INSIGHTS-JOURNAL OF
HEALTH AND REHABILITATION

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

ETHICAL ASPECT OF PAPER PUBLICATION: A CROSS-SECTIONAL SURVEY AMONG POSTGRADUATE RESIDENTS AT INDUS HOSPITAL, KARACHI

Original Research

Asma Akhter[1], Adeel Ur Rehman[2]*, Kashif Naeem[2], Awais Anwar[1], Tooba Mughal[2]
[1]Resident Anesthesia Department, The Indus Hospital And Health Network Karachi
[2]Consultant Anesthesia Department, The Indus Hospital And Health Network Karachi

Corresponding Author: Adeel Ur Rehman, adeel.rehman@tih.org.pk, Consultant Anesthesia Department, The Indus Hospital And Health Network Karachi
Acknowledgement: The authors gratefully acknowledge the cooperation of all postgraduate residents who participated in this study.

Conflict of Interest: None | Grant Support & Financial Support: None | Publication Date: 12-05-2025

ABSTRACT

Background: Ethical standards in medical research are essential to uphold transparency, credibility, and patient trust. Increasing academic pressure to publish has contributed to a rise in unethical practices such as plagiarism, data fabrication, authorship disputes, and undeclared conflicts of interest. While global initiatives aim to strengthen ethical guidelines, awareness and adherence to these principles vary across regions. In Pakistan, structured education on research ethics during postgraduate training remains limited and underexplored.

Objective: To assess the level of knowledge among postgraduate medical residents regarding ethical principles related to research publications, including specific areas such as plagiarism, authorship, conflict of interest, salami slicing, duplicate and simultaneous publication.

Methods: This descriptive cross-sectional study was conducted at Indus Hospital, Karachi, over a six-month period from June 24 to December 24, 2024. A total of 120 postgraduate residents were recruited using non-probability convenience sampling. Participants completed a structured online questionnaire consisting of demographic data and six binary-response questions evaluating ethical knowledge. Knowledge scores were categorized as adequate or inadequate based on a >50% threshold. Data were analyzed using SPSS version 26. Descriptive statistics were presented as frequencies, percentages, medians, and interquartile ranges. Chi-square and Shapiro-Wilk tests were applied, with a p-value of <0.05 considered statistically significant.

Results: Out of 120 participants, 101 (84%) demonstrated adequate knowledge, while 19 (16%) had inadequate knowledge. Gender was not significantly associated with knowledge level (p=0.864). Median age was significantly higher in those with inadequate knowledge (30 years, IQR 29–32) compared to those with adequate knowledge (29 years, IQR 28–30; p=0.046). Research workshop attendance was significantly associated with adequate knowledge (p=0.002), while qualification, institute type, and research course enrolment showed no significant relationship. The lowest awareness was observed in salami slicing (26%) and conflict of interest (61%).

Conclusion: Most postgraduate residents demonstrated satisfactory knowledge of research publication ethics. However, targeted interventions such as structured workshops are crucial to address persistent knowledge gaps, particularly in lesser-known areas like salami slicing and conflict of interest, thereby promoting integrity in medical research.

Keywords: Authorship, Conflict of Interest, Ethics, Medical Education, Plagiarism, Salami Slicing, Surveys and Questionnaires

INTRODUCTION

The ethical integrity of scientific research and its dissemination through publication is a cornerstone of academic and clinical advancement. In the context of medical science, where new evidence continuously informs clinical practice, adherence to ethical principles is essential to ensure that the knowledge produced is both credible and beneficial to humanity (1,2). Ethical conduct in research encompasses values such as honesty, transparency, accountability, and respect for intellectual property, all of which serve to protect the integrity of scientific inquiry and uphold public trust (1,3). However, the increasing emphasis on publishing for career progression, academic recognition, and institutional advancement has generated a culture of pressure that can sometimes override these core values (2,3). This pressure is evident from the undergraduate medical education phase and intensifies through postgraduate training and academic leadership roles (2). Medical publishing is not only a reflection of scholarly effort but also a determinant of professional growth, making it a critical component of postgraduate medical education (3). Nonetheless, with the increasing value placed on publication, there has been a parallel rise in unethical practices such as data fabrication, falsification, plagiarism, self-plagiarism, inappropriate authorship allocation, and duplicate submissions (4-6). Furthermore, failure to disclose conflicts of interest and manipulating peer review systems have further undermined the credibility of scientific literature (6,7). The problem is particularly pronounced in medical publishing compared to other scientific disciplines, due in part to the high stakes involved in healthcare decision-making and professional evaluations (6,7).

