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A NATIONAL CROSS-SECTIONAL STUDY EVALUATING PATIENT PREFERENCES FOR PHYSICIAN ATTIRE

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A NATIONAL CROSS-SECTIONAL STUDY EVALUATING Patient preferences for physician attire

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OBJECTIVES: Several large studies have shown that improving the patient experience is associated with higher reported patient satisfaction, increased adherence to recommended treatment plans and clinical outcomes. Whether physician attire can affect the patient experience—and how this influences satisfaction— is unknown. Therefore, we performed a national, cross-sectional study to examine patient perceptions, expectations and preferences regarding physicians dress.

SETTING: Ten academic hospitals in the United States.

PARTICIPANTS: Convenience sample of 4,062 patients recruited from June 1, 2015 to October 31, 2016.

PRIMARY AND SECONDARY OUTCOMES MEASURED: We conducted a questionnaire-based study of patients across ten academic hospitals in the United States. The questionnaire included photographs of the same male and female physician dressed in seven different forms of attire and were asked to rate the provider pictured in various clinical settings. Preference for attire was calculated as the composite of five domains (knowledgeable, trustworthy, caring, approachable, and comfortable) via a standardized instrument. Secondary outcome measures included variation in preferences by respondent characteristics (e.g., gender), context of care (e.g., inpatient vs. outpatient) and geographic region.

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RESULTS: Of 4,062 patient responses, 53% indicated that that physician attire was important to them during care. Over one third agreed that it influenced their satisfaction with care. Compared to all other forms of attire, formal attire with a white coat was most highly rated (p=0.001 vs. scrubs with white coat; p<0.001 all other comparisons). Important differences in preferences for attire by clinical context and respondent characteristics were noted. For example, respondents \geq 65 years preferred formal attire with white coats (p<0.001) while scrubs were most preferred for surgeons.

CONCLUSIONS: Important perceptions and expectations for physician dress that vary by patients, context, and region exist. Nuanced policies addressing physician dress code to improve patient satisfaction appear important.

TRIAL REGISTRATION: Observational study, not registered

STRENGTHS AND LIMITATIONS OF THIS STUDY

- The largest study to examine patient preferences for physician attire. Given methodological strengths including randomization of instrument sequence, as well as inclusion of diverse regions and patient populations, our findings clarify possible dress codes in various healthcare settings.
- Our study and survey instrument were specifically designed to avoid biases associated with images. For example, we hired a professional photographer and studio to ensure photographs of physicians were otherwise identical. Similarly, we also used models of the same race (Caucasian) with identical postures and facial expressions so as to limit confounding associated with models of different backgrounds or appearance as has occurred in previous studies.
- Our findings have policy implications: namely, patients appear to care about attire and may expect to see their doctor in certain ways. Hospitals, clinics, emergency departments and ambulatory surgical centers should consider using these data to set dress codes for physicians providing care in these settings.
- The providers pictured in our survey instrument were young, slender, Caucasian and all cared for in academic settings, which may have introduced bias into responses. Similarly, we did not record information for patients who refused to participate in the study, also potentially introducing bias
- While approaching patients as they were receiving care helps generate validity, it is possible that reported impressions may not reflect actual preferences.

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INTRODUCTION

At its core, the practice of medicine hinges on the patient-physician relationship. From initial introductions, physicians work to build rapport to foster a partnership to provide patient-centered care, defined as that which is: "respectful of, and responsive to, individual patient preferences, needs and values."¹ Not surprisingly, medical school curricula often include courses aimed at improving the patient experience.² Similarly, since 2007, the Centers for Medicare and Medicaid have required hospitals to collect, submit and publicly report the results of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey or risk financial penalties.³ These data are also important because they have been linked to clinical outcomes. For example, a positive correlation between patient satisfaction, improved mortality and reduced 30-day readmissions have been reported.⁴⁻⁸

Although improving the patient experience, and consequently satisfaction, is an important target for many hospitals, how best to do this is unclear. One approach is to understand how physician attire influences the patient experience and develop guidelines based on patients' preferences. Indeed, some healthcare systems across the country have adopted stringent dress codes. In a recently published article, we contacted human resource professionals and administrators at top US News & World Report Hospitals,⁹ and found that five had written guidelines endorsing formal and professional attire. Yet patient preferences for physician attire are not straightforward. In a systematic review, we found that while patients preferred formal attire and white coats overall, attire such as scrubs or casual dress were preferred in specific settings.⁹ These findings make intuitive sense: patients often have notions of how a "professional" should

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dress and are more likely to respond positively to those that meet these stereotypes. Strategies targeting physician dress may therefore enhance trust and satisfaction.

To date, no studies have examined whether physician dress may influence satisfaction and, if so, what types of attire might be most relevant. Additionally, whether these preferences vary by context of care (e.g., inpatient vs. outpatient setting), patient characteristics (e.g., age and gender) or region is not known. Therefore, we performed a cross-sectional survey of patients receiving care across the US using a standardized questionnaire to better understand these issues.

