

Patient Preferences for Physician Attire in Ophthalmology Practices

Lindsey B. De Lott, MD, MS¹ Joseph F. Panarelli, MD² David Samimi, MD^{3,4} Christopher Petrilli, MD^{5,6}
Ashley Snyder, MPH⁶ Latoya Kuhn, MPH^{7,8} Sanjay Saint, MD, MPH^{7,8,9} Vineet Chopra, MD, MSc^{6,7,8,9}
Katherine M. Whipple, MD¹⁰

¹Kellogg Eye Center, University of Michigan, Ann Arbor, Michigan

²Department of Ophthalmology, New York Eye and Ear Infirmary of Mount Sinai, New York, New York

³Eyesthetica, Los Angeles, California

⁴Roski Eye Institute, University of California, Los Angeles, California

⁵Division of General Internal Medicine and Clinical Innovation, Department of Medicine, New York University Langone Health, New York, New York

⁶Division of Hospital Medicine, Department of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan

⁷Center for Clinical Management Research, Veterans Affairs Ann Arbor Healthcare System, Ann Arbor, Michigan

⁸Veterans Affairs/University of Michigan Patient Safety Enhancement Program, Ann Arbor, Michigan

⁹Department of Internal Medicine, University of Michigan Medical School, Ann Arbor, Michigan

¹⁰Envision Eye & Aesthetics, Rochester, New York

Address for correspondence Lindsey B. De Lott, MD, MS, Kellogg Eye Center, University of Michigan, 1000 Wall Street, Ann Arbor, MI 48105 (e-mail: ldelott@med.umich.edu).

J Acad Ophthalmol 2019;11:e36–e42.

Abstract

Importance Interest is growing in targeting physician attire to improve the patient experience. Few studies in ophthalmology have examined patient preferences for physician attire.

Objective To understand patient preferences for physician attire in ophthalmology practices in the United States.

Design Survey-based, cohort study.

Setting Two private and two academic ophthalmology practices.

Participants A convenience sample of patients receiving ophthalmic care between June 1, 2015 and October 31, 2016.

Methods A questionnaire containing 22 questions and photographs of a male and female physician in seven forms of attire were presented to patients; 14 unique questionnaires were randomly distributed. Patient preference for physician attire was the primary outcome determined by summing ratings of how knowledgeable, trustworthy, caring, approachable, and comfortable the pictured physician made the respondent feel. One-way ANOVA assessed differences in mean composite scores. Comparisons between respondent demographics, practice type, and attire preferences were assessed by chi-square tests. Patient satisfaction was assessed by agreement with questions about importance of physician attire and whether this influences happiness with care.

Results In total, 1,297 of 1,826 (71.0%) questionnaires were completed. Physician attire was rated as “important” by 62.9% of participants. A total of 43.6% of participants

Keywords

- ▶ physician attire
- ▶ practice
- ▶ patient experience

received
November 5, 2018
accepted after revision
April 8, 2019

DOI <https://doi.org/10.1055/s-0039-1688913>.
ISSN 2475-4757.

Copyright © 2019 by Thieme Medical Publishers, Inc., 333 Seventh Avenue, New York, NY 10001, USA.
Tel: +1(212) 584-4662.

License terms



indicated that physician attire influenced how happy they were with their care. Overall, formal attire with white coat was preferred to casual, formal, and business attire (all comparisons, $p < 0.05$). No differences in composite scores between formal attire with white coat, scrubs alone, scrubs with white coat, or casual attire with white coat were observed. However, compared with formal attire with white coat, physicians wearing scrubs without white coat appeared less knowledgeable (mean [standard deviation]: 8.2 [1.8] vs. 7.4 [2.1]; $p < 0.05$) and trustworthy (8.3 [1.8] vs. 7.6 [2.1]; $p < 0.05$). Additionally, casual attire with white coat was rated as less knowledgeable compared with formal attire with white coat (7.4 [2.0] vs. 8.2 [1.8]; $p < 0.05$). Preferences for attire varied by clinical setting: patients preferred surgeons (45.2%) and physicians in emergency rooms (41.7%) in scrubs rather than formal attire with white coat.

