefore, H1c was not supported.

A second series of *t*-tests (Table 1) revealed that residents who completed training (n=41), regardless of specialty, reported significantly more knowledge about the fundamental principles (t=2.11; p=0.04), benefits (t=2.30; p=0.03), and common techniques (t=2.54; p=0.01) of OMT, and rated their ability to perform OMT (t=3.42; p=0.001) higher than those who had not completed postgraduate training. Thus, H1 is supported. Trained residents also talked to patients about OMT (t=5.81; p<0.001), referred patients for OMT (t=2.66; p=0.01), and performed OMT (t=6.72; p<0.001) more frequently. Therefore, H2 and H3 were supported.

To answer RQ1, we examined whether differences exist by training modality. Thirty (73.2%) of the 41 residents who completed postgraduate training participated in in-person training events, whereas the others reported indirect or self-directed training such as shadowing an osteopathic physician (n=14; 34.1%), reading journal articles on OMT (n=25; 61.0%), or participating in other opportunities such as didactics during residency (n=20; 48.8%). Participants who completed in-person training included primarily residents in primary care specialties (n=24; 80.0%), with 2 residents (6.7%) from obstetrics and gynecology and 4 residents (13.3%) from other subspecialties.

Residents who completed in-person training (n=30) reported significantly higher knowledge of the fundamental principles (t=−2.06; p=0.05) and benefits of OMT (t=−2.15; p=0.04) than their peers who completed self-directed training (n=11), although no difference existed in knowledge of OMT techniques (Table 2). Residents who completed in-person training also reported talking to their patients about OMT (t=−3.35; p=0.002) and performing OMT (t=−3.64; p=0.001) more frequently, and also having more confidence in their ability to perform OMT (t=−2.43; p=0.02). No significant difference emerged for the frequency of referring patients for OMT. Residents who completed in-person training (n=30) reported significantly stronger subjective norms (t=−5.76; p<0.001; and t=−5.38; p<0.001), perceived behavioral control (t=−3.48; p=0.001; and t=−3.24; p=0.002), positive attitudes (t=−2.01; p=0.05; and t=−2.22; p=0.03), and intentions (t=−4.35, p<0.001; and t=−3.40, p=0.001) regarding talking to patients about OMT and performing OMT, respectively. Residents who completed in-person training (n=30) reported stronger subjective norms (t=−2.01; p=0.05) related to referring patients for OMT, but no significant difference existing for perceived behavioral

Table 3: ANOVA (behavior by specialty choice).

	F	p-Value	*IM/FM/Peds* (n=30) M, SD	*OB/GYN* (n=6) M, SD	*Surgical specialty* (n=8) M, SD	*Other specialty* (n=16) M, SD
Talking to patients about OMT	7.99	**0.00**	**2.93 (0.94)[a]**	2.33 (1.00)	**1.25 (0.46)[b]**	**2.00 (1.10)[b]**
Referring patients for OMT	1.00	0.40	2.20 (1.22)	2.17 (0.98)	1.50 (0.76)	1.94 (0.85)
Performing OMT on patients	12.08	**0.00**	**3.10 (0.96)[a]**	2.33 (1.03)	**1.13 (0.35)[b]**	**1.81 (1.11)[b]**

[a,b]Significant difference of p<0.001 exists between means with different superscripts. ANOVA, analysis of variance; FM, family medicine; IM, internal medicine; OMT, osteopathic manipulative treatment; Peds, pediatrics; SD, standard deviation. Bold values are statistically significant at the p = .05 level.

control, attitude, or intentions related to referring patients for OMT (Table 2).