METHODS

Study design and population

Between June 1, 2015 to October 31, 2016, a total of 6,280 surveys were provided to ten academic medical centers in the United States (US) of which 4,062 surveys were filled and available for analyses (response rate = 65%). The questionnaire consisted of 22 questions and included photographs of a male and a female physician in various forms of attire. The questionnaire was administered to adult patients that were receiving care in clinics (outpatients) or admitted to the hospital (inpatients). At all sites, the questionnaire was administered by research staff using paper instruments. Respondents provided verbal consent. No identifying information was collected from those that completed the study.

Study design and data collection

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The questionnaire was developed from a systematic review that examined the role of physician attire on patient preferences and satisfaction.⁹ A multidisciplinary team of psychometricians, research scientists, choice architects, survey experts, and bioethicists developed the study instrument. Each question sought to elicit preferences regarding various forms of physician attire, including: casual, casual with white coat, scrubs, scrubs with white coat, formal, formal with white coat, and business suit (**Figure 1**). Photographs of the same Caucasian male and female physician donning such attire were taken by a professional photographer with strict attention to facial expressions, pose, lighting, and other non-verbal cues as these may influence preference or likability.

To avoid bias, 14 different versions of the study instrument were created, and distribution of the questionnaires was randomized to participants. In each version, the gender and attire of the first physician model varied to prevent ordering, priming or anchoring effects (**Supplementary File**). The questionnaire had four sections: in the first section, respondents were asked to rate the physician depicted across five domains including knowledge, trust, care, approachability, and comfort. In the second section, respondents were presented with seven photographs of the same physician wearing different attire and asked to select their preference in various clinical settings. The third and fourth sections sought respondents' general opinions regarding physician attire, demographic data and frequency of interactions with physicians.

Before administration, the survey instrument was pilot-tested with a convenience sample of patients at the lead site to ensure photographs, questions, ratings, and randomly generated order of the 14 surveys at each site would functioned as desired.

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Measurements

Ratings regarding how knowledgeable, trustworthy, caring, and approachable each physician appeared, as well as how comfortable the physician made the respondent feel, were measured using a 1-10 scale, where 1 indicated "somewhat preferred" vs. 10 "extremely preferred." Preference of attire within specific care settings (e.g., primary care, emergency room, hospital, surgery, and overall) was assessed using photos for each of the 7 attire categories. Respondent opinions regarding importance of dress and white coats were collected using a 1-5 Likert scale, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." We assessed patient satisfaction based on agreement with two guestions: "How my doctor dresses is important to me," and "How my doctor dresses influences how happy I am with the care received." For analyses, responses were trichotomized as follows: agreement = strongly agree and agree; neither agree nor disagree; and disagreement = disagree or strongly disagree. Demographics including age, gender, education level, race, and number of physician encounters were collected. Preferences for attire and demographics were dichotomized for bivariate comparison. Questions that were unanswered or where more than one response was entered were excluded.

Outcomes

The primary outcome of interest – preference for attire -- was calculated as the composite average of the five individual rating domains (knowledgeable, trustworthy, caring, approachable, and comfortable). Additionally, variation in preferences for physician attire by respondent characteristics (e.g., gender, age), context of care (e.g.,

inpatient vs. outpatient) and geographical region (e.g., Northeast, Midwest, South, and West) were also assessed.

Statistical analyses

Data from paper questionnaires were entered independently and in duplicate. Since respondents were not required to answer all questions, the denominator for individual questions (and associated response rate) varied. Descriptive statistics (means, percentage) and standard deviation (SD) were initially 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.² 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 deemed exempt from regulation by the University of Michigan Institutional Review Board (HUM00085305).

RESULTS

A total of 4,062 questionnaires were completed by patients across ten academic

medical centers in the United States. Respondents represented all parts of the United States including the Northeast, Midwest, South and West. Most patients were surveyed while admitted to the hospital (n=2,616 [64%]); however, a substantial proportion of outpatients were also included (n=1,446 [36%]). Respondents were most often white (71%)and male (65%). The plurality of patients was 65 years of age or older (36%). Seventy percent of those surveyed indicated having attended some college or having college degrees. With respect to interactions with the health system, 38% of respondents reported 6 or more physician visits in the past year (**Table 1**).

Ratings of Physician Attire

Respondents rated formal attire with white coat for both male and female physician models as the most preferred form of dress compared to other forms of attire with a mean composite score of 8.1 (SD 1.8) [all pairwise comparisons p<0.001]. Cronbach's alpha for the 5-items included in the composite score was 0. 96.. Ratings for formal attire with white coat were greatest across all domains including how knowledgeable, trustworthy, caring, and approachable the physician appeared as well as how comfortable the physician made the respondent feel. Moreover, these findings were significant in the domains of trustworthiness, caring and how comfortable the physician made the respondent feel in all pairwise comparison testing to other forms of attire (p<0.05). For the rating of approachability, formal attire with a white coat was not statistically different from scrubs with a white coat or formal without a white coat in pairwise comparison. Scrubs with white coat ranked second overall, with a mean

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composite score of 7.6 (SD=1.9) followed by formal attire without a white coat with a mean composite score of 7.5 (SD=2.0) (Figure 2).

