



Neurosurgeons' Interest in Osteopathic Medicine and the Need for More Evidence: A Call for Further Research to Determine Clinical Benefits

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INTRODUCTION

Osteopathic Manipulative Medicine (OMM) is highly researched and integrated into many medical and surgical subspecialties. The effects of osteopathic manipulative medicine have been researched in a wide range of conditions¹, including conditions of autonomic^{2,3,4}, cranial^{5,6,7,8}, and spinal^{9,10,11} dysfunction. Specifically, there is a particular abundance of research in the management of chronic, non-specific cervical^{12,13} and lower back pain^{9,14,15,16,17,18,19,20}, and the management of postoperative pain^{21,22,23}. Though subsets of these research topics may be efficacious to neurosurgical patients, little research is to be found on the use of OMM specifically in the management of neurosurgical patients. This is illustrated by a literature search on PubMed, where a search of articles containing both osteopathic and neurosurgical topics generated only 23 articles, with only 13 involving studies in humans. This study aims to assess the the knowledge, perspectives, comfort, and interest of OMM and future osteopathic-based research in the neurosurgical community.

MATERIAL AND METHODS

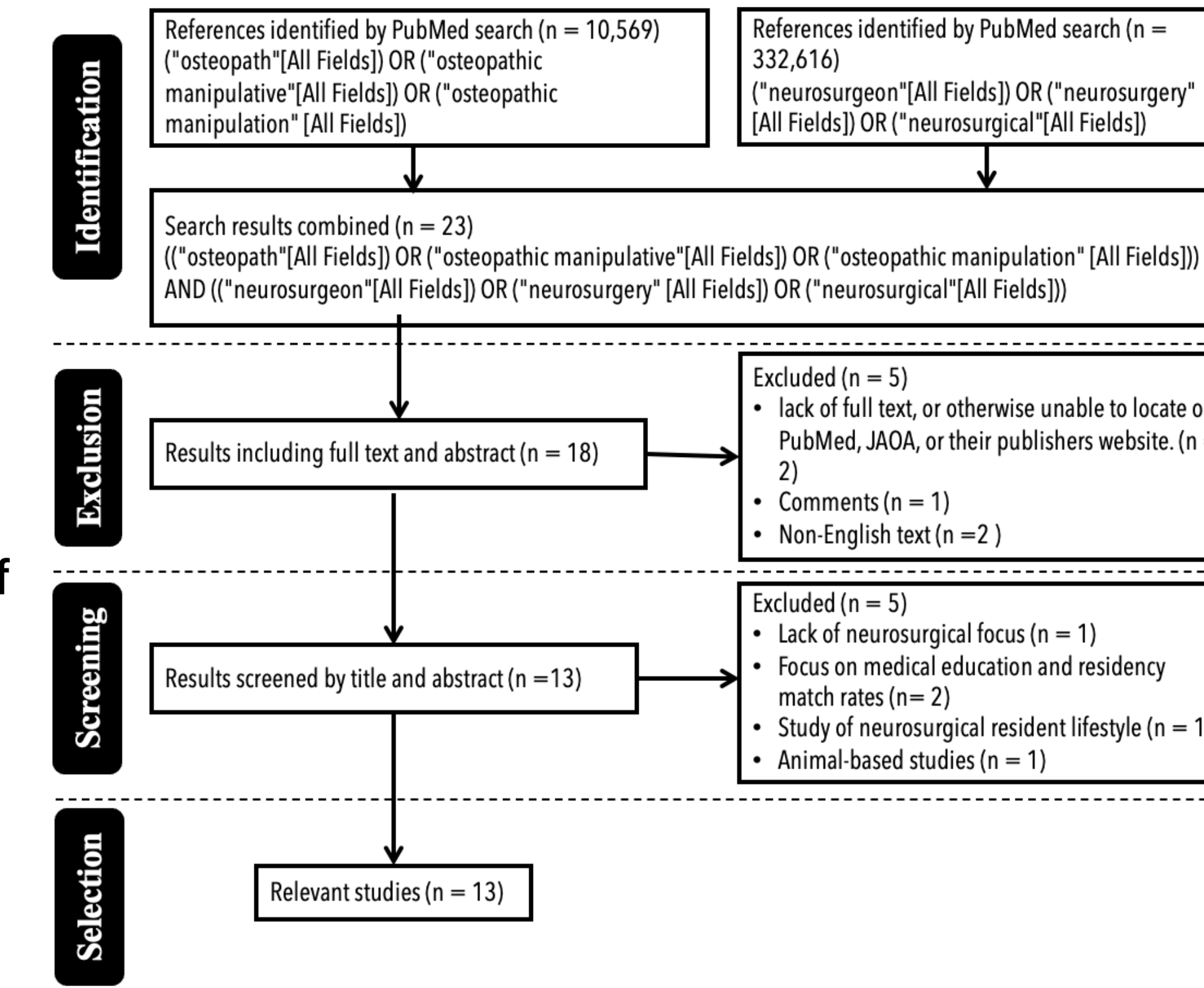
Data Acquisition – 6,503 members of the American Association of Neurological Surgeons were found on the “Member Directory” tab on www.AANS.org. Membership types included in this study were: fellows (FAANS), candidates (residents/fellows), provisional, lifetime, associates (MDs and PhDs), international candidates, and international neurosurgeons. A survey was then created using SurveyMonkey and distributed anonymously via email. Questions of the survey included

