

Understanding Patient Preference of Providers to Treat Foot and Ankle Disorders

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Objective: The purpose of this study is to evaluate patients' knowledge of the professional training between doctors of podiatric medicine (DPM) and orthopedic surgery doctors (MD or DO), patients' confidence in understanding these differences, and factors that are important to patients when selecting a provider.

Design: A 28-question survey was administered to new patients who were referred to the foot and ankle service in an orthopedic department. Survey questions included data on patient demographics, patient opinion, and knowledge of differences between podiatrists and orthopedic surgeons.

Setting: Patient surveys were administered at Froedtert Memorial Lutheran Hospital in Wauwatosa, Wisconsin USA and Mayo Clinic in Jacksonville, Florida USA.

Participants: 186 patients completed the survey.

Methods: Study population characteristics and survey results were analyzed with variance (ANOVA), Fisher's Exact test, binomial tests, and chi-square tests.

Results: Of the 186 patients who completed the entire survey, 108 chose "orthopedic surgeon" as their provider of preference for any foot or ankle injury. Patients preferred an orthopedic surgeon over a DPM for ankle (65.7% vs. 9.6%, $P < 0.01$) and knee injuries (86.0% vs. 5.0%, $P < 0.01$), while they preferred a DPM for toe pain (29.4% vs. 42.2%, $P < 0.03$). 80.8% of patients thought orthopaedic surgeons and podiatrists undergo the same professional training.

Conclusions: Patients have poor understanding of the different provider training between a DPM and orthopedic surgeon. Patients showed a preference based on anatomic location with podiatrist favored for conditions affecting the toes. Those patients that demonstrate a higher level of knowledge of the specialties were more likely to prefer an orthopaedic surgeon. Other factors, such as physician interpersonal skills and provider availability, may be more important for patients than training backgrounds.

Keywords: Community survey; Patient education; Patient preference

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Although there is considerable overlap, differences exist in the training backgrounds of medical providers who treat foot and ankle disorders.¹ It is not known to what extent professional training influences how patients seek care. There is not a reliable way for patients to discern the qualifications or training backgrounds of foot and ankle specialists. Elliot et al² rated 48% of professional foot and ankle websites as having “poor” or “unacceptable” information available to patients. Patients may not know what orthopedic and podiatric training entail. Orthopedic education consists of four years of medical school, followed by five years of residency with the option to pursue a one-year fellowship specializing in foot and ankle. Podiatric medical education typically consists of four years of post-baccalaureate education followed by 3–4 years of podiatric surgical residency training.^{1,3–5} Currently, most graduates of podiatric residencies are trained in hindfoot and ankle procedures and some may even pursue further specialization with fellowship. While the training length of orthopedic surgeons is longer on average, some may assume that podiatrists are better equipped to manage foot and ankle conditions as they only focus on medicine that pertains to the feet, compared to the broader training of an orthopedic surgeon. In addition to differences in training background, the credentialing and scope of practice may also differ by state, institution or practice between orthopedic surgeons and podiatrists, with podiatric scope of practice often being limited anatomically to a level in the foot, ankle or lower leg.

To our knowledge, there has been no previous evaluation of patients’ understanding of the differences and similarities between foot and ankle providers. There has been no published work showing which factors are important to patients. The purpose of this study was to analyze the public understanding of the differences between orthopedic foot and ankle surgeons compared to podiatric specialists, as well as their expectations of a surgeon. We aimed to determine if there was a difference between perceived and actual knowledge. Additionally, we aimed to characterize the populations that may select for a particular foot and ankle professional through this study.

Methods

In this institutional review board-approved study, a 28-question survey was administered (prior to their appointment) to any new patient who agreed to participate in the orthopedic foot and ankle department at two tertiary care centers between 8/8/18 and 12/31/18. These patients were seen for a variety of ailments affecting the foot and ankle. Patient surveys were included if they completed the survey and were excluded if they were a previously established patient. Survey questions included data on patient demographics, patient preferences, and knowledge of differences between podiatrists and orthopedic surgeons.