Preferences for Physician Attire by Care Settings

When examining preferences for physician attire by care setting, important differences emerged. Formal attire with white coat was preferred by respondents for their primary care (44%) and hospital physician (39%). Conversely, scrubs were rated highest for emergency room physicians (40%) and surgeons (42%). In both emergency and surgery settings, scrubs alone were followed in preference by scrubs with white coats (34% and 23%, respectively). When asked, "Overall, which clothes do you feel that your doctor should wear?" most respondents preferred formal attire with white coat (44%) followed by scrubs with white coat (26%) (**Table 2**). Excluding surgeons, respondents indicated no preference for a white coat on female physicians (p=0.85), but preferred male physicians without white coats (p<0.001). No differences in preference by physician gender in other clinical care settings were noted (**Figure 3**).

Perceived Influence on Satisfaction, Importance and Appropriateness of Physician Attire

More than half (53%) of the patients surveyed agreed with the statement that how their doctor dresses was important to them, while 36% of respondents agreed with the statement that physician attire influenced how happy they were with the care they received. Views regarding appropriateness of casual attire when physicians see

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patients on the weekends were mixed: 44% of respondents stated this was appropriate while 56% were either neutral or disagreed with the practice.

Specific questions regarding when physicians should don a white coat elicited various preferences. Most respondents (55%) indicated that they agreed or strongly agreed with the statement that doctors should wear a white coat when seeing patients in the office. In the emergency room, however, 44% agreed with the statement that physicians should wear a white coat when seeing patients vs. 56% that indicated either no preference (38%) or disagreement (18%). When asked whether doctors should wear a white coat when seeing patients (62%) agreed or strongly agreed with this statement (**Table 3**).

Variations in Patient Preferences of Physician Attire

Important variations in patient preferences for attire were noted. For example, female respondents more often preferred scrubs with white coats in emergency room and hospital settings than males (41% vs. 31% [p<0.001] and 32% vs. 27% [p=0.001], respectively). However, both genders indicated formal attire with white coat was overall most preferred (43% and 44%, respectively). In hospital settings, respondents 65 years of age or older frequently preferred formal attire with white coats than younger patients (44% vs. 36%, p<0.001). Conversely, younger patients more often preferred scrubs and white coats than formal attire overall (28% vs. 21%, p<0.001). Some differences in preferences regarding physician dress based on respondent education level were also noted. Specifically, respondents with a college degree preferred formal and white coat

for their primary care provider more often than those without a college degree (48% vs. 42%, p<0.001).

No differences in preferences between those with three or more physician visits in the preceding year vs. those with less frequent visits were noted. Similarly, preferences for attire did not vary by setting in which respondents were polled, although respondents in the outpatient setting more often preferred doctors in the hospital to wear scrubs and a white coat compared to hospitalized respondents (32% vs. 27%, p=0.002). However, preferences for attire did vary by geographic region. For example, while formal attire and white coats were preferred across all regions, 50% of respondents in the West and 51% in the South selected this as their preferred option compared to 38% and 40% in the Northeast and Midwest, respectively. Conversely, over half of all respondents in the Northeast selected scrubs as their preferred attire for surgeons compared to a quarter of respondents in the South (54% vs. 25%, p<0.001).

CONCLUSIONS

This study of over 4,000 patients receiving medical care in diverse academic medical centers is the largest to report preferences regarding physician attire in the US. Over half of the participants indicated that how a physician dresses was important to them, with over one in three stating that this influenced how happy they were with care received. Overall, respondents indicated that formal attire with white coats was the most preferred form of physician dress. However, in settings such as surgery or emergency rooms, scrubs with white coats were most preferred. Although variation in preferences by respondent age, gender, education and geography were noted, these findings

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indicate that not only do most patients have expectations regarding doctor attire, but that a "professional" look matters most. Given the size, methodological rigor and representativeness of these data, policies addressing physician attire should be considered to improve patient satisfaction.

Previous studies have shown that patients harbor conscious and unconscious biases when it comes to provider dress.^{10,11} Thus, our finding that patients have specific preferences regarding physician attire was not surprising. What this study highlights, however, is the potential importance of physician attire to the physician-patient relationship. Indeed, specific clinical and contextual aspects appear to influence a patient's preconceived notion of 'professional attire'. For instance, we found that the locale where care is delivered (e.g., hospital vs. clinic) as well as context of care (e.g., emergency room or surgery) affected preferences. Similarly, we observed that certain respondent characteristics such as age, gender, and education also influenced their preferences. These findings can potentially be used to improve the patient experience. For instance, providers engaged in care of elderly patients (e.g., geriatric clinics, hospital settings or extended-care facilities) may consider donning formal attire more so than surgeons or emergency room physicians where scrubs may be more important. Similarly, hospitals in southern regions of the US may wish to endorse formal attire and white coats as their preferred policy. For providers in the emergency room and surgical arenas, such attire may in fact be viewed as out of place – and thus different rules might be necessary. These examples illustrate how policies for specific doctors, settings or patients can be leveraged to focus on patient-centered care.