Q1: What is your age?
Q2: What is your gender? (Male, Female, Prefer not to answer, Other)
Q3: What type of medical degree do you hold? (MD, DO)
Q4: What year did you graduate medical school?
Q5: In which state(s) did you attend medical school?
Q6: In which state(s) did you do your residency?
Q7: In which state(s) do you currently practice?
Q8: How would you describe your current practice? (Hospital-based, Group practice, Private practice, other)
Q9: About how often do you use, or refer a patient for, osteopathic manipulative medicine in your practice? (1=never to 5=every day)
Q10: On a scale of 1-5, what is your familiarity with the tenets of osteopathic medicine? (1=no knowledge to 5=very familiar)
Q11: On a scale of 1-5, what is your familiarity with applications of osteopathic manipulative techniques in your practice? (1=no knowledge to 5=very familiar)
Q12: On a scale of 1-5, how comfortable are you recommending osteopathic manipulative medicine as a non-surgical, preoperative option (in general) for your patients? (1=very uncomfortable to 5=very comfortable)
Q13: On a scale of 1-5, how comfortable are you recommending osteopathic manipulative medicine as a post-surgical, rehabilitation option (in general) for your patients? (1=very uncomfortable to 5=very comfortable)
Q14: On a scale of 1-5, how comfortable are you recommending osteopathic manipulative medicine as a pain management option (in general, both pre- and post-operatively) for your patients? (1=very uncomfortable to 5=very comfortable)
Q15: On a scale of 1-5, how interested are you in seeing more research into potential applications of osteopathic manipulative medicine in the field of neurosurgery? (1=no interest to 5=this must happen)
Q16: On a scale of 1-5, if you were presented with peer-reviewed research showing positive results from osteopathic manipulative techniques used in neurosurgical patient populations, how likely are you to integrate their use into your own practice? (1=I would never to 5=very likely)
Q17: For previous question, if you answered "I would never", "very unlikely" or "unlikely", what barriers do see that prevent you in doing so?
Q18: FOR DOs: Have you used osteopathic manipulative techniques in your practice? If so, please comment on the techniques you use, patient population you use them in, etc.

MATERIAL AND METHODS CONTINUED

Statistical Analysis – Statistical analysis was performed using Prism v9.5.1. Survey response data was compared using a two-tailed T-test, and statistical correlation was made using simple linear regression analysis. Statistical significance defined as a $p < 0.05$.

Literature Search – A search was conducted via PubMed on March 29, 2023 to assess the number of literature articles about OMM with a neurosurgical focus. Query of the database was done by searching [“(Osteopath” OR “Osteopathic manipulative” OR “Osteopathic manipulation”) AND (“Neurosurgeon” OR “Neurosurgery” OR “neurosurgical”)]. Results of the search are detailed below.