The implications of such misconduct extend beyond individual authors, affecting peer reviewers, editors, institutions, patients, and the broader scientific community (5,8). Recognizing the gravity of this issue, several national and international platforms—such as the Committee on Publication Ethics (COPE) and the International Committee of Medical Journal Editors (ICMJE)—have established guidelines to uphold integrity and transparency in research publishing (3-5,8). These efforts aim to foster an ethical research culture and equip professionals with the knowledge needed to navigate the complex ethical landscape of academic publication. Despite these advancements, there is a growing concern regarding the declining adherence to ethical norms among early-career researchers, particularly in resource-limited settings where formal education in research ethics may be insufficient. In countries like Pakistan, data assessing the knowledge and awareness of ethical publishing practices among postgraduate medical trainees remain limited. A significant gap persists in structured learning opportunities such as Continuing Medical Education (CME) sessions and hands-on workshops focused on publication ethics. Institutional Review Committees (IRCs), which play a pivotal role in evaluating the ethical and scientific merit of research proposals, are often underutilized or misunderstood by trainees unfamiliar with their function or significance.

This study was therefore designed to assess the awareness and understanding of ethical publication practices among postgraduate residents at The Indus Hospital, Karachi. By identifying knowledge gaps and prevalent misconceptions, the findings aim to inform the development of targeted educational interventions. The ultimate objective is to promote a culture of ethical authorship and transparent scientific contribution, in line with international standards and best practices, thereby enhancing the reliability and credibility of locally produced medical research.

METHODS

A descriptive, cross-sectional study was carried out at Indus Hospital, Karachi, over a six-month duration from June 24, 2024, to December 24, 2024, to assess the knowledge of ethical aspects related to paper publication among postgraduate medical residents. The study employed a non-probability convenience sampling technique. The sample size was estimated using the OpenEpi sample size calculator, based on a 95% confidence interval, a salami slicing prevalence of 26%, and a margin of error of 8%. The resulting minimum sample size was 120 participants. This calculation was aligned with the subgroup frequencies outlined in the prior literature by Rohit Sane (1), including the expected prevalence for ethical domains such as authorship (58.33%), plagiarism (86.67%), simultaneous publication (35%), duplicate publication (31.67%), salami slicing (26%), and conflict of interest (68.33%). The final sample size of 120 was therefore deemed appropriate to reflect these dimensions. Participants included postgraduate residents of either gender, aged between 23 and 75 years, enrolled in the Fellowship of the College of Physicians and Surgeons (FCPS) or Membership of the College of Physicians and Surgeons (MCPS) training programs across all years at Indus Hospital, Karachi. Residents who refused to participate or did not provide consent were excluded from the study. Ethical approval for this research was granted by the Institutional Review Board (IRB) of Indus Hospital. Participation was voluntary, and informed consent was obtained online from all participants before data collection began. Eligible residents were contacted by the principal investigator via email, phone call, or text message and were provided with a brief explanation of the study's purpose. Those who agreed to participate proceeded to complete a structured, self-administered online questionnaire.

The questionnaire was divided into two sections. Section A gathered demographic data, including age, gender, highest qualification, clinical specialty, enrolment in research courses, and participation in research workshops. Section B was designed to evaluate

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

participants' knowledge of key ethical issues in research publication, such as authorship criteria, conflict of interest disclosures, plagiarism, simultaneous and duplicate publication, and salami slicing. Each of the six knowledge-related questions in Section B provided two response options: "Yes" (scored as 1) and "No" (scored as 0). A cumulative score above 50% was interpreted as adequate knowledge, while a score of 50% or lower was considered inadequate. Data were entered and analyzed using IBM SPSS Statistics for Windows, Version 26.0. Descriptive statistics such as means and standard deviations were used for normally distributed quantitative variables, while medians and interquartile ranges (IQR) were reported for non-normally distributed data. Categorical variables like gender, qualification, and research training were summarized using frequencies and percentages. The Shapiro-Wilk test was applied to assess normality of distribution. Potential effect modifiers, including age, gender, clinical specialty, enrolment in research training, and duration of active research involvement, were controlled through stratification. Following stratification, associations between variables were examined using chi-square tests, with a p-value of <0.05 considered statistically significant.