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How should one interpret these findings given concerns for infection transmission associated with physician dress? Previous studies have shown that bacteria and pathogens can be isolated from white coats, neckties and sleeves of medical providers.¹²⁻²⁰ These studies are one of the reasons why a "bare below the elbows" (BBE) policy exists in some countries. While we did not specifically ask respondents to consider this risk when choosing attire preferences, three aspects deserve discussion. First, despite the abundance of literature on infection prevention, we are unaware of any study that links physician dress to source or transmission of infection. Rather, one study randomly sampled physicians' fingertips and reported no association between BBEcompliant versus non-compliant attire and presence of bacterial colony-forming units or clinically significant organisms.²¹ Second, evidence suggests that other practices (e.g., hand hygiene) may be more relevant than physician dress in preventing infection. In an institution-wide study at Vanderbilt University Medical Center, direct observation combined with financial incentives for appropriate hand hygiene increased compliance with hand hygiene policies and decreased device-associated standardized infection ratios.²² Conversely, wearing a white coat has been associated with increased selective and sustained attentiveness to tasks.²³ These findings suggest that clothing may influence the wearer's own psychological processes, a phenomenon coined "enclothed cognition."²⁴ Therefore, attentiveness to hand hygiene may, in fact, be increased when physicians wear white coats or formal attire – improving patient care and satisfaction.^{25,26} Third, we add to the growing body of evidence that suggests patients have preferences regarding attire.^{9,10,27-47} Physician attire may offer an important

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modifiable variable in the doctor-patient relationship that could improve patient experience and satisfaction and ultimately produce better outcomes.⁴⁸⁻⁵⁰

Our study has several limitations. First, as with other studies of physician attire, we showed respondents pictures of providers and elicited preferences via a paper guestionnaire. Our providers were young, slender, Caucasian and all cared for in academic settings, which may have introduced bias into responses. Similarly, we did not record information for patients who refused to participate in the study, also potentially introducing bias. Second, while approaching patients as they were receiving care helps generate validity, it is possible that reported impressions may not reflect actual preferences. Third, we asked patients to report preferences via Likert scales and predefined categories. Although this allows for a range of answers (including a neither agree or disagree option), such categorizations may force respondents to answer in ways that do not capture their true feelings. Fourth, while the proportion of Caucasian respondents were similar to 2010 Census data estimates, a lower than expected number of Hispanic respondents (5% compared with 16% estimated by the Census data) participated.⁵¹ Thus, whether our findings will hold true across race or ethnicity is not known. Finally, we did not include questions regarding infection transmission given the lack of evidence supporting the notion that white coats or attire is associated with infections.

Our study also has important strengths. First, this is the largest study to examine patient preferences for physician attire. Given methodological strengths including randomization of instrument sequence, as well as inclusion of diverse regions and patient populations, our findings clarify possible dress codes in various healthcare

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settings. Second, in contrast to other studies, we specifically designed our study and survey instrument to avoid biases associated with images. For example, we hired a professional photographer and studio to ensure photographs of physicians were otherwise identical. Similarly we also used models of the same race (Caucasian) with identical postures and facial expressions so as to limit confounding associated with models of different backgrounds or appearance as has occurred in previous studies.^{29,36,37,39,45} Additionally, we implemented strategies during survey collection such as randomizing order of delivery and images to minimize bias. These approaches help lend a high degree of internal validity to our findings. Third, our findings have policy implications: namely, patients appear to care about attire and may expect to see their doctor in certain ways. Hospitals, clinics, emergency departments and ambulatory surgical centers should consider using these data to set dress codes for physicians providing care in these settings.

In summary, while physician attire cannot replace excellent clinical care, our data suggest that it may impact how patients perceive care and perhaps how willing they are to trust their doctors. In an era of patient-centeredness and patient satisfaction, physician attire may be an important, modifiable component of patient care. As perceptions and expectations regarding physician dress by patients, context, and region exist, nuanced policies that target such factors appear relevant. Future studies implementing such policies in both hospital, clinic and emergency room settings appear necessary.

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TABLES

TABLE 1. Characteristics of Study Respondents and Sites*

Characteristics	N (%)
Age	N=3998
18-25	151 (4)
26-34	340 (9)
35-54	952 (24)
55-64	1103 (28)
65+	1452 (36)
Gender	N=3946
Female	1374 (35)
Male	2572 (65)
Education	N=3970
Less than High School	110 (3)
High School	1080 (27)
Some College	1101 (28)
College	1052 (27)
Graduate Degree or Above	627 (16)
Race	N=3974
White	2802 (71)
African American	731 (18)
Asian	79 (2)
Hispanic	181 (5)
Other/Mixed Race	181 (5)
Number of Different Doctors Seen in the Past Year	N=3987
0	29 (1)
1	250 (6)
2	496 (12)
3	637 (16)
4	606 (15)
5	440 (11)
6 or more	1529 (38)
Geographic Region	N =4062
Midwest	2225
Northeast	449
West	257
South	1131