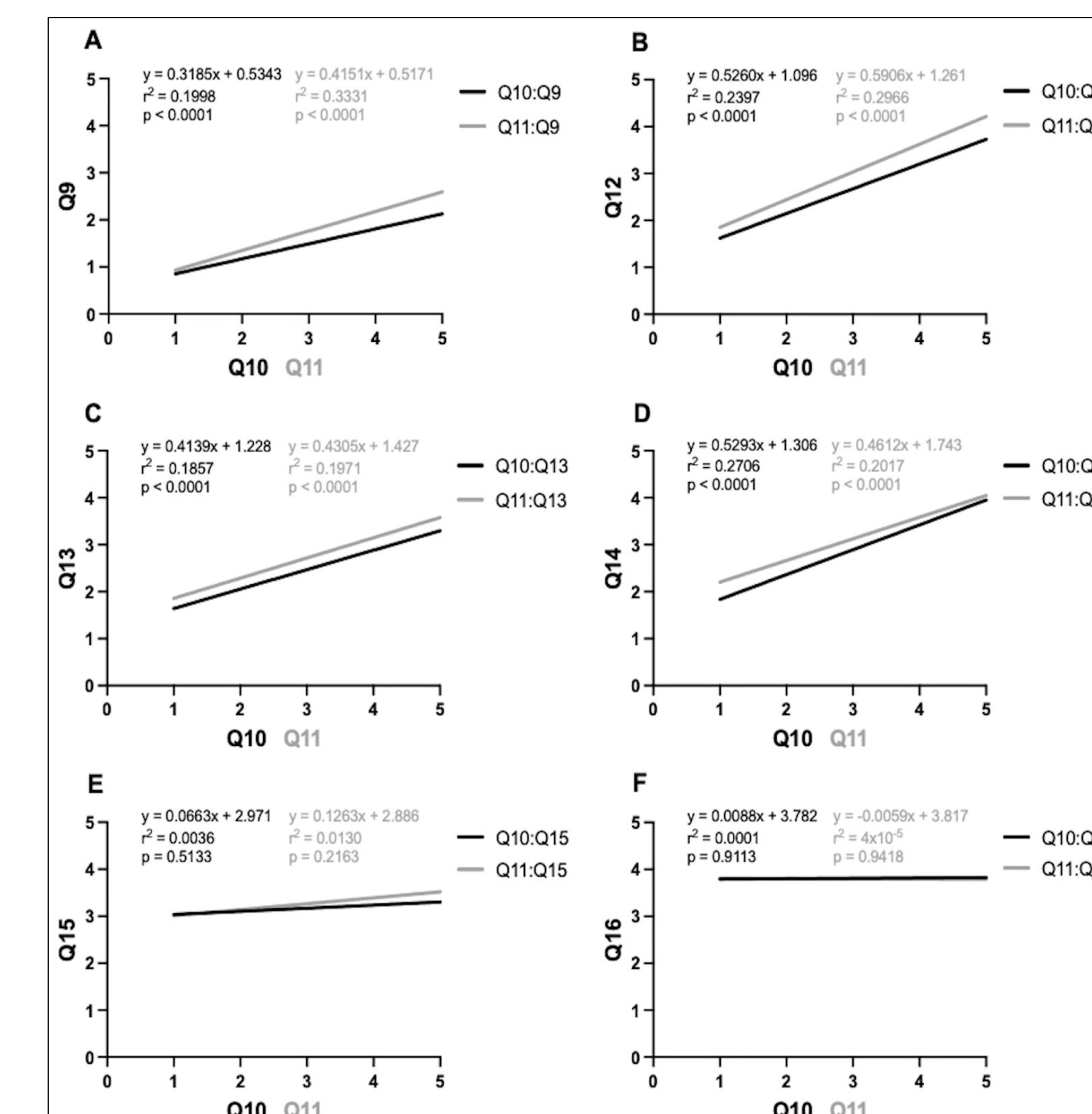
RESULTS

Of the 6503 neurosurgeons surveyed, 133 submitted responses, and 121 met inclusion criteria. This cohort consisted of 112 Allopathic physicians (MDs) and 7 Osteopathic physicians (DOs) (94.12% and 5.88%, respectively). The average age of neurosurgeons in our study was 47.14 ± 13.72 . Of our respondents, 93 of our survey respondents identified themselves as male and 21 as female. The vast majority of responders reported working in a hospital-based setting, while 17 reported working in private practice and 17 in a group practice. Nine reported working in an academic, university setting and two worked in private consulting positions

	TOTAL	MD	DO	
Q9:	1.36 (± 0.76)	1.33 (± 0.76)	1.86 (± 1.22)	ns $p=0.0910$
Q10:	2.60 (± 1.12)	2.47 (± 1.03)	4.57 (± 0.53)	*** $p<0.0001$
Q11:	2.03 (± 1.12)	1.96 (± 1.05)	3.29 (± 1.38)	** $p=0.0018$
Q12:	2.46 (± 1.21)	2.38 (± 1.15)	3.71 (± 1.50)	** $p=0.0042$
Q13:	2.30 (± 1.08)	2.24 (± 1.04)	3.29 (± 1.25)	* $p=0.0122$
Q14:	2.68 (± 1.14)	2.60 (± 1.11)	4.00 (± 0.82)	** $p=0.0014$
Q15:	3.14 (± 1.23)	3.14 (± 1.21)	3.14 (± 1.68)	ns $p>0.9999$
Q16:	3.81 (± 0.94)	3.83 (± 0.89)	3.43 (± 1.51)	ns $p=0.2744$

On average, neurosurgeons reported referring patients for OMM less than once per year, with 79.33% responding ‘never.’ (Q9). When comparing DO to MD neurosurgeons, DOs ranked both their familiarity with the tenets of osteopathic medicine and applications of OMM in their practice significantly higher (Q10-11). DO neurosurgeons were significantly more comfortable than MDs in recommending both preoperative and postoperative care as well as non-operative pain management (Q12-14). DOs and MDs show no statistical difference when assessed for interest in future research on the application of OMM within neurosurgery and were self-rated as “somewhat Interested” (Q15). If presented with research demonstrating the positive applications of OMM relevant research to the management of neurosurgery patients, DOs and MDs trended towards being “likely” to integrate OMM into their practice (Q16).

