Fellowship Training Is a Significant Predictor of Sports Medicine Physician Social Media Presence

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Purpose: To quantify social media use of professional sports team physicians on popular platforms and analyze differences between users and nonusers. **Methods:** Team physicians for professional sports teams in the National Football League, National Hockey League, Major League Baseball, and National Basketball Association were identified and characterized based on training background, practice setting, and geographic location. Rates of social media presence on Facebook, Twitter, LinkedIn, Instagram, and ResearchGate were determined. Differences between social media users and nonusers were analyzed. **Results:** In total, 505 professional team physicians were identified across 4 major professional sports; 64.6% of physicians were orthopaedic surgeons. Of 505 physicians, 65.7% had a social media presence. More specifically, 21.8% had a professional Facebook page, 22.6% a professional Twitter page, 52.1% a LinkedIn profile, 21.4% a ResearchGate profile, and 9.1% an Instagram account. Fellowship-trained physicians ($P = .008$) had greater odds of having a social media presence. **Conclusions:** Nearly two-thirds of professional team physicians have a social media presence, most commonly LinkedIn. Fellowship training is a significant predictor of sports medicine physician social media presence. Sports league affiliation, training background, practice setting, and geographic location are unrelated to social media presence. **Level of Evidence:** IV, cross-sectional study.

The internet has become an integral means for individuals to connect to the health care system. A study of more than 30,000 adults found that nearly 45% of patients have searched the internet for health-related information.¹ Patients frequently use social media to receive support from others living with similar conditions.² Thus, the internet has the potential to impact patients' health-related beliefs and behaviors.

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Physicians are also active users of the internet.³ Social media has grown as a means through which physicians can educate the public, increase their own knowledge base, and communicate with colleagues.² Social media also serves as an avenue for physicians to market themselves to potential patients.² In fact, one study found that patients often are strongly influenced by social media when choosing a potential plastic surgeon.⁴

Many physicians use social media; one survey showed that approximately 65% of physicians engage with social media for professional purposes.⁵ Rates of professional social media presence vary between specialties. For instance, about 62% of plastic surgeons use social media as part of their practice.⁶ Among pediatric orthopaedic surgeons, 36.8% had a LinkedIn profile and about one-third had a professional YouTube presence.⁷

Professional sports team physicians constitute a unique subset of physicians in that they are affiliated with prominent organizations with large media presences and global audiences. To date, the use of social media by professional sports team physicians has not been well characterized. The purpose of this study was to quantify social media use of professional sports team physicians on popular platforms and analyze

differences between users and nonusers. Our primary hypothesis was that a majority of sports team physicians would have a social media presence. Our secondary analyses focused on factors affecting rates of social media use. We hypothesized that most sports team physicians would have a social media presence. We also hypothesized that the rates of social media usage would be greater among private practice physicians than academic physicians. Lastly, we hypothesized that all other demographic variables, including training background and sports affiliation, would be unrelated to social media use.

Methods

Team physicians were identified from various lists. National Football League team physicians were identified on the National Football League Physicians Society website.⁸ Team physicians for Major League Baseball, National Basketball Association, and National Hockey League were identified from published lists of team physicians.⁹⁻¹¹ We focused on these leagues to be consistent with another study of sports team physicians.¹² From those lists, individual information was gathered for each professional team physician. Internet searches of each physician were performed on Google and social media platforms to determine whether each physician had professional accounts on Facebook, Twitter, Instagram, ResearchGate, and LinkedIn, as these are among the most commonly used social media platforms by physicians.^{6,7} Physicians were searched on Google using the full name with and without his/her title (e.g., M.D./D.O.) in the search. We did not search past the first page of Google, and no closed social media pages were found on Google. We used the individual physician search results and the information on the associated team's website (if available) to cross reference the team physician information from the published lists. We planned to have a second coder review any conflicting information and make a decision based on the data. Physicians were excluded from analysis if they were retired, deceased, or reliable demographic information could not be found.

Training background (including medical school, specialty, and fellowship), practice setting (academic or private), and current geographic location (West, South, Northeast, Midwest, Northwest, East, Southwest, or International) were recorded based on our internet searches. Large metropolitan location was classified as those working in a city with a population greater than 1.5 million people.¹³ We assigned top 25 medical school status to those who went to a school listed in the top 25 of the 2019 U.S. News and World Report medical school research rankings.¹⁴ For those in academic practice, we assigned top 25 affiliate status to those affiliated with a hospital listed in the top 25 of the

2018-2019 U.S. News and World Report ranking of orthopaedic hospitals.¹⁵

For our primary analysis, we quantified the number of professional team physicians with a professional Facebook, Twitter, LinkedIn, ResearchGate, or Instagram account. We also quantified the proportion of physicians with any social media presence, meaning a professional account on at least 1 of these 5 platforms.