TABLE 2. Respondent Preferences for Physician Attire (By Setting)

Preference for Physician Attire [by Setting]	Total
Which doctor would you prefer for your primary care physician?	N=3959
Casual	133 (3)
Casual & White Coat	417 (11
Scrubs	201 (5
Scrubs & White Coat	586 (15
Formal	610 (15
Formal & White coat	1758 (44
Business Suit	254 (6
Which doctor would you prefer to see when visiting the ER?	N=3966
Casual	54 (1)
Casual & White Coat	240 (6
Scrubs	1577 (40)
Scrubs & White Coat	1351 (34
Formal	113 (3
Formal & White coat	592 (15
Business Suit	39 (1
Which doctor would you prefer when in the hospital?	N=3946
Casual	61 (2
Casual & White Coat	351 (9
Scrubs	412 (10
Scrubs & White Coat	1126 (29
Formal	280 (7
Formal & White coat	1546 (39
Business Suit	170 (4
Which doctor would you prefer for your surgeon?	N=3952
Casual	32 (1
Casual & White Coat	151 (4
Scrubs	1648 (42
Scrubs & White Coat	926 (23
Formal	150 (4
Formal & White coat	824 (21
Business Suit	221 (6
Overall, which clothes do you feel your doctor should wear?	N=3924
Casual	60 (2
Casual & White Coat	292 (7
Scrubs	329 (8
Scrubs & White Coat	1013 (26
Formal	340 (9
Formal & White coat	1708 (44
Business Suit	182 (5)

TABLE 3. Respondent Opinions Regarding Importance of Physician Attire

Opinions Pagarding Influence and Appropriateness of Physician Pross	T
How my doctor dresses is important to me	N=4
Diagrae or Strongly Diagrae	502
Noither Agree per Disagree	1295
Agree or Strengly Agree	2 127
How my doctor drosses influences how happy Lam with the care Lrossive	2,137
Disagree or Strongly Disagree	031
Neither Agree for Disagree	1620
Agree or Strongly Agree	1 / 59
It is appropriate for a doctor to dress casually when seeing patients over the weekend	N=4
Disagree or Strongly Disagree	857
Neither Agree nor Disagree	1372
Agree or Strongly Agree	1.774
Doctors should wear a white coat when seeing patients in their office.	N=4
Disagree or Strongly Disagree	485
Neither Agree nor Disagree	1321
Agree or Strongly Agree	2,201
Doctors should wear a white coat when seeing patient in the ER.	N=4
Disagree or Strongly Disagree	704
Neither Agree nor Disagree	1519
Agree or Strongly Agree	1,782
Doctors should wear a white coat when seeing patients in the hospital.	N=4
Disagree or Strongly Disagree	346
Neither Agree nor Disagree	1188
Agree or Strongly Agree	2,472
Doctors should always wear a white coat when seeing patients in any setting.	N=4
Disagree or Strongly Disagree	1,022
Neither Agree nor Disagree	1641
Agree or Strongly Agree	1,344

Note: Percentages may not add up to 100 due to rounding.

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FIGURES

 Figure 1. Photographs of Model Male and Female Physician in Various Attire Used in Survey Instrument

and Female Physician in Various.

Lene Don. Figure 2. Rating of Physician Attire Across Preference Domains

Figure 3. Preference for white coat by clinical care setting and physician gender

 <u>e setting a.</u>

	Casual	Casual & White Coat	Scrubs	Scrubs & White Coat	Formal	Formal & White Coat	Business Suit
<u>Female</u>	Ŷ				Ŵ		Ŷ
	Jeans with collared, short sleeved shirt with tennis shoes	Jeans with collared, short sleeved shirt, a white coat with tennis shoes	Light blue scrubs top with short sleeves and light blue scrub pants with tennis shoes	Light blue scrubs top with short sleeves and light blue scrub pants with tennis shoes and a white coat	Light blue buttoned- down dress shirt and navy suit pants with black leather shoes with 1-inch heels	Light blue buttoned- down dress shirt and navy suit pants with black leather shoes with 1-inch heels and a white coat	Navy blue business suit, light blue buttoned-down dress shirt with black leather shoes with 1- inch heels
<u>Male</u>	Ř				Ŵ	Î	Ŷ
	Jeans with collared, short sleeved shirt with tennis shoes	Jeans with collared, short sleeved shirt, a white coat with tennis shoes	Light blue scrubs top with short sleeves and light blue scrub pants with tennis shoes	Light blue scrubs top with short sleeves and light blue scrub pants with tennis shoes and a white coat	Light blue buttoned- down dress shirt with dark blue tie and navy suit pants with black leather shoes	Light blue buttoned- down dress shirt with dark blue tie and navy suit pants with black leather shoes and a white coat	Navy blue business suit, light blue buttoned-down dress shirt with dark blue tie with black leather shoes

Figure 1. Photographs of Model Male and Female Physician in Various Attire Used in Survey Instrument

Fema.. x50mm (300 x 300 レг.,

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*All comparisons of the composite score are significantly different when compared to the referent group (formal attire + white coat) at p<0.05. Note: Female model is pictured for illustrative purposes. The data reflects ratings of physician attire for both male and female physician models.