The degree of familiarity with the tenets of osteopathic medicine and applications of OMT in practice was positively correlated with the number of times neurosurgeons use or refer their patients for OMM ($p < 0.0001$) (A). The degree of familiarity of the tenets of osteopathic medicine and applications of OMT in practice was positively correlated with comfort recommending OMM as a nonsurgical, preoperative treatment option ($p < 0.0001$) (B), as a post-surgical, rehabilitative treatment option ($p < 0.0001$) (C), and as a pain management option ($p < 0.0001$) (D). However, there was no correlation between these familiarities and interest in seeing more osteopathic-based neurosurgical research (E) or a likeliness to integrate OMM into their practice if presented with research showing clinical benefit (F).



CONCLUSION

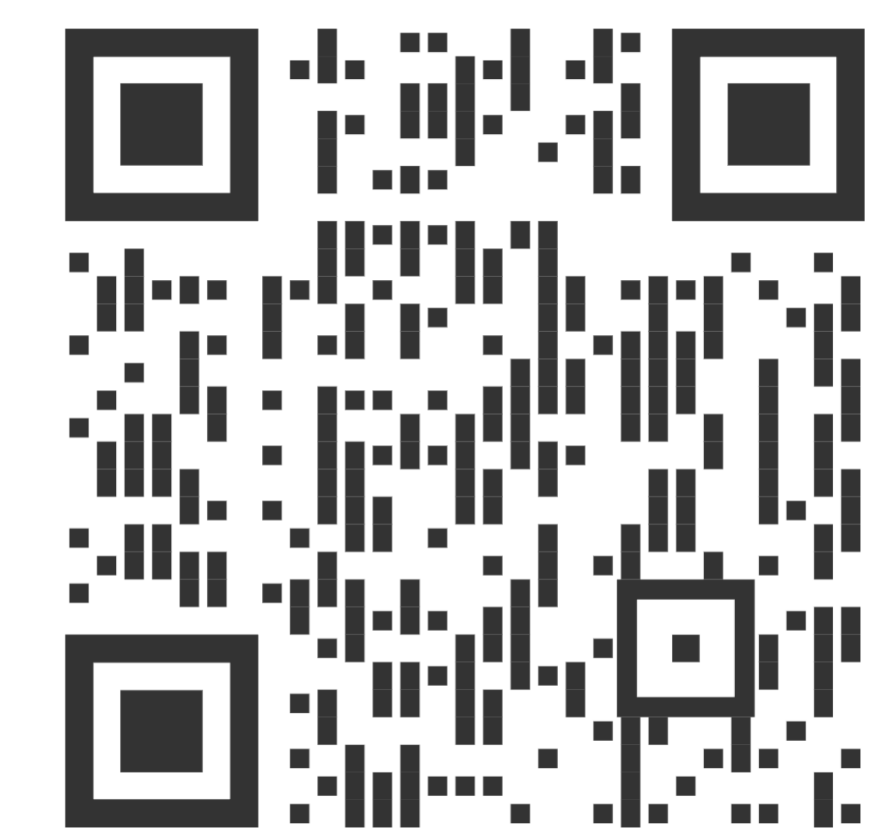
1. Neurosurgeons, regardless of degree expressed interest in seeing more research into the potential application of OMT in their field.
2. Increasing Neurosurgeon's knowledge of Osteopathic Medicine could result in an increase in the number of referrals for OMT, and an overall increase in presence of osteopathic medicine in the management of neurosurgical patients.
3. An increase in osteopathic research would likely increase the incorporation into Neurosurgical practice.

FUTURE DIRECTIONS

With research interest established, we plan to apply for funding of neurosurgery-focused research projects. The goal of our proposals will center around confirmation studies of the physiologic processes underlying osteopathic manipulative techniques.

- Effects on sympathetic and parasympathetic processes (e.g. rib raising, occipital release, etc.)
- Fryette mechanics (fMRI study)
- CSF mobility, potentially in patients with chiari malformation, syringomyelia and/or hydrocephalus (e.g. BLT)
- Connections to lymphatics (e.g. lymphatic pump techniques)
- Post-stroke rehabilitation
- Use of OMM to modulate progression of spinal curvature in pediatric scoliosis.
- Management of chronic lower back pain following lumbar spinal fusion.

REFERENCES



Please scan the QR code for complete list of references in future publication

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