Demographic data included age, prior experience working in (or familiar with someone that works in) healthcare, previously seen by a DPM, highest level of education (high school, some

college, college degree, or graduate or professional). Patients were asked to provide their preferred provider-type (DPM, orthopedic surgeon, indifferent/unsure) for a variety of conditions by anatomic location including foot, ankle, and knee. They were also asked to assess their own confidence of their knowledge of the differences between the two professions (classified as poor, average, above average, or not sure). Lastly, they were also asked about their expectations for their doctor (ie, whether they attended medical school, were fellowship-trained, board certified, and/or able to treat other joints in addition to foot and ankle).

In the survey, 10 questions were factual (ie, “medical school is how many years long?”) and were used to objectively assess a patient’s knowledge. The number of correct answers of these questions were combined to form an Actual Knowledge Score (AKS) used for analysis. A score of 10 was the highest achievable questionnaire score (highest actual knowledge) and 0 the lowest. Provider preference and mean AKS (95% confidence interval) was also sorted by location of injury. Additionally, perceived knowledge (a patient’s own determination of knowledge) was compared to their AKS.

Study population characteristics and significance of survey results were determined through analysis of data using SPSS (version 21, IBM corp). Continuous data were analyzed with analysis of variance (ANOVA) and included mean ± standard deviation (SD). Categorical data was analyzed with Chi-squared and Fisher’s Exact test. Binomial testing was performed for comparison between groups. Statistical significance was declared at alpha = 0.05. Due to the exploratory nature of the study, the overall type I error was not controlled.

Results

The survey gathered data from 186 patients. Of the 186 surveys, there were 185 patients who met the inclusion criteria. One patient was excluded for beginning the survey but not completing it.

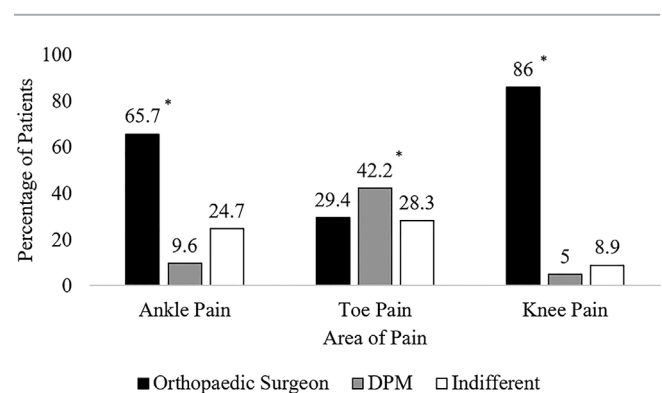


Figure 1. Listed are the responses for preferred provider-type by location of pain. DPM, Doctor of Podiatric Medicine; *indicates significance ($P < 0.05$).

For ankle pain, patients primarily preferred to be treated by an orthopedic surgeon (65.7% vs 9.6%, $P<0.01$). Podiatrists were the preferred provider for toe pain and orthopedic surgeons were strongly preferred for evaluation of knee pain (Figure 1).

Between the various provider preference groups, there was no significant difference in age, healthcare affiliation, previous DPM visits, level of education, and perceived knowledge about the differences between the two specialties (Table 1). For patients who listed DPM as their preference over orthopedic surgeons, they were less likely to expect their doctor to have completed residency (78.3% vs 95.3%, $P=0.02$). There were no other demographic differences.

Patients who preferred an orthopedic surgeon for evaluation of foot and ankle pain also had higher AKS mean score (95% confidence interval): 5.8 (5.5-6.1) vs 4.7 (3.9-5.5), $P=0.006$ (Table 2). The same was true for knee pain, with 86%

preferring an orthopedic surgeon vs 5.0% preferring a DPM, $P<0.01$, and knowledge scores again being higher: 5.7 (5.4-5.9) vs 4.8 (3.8-5.8), $P=0.003$. Inversely, most patients preferred to see a DPM for toe pain (29.4% vs. 42.4%, $P<0.03$). However, patients who selected an orthopedic surgeon for toe pain had higher AKS: 6.0 (5.6-6.5) vs. 5.2 (4.8-5.6), $P=0.027$.