RESULTS

The total sample consisted of 120 postgraduate residents, with a near-equal gender distribution: 61 males (51%) and 59 females (49%). The median age was 29 years (IQR 28–30), with the youngest participant being 26 years old and the oldest 40 years old. Most participants (84%) were enrolled in the FCPS training program, while the remaining 16% were in the MCPS program. Anesthesia was the most commonly represented clinical specialty, with 38% of participants, followed by General Surgery (11%), Pediatrics Medicine/Surgery (10%), and General/Family/Emergency Medicine (8%). Smaller proportions were reported in ENT, Nephrology/Urology, Orthopedics, PICU, Pulmonology, Radiology, and other specialties. A significant majority (96%) were affiliated with private institutions, and only 4% were from government settings. Regarding ethical knowledge, 101 participants (84%) demonstrated adequate knowledge, while 19 participants (16%) were categorized as having inadequate knowledge. Among male participants, 50 (92%) had adequate knowledge, and 9 (8%) had inadequate knowledge. Among females, 51 (90%) had adequate knowledge and 10 (10%) had inadequate knowledge. No statistically significant difference was observed between genders in overall knowledge levels (p=0.864). The median age was slightly higher among participants with inadequate knowledge [30 years (IQR 29–32)] compared to those with adequate knowledge [29 years (IQR 28–30)], with the difference reaching statistical significance (p=0.046). No significant differences in knowledge levels were found between qualification groups (FCPS vs MCPS; p=0.734) or between type of institution (private vs government; p=0.584).

Research training background was also explored. Of the participants with inadequate knowledge, 13 (68%) had previously enrolled in a research course compared to 60 (59%) among those with adequate knowledge, showing no significant association (p=0.460). However, attendance at research publication workshops was significantly associated with knowledge level. Among those with adequate knowledge, 96 participants (95%) had attended such workshops, compared to only 13 (68%) in the inadequate knowledge group (p=0.002), indicating a positive impact of workshop participation. Topic-wise analysis revealed varying levels of knowledge. For plagiarism, 93% overall had adequate knowledge, including 92% of males and 95% of females (p=0.487). Authorship knowledge was also high, with 93% in both genders showing adequate understanding (p=1.000). Knowledge of conflict of interest was comparatively lower, at 63% in males and 59% in females (overall 61%; p=0.678). In simultaneous publication, 88% of males and 82% of females had adequate knowledge (85% total; p=0.344). Similarly, knowledge about duplicate publication was high in both genders (90% each; p=0.951). However, knowledge about salami slicing was notably poor, with only 20% of males and 31% of females (26% overall) demonstrating adequate understanding, though this difference was not statistically significant (p=0.176). Overall, 91% of participants demonstrated adequate knowledge regarding publication ethics, with no significant gender-based differences (p=0.796).

Table: Demographic of the Participants

Variable	**Frequency N=120 (%)**
Gender	
Male	61 (51)
Female	59 (49)
Age (year)	
Median (IQR)	29 (28-30)
Min-Max	26-40
Qualification of the Participants	
FCPs trainee year	101 (84)
MCPS trainee year	19 (16)

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Clinical Specialty	
Anaesthesia	45 (38)
General Surgery	13 (11)
Paeds Medicine/Surgery	12 (10)
General/Family/Emergency Medicine	10 (8)
ENT	8 (7)
Nephrology/Urology	8 (7)
Orthopaedics	6 (5)
PICU	4 (3)
Pulmonology	4 (3)
Radiology	4 (3)
Other	6 (5)
Type of Institute	
Private	115 (96)
Government	5 (4)

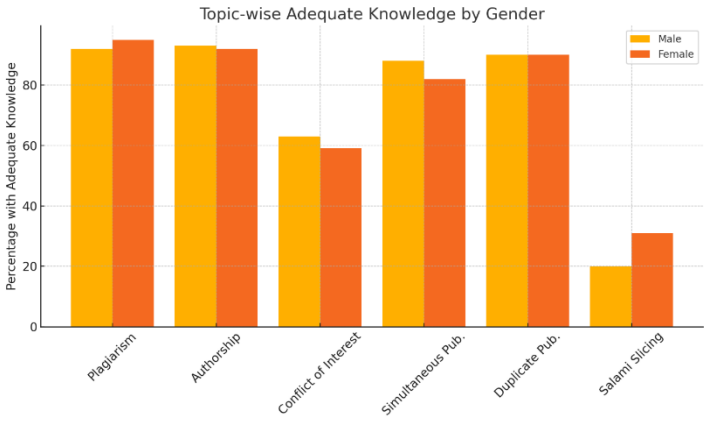
Table: Association Between Knowledge Levels and Demographic/Professional Characteristics Among Participants