Finally, to answer RQ2, we conducted an ANOVA to explore the differences by specialty choice across all participants, regardless of postgraduate training (n=60). The results (Table 3) revealed significant differences by specialty for talking to patients about OMT, $F(3,56)=7.99$; p=0.000, and performing OMT, $F(3,56)=12.08$; p=0.000. The post-hoc analysis revealed that primary care (i.e., Internal Medicine [IM]/Family Medicine [FM]/Pediatrics [Peds]) residents talk to their patients about OMT more frequently than residents in surgical, p=0.000; 95% CI=0.92, 2.44, and other subspecialty, p=0.002; 95% CI=0.34, 1.52, residency programs. Primary care residents also perform OMT more frequently than residents in surgical, p=0.000; 95% CI=1.21, 2.74, and other subspecialties, p=0.000; 95% CI=0.68, 1.88. No significant differences by specialty emerged for referring patients to OMT, $F(3,56)=1.00$; p=0.40.

Discussion

The results of this study highlight the value of postgraduate OMT training. Residents who complete postgraduate training integrate OMT into patient care more frequently. According to the theory of planned behavior [9], the increase in behavior is due, in part, because participating in postgraduate training was associated with stronger subjective norms, perceived behavioral control, positive attitudes, and intentions regarding the use of OMT. These variables are validated predictors of behavior, making them important outcomes for training to promote OMT. However, an interesting finding is that residents who completed training did not report significantly different attitudes, subjective norms, perceived behavioral control, or intentions regarding *referring* patients for OMT, yet they did report referring patients to OMT more frequently than residents who did not complete postgraduate training. More research is needed to explore what factors may contribute to an increased likelihood to refer for OMT instead, but this finding is promising in that it suggests that postgraduate training encourages residents from all specialties to refer patients for OMT.

If OMM is important and unique to osteopathic physicians, these results suggest that training in OMT influences the way that residents think and act about practice and referral for OMT, potentially maintaining an osteopathic identity. As live presentations were the most associated with greater use of OMT, this highlights the importance of in-person, real-time education vs self-directed videos or readings. Although self-directed trainings may help increase knowledge of OMT techniques, live in-person training offered at professional conferences or osteopathic medical schools may foster positive attitudes, increased knowledge of the benefits of OMT, and greater confidence in integrating OMT into patient care.

This training may be most important for promoting the value of OMT in patient care for residents in non–primary care residencies. We found that regardless of postgraduate training, residents in primary care specialties utilize OMT more frequently than residents in surgical or other subspecialties. However, research has shown that allopathic residents who participate in formal OMT training show an increased interest in learning more about OMT and are successful in its application [8, 12]. Therefore, our results support the use of in-person training in programs that wish to increase MD residents' knowledge, attitudes, and intentions to integrate OMT into clinical practice.

This study is not without its limitations. Our response rate for the survey was 31.9%. Therefore, one limitation is the potential for non–response bias. Our results do not reflect those residents who chose not to complete a voluntary survey about osteopathic principles and practices. It is possible that participants who chose not to respond have different attitudes, perceived norms, perceived behavioral control, and intentions regarding OMM; however, this response rate is consistent with

previously published online survey studies [13]. We also relied on residents' self-report of knowledge and behavior, which are not objective measures of these concepts. However, behavioral theories like the one that guided this study confirm that self-assessments of knowledge, attitudes, norms, perceived behavioral control, and intentions are valid predictors of actual behavior. Future directions of this research include: repeating to include the unique changes in teaching and patient care during the COVID-19 pandemic; and to account for more experience in teaching OPP to allopathic residents.

Conclusions

The value of OMT in patient care, along with the establishment and continuation of osteopathic identity, is longstanding. As we continue our single accreditation of residency through ACGME and as OPP are incorporated into the osteopathic medical curriculum, the continued use of these skills would allow providers to maintain osteopathic identity. Additionally, during the height of the COVID-19 pandemic, we routinely were required to instruct our students and residents virtually, including material surrounding OMT. The results of this study show that the tendency for an osteopathic resident to utilize and discuss OMT with patients is related to how much exposure they have had after graduation. Additionally, it also suggests the importance of in-person teaching as more impactful when it comes to physicians demonstrating or discussing OMT during a patient interaction.

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Competing interests: None reported.

Informed consent: All participants in this study provided informed consent online prior to participation.

Ethical approval: The study was reviewed and approved by the Ohio University Institutional Review Board (#18-X-357).

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