Analysis of the patient knowledge survey questions reflected misconceptions and pertinent discrepancies including 80.8% believing DPMs and orthopedic surgeons undergo the same professional training, 70.8% agreeing DPMs and orthopedic surgeons both attend medical school, and 57.1% believing all healthcare professionals called “doctor” went to medical school (Table 3). Patient perception of provider training length was also inaccurate with perceived average length of training after college (reported as mean \pm standard deviation) for DPMs being 4.5 ± 2.2 years (actually 7-8 years) and

Table 1: Description of study population sorted by patient preference of provider for any foot or ankle condition

Variable	Provider Preference				P value
	Total (n=178)	Orthopedic Surgeon (n=108)	DPM (n=24)	Indifferent (n=46)	
Age (years), mean \pm SD	50.2 \pm 14.1	51.6 \pm 13.9	50.1 \pm 14.4	46.9 \pm 14.1	0.17 ^A
Works in healthcare or knows someone in field, n (%)	114 (64.4)	75 (70.1)	15 (62.5)	24 (52.2)	0.10 ^{C+}
Previously seen by DPM, n (%)	125 (70.6)	79 (73.1)	17 (70.8)	29 (64.4)	0.56 ^{C+}
Highest level of Education, n (%)					0.60 ^F
High school	19 (10.7)	12 (11.1)	1 (4.2)	6 (13.0)	
Some college	62 (34.8)	34 (31.5)	13 (54.2)	15 (32.6)	
College degree	63 (35.4)	40 (37.0)	7 (29.2)	16 (34.8)	
Graduate or professional degree	34 (19.1)	22 (20.4)	3 (12.5)	9 (19.6)	
Knowledge of differences between DPM & orthopedic surgeon, n (%)					0.08 ^F
Poor	37 (20.8)	18 (16.7)	4 (16.7)	15 (32.6)	
Average	90 (50.6)	60 (55.6)	12 (50.0)	18 (39.1)	
Very Knowledgeable	33 (18.5)	22 (20.4)	6 (25.0)	5 (10.9)	
Not sure	18 (10.1)	8 (7.4)	2 (11.1)	8 (17.4)	
Expectations of doctor, n (%)					
Attended medical school	174 (99.4)	105 (100)	24 (100)	45 (97.8)	0.40 ^{C+}
Completed residency	162 (92.0)	102 (95.3)	18 (78.3)	42 (91.3)	0.02 ^{C+}
Fellowship-trained	136 (76.4)	82 (75.9)	20 (83.3)	34 (73.9)	0.79 ^{C+}
Board certified	163 (92.1)	100 (93.5)	21 (87.5)	42 (91.3)	0.62 ^{C+}
Able to treat other joints in addition to foot and ankle	73 (41.5)	44 (41.1)	8 (34.8)	21 (45.7)	0.68 ^{C+}

DPM, Doctor of Podiatric Medicine; SD, standard deviation; ⁺Exact test; ^AANOVA F-test; ^CChi-square test; ^FFisher's Exact test

Table 2. Percent of patients that prefer a specific type of foot and ankle provider based on area of pain

Area of Pain	Provider Preference			P value
	Orthopedic Surgeon	DPM	Indifferent	
Ankle				
n (%)	117 (65.7)	17 (9.6)	43 (24.7)	<0.01 ^B
Knowledge Score - mean (95% CI)	5.8 (5.5-6.1)	4.7 (3.9-5.5)	5.0 (4.5-5.4)	0.006 ^A
Toe				
n (%)	53 (29.4)	76 (42.2)	51 (28.3)	<0.03 ^B
Knowledge Score - mean (95% CI)	6.0 (5.6-6.5)	5.2 (4.8-5.6)	5.3 (4.7-5.8)	0.027 ^A
Knee				
n (%)	154 (86.0)	9 (5.0)	16 (8.9)	<0.01 ^B
Knowledge Score - mean (95% CI)	5.7 (5.4-5.9)	4.8 (3.8-5.8)	4.1 (3.2-5.0)	0.003 ^A

DPM, Doctor of Podiatric Medicine; ^AANOVA F-test; ^BBinomial test

orthopedic surgeons 6.6 ± 2.2 years (actually 9-10 years). Additionally, the length of medical school was thought to be 5.6 ± 1.9 years (actually 3-4 years).