Figure 2. Rating of Physician Attire Across Preference Domains

80x50mm (300 x 300 DPI)

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Figure 3. Preference for white coat by clinical care setting and physician gender

80x45mm (300 x 300 DPI)

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BMJ Open 1.A.0 Understanding the Role of Physician Clothing on Patient Opinion

Thank you for taking the time to complete this survey. Your answers will be the us better understand whether physician dress influences patients' opinions of th喜聲的ctor.

Your responses are very important to us. There are no right or wrong a signature and we are interested only in your honest opinions. This survey is brief and should take no more than 5 minutes to complete.

In Section A please provide a rating by circling the number on the scale that com/ and similar corresponds to your answer.

In Sections B, C, and D, please provide your one best answer to each autom.

All of your answers will be kept confidential. We will not use names in any notes, reports, or summaries. Your responses will also not be shared with any of your doctors or care providers. bliographique

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Section A – Physician Attire - Ratings	right
Please rate the doctor for each of the following questions by circling the number that corresponds to y	our ang
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	3) How <u>caring</u> does this doctor appear?	1 Sor	2 new	3 hat	4	5	6	http://bmjopen (BES) . mining, Al train	8 E:	9 xtren	10 nely
	4) How <u>approachable</u> does this doctor appear?	1 Soi	2 mew	3 'hat	4	5	6	bmj.com/ on June iing, aאלל similar te	8 E	9 xtren	10 nely
	5) How <u>comfortable</u> does this doctor make you feel?	1 Soi	2 mew	3 hat	4	5	6	12, 2025 at Agence chnologies.	8 E	9 xtren	10 nely
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136/bmjopen-2017-02123 on 29 May 2018. D Enseignem cted by copyright, including for uses related **BMJ** Open Section B - Physician Attire - Preferences Please provide your ONE best answer to each of the following questions 0 đ text and 5 http://bmjopen.bmj.com/ on June12, 2025jat BES) . mining, Al training, and similar technologies. C A В D E G 6) Which doctor would you prefer for your primary care doctor? (Please select only ONE option) Π П Π A B C D E G 7) Which doctor would you prefer to see when visiting the emergency room? (Please select only ONE option C D Е G В A 8) Which doctor would you prefer to see when in the hospital? (Please select only ONE option) June 12, 2025 at Agence Bibliographique de l Е C D G A В 9) Which doctor would you prefer for your surgeon? (Please select only ONE option) A B C D E G 10) Overall, which clothes do you feel doctors should wear? (Please select only ONE option) С Ε G Α В D Page 3 of 5 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

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Section D –	Demographics	;			pyright,	91 <u>1.A.0</u> 2017	
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Section/Topic	ltem #	Recommendation	Reported of
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	3
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	3
Introduction	1		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5-
Objectives	3	State specific objectives, including any prespecified hypotheses	e
Methods			
Study design	4	Present key elements of study design early in the paper	e
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	6-
Participants	6	(a) Give the eligibility criteria, and the sources and methods of selection of participants	6-
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	8-
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	8-
Bias	9	Describe any efforts to address potential sources of bias	;
Study size	10	Explain how the study size was arrived at	N/
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8-
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	9
		(b) Describe any methods used to examine subgroups and interactions	9
		(c) Explain how missing data were addressed	<u>c</u>
		(d) If applicable, describe analytical methods taking account of sampling strategy	N/

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Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility,	9-10
		confirmed eligible, included in the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9-10
		(b) Indicate number of participants with missing data for each variable of interest	Table 1-3
Outcome data	15*	Report numbers of outcome events or summary measures	10-13
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence	10-13
		interval). Make clear which confounders were adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	10-13
Discussion			
Key results	18	Summarise key results with reference to study objectives	14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-17
Generalisability	21	Discuss the generalisability (external validity) of the study results	16
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	N/A – No funding

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in cohort and cross-sectional studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

BMJ Open

Understanding Patient Preference for Physician Attire: A Cross-Sectional Observational Study of Ten Academic Medical Centers in the United States

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Manuscript ID	bmjopen-2017-021239.R1
Article Type:	Research
Date Submitted by the Author:	06-Mar-2018
Complete List of Authors:	Petrilli, Christopher; University of Michigan, Internal Medicine Saint, Sanjay; Veterans Affairs Ann Arbor Healthcare System, Internal Medicine; University of Michigan, Internal Medicine Jennings, Joseph; Georgetown University School of Medicine, Internal Medicine Caruso, Andrew; Baylor College of Medicine, Internal Medicine Kuhn, Latoya; University of Michigan, Internal Medicine; Veterans Affairs Ann Arbor Healthcare System, Internal Medicine Snyder, Ashley; University of Michigan, Internal Medicine Chopra, Vineet; University of Michigan, Medicine; Veterans Affairs Ann Arbor Healthcare System, Internal Medicine
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Understanding Patient Preference for Physician Attire: A Cross-Sectional Observational Study of Ten Academic Medical Centers in the United States

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OBJECTIVE: Several large studies have shown that improving the patient experience is associated with higher reported patient satisfaction, increased adherence to treatment and clinical outcomes. Whether physician attire can affect the patient experience—and how this influences satisfaction— is unknown. Therefore, we performed a national, cross-sectional study to examine patient perceptions, expectations and preferences regarding physicians dress.