For our secondary analyses, we performed a multivariable logistic regression of demographic variables on the probability of having a social media presence. The included variables were academic (vs private) practice, top 25 orthopaedic hospital affiliation per 2018-2019 U.S. News and World Report,¹⁵ top 25 medical school training per 2019 U.S. News and World Report,¹⁴ orthopaedic surgery training (vs nonorthopaedic surgery), fellowship (vs no fellowship), large metropolitan location (vs all smaller locations), and professional sport league affiliation. We examined for potential collinearity by measuring the variance inflation factor. For multilevel variables that were significant, we performed follow-up χ^2 pairwise comparisons between all other levels of that variable.

Data were analyzed using SPSS 23,¹⁶ R software environment (version 3.5.1),¹⁷ and packages "survey,"¹⁸ and "usdm."¹⁹ Alpha level of 0.05 was used for all statistical analyses. Institutional review board review was not required, as all data were publicly available.

Results

Sample Demographics

In total, 519 professional team physicians were identified across 4 major sports. Eleven were excluded due to lack of information and 3 were excluded as they were either retired or deceased. Thus, 505 professional team physicians were analyzed in this study; 95.6% were Medical Doctors (M.D.s), with 64.6% orthopaedic surgeons ($n = 326$). In total, 82.4% had fellowship training ($n = 416$), with the majority of orthopaedic surgeons completing a fellowship in sports medicine (74.5%, $n = 243$) and a large proportion of nonorthopaedic surgeons completing a fellowship in sports medicine (46.5%, $n = 79$). Orthopaedic surgeons had a greater rate of fellowship (93.9%, $n = 326$) than nonorthopaedic surgeons (61.5%, $n = 179$) in a χ^2 test ($P < .001$). In total, 28.9% ($n = 146$) trained at top 25 medical schools per 2019 U.S. News and World Report.¹⁴ Team sports physicians were distributed throughout the United States, with the majority of U.S.-based physicians in the Midwest, West, and South U.S. (28.5%, 21.8%, and 20.2%; $n = 144, 110, 102$). The Southwest and Northwest U.S. were the least represented (0.4%, 1.6%; $n = 2, 8$). International-based physicians were more likely to

Table 1. Team Sports Physicians in Each League by Training Background, Training Location, and Current Practice

	NFL (n = 179)	NBA (n = 89)	MLB (n = 155)	NHL (n = 82)	Total (n = 505)
Training background					
Emergency medicine	2.2%	0.0%	4.5%	0.0%	2.2%
Family medicine	14.0%	9.0%	18.7%	8.5%	13.6%
Internal medicine	17.3%	3.4%	16.1%	2.4%	12.1%
Medicine/pediatrics	0.6%	0.0%	0.0%	0.0%	0.2%
Neurology	0.6%	1.1%	0.0%	0.0%	0.4%
Neurosurgery	3.4%	2.2%	0.0%	2.4%	2.0%
Orthopaedic surgery	56.4%	80.9%	54.2%	84.1%	64.6%
Pediatrics/surgery	0.6%	0.0%	0.0%	0.0%	0.2%
PM&R	2.2%	1.1%	0.0%	1.2%	1.2%
Psychiatry	0.6%	0.0%	0.0%	0.0%	0.2%
Surgery	0.6%	0.0%	0.6%	0.0%	0.4%
Other/unknown	1.7%	2.2%	5.0%	1.2%	2.8%
Fellowship trained	82.7%	84.3%	74.2%	95.1%	80.3%
M.D.	97.8%	96.6%	92.9%	95.1%	95.6%
D.O.	1.1%	3.4%	2.6%	4.9%	2.6%
Other/unknown	1.1%	0.0%	4.5%	0.0%	1.8%
Top 25 medical school	27.4%	31.5%	28.4%	30.5%	28.9%
Training location					
United States	95.5%	98.9%	97.4%	86.6%	95.2%
Canada	0.0%	1.1%	1.9%	13.4%	3.0%
United Kingdom	4.5%	0.0%	0.0%	0.0%	1.6%
Other	0.0%	0.0%	0.6%	0.0%	0.2%
Current practice					
Academic	71.5%	53.9%	52.3%	64.6%	61.4%
Private	28.5%	46.1%	47.7%	35.4%	38.6%
Top 25 orthopaedic hospital	25.7%	31.5%	25.2%	23.2%	26.1%
Large metropolitan area	21.2%	27.0%	23.9%	30.5%	24.6%

MLB, Major League Baseball; NBA, National Basketball Association; NFL, National Football League; NHL, National Hockey League; PM&R, physical medicine & rehabilitation.

be based in Canada and the United Kingdom. 24.6% ($n = 124$) of all team physicians work in large metropolitan areas. [Table 1](#) depicts a summary of team physicians by sport, training background, and current practice.