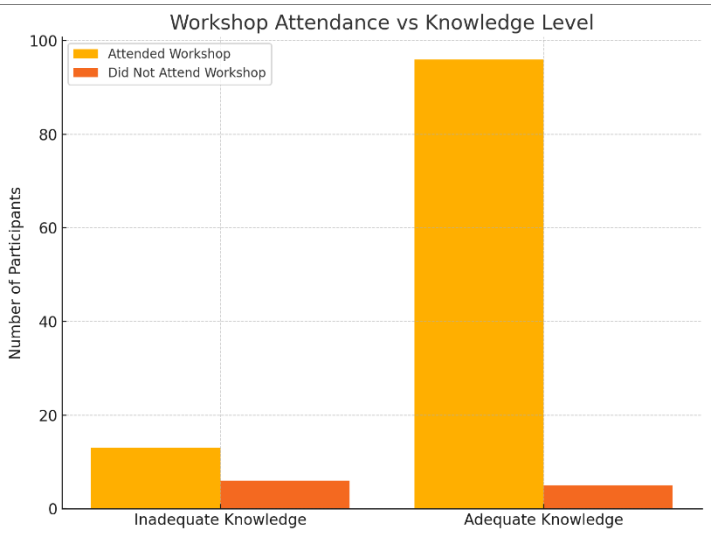
Variable	Inadequate Knowledge N=19	Adequate Knowledge N=101	Total N=120	P-Value
Gender				
Male	9 (47)	50 (50)	59 (49)	0.864
Female	10 (53)	51 (50)	61 (51)	
Age (year)				
Median (IQR)	30 (29-32)	29 (28-30)	29 (28-30)	0.046
Min-Max	27-40	26-38	26-40	
Qualification				
FCPs trainee year	17 (89)	84 (83)	101 (84)	0.734
MCPS trainee year	2 (11)	17 (17)	19 (16)	
Type of Institute				
Private	18 (95)	97 (96)	115 (96)	0.584
Government	1 (5)	4 (4)	5 (4)	
Ever Enrolled in a Research Course				
Yes	13 (68)	60 (59)	73 (61)	0.460
No	6 (32)	41 (41)	47 (39)	
Ever Attended a Research Publication Workshop				
Yes	13 (68)	96 (95)	109 (91)	0.002
No	6 (32)	5 (5)	11 (9)	

INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

Table: Participants' Knowledge of Specific Publication Issues, Stratified by Gender

Variable	Male (N=59)	Female (N=61)	Total (N=120)	P-Value
Plagiarism				
Adequate knowledge	54 (92%)	58 (95%)	112 (93%)	0.487
Inadequate knowledge	5 (8%)	3 (5%)	8 (7%)	
Authorship				
Adequate knowledge	55 (93%)	56 (92%)	111 (93%)	1.000
Inadequate knowledge	4 (7%)	5 (8%)	9 (8%)	
Conflict of Interest				
Adequate knowledge	37 (63%)	36 (59%)	73 (61%)	0.678
Inadequate knowledge	22 (37%)	25 (41%)	47 (39%)	
Simultaneous Publication				
Adequate knowledge	52 (88%)	50 (82%)	102 (85%)	0.344
Inadequate knowledge	7 (12%)	11 (18%)	18 (15%)	
Duplicate Publication				
Adequate knowledge	53 (90%)	55 (90%)	108 (90%)	0.951
Inadequate knowledge	6 (10%)	6 (10%)	12 (10%)	
Salami Slicing				
Adequate knowledge	12 (20%)	19 (31%)	31 (26%)	0.176
Inadequate knowledge	47 (80%)	42 (69%)	89 (74%)	
Overall Adequate Knowledge				
Adequate knowledge	54 (92%)	55 (90%)	109 (91%)	0.796
Inadequate knowledge	5 (8%)	6 (10%)	11 (9%)	