Conclusions Physician attire is important to patients receiving ophthalmic care. Policies aimed at physician attire in ophthalmology practices should be considered.

Patient experience and satisfaction is a complex but increasingly important measure of the quality of eye care delivered by ophthalmologists. Patients who are satisfied with their eye care are more likely to recommend an ophthalmology practice,^{1,2} and adhere to medications,³⁻⁵ which in turn, may lead to improved outcomes.^{6,7} Physician attire is one factor that appears to influence patient satisfaction.⁸ As physician attire is readily modifiable, there is growing interest in targeting attire to improve the patient experience.

Few studies of physician attire in ophthalmology practices in the United States exist. Those available offer conflicting results, and none have examined the relationship between ophthalmologists' attire and patient satisfaction. A recent systematic review of physician attire across several specialties found that most patients prefer formal attire with a white coat.⁹ Other surveys of ophthalmology practices suggest that 28 to 58% of patients preferred that their ophthalmologist wear a white coat.^{10,11} These disparate results may be explained, in part, by the numerous contexts within which ophthalmologists practice, providing care in clinics, ambulatory surgical centers, and emergency departments. Better understanding patient preferences for physician dress within various eye care settings can inform clinic policy and may also help improve the patient experience.

Therefore, we designed a cross-sectional, multicenter study to understand patient preferences for specific types of attire and examine whether attire influences satisfaction among patients receiving care within ophthalmology practices. Additionally, we investigated how specific demographics, clinical context, and practice type may influence these preferences. Based on prior work, we hypothesized that patients would prefer more formal attire in an office setting, but less formal attire, such as scrubs, in a surgical or emergency setting.

Methods

Study Design and Population

Between June 1, 2015 and October 31, 2016, a total of 1,826 questionnaires were provided to a convenience sample of four ophthalmology practices in the United States; two sites

were academic, multispecialty practices and two sites were private practices. From the academic sites, questionnaires were completed by patients receiving care in comprehensive, neuro-ophthalmology, cornea, and glaucoma subspecialty clinics. The private practices were a mix of comprehensive ophthalmology and oculoplastic surgery.

The questionnaire was only administered to adult patients, but could also be filled out by a surrogate if their vision prevented them from recording their own responses. At all sites, the questionnaire was administered by research staff using paper. Respondents provided informed verbal consent. No identifying information was collected from participants that completed the study.

Study Design and Data Collection

We developed the study questionnaire from a systematic review and existing studies that examined the role of physician attire on patient preferences and satisfaction.^{8,9} A multidisciplinary team developed and pilot tested the study instrument.⁸ In brief, the questionnaire consisted of 22 questions and included photographs of a male and a female physician in seven forms of attire: casual (polo shirt, jeans, and athletic shoes), casual with white coat, scrubs alone, scrubs with white coat, formal (button-down shirt, dress pants, dress shoes, and tie for the male model), formal with white coat, and business suit (→ Fig. 1). To avoid bias, 14 different versions of the study instrument were created, and distribution of the questionnaires was randomized such that each consecutive patient received a unique instrument. Therefore, the gender and attire of the first physician model varied in survey instruments to prevent ordering, priming, or anchoring effects.⁸ The questionnaire had four sections: in the first section, respondents were asked to rate the physician depicted across five domains: knowledge, trust, care, approachability, and how comfortable the physician pictured made them feel ("comfortable"). In the second section, respondents were presented with seven photographs of the same physician wearing different attire and were asked to select their preference for physician dress in various clinical settings. Finally, general opinions regarding physician attire, demographic data, and frequency of interactions with physicians were obtained.

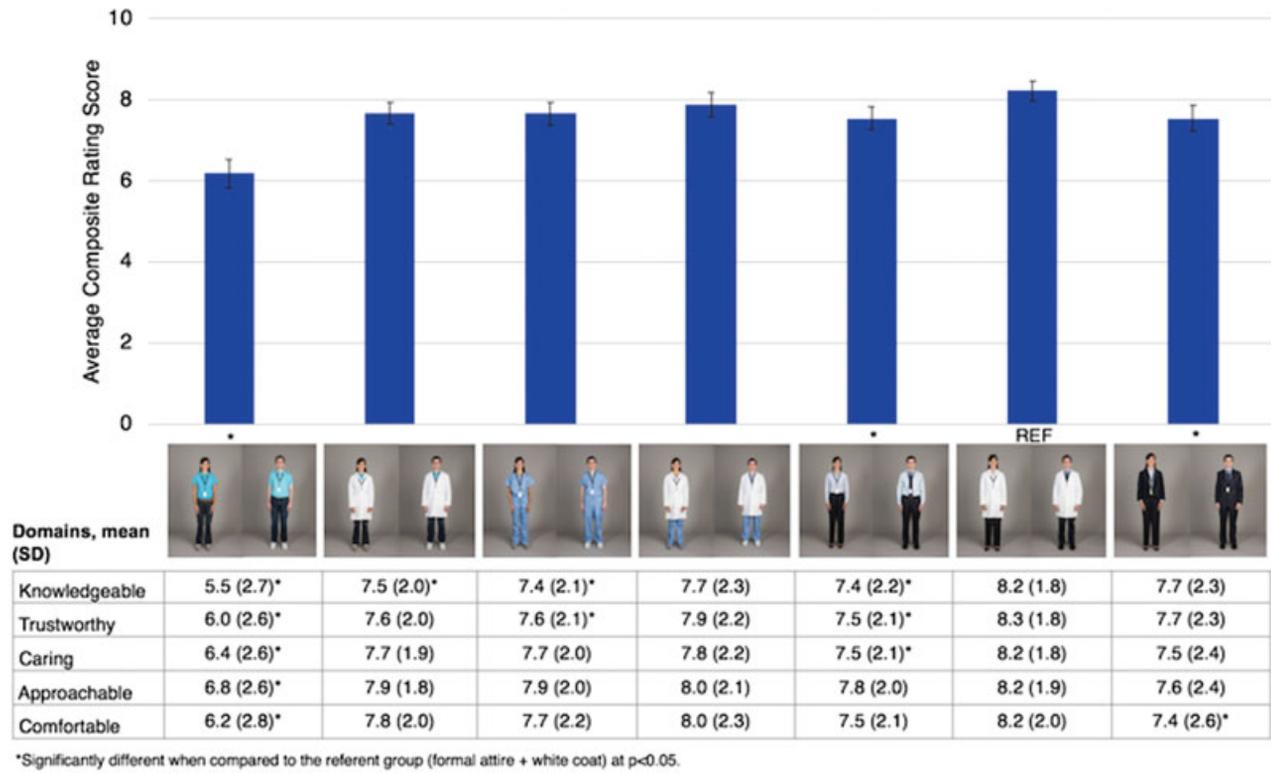


Fig. 1 Physician attire preferences overall and across domains.

Measurements

Ratings regarding how knowledgeable, trustworthy, caring, approachable, and comfortable the physician attire made the respondent feel were measured using a 1 to 10 scale, with 1 indicating “somewhat preferred” versus 10 “extremely preferred.” Preference of attire within specific care settings (surgery, emergency department, and overall) was assessed by asking questions for each of the seven attire categories. Respondent opinions regarding importance of dress and white coats were collected using a 1 to 5 Likert scale, with 1 indicating “strongly disagree” versus 5 “strongly agree.” For analyses, responses were placed in three categories (agreement = strongly agree and agree; neutral = neither agree nor disagree; and disagreement = disagree or strongly disagree). Preferences for attire by respondent characteristics such as age, gender, education level, race, and number of physician encounters in the past year were assessed. Unanswered questions and those with multiple responses were excluded.