Patients who claimed to be very knowledgeable about the differences between DPMs, orthopedic surgeons, and other healthcare workers scored higher on their questionnaires, indicating there is a significant association between actual and perceived knowledge: very knowledgeable (n=35): 6.3

(5.6-6.9); average knowledge (n=93): 5.5 (5.15-9); poor knowledge (n=37): 4.9 (4.4-5.4); not sure (n=19): 4.1 (3.1-5.0) ($P<0.001$). There was also a greater AKS (1.1 points higher) in patients who claimed to know what it meant to be board certified: 5.8 (5.5-6.1) vs 4.7 (4.2-5.1) ($P<0.001$). Patients with backgrounds in healthcare also scored higher: 5.6 (5.3-6.0) vs. 4.8 (4.4-5.3) ($P=0.01$). Patients who claimed to be “very knowledgeable” of the differences between providers were more likely to select an orthopedic surgeon

Table 3. Percent of patients that answered “true” or “false” to survey questions

Survey Question	No. of Respondents	True (%)	False (%)	Not Sure (%)
Podiatrists and orthopedic surgeons undergo the same professional training.	177	80.8	19.2	-
Podiatrists are able to do surgery on the foot and ankle.	177	35.0	36.7	28.2
Orthopedic surgeons are able to do surgery on the foot and ankle.	179	91.1	2.8	6.1
Podiatrists are better for non-surgical care of the foot and ankle.	178	38.8	19.7	41.6
Podiatrists are better than orthopedic surgeons for surgical care of foot and ankle conditions.	179	15.6	53.1	31.3
All healthcare professionals called “doctor” went to medical school.	177	57.1	42.9	-
Some physical therapists hold the title of doctor.	177	56.2	39.6	4.3
Some nurses hold the title of doctor.	176	64.8	35.2	-
I know what it is to be board certified.	178	75.8	24.2	-
Podiatrists and orthopedic surgeons both attend medical school.	178	70.8	13.5	15.7
Podiatrists have more years of required training than orthopedic surgeons.	178	3.9	59.6	36.5

over a DPMs ($P=0.008$). Additionally, patients who knew what it means to be board certified were more likely to select an orthopedic surgeon ($P=0.031$). Prior experience with a DPM did not yield significant difference in knowledge scores: prior experience, 5.5 (5.2-5.9) vs none, 5.0 (4.5-5.5) ($P=0.11$). There was not a significant difference in knowledge based solely on provider preference: DPMs preference 5.8 (5.4-6.2) vs. orthopedic preference 5.4 (4.8-6.0) ($P=0.229$). Additionally, when sorted by provider preference, there were no differences in age (DPMs, 51.1 (47.3-54.9) years vs orthopedic surgeon, 49.8 (45.653.9) years ($P=0.81$)) or education level ($P=0.58$).

Discussion

Our study demonstrates that there is a significant association between patient's understanding of provider differences and actual knowledge. In our cohort, patients who were more knowledgeable on the differences between providers mostly preferred orthopedic surgeons for their surgical and non-surgical foot and ankle cares. Patients who preferred orthopedic surgeons for ankle, toe, and knee pain had higher average AKS: ankle pain (1.1 points higher), toe pain (1.0 points higher), and knee pain (0.9 points higher). In case of knee pain, patients mostly prefer orthopedic surgeon no matter their knowledge and this reflects the specialization of podiatrist to more distal anatomic areas below the knee. This question was chosen to ensure survey results were reflective of real-world care and survey accuracy. Patients who indicated they knew what being board certified means have an actual knowledge score averaging 1.1 greater than that of the patients who do not know the meaning, indicating that people who are more familiar with the healthcare system tend to lean towards choosing an orthopedic surgeon. Affirming this, the AKS of patients with previous experience in healthcare averages 0.8 AKS more than that of inexperienced patients. There is not enough evidence to claim the association of patient's experience with DPM, age, or level of education with actual knowledge.