Social Media Presence

Of the 505 physicians, 65.7% ($n = 332$) had a social media presence. More specifically, 21.8% had a professional Facebook page ($n = 110$), 22.6% a professional Twitter page ($n = 114$), 52.1% a LinkedIn profile ($n = 263$), 21.4% a ResearchGate profile ($n = 108$), and 9.1% an Instagram account ($n = 46$). [Table 2](#) depicts the summary of the results of the analysis of

professional team physicians with any social media presence by type of social media and sport.

Predictors of Social Media Presence

A logistic regression on the probability of having a social media presence found that fellowship-trained team physicians had significantly greater odds (odds ratio = 2.04, $P = .008$) of using social media than nonfellowship-trained physicians. U.S. News top 25 rank of medical school, U.S. News top orthopaedic designation of affiliated hospital, sports league affiliation, and practicing in an academic versus private practice were unrelated to social media presence ([Table 3](#)). All tested variables were unlikely to be

Table 2. Percentage of Team Physicians in Each Sports League With Social Media Presence, by Type of Social Media

	NFL (n = 179)	NBA (n = 89)	MLB (n = 155)	NHL (n = 82)	Total (n = 505)
Overall	62.6%	74.2%	64.5%	65.9%	65.7%
Facebook	16.2%	31.5%	21.9%	23.2%	21.8%
Twitter	17.9%	25.8%	25.2%	24.4%	22.6%
LinkedIn	47.5%	58.4%	52.9%	53.7%	52.1%
ResearchGate	21.2%	23.6%	20.0%	20.7%	21.4%
Instagram	8.4%	7.9%	10.3%	9.8%	9.1%

NOTE. "Overall" indicates the percentage of physicians with presence on at least 1 of the 5 social media platforms studied.

MLB, Major League Baseball; NBA, National Basketball Association; NFL, National Football League; NHL, National Hockey League.

Table 3. Multivariable Logistic Regression Table on Social Media Presence

Factor	Odds Ratio [95% CI]	P Value
Academic	1.32 [0.85-2.06]	.22
Top 25 orthopaedic hospital	1.23 [0.73-2.07]	.43
Top 25 medical school	1.25 [0.80-1.94]	.33
Orthopaedic surgery training	1.04 [0.67-1.61]	.87
Fellowship	2.04 [1.20-3.46]	.008*
Large metropolitan location	1.35 [0.85-2.15]	.21
Sport		
NHL	1.07 [0.61-1.89]	.82
MLB	1.25 [0.78-1.99]	.36
NBA	1.80 [0.99-3.26]	.053
NFL	ref	Ref

CI, confidence interval; MLB, Major League Baseball; NBA, National Basketball Association; NFL, National Football League; NHL, National Hockey League; ref, reference value.

*Statistical significance at a level of .01.

multicollinear, as no variable had a variance inflation factor above 1.5.¹⁹

Discussion

In this study, we found that the overall presence on popular social media platforms among team physicians for major American professional sports teams is high, at greater than 65% across all sports. In addition, fellowship training is associated with social media use among team physicians for 4 major American professional sports leagues. Sports league affiliation, training background, practice setting, and geographic location were unrelated to social media presence.

Overall, we found that of the 505 professional team physicians, 65.7% had a social media presence, with the most commonly used platform being LinkedIn at 52.1% of professional sports team physicians. Professional sports teams have massive fan bases and corresponding social media presence, and tend to be located in major metropolitan areas. Therefore, we expected to see overall high rates of social media use among physicians affiliated with professional teams. Our results support our hypothesis that the majority of sports team physicians would be on social media. By contrast, in a 2017 study of more than 900 pediatric orthopaedic surgeons, Lander et al,⁷ found lower rates of a professional Facebook page, Twitter account, and LinkedIn profiles relative to the rates seen in the current study. However, rates of ResearchGate usage were higher among pediatric orthopaedic surgeons.⁷ Another study found that 61.9% of plastic surgeons had active professional social media accounts.⁶ Among colorectal surgeons, only 37.1% had LinkedIn profiles.²⁰ Comparing our findings with these studies suggests that in general professional team physicians may have greater rates of social media use than physicians not affiliated with a professional sports team. Despite these

greater rates, there still are many professional sports team physicians who are not using social media in their practice.⁴ Future studies on patient preferences might help align physician social media use and patient preferences or perceived needs, and which platforms patients prefer when seeking health information or to engage potential physicians.

A second key finding was that fellowship training was a significant predictor of social media presence among professional team physicians. The specific factors that underpin this finding are beyond the scope of the present study; however, we believe several factors may be at play here. Some physicians pursuing fellowship training may be seeking additional expertise to distinguish themselves from generalists in their field; the same desire to stand out may drive social media engagement. In addition, given their more advanced knowledge of the evaluation and management aspects of their field, we suspect fellows are more likely to glean practice development concepts from their training than senior residents, an increasing part of which appears to be social media. In a related vein, subspecialty training may lead physicians to further develop their professional identity, which may also drive greater social media use.²¹ It is possible that emphasizing social media education earlier in medical training, such as during residency, may promote social media use among graduates. It is important to note, however, that most physicians may pursue fellowship for reasons unrelated to social media presence, such as to develop subspecialty knowledge, refine and learn new skills, or enhance future academic prospects.

In contrast to our initial hypothesis, we found that private practice physicians had equal social media use relative to academic physicians. Several previous studies have reported that private practice physicians have greater social media use relative to physicians in academic medicine.^{6,7,22} One possible explanation for this disparity is that, given the high overall levels of social media use among professional sport team physicians, differences between private and academic physicians are subtler and thus more difficult to measure.

Another notable finding was that 10% of team physicians had an active Instagram account. Previous studies on social media usage have not included Instagram in their analyses.^{7,20} This may be due to the fact that Instagram has seen tremendous growth in user numbers since 2016.²³ Our findings may suggest that team physicians are adapting their social media presence to align with social trends, though the precise reason why some physicians are using Instagram remains unclear.

Looking broadly at our demographic data and other secondary measures, we identified 505 professional team physicians across 4 major professional American

sports. The majority of these physicians were M.D.s. These physicians were evenly distributed throughout the United States, with the most commonly represented areas aligning with the distribution of large urban centers in the United States.¹³ About two-thirds had training in orthopaedic surgery, which is consistent with previous research on sports physicians.¹² More than 4 in 5 of the team physicians were fellowship trained, with sports medicine being the most common fellowship. Orthopaedic surgeons had greater rates of fellowship, particularly sports medicine fellowship, relative to non-orthopaedic surgeons. Of note, 28.9% of the team physicians trained at a top 25 medical school. Similarly, about one-quarter of team physicians work at a top 25 orthopaedic hospital. These findings suggest that medical school and affiliated hospital U.S. News rankings are not highly associated with professional team physician status. Residency and fellowship relationships to professional teams may play a larger role, but such metrics were more difficult to quantify and were beyond the scope of this study.

Limitations

We are aware of limitations to our study. One limitation is that our study is a single time point analysis, a cross-sectional snapshot, while social media use evolves as physicians increasingly use social media and as social media platforms emerge and/or grow. There may have been other social media platforms that we failed to capture; however, we did not observe any other major platforms being used in our search. Second, we did not concurrently analyze a cohort of nonsports team physicians. Given the rapid rate at which social media platforms grow and develop, we must exercise some caution comparing our results to previous studies on social media usage by physicians, which were conducted in past years. Third, our analysis of training background as a factor is limited, given that we could not objectively rank residencies and fellowships to measure their influence with regard to professional team physician status. In the same vein, our evaluation of orthopaedic hospital ranking is limited because many non-orthopaedic sports team physicians may not necessarily work in an orthopaedic hospital. We focused on the orthopaedic specialty rankings; however, because this specialty was the most similar to sports medicine of all the specialties ranked. Fifth, we did not analyze other professional sports leagues such as Major League Soccer, Major League Lacrosse, and Major League Rugby, and social media usage may be significantly different among team physicians affiliated with these other professional sports leagues. Finally, and perhaps most significantly, we quantified social media presence or absence based on having a profile as compared with measuring activity such as frequency of posting or engagement with the public.

Conclusions

Nearly two-thirds of professional team physicians have a social media presence, most commonly LinkedIn. Fellowship training is a significant predictor of sports medicine physician social media presence. Sports league affiliation, training background, practice setting, and geographic location are unrelated to social media presence.

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