Outcomes

The primary outcome of interest—preference for attire—was calculated as the average of the scores within the five rating domains (knowledgeable, trustworthy, caring, approachable, and comfortable). Variation in attire preferences by respondent characteristics (e.g., gender, age), clinical context, and practice type (academic vs. private) was also assessed. Patient satisfaction was evaluated based on scores for two questions: “How my doctor dresses influences how happy I am with the care received” and “How my doctor dresses is important to me.”

Statistical Analyses

Data from paper questionnaires were entered independently and in duplicate into a database by two study-team members. Since respondents were not required to answer all questions, the response rate varied by question. Descriptive statistics (means, percentage) and standard deviation (SD) were used to tabulate results. Differences in the mean composite rating scores from the physician ratings section were assessed using one-way ANOVA. To reduce the potential for type I error, postestimation pairwise comparisons were performed using the Tukey–Kramer method.¹² Differences in proportions for categorical data were compared using the Z-test. Bivariate comparisons between respondent characteristics and preferences for attire were assessed using chi-squared tests. A two-sided p-value of less than 0.05 was considered statistically significant. All analyses were performed using Stata 14 MP/SE (StataCorp, College Station, TX).

Ethical and Regulatory Oversight

The study was reviewed and exempted from institutional review board regulation by the University of Michigan.

Results

A total of 1,297 questionnaires were completed and available for analysis (response rate = 71.0%). Overall, respondents were most often white (67.5%) and female (64.9%). Most patients were 55 years of age or older (56.2%) and completed at least some college (80.0%) (► Table 1).

Table 1 Respondent demographics and health care utilization

Characteristics, n (%)	Total N (%)
Age	N = 1,281
18–25	90 (7.0)
26–34	124 (9.7)
35–54	347 (27.1)
55–64	290 (22.6)
65+	430 (33.6)
Gender	N = 1,248
Female	810 (64.9)
Male	438 (35.1)
Education	N = 1,277
Less than high school	36 (2.8)
High school	225 (17.6)
Some college	285 (22.3)
College	438 (35.1)
Graduate degree or above	293 (22.9)
Race	N = 1,263
White	852 (67.5)
Black	102 (8.1)
Asian	109 (8.6)
Hispanic	124 (9.8)
Other/mixed race	76 (6.0)

Ratings of Physician Attire

For images of both male and female physicians, formal attire with a white coat had the highest mean composite score of 8.2 (SD: 1.7) and was significantly preferred over casual, formal, or business attire overall ($p < 0.05$; ► **Fig. 1**). No significant preferences for formal attire with white coat over casual attire with white coat, scrubs with white coat, or scrubs alone were observed. Cronbach's α for the five items included in the composite score was 0.97.

Formal attire with a white coat also attained the highest scores across all five domains of how knowledgeable, trustworthy, caring, and approachable the physician appears and how comfortable the physician would make them feel. Overall, while formal attire with white coat was not preferred over casual attire with white coat, scrubs with white coat, or scrubs alone, physicians wearing formal attire with a white coat were rated as being more knowledgeable (8.2 [SD: 1.8]) compared with those in casual attire with a white coat or scrubs alone (7.5 [SD: 2.0] and 7.4 [SD 2.1], respectively; $p < 0.05$). Physicians in formal attire with white coat were also rated as more trustworthy in comparison to physicians wearing scrubs alone (8.3 [SD: 1.8] vs. 7.6 [SD: 2.1]; $p < 0.05$). There were no significant differences across domains between formal attire with white coat and scrubs with white coat.

Preferences for Physician Attire by Care Settings

When asked “overall, which clothes do you feel your doctor should wear,” 52.3% of respondents rated formal attire with

Table 2 Respondent preferences for physician attire in various settings

Preference for physician attire by setting	Total N (%)
Which doctor would you prefer to see when visiting the ER?	N = 1,274
Casual	9 (0.7)
Casual and white coat	58 (4.6)
Scrubs	531 (41.7)
Scrubs and white coat	433 (34.0)
Formal	21 (1.7)
Formal and white coat	201 (15.8)
Suit	21 (1.7)
Which doctor would you prefer for your surgeon?	N = 1,275
Casual	5 (0.4)
Casual and white coat	28 (2.2)
Scrubs	576 (45.2)
Scrubs and white coat	276 (21.7)
Formal	42 (3.3)
Formal and white coat	278 (21.8)
Suit	70 (5.5)
Overall, which clothes do you feel your doctor should wear?	N = 1,265
Casual	10 (0.8)
Casual and white coat	75 (5.9)
Scrubs	61 (4.8)
Scrubs and white coat	276 (21.8)
Formal	108 (8.5)
Formal and white coat	662 (52.3)
Suit	73 (5.8)

Abbreviation: ER, emergency room.

white coat as preferred (► **Table 2**). However, clinical context influenced this preference. Scrubs alone (41.7%) or scrubs with white coat (34.0%) were preferred in the emergency room setting. For surgeons, scrubs (45.2%) were preferred. When preference of a white coat versus no white coat was assessed by physician gender and setting, white coats were preferred over choices without a white coat, except for female surgeons where no difference between both was observed ($p = 0.261$; ► **Fig. 2**)

Preferences for physician attire by care settings were also assessed by respondent gender, age, education, and practice type. No differences by respondent gender, education, or practice type were observed. When examining respondent age, a greater proportion of younger patients (<65 years old) preferred their surgeon to wear scrubs (47.9 vs. 39.5; $p = 0.003$).

Perceived Influence on Satisfaction, Importance, and Appropriateness of Physician Attire

When considering the influence of physician attire on patient satisfaction, 62.9% responded that how their physician dressed

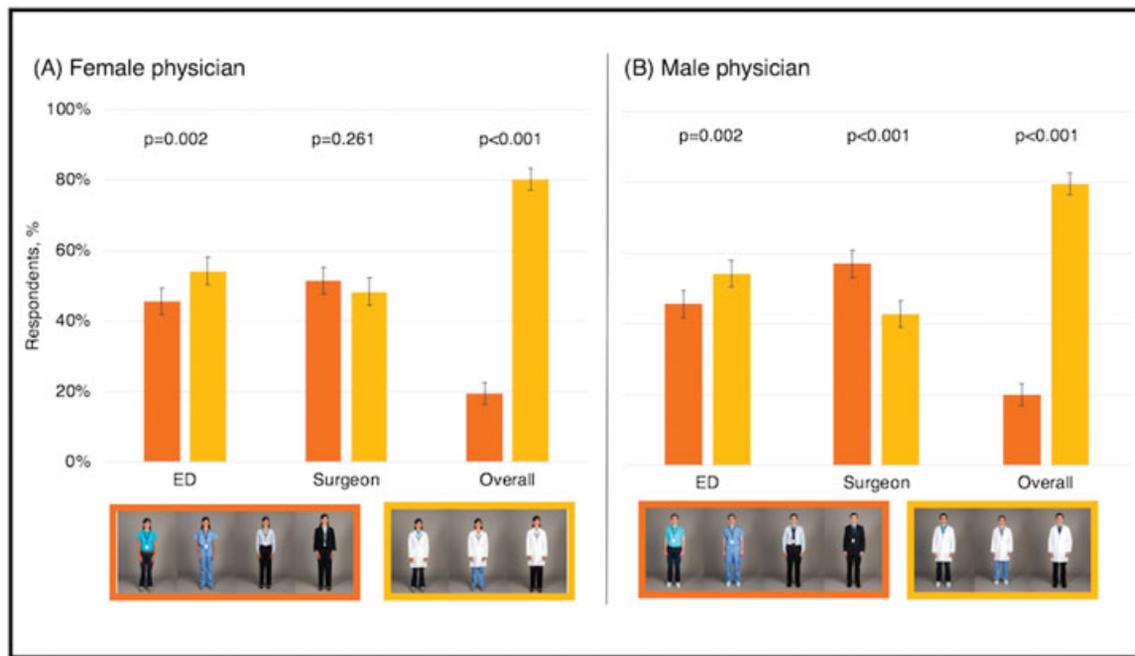


Fig. 2 Preference for white coat by clinical setting and physician gender.

was important to them and 43.6% answered that it influenced how happy they were with the care they received (→ **Table 3**). Nonwhite respondents and those that received eye care in a private practice setting or had fewer than three physician visits in the past year were significantly more likely to agree with these statements ($p \leq 0.001$ for all comparisons). Compared with those with a college education, respondents without a college education more often indicated physician attire influences perceived happiness with care received (48.1% no college vs. 40.3% college; $p = 0.023$).

When considering appropriateness of attire, most respondents indicated that doctors should wear white coats when seeing patients in their office (58.8%) or the emergency department (48.0%); however, 29.4 and 33.7% indicated no preference, respectively. Similarly, 47.8% agreed that it was appropriate for physicians to wear casual dress on the weekends, while 30.3% indicated no preference. When asked if “doctors should *always* wear a white coat when seeing patients in *any* setting,” only 23.3% disagreed.

Discussion

To our knowledge, this is the largest and most comprehensive study of patient preferences for physician attire conducted in ophthalmology practices within the United States. Of the over 1,200 patients surveyed, physician attire was important to a majority of respondents and nearly half reported that it influences how happy they are with the care received. All attire options that included white coats were preferred to those that did not, with patients preferring formal attire with white coats overall. However, when casual attire was worn under a white coat, patient’s perceptions of physician knowledge declined, suggesting that the clothing a physician wears under their white coat is important as well. Despite an overall

preference for white coats with formal attire, the clinical context matters, as patients preferred that their surgeon wear scrubs. Not surprisingly, some preferences varied by age, practice type, and health care utilization. Taken together, these findings point to patient expectations for a physician “uniform” that is not only professional, but also context specific. Initiatives focused on improving the patient experience in ophthalmology practices should consider tailoring policies regarding physician attire to the clinical setting and patient population that the practice is serving.

Although few studies have asked patients about preferences regarding physician attire in U.S. ophthalmology settings, ours is the first to examine whether ophthalmologist attire influences patient satisfaction. Using the same survey instrument, a prior study of general medicine patients conducted at 10 academic hospitals in the United States found that physician attire was important to 53% of patients and 36% affirmed that it influenced satisfaction with their care.⁸ Within ophthalmology, a greater proportion of patients agreed that physician attire was important (62.9%) and influenced satisfaction with care (43.6%). However, our survey was conducted in a combination of private and academic practices. Those patients receiving eye care in an academic ophthalmology practice rated the importance of attire (55.4%) and its influence on satisfaction (32.7%) similar to those in a general medicine academic practice. Yet, for the over 600 patients receiving care in private ophthalmology practices, a significantly larger proportion of patients rated physician attire as important (70.4%) and reported that it influenced their happiness with their care (55.6%). Similarly, patients within ophthalmology practices that had fewer than three physician visits in the past year were more likely to affirm that physician attire is important and influences satisfaction with care, when compared with those with more than three physician interactions in the

Table 3 Respondent opinions regarding influence, importance, and appropriateness of physician dress

Opinions regarding influence and appropriateness of physician dress	Total N (%)
How my doctor dresses is important to me	N = 1,284
Strongly disagree	46 (3.6)
Disagree	114 (8.9)
Neither agree nor disagree	317 (24.7)
Agree	609 (47.4)
Strongly agree	198 (15.4)
How my doctor dresses influences how happy I am with the care I receive	N = 1,280
Strongly disagree	69 (5.4)
Disagree	185 (14.5)
Neither agree nor disagree	468 (36.6)
Agree	445 (34.8)
Strongly agree	113 (8.8)
It is appropriate for a doctor to dress casually when seeing patients over the weekend	N = 1,282
Strongly disagree	61 (4.8)
Disagree	219 (17.1)
Neither agree nor disagree	389 (30.3)
Agree	521 (40.6)
Strongly agree	92 (7.2)
Doctors should wear a white coat when seeing patients in their office	N = 1,281
Strongly disagree	18 (1.4)
Disagree	133 (10.4)
Neither agree nor disagree	377 (29.4)
Agree	587 (45.8)
Strongly agree	166 (13.0)
Doctors should wear a white coat when seeing patients in the ER	N = 1,285
Strongly disagree	26 (2.0)
Disagree	209 (16.3)
Neither agree nor disagree	433 (33.7)
Agree	495 (38.5)
Strongly agree	122 (9.5)
Doctors should always wear a white coat when seeing patients in any setting	N = 1,284
Strongly disagree	40 (3.1)
Disagree	259 (20.2)
Neither agree nor disagree	506 (39.4)
Agree	375 (29.2)
Strongly agree	104 (8.1)

prior year. The influence of practice type and health care utilization on ratings of patient satisfaction underscores the potential importance of physician attire for some patient groups and the value of aligning dress-code policies with patient preferences.

Our study also sheds light on some of the observed differences in prior studies of physician attire preferences in U.S. ophthalmology practices and expands upon that work. We found that when patients were directly asked if doctors should wear a white coat when seeing patients in the clinic, 54.9% agreed, similar to the 58% of families who agreed that ophthalmologists should wear a white coat when seeing patients in an academic pediatric ophthalmology clinic.¹¹ In contrast, a survey of patients in a vitreoretinal practice found that only 28% of patients preferred that their physician wear a white coat.¹⁰ Important methodological differences in study design likely explain these disparate results. The vitreoretinal study solicited preferences on several attire types but did not use photographs or clear definitions of what represents certain types of attire (e.g., semiformal). Also, white coats were not coupled with other attire types.

Despite the clear patient preference for white coats, some physicians eschew white coats out of concern that it may induce anxiety, fear, or may pose an infection risk. Yet, contrary to the often-stated concerns raised about white coats causing anxiety and fear, we found that patients rated the photographs of physicians wearing all types of attire that included a white coat as appearing most approachable and making them feel most comfortable. It is possible that anxiety about physicians in white coats has declined over time as white coats have become more ubiquitous among nonphysician providers, such as physician extenders. Furthermore, while bacteria have been isolated from the white coats of physicians,¹³ there are no studies that have shown an association between white coats and an increased risk of infection. Moreover, policies to curb white coat use have not led to a decrease in the number of infectious bacteria isolated from the hands of health care workers.¹⁴

Our study has limitations. First, we could only solicit preferences from patients that agreed to take our survey. Those with more significant vision loss may have been less likely to participate, which may bias our results. Similarly, some patients with severe vision impairment may have had to rely on descriptions of the photographs from a surrogate, limiting insight. Second, the physicians depicted in our survey instrument were young, Caucasian, and lean. Although this approach helped standardize our survey, we cannot comment on whether factors such as race or body habitus may influence perceptions regarding physician knowledge, trustworthiness, caring, approachability, and comfort. Third, we did not solicit open-ended responses to attire preferences, potentially limiting explanations or conditional responses. However, we used Likert scales with “no preference” options to allow for a “neutral” choice. Lastly, we did not investigate the influence of socioeconomic factors on attire preferences as this was beyond the scope of our study.

Despite these limitations, our study also has strengths. First, this is the largest study to date in ophthalmology and

the only study within ophthalmology to assess the influence of physician attire on patient satisfaction. We explored the variation in attire preferences based on the context of care, which is particularly important for ophthalmologists who often see patients in different clinical contexts. Second, we used photographs of models taken in a standardized manner (e.g., identical posture, facial expression) rather than relying on descriptions of attire to assess preferences. Additionally, surveys were distributed in a randomized fashion to minimize bias. Both of these factors lend a high degree of internal validity to our study. Third, we surveyed patients in both academic and private practices, which improves the external validity of our study.

Physician attire is an important and modifiable factor that influences patient satisfaction with ophthalmic care. Although attire is by no means a surrogate for excellent clinical service and clinical care, it can support the patient-physician relationship by fostering a sense of trust, competency, and placing our patients at ease. Patients expect that their ophthalmologist looks professional and wear a white coat in clinics. In the surgical setting, scrubs are acceptable. Further work is needed to explore implementation of dress-code policies and how these policies influence the overall patient experience.

Note

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the U.S. government.

Funding

L.B.D.: National Eye Institute, Bethesda, MD (K12EY022299-04). The funding organization had no role in the design or conduct of this study.

Conflict of Interest

J.F.P.: consultant/speaker to Aerie and Allergan, honorarium from Glaukos.

S.S.: medical advisory board for Doximity and scientific advisory board for Jvion.

No conflicting relationship exists for the other authors.

References

- Long C, Tsay EL, Jacobo SA, Papat R, Singh K, Chang RT. Factors associated with patient press ganey satisfaction scores for ophthalmology patients. *Ophthalmology* 2016;123(02):242-247
- Rahmatnejad K, Myers JS, Falls ME, Myers SR, Waisbourd M, Hark LA. Factors associated with patient satisfaction in an outpatient glaucoma population. *Semin Ophthalmol* 2018;33(06):757-765
- Lemij HG, Hoevenaars JG, van der Windt C, Baudouin C. Patient satisfaction with glaucoma therapy: reality or myth? *Clin Ophthalmol* 2015;9:785-793
- Fenton JJ, Jerant AF, Bertakis KD, Franks P. The cost of satisfaction: a national study of patient satisfaction, health care utilization, expenditures, and mortality. *Arch Intern Med* 2012;172(05):405-411
- Trattler W, Katsev D, Kerney D. Self-reported compliance with topical cyclosporine emulsion 0.05% and onset of the effects of increased tear production as assessed through patient surveys. *Clin Ther* 2006;28(11):1848-1856
- Manary MP, Boulding W, Staelin R, Glickman SW. The patient experience and health outcomes. *N Engl J Med* 2013;368(03):201-203
- Barbosa CD, Balp MM, Kulich K, Germain N, Rofail D. A literature review to explore the link between treatment satisfaction and adherence, compliance, and persistence. *Patient Prefer Adherence* 2012;6:39-48
- Petrilli CM, Saint S, Jennings JJ, et al. Understanding patient preference for physician attire: a cross-sectional observational study of 10 academic medical centres in the USA. *BMJ Open* 2018;8(05):e021239
- Petrilli CM, Mack M, Petrilli JJ, Hickner A, Saint S, Chopra V. Understanding the role of physician attire on patient perceptions: a systematic review of the literature-targeting attire to improve likelihood of rapport (TAILOR) investigators. *BMJ Open* 2015;5(01):e006578
- Mason L, Mason J III. Patients' attitudes regarding characteristics of physicians in ophthalmology. *BMC Res Notes* 2017;10(01):733
- Reddy AK, Coats DK, Yen KG. An evidence-based approach to physician etiquette in pediatric ophthalmology. *J Pediatr Ophthalmol Strabismus* 2011;48(06):336-339, quiz 335, 340
- Tukey JW. Comparing individual means in the analysis of variance. *Biometrics* 1949;5(02):99-114
- Treacle AM, Thom KA, Furuno JP, Strauss SM, Harris AD, Perencevich EN. Bacterial contamination of health care workers' white coats. *Am J Infect Control* 2009;37(02):101-105
- Willis-Owen CA, Subramanian P, Kumari P, Houlihan-Burne D. Effects of 'bare below the elbows' policy on hand contamination of 92 hospital doctors in a district general hospital. *J Hosp Infect* 2010;75(02):116-119