INSIGHTS-JHR
INSIGHTS-JOURNAL OF HEALTH AND REHABILITATION

DISCUSSION

The findings of this study revealed a high level of overall awareness regarding publication ethics among postgraduate residents, with 91% of participants demonstrating adequate knowledge. This contrasts with several earlier studies, both regional and international, that reported substantial gaps in the understanding and application of research ethics among healthcare professionals and postgraduate trainees. A previous investigation assessing plagiarism awareness among European and Chinese academics noted that while most participants were familiar with basic concepts, regional differences existed, with a considerable proportion of respondents from China lacking understanding of specific plagiarism types (9). Another study conducted using a structured questionnaire comprising yes/no responses and Likert scales found variability in knowledge levels, with many participants exhibiting only superficial familiarity with core ethical principles (10). Furthermore, studies assessing knowledge of ethical frameworks such as the Declaration of Helsinki and the Belmont Report among medical residents and neuroscience trainees in Pakistan highlighted alarmingly low levels of awareness (11,12). Compared to such findings, the results of the current study suggest a relatively more informed cohort, particularly in areas like plagiarism and authorship. However, despite this encouraging trend, knowledge deficits persisted in domains such as salami slicing and conflict of interest, where awareness was markedly lower. These findings align with national studies showing a disconnection between theoretical knowledge and practical application of ethics in clinical and academic settings (13,14). Moreover, prior comparative research between private and public sector trainees in Pakistan indicated disparities in bioethics understanding, whereas this study found no significant differences in knowledge based on institutional affiliation, suggesting some progress in the standardization of ethics training across settings (15).

Among the significant associations observed, age and attendance at research publication workshops were linked to higher knowledge levels, emphasizing the importance of ongoing, structured ethics education. This finding reinforces the argument for mandatory inclusion of research ethics modules and CME-accredited workshops in postgraduate training curricula. Gender, qualification type, and institutional sector did not demonstrate any statistically significant influence on ethical knowledge levels, indicating a broad-based awareness that cuts across demographic and academic variables (16). This study's strengths include a clearly defined sample, a focused and validated assessment of knowledge across multiple domains of publication ethics, and a high response rate. However, several limitations should be acknowledged. Being a single-center study conducted at a tertiary care hospital in Karachi, the findings may not be generalizable to other settings, particularly rural or resource-limited institutions. The use of self-administered questionnaires introduces the possibility of response bias, including social desirability bias, where participants may overreport ethical awareness to align with perceived expectations. Additionally, the cross-sectional design captures knowledge at a single time point, limiting insights into how ethical understanding evolves with training or exposure. The sample also had uneven distribution across clinical specialties, making it difficult to assess field-specific patterns in ethics awareness. Importantly, the study did not explore attitudes, motivations, or barriers through qualitative methods, which could have enriched the interpretation of quantitative findings (17,18).

Despite these limitations, the study offers valuable insight into the current state of ethics awareness among postgraduate medical residents in Pakistan. The relatively high level of general knowledge, coupled with identified gaps in specific ethical domains, points toward the need for more nuanced and continuous training interventions. Future studies should consider incorporating longitudinal designs, qualitative interviews, and a broader institutional scope to assess the impact of structured ethics education over time and to better understand the contextual factors influencing ethical decision-making in clinical and academic environments (19).

CONCLUSION

This study concluded that while the majority of postgraduate medical residents demonstrated a satisfactory understanding of research publication ethics, notable deficiencies remained in specific areas such as salami slicing and conflict of interest. These gaps underscore the importance of focused educational efforts to reinforce less familiar ethical concepts. The association between higher knowledge and prior workshop attendance highlights the practical value of structured training in fostering responsible research practices. These findings support the integration of comprehensive ethics education into postgraduate programs to strengthen ethical standards and ensure the integrity of scholarly contributions in medical research.

AUTHOR CONTRIBUTIONS

Author	Contribution
Asma Akhter	Conceptualization, Methodology, Formal Analysis, Writing - Original Draft, Validation, Supervision
Adeel Ur Rehman	Methodology, Investigation, Data Curation, Writing - Review & Editing
Kashif Naeem	Investigation, Data Curation, Formal Analysis, Software
Awais Anwar	Software, Validation, Writing - Original Draft
Tooba Mughal	Formal Analysis, Writing - Review & Editing

REFERENCES

1. Paruzel-Czachura M, Baran L, Spendel Z. Publish or be ethical? Publishing pressure and scientific misconduct in research. Research Ethics. 2021 Jul;17(3):375-97.