Using our survey, we have demonstrated that patients' understanding of the differences between orthopedic surgeon and DPM qualifications, scope of practice and length of training is significantly lacking. This suggests the information available to patients to make a well-informed decision is poor. Alternatively, it may be that patients are relatively uninterested in specific training background. When considering common techniques used to find information (eg, internet searches), patients looking for information regarding the similarities, differences, and qualifications of DPMs and orthopedic surgeons are presented with a plethora of sites that generalize definitions and very commonly include statements similar to the following; "both DPMs and orthopedic surgeons are qualified to treat foot and ankle conditions, surgically and non-surgically. In general, the best bet is to choose the doctor you feel the most comfortable with, or who has the most experience treating your particular condition".⁶ While claims like this hold

merit in some instances, there is not a clear delineation of scope or practice or qualification.

Availability may be more important to patients than training background. In their 1987 study, Weiner et al¹ noted that with the exclusion of amputation, a DPM is more likely to be chosen over an MD for major foot and ankle surgery with most initial clinical visits being self-referred, our study could not affirm this claim as the majority of the patients were referred. They also noted that as the prevalence of DPMs increased, so did selection of DPM as a first-choice provider. Conversely, increasing the prevalence of orthopedists did not significantly decrease the selection of DPMs, leading to the conclusion the amount of DPMs in a region and thus the ability to see a specialist quickly is more important to patients than the training background of the specialist. Moreover, our study did not even address whether factors such as professional training would be important to a patient.

Collaborative efforts between podiatry and orthopedics are essential for improving patient satisfaction and reducing certain burdens including costs. Utilizing podiatric triaging in orthopedic clinics has been shown to improve efficiency, increase provider availability, and increase patient satisfaction. Additionally, this allows for an increased number of patients seen and further surgical-utilization of orthopedic surgeons.⁷⁻⁹ In an outpatient setting screening for surgical candidacy, as many as two-thirds of orthopedic patients were able to be removed from an orthopedist's waitlist by a DPM. This decrease in clinical duties of orthopedic surgeons allows for the opportunity to pursue higher surgical volume. This may be beneficial since higher surgical volumes in total hip replacement correlates with lower rates of mortality and certain complications.¹⁰ Similar outcomes would be expected for foot and ankle surgeries.

Limitations of this study include the inherent bias that patients presenting to an orthopedic clinic may already prefer an orthopedic surgeon for their provider. Similarly, it can hardly be expected that this population would be representative of the general population or other practices. The authors were surprised that the population surveyed was not significantly more knowledgeable about the differences in foot and ankle providers. Given the potential selection bias in our study, in a tertiary orthopedic foot and ankle surgeons' offices, we found that our patients were not knowledgeable in identifying differences between orthopedic surgeons and DPMs. For patients that self-refer, they may have a bias towards favoring orthopedic surgeons, or have had a poor experience with DPMs in the past, thus skewing their answers. The authors understand that the population was recruited from a tertiary referral center an orthopedic foot and ankle office. The generalizability cannot be assumed for the general orthopedic surgeon, podiatrists, or any other medical practice. In addition, the significance and utility of the AKS is unknown. In this study, we created this

metric to facilitate the statistical analysis among the many survey questions.

It would be interesting to repeat this study in podiatric clinics and perhaps other specialty clinics to observe if similar results are obtained. Similarly, more detailed analysis could be given to whether provider training is even relevant to patients when they are seeking care. Another limitation is demographic variance—answers to the survey may vary greatly by region, income, education level, and more. This study addressed this variance by characterizing patients to show what demographic the study population was representing. A larger study with multiple institutions capturing a broader spectrum of demographics will help contribute to these conclusions.

Conclusions

Patients are either poorly informed or indifferent to the training of podiatric and orthopedic surgeons. Patients with more actual knowledge tend to prefer orthopedic surgeons for their foot or ankle cares, but region of pathology has a strong influence on provider selection. Further research is needed to explore what importance provider training background has on seeking care and whether insurance restrictions, ease of making an appointment, and physician interpersonal skills are more important.

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Concept/research design: JK, GS; Data collection: JK, AN, BL, GS; Data analysis: JK, AN, BL, GS, GW; Writing: JK, AN, GS, GW; Provided subjects: JK, BL, GS; Provided facilities/ equipment: BL, GS; Consultation: AN, GW. All authors have reviewed and approved the final version of the manuscript.