SETTING: Ten academic hospitals in the United States.

PARTICIPANTS: Convenience sample of 4,062 patients recruited from June 1, 2015 to October 31, 2016.

PRIMARY AND SECONDARY OUTCOMES MEASURED: We conducted a questionnaire-based study of patients across ten academic hospitals in the United States. The questionnaire included photographs of a male and female physician dressed in seven different forms of attire. Patients were asked to rate the provider pictured in various clinical settings. Preference for attire was calculated as the composite of responses across five domains (knowledgeable, trustworthy, caring, approachable, and comfortable) via a standardized instrument. Secondary outcome measures included variation in preferences by respondent characteristics (e.g., gender), context of care (e.g., inpatient vs. outpatient) and geographic region.

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RESULTS: Of 4,062 patient responses, 53% indicated that physician attire was important to them during care. Over one third agreed that it influenced their satisfaction with care. Compared to all other forms of attire, formal attire with a white coat was most highly rated (p=0.001 vs. scrubs with white coat; p<0.001 all other comparisons). Important differences in preferences for attire by clinical context and respondent characteristics were noted. For example, respondents \geq 65 years preferred formal attire with white coats (p<0.001) while scrubs were most preferred for surgeons.

CONCLUSIONS: Patients have important expectations and perceptions for physician dress that vary by context, and region. Nuanced policies addressing physician dress code to improve patient satisfaction appear important.

TRIAL REGISTRATION: Observational study, not registered

STRENGTHS AND LIMITATIONS OF THIS STUDY

- This is the largest study to date that examines patient preferences for physician attire.
- The study design and survey instrument were carefully designed to limit biases associated with physician images.
- Our finding show that patients appear to care about attire and may expect to see their doctor dress in a certain way, which has policy implications for institutional dress codes.
- The providers pictured in our survey instrument were young, slender, and Caucasian, which may limit generalizability of findings.
- While soliciting patient responses while hospitalized helps generate validity, it is possible that reported impressions may not reflect actual preferences.

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INTRODUCTION

At its core, the practice of medicine hinges on the patient-physician relationship. From initial introductions, physicians work to build rapport to foster a partnership to provide patient-centered care, defined as that which is: "respectful of, and responsive to, individual patient preferences, needs and values."¹ Not surprisingly, medical school curricula often include courses aimed at improving the patient experience.² Similarly, since 2007, the Centers for Medicare and Medicaid have required hospitals to collect, submit and publicly report the results of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey or risk financial penalties.³ These data are also important because they have been linked to clinical outcomes. For example, a positive correlation between patient satisfaction, improved mortality and reduced 30-day readmissions have been reported.⁴⁻⁸

Although improving the patient experience, and consequently satisfaction, is an important target for many hospitals, how best to do this is unclear. One approach is to understand how physician attire influences the patient experience and develop guidelines based on patients' preferences. Indeed, some healthcare systems across the country have adopted stringent dress codes. In a recently published article, we contacted human resource professionals and administrators at top US News & World Report Hospitals,⁹ and found that five had written guidelines endorsing formal and professional attire. Yet patient preferences for physician attire are not straightforward. In a systematic review, we found that while patients preferred formal attire and white coats overall, attire such as scrubs or casual dress were preferred in specific settings.⁹ These findings make intuitive sense: patients often have notions of how a "professional" should

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dress and are more likely to respond positively to those that meet these stereotypes. Strategies targeting physician dress may therefore enhance trust and satisfaction.

Therefore, we performed a cross-sectional survey of patients receiving care across the US using a standardized questionnaire to better understand the impact of physician attire across different clinical settings (e.g., hospitalized vs. ambulatory clinic visits). In addition, we aimed to analyze a larger sample of patients from multiple health systems than has been previously reported in the literature.

METHODS

Study design and population

Between June 1, 2015 to October 31, 2016, a total of 6,280 surveys were provided to ten academic medical centers in the United States (US) of which 4,062 surveys were filled and available for analyses (response rate = 65%). The participating sites spanned four main geographic regions of the US. The questionnaire consisted of 22 questions and included photographs of a male and a female physician in various forms of attire. The questionnaire was administered to adult patients that were receiving care in clinics (outpatients) or admitted to the hospital (inpatients). Outpatients were approached in waiting rooms of general medicine and medical subspecialty clinics, while inpatients were approached in their hospital rooms when admitted to non-surgical units. At all sites, the questionnaire was administered by research staff using paper instruments. The surveys were administered during normal business hours at times convenient to each sites' research staff. Respondents were allowed to request help filling out the form from any visitor accompanying them. The research staff delivered the paper instrument and returned approximately 5-10 minutes later to pick-up the completed form. Respondents provided verbal consent. No identifying information was collected from those that completed the study.

Sample size calculation

It was assumed that responses between two attire forms would be normally distributed on the 1-10 scale between attire types. An estimated standard deviation of 2.2 was used. If our study included at least 816 patients, (assuming a two-sided alpha error of 0.05), we expected to have 90% power to detect differences for effect sizes of 0.50 on the 1-10 scale. Fewer subjects would be needed if the standard deviation were smaller.

Patient and Public Involvement

The study was designed to understand patient experience and preferences. However, patients were not included in the design of the survey instrument, recruitment, or conduct of the study. Patients who participated did so anonymously, and therefore the study team will be unable to disseminate the results to study participants.

Study design and data collection

The questionnaire was developed from a systematic review that examined the role of physician attire on patient preferences and satisfaction.⁹ A multidisciplinary team of psychometricians, research scientists, choice architects, survey experts, and

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bioethicists developed the study instrument. Each question sought to elicit preferences regarding various forms of physician attire, including: casual, casual with white coat, scrubs, scrubs with white coat, formal, formal with white coat, and business suit (**Figure 1**). Photographs of the same Caucasian male and female physician donning such attire were taken by a professional photographer with strict attention to facial expressions, pose, lighting, and other non-verbal cues as these may influence preference or likability.

To avoid bias, 14 different versions of the study instrument were created, and distribution of the questionnaires was randomized to participants. In each version, the gender and attire of the first physician model varied to prevent ordering, priming or anchoring effects (**Supplementary File**). The questionnaire had four sections: in the first section, respondents were asked to rate the physician depicted across five domains including knowledge, trust, care, approachability, and comfort. In the second section, respondents were presented with seven photographs of the same physician wearing different attire and asked to select their preference in various clinical settings. The third and fourth sections sought respondents' general opinions regarding physician attire, demographic data and frequency of interactions with physicians.

Before administration, the survey instrument was pilot-tested with a convenience sample of patients at the lead site to ensure photographs, questions, ratings, and randomly generated order of the 14 surveys at each site would functioned as desired.

Measurements

Ratings regarding how knowledgeable, trustworthy, caring, and approachable each physician appeared, as well as how comfortable the physician made the

respondent feel, were measured using a 1-10 scale, where 1 indicated "somewhat preferred" vs. 10 "extremely preferred." Preference of attire within specific care settings (e.g., primary care, emergency room, hospital, surgery, and overall) was assessed using photos for each of the 7 attire categories. Respondent opinions regarding importance of dress and white coats were collected using a 1-5 Likert scale, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." We assessed patient satisfaction based on agreement with two questions: "How my doctor dresses is important to me," and "How my doctor dresses influences how happy I am with the care received." For analyses, responses were trichotomized as follows: agreement = strongly agree and agree; neither agree nor disagree; and disagreement = disagree or strongly disagree. Demographics including age, gender, education level, race, and number of physician encounters were collected. Preferences for attire and demographics were dichotomized for bivariate comparison. Questions that were unanswered or where more than one response was entered were excluded.

Outcomes

The primary outcome of interest – preference for attire -- was calculated as the composite average of the five individual rating domains (knowledgeable, trustworthy, caring, approachable, and comfortable). Additionally, variation in preferences for physician attire by respondent characteristics (e.g., gender, age), context of care (e.g., inpatient vs. outpatient) and geographical region (e.g., Northeast, Midwest, South, and West) were also assessed.

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Statistical analyses

Data from paper questionnaires were entered independently and in duplicate. Since respondents were not required to answer all questions, the denominator for individual questions (and associated response rate) varied. Descriptive statistics (means, percentage) and standard deviation (SD) were initially 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.² Differences in proportions for categorical data were compared using the Z-test. Bivariate comparisons between respondent age, gender, and level of education and corresponding respondent 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 deemed exempt from regulation by the University of Michigan Institutional Review Board (HUM00085305).

RESULTS

A total of 4,062 questionnaires were completed by patients across ten academic medical centers in the United States. Respondents represented all parts of the United States including the Northeast, Midwest, South and West. Most patients were surveyed while admitted to the hospital (n=2,616 [64%]); however, a substantial proportion of

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outpatients were also included (n=1,446 [36%]). Respondents were most often white (71%)and male (65%). The plurality of patients was 65 years of age or older (36%). Seventy percent of those surveyed indicated having attended some college or having college degrees. With respect to interactions with the health system, 38% of respondents reported having seen 6 or more physicians in the past year (**Table 1**).

Ratings of Physician Attire

Respondents rated formal attire with white coat for both male and female physician models as the most preferred form of dress compared to other forms of attire with a mean composite score of 8.1 (SD 1.8) [all pairwise comparisons p<0.001]. Cronbach's alpha for the 5-items included in the composite score was 0. 96.. Ratings for formal attire with white coat were greatest across all domains including how knowledgeable, trustworthy, caring, and approachable the physician appeