Gender Differences in X (Formerly Twitter) Use Among Orthopedic Surgeons from US News Top-Ranked Hospitals

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Abstract

Background: Gender disparities in academic medicine persist, particularly in male-dominated fields such as orthopedic surgery. Social media platforms are reshaping academic communication, though data describing gender differences in use and engagement limited.

Objective: The aim of this study was to analyze gender-based differences in X use, influence, and engagement among individual orthopedic surgeons.

Methods: This cross-sectional study evaluated publicly available data from the 2023 U.S. News and World Report top 20 hospitals for orthopedic surgery. Demographic data, apparent gender (binary), and public X (formerly Twitter) data were collected.

Results: Of 1,327 orthopedic surgeons, 25% were on X. X-users were more likely to hold leadership roles ($p<0.001$), higher faculty appointments ($p<0.001$), and additional advanced degrees ($p=0.007$). Women X-user (vs men) were less likely to be full professors (12% vs 20%); $p=0.041$). While women (vs men) had similar numbers of followers, following, and posts ($p>0.05$), women liked more posts (median 242 vs 35, $p=0.006$) and were more likely to mention being a parent, spouse, or hobbies/interests (24.4% vs 12.1%; $p=0.048$).

Conclusions: Orthopedic surgeons on X were more likely to have higher academic rank, leadership titles, and dual degrees, though gender disparities persisted with women X-users harboring lower rates of full professorship. Women orthopedic surgeons were more actively engaged with other posts on X. The motivation behind these trends is worthy of further study.

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Abstract:

Background: Gender disparities in academic medicine persist, particularly in male-dominated fields such as orthopedic surgery. Social media platforms are reshaping academic communication, though data describing gender differences in use and engagement limited.

Methods: This cross-sectional study evaluated publicly available data from the 2023 U.S. News and World Report top 20 hospitals for orthopedic surgery**.** Demographic data, apparent gender (binary), and public X (formerly Twitter) data were collected.

Results: Of 1,327 orthopedic surgeons, 25% were on X. X-users were more likely to hold leadership roles ($p<0.001$), higher faculty appointments ($p<0.001$), and additional advanced degrees ($p=0.007$). Women X-user (vs men) were less likely to be full professors (12% vs 20%); $p=0.041$). While women (vs men) had similar numbers of followers, following, and posts ($p>0.05$), women liked more posts (median 242 vs 35, $p=0.006$) and were more likely to mention being a parent, spouse, or hobbies/interests (24.4% vs 12.1%; $p=0.048$).

Conclusions: Orthopedic surgeons on X were more likely to have higher academic rank, leadership titles, and dual degrees, though gender disparities persisted with women X-users harboring lower rates of full professorship. Women orthopedic surgeons were more actively engaged with other posts on X. The motivation behind these trends is worthy of further study.

Keywords: Social media; X (Twitter); gender disparities; orthopedic surgery; physician workforce disparities.

INTRODUCTION

Despite increasing gender parity in medical school matriculation, gender differences in promotion, tenure, and satisfaction in academic medicine persist[1]. These differences are particularly pronounced in orthopedic surgery, where women comprise 18% of the academic workforce, but only 9% of higher professorial ranks and 1% of department chairs[2]. Social media, including X (previously Twitter), has emerged as a tool for career advancement, enabling greater dissemination of research and enhancing digital scholarship[3]. However, differences in X use and existing gender disparities among X-using orthopedic surgeons are understudied and examined herein.

METHODS

This cross-sectional study evaluated publicly available data and was exempt from ethical approval according to the Cedars-Sinai Medical Center institutional review board. The 20 best hospitals for orthopedic surgery were identified according to 2023 U.S. News and World Report (USNWR) rankings, and institutional websites were accessed to identify residency-trained orthopedic surgeons. Podiatrists, physiatrists, and non-operative sports medicine practitioners were excluded. Available faculty demographic data were collected, including training dates, degrees received, faculty appointments, and apparent gender (binary) using name, pronouns, and/or public profile images. Physicians were searched on X and public data (i.e., number of followers/following/likes/posts, date of account creation, and biography) were recorded between February and June 2024. Descriptive statistics were performed using Wilcoxon rank-sum test for continuous variables and chi-square or Fisher’s exact test for categorical variables. Statistical analyses were performed using StataSE, version 17.0 (StataCorp LLC) with two-sided tests at a significance level of 0.050.

RESULTS

A total of 1,327 orthopedic surgeon profiles were analyzed, of which 330 (24.9%) were on X. Compared to non-users, X-users were more likely to hold leadership roles ($p<0.001$), higher faculty appointments ($p<0.001$), and additional advanced degrees ($p=0.007$). Among X-users, women (vs men) were less likely to be full professors (12.2% vs 19.7%); $p=0.041$). While women (vs men) had similar numbers of followers, following, and posts ($p>0.05$), women had higher levels of self-engagement in the form of liking more posts (median 242 vs 35, $p=0.006$). On thematic analysis of X profile biographies, women (vs men) were more likely to mention personal information including being a parent, spouse, or hobbies/interests (24.4% vs 12.1%; $p=0.048$), while men (vs women) were more likely to mention their job/specialty (93.4% vs 82.9%; $p=0.02$).

DISCUSSION

Orthopedic surgeons on X were more likely to have higher academic rank, more leadership titles, and dual degrees, though gender disparities persisted with women X-users harboring lower rates of full professorship. Additionally, women were more likely to engage with posts from other users and share personal/family information in their profile biographies, consistent with studies showing that women physicians are more likely than men to use social media to build support networks and/or foster online communities[4]. Hashtag (i.e., #OrthoTwitter) and post content analyses may further inform these trends[5].

We observed similar time-adjusted levels of X followers and posts between men and women, aligning with survey data demonstrating that men and women physicians report similar rates of using social media to build their professional network and increase collaborations[4]. However, despite comparable intent for professional development use, women physicians are less likely to report career-advancing benefits (i.e., speaking engagement or expanded research portfolio)[4]. Further, others have shown that despite similar follow count, men physicians are more likely to hold a ‘verified’ X account—a designation of validity[6]. Together, these data underscore the need for further

research to determine whether social media use by women physicians improves gender inequities or if existing biases that impede professional advancement persist.

This study has several potential limitations, including inaccuracies or incompleteness in publicly available data. Subjective (binary) gender classification may result in classification bias or inaccuracy in preferred gender. Results from surgeons at top USNWR hospitals may not reflect other medical practice settings. Nonetheless, we demonstrate that gender disparities persist in the orthopedic surgery X community, though women orthopedic surgeons were more actively engaged. The motivation behind these trends and the impact of social media use on gender disparities in professional development are worthy of further study.

CONFLICTS OF INTEREST

None declared.

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Table 1. Baseline characteristics stratified by X use.

Variable	**Not on X (N=997)**	**On X (N=330)**	**P-value**

Geographic Region			
Northeast	364(36.51)	148(44.85)	**<0.001**
Midwest	178(17.85)	75(22.73)	
South	84(8.43)	30(9.09)	
West	371(37.21)	77(23.33)	
Gender			
Male	902(90.47)	289(87.58)	0.133
Female	95(9.53)	41(12.42)	
Faculty type			
None/Not listed	431(43.23)	72(21.82)	**<0.001**
Instructor	40(4.01)	12(3.64)	
Assistant	264(26.48)	118(35.76)	
Associate	114(11.43)	66(20.00)	
Full Professor	148(14.84)	62(18.79)	
No. leadership titles			
0	731(73.32)	184(55.76)	**<0.001**
1	182(18.25)	91(27.58)	
2	57(5.72)	37(11.21)	
3+	27(2.71)	18(5.45)	
Subspecialty			
General	27(2.71)	2(0.61)	**<0.001**
Sports medicine	205(20.56)	106(32.12)	
Upper extremity	167(16.75)	40(12.12)	
Lower extremity	259(25.98)	74(22.42)	
Spine	159(15.95)	33(10.00)	
Trauma	48(4.81)	12(3.64)	
Pediatric	43(4.31)	18(5.45)	
Musculoskeletal oncology	20(2.01)	10(3.03)	
Multiple/Other	69(6.92)	35(10.61)	
Dual degree (PhD, MBA, MPH, MS)			
Yes	83(8.32)	44(13.33)	**0.007**
No	914(91.68)	286(86.67)	
Length of training since medical school (years)			
Median (IQR)	6(6-7)	6(6-7)	0.389

Data are presented as number of patients (column %) or median (IQR, interquartile range). P-value is calculated by Wilcoxon rank-sum test for continuous variables; and chi-square test or Fisher's exact test for categorical variables as appropriate.

Table 2. Characteristics of orthopedic surgeons on X stratified by gender.

Variable	**Male (N=289)**	**Female (N=41)**	**P-value**
Region			
Northeast	126(43.6)	22(53.66)	0.373

Midwest	67(23.18)	8(19.51)	
South	29(10.03)	1(2.44)	
West	67(23.18)	10(24.39)	
Faculty type			
None/Not listed	68(23.53)	4(9.76)	**0.041**
Instructor	12(4.15)	0	
Assistant	98(33.91)	20(48.78)	
Associate	54(18.69)	12(29.27)	
Full professor	57(19.72)	5(12.2)	
No. leadership titles			
0	162(56.06)	22(53.66)	0.949
1	78(26.99)	13(31.71)	
2	33(11.42)	4(9.76)	
3+	16(5.54)	2(4.88)	
Subspecialty			
General	2(0.69)	0	**0.005**
Sports medicine	94(32.53)	12(29.27)	
Upper extremity	32(11.07)	8(19.51)	
Lower extremity	69(23.88)	5(12.2)	
Spine	32(11.07)	1(2.44)	
Trauma	11(3.81)	1(2.44)	
Pediatric	10(3.46)	8(19.51)	
Musculoskeletal oncology	8(2.77)	2(4.88)	
Multiple/Other	31(10.73)	4(9.76)	
Dual degree (PhD, MBA, MPH, MS)			
Yes	37(12.8)	7(17.07)	0.452
No	252(87.2)	34(82.93)	
Length of training since med school graduation (years)			
Median (IQR)	6(6-7)	6(6-7)	0.241
X use variables (publicly available)			
Time on X (years),			
Median (IQR)	9(6-12)	8(5-11)	0.133
Average number of followers on X			
Median (IQR)	221(40-717)	270(79-773)	0.386
Average number of following on X			
Median (IQR)	123(31-307)	159(32-426)	0.414
Average number of liked posts on X			
Median (IQR)	35(0-537.5)	242(20-1110)	**0.006**
Average number of posts on X			
Median (IQR)	103(18-579.5)	83(17-452)	0.705
Thematic content of X profile biography			
Job roles and/or specialty			
Mention	270(93.43)	34(82.93)	**0.020**
No mention	19(6.57)	7(17.07)	
Personal information (parent, spouse, and/or interests)			
Mention	35(12.11)	10(24.39)	**0.048**
No mention	254(87.89)	31(75.61)	

Data are presented as number of patients (column %) or median (IQR, interquartile range).
P-value is calculated by Wilcoxon rank-sum test for continuous variables; and chi-square test or Fisher's exact test for categorical variables as appropriate.