2. Yi N, Nemery B, Dierickx K. Perceptions of plagiarism by biomedical researchers: an online survey in Europe and China. BMC Medical Ethics. 2020 Dec;21:1-6.

3. Azakir B, Mobarak H, Al Najjar S, El Naga AA, Mashaal N. Knowledge and attitudes of physicians toward research ethics and scientific misconduct in Lebanon. BMC medical ethics. 2020 Dec;21:1-0.

4. Qadri HM, Shahid R, Fatima SB, Naveed N, Khizar A, ul Haq S, Khan ZM, Bashir A, Collaborator G. Knowledge, Attitude and Perception of Research Ethics and Research Ethics Committees among Post-Graduate Residents of Neurosciences-A Nationwide Analysis from Pakistan. Pakistan Journal of Medical Sciences. 2024 Dec;40(12PINS Suppl):S55.

5. Ashfaq T, Ishaq A, Shahzad F, Saleem F. Knowledge and perception about bioethics: A comparative study of private and government medical college students of Karachi Pakistan. Journal of family medicine and primary care. 2021 Mar 1;10(3):1161-6.

6. Shalhub S. The arbitrary definition of unprofessional social media is larger than #medbikini. J Vasc Surg. 2020;72(5):1821-2.

7. DiLosa K, Drudi LM. Changing tides: A vascular surgery trainee perspective on the #MedBikini Campaign and a call for action. J Vasc Surg. 2020;72(5):1819-20.

8. Chen L, Li Y, Guo X, Liu W. Comparison of case-based learning and traditional lecture in teaching residents on research misconduct: a controlled before-and-after study. PLoS One. 2025;20(4):e0322336.

9. Drevik J, Ramage V, Tverye A, Lee EK, Souders CP. Exploring Industry Payments to Urology Residents: A Longitudinal Analysis Under the Sunshine Act. J Surg Educ. 2024;81(10):1462-8.

10. Fanning JE, Lee D, Schuster K, Park JB, Escobar-Domingo MJ, Bommineni V, et al. Ghost Publications and Research Misrepresentation in the 2023-2024 Plastic Surgery Common Application. Ann Plast Surg. 2025;94(4S Suppl 2):S322-s6.

11. Cline A, Pona A, Ezekor M, Huang WW, Feldman SR. The importance of publications, research, volunteer, and work experience in dermatology residency applicants. J Am Acad Dermatol. 2021;84(2):e99-e100.

12. Chen L, Li Y, Wang J, Li Y, Tan X, Guo X. Knowledge, attitudes and practices about research misconduct among medical residents in southwest China: a cross-sectional study. BMC Med Educ. 2024;24(1):284.

13. Yang L, Leswick D, Rashidi F. Mistakes, Misrepresentation, and Misunderstanding on Applications to a Canadian Diagnostic Radiology Residency Program. Can Assoc Radiol J. 2023;74(1):22-9.

14. Wynia MK, Baugh CM, Campbell EG. Next Steps for Addressing Conflicts of Interest in Residency Programs. JAMA Netw Open. 2023;6(10):e2337828.

15. Carmody JB, Rajasekaran SK. On Step 1 Mania, USMLE Score Reporting, and Financial Conflict of Interest at the National Board of Medical Examiners. Acad Med. 2020;95(9):1332-7.

16. Janssen SJ, Langerhuizen DWG, Kerkhoffs G, Ring D. Payments by Industry to Residency Program Directors in the United States: A Cross-Sectional Study. Acad Med. 2022;97(2):278-85.

17. Letchuman V, Barrow DL, Adamson DC. Trends in Academic Misrepresentation in Neurological Surgery Residency Applicants: A 2-Year Analysis. World Neurosurg. 2021;151:e988-e94.

18. Prinster TB, Weisleder P. Trust but Verify: Misrepresentation of Publication Records Among Child Neurology Residency Applicants. Pediatr Neurol. 2022;133:63-6.

19. Burkhart RJ, Hecht CJ, 2nd, Karimi AH, Acuña AJ, Kamath AF. What Are the Trends in Research Publication Misrepresentation Among Orthopaedic Residency and Fellowship Applicants From 1996 to 2019? A Systematic Review. Clin Orthop Relat Res. 2023;481(7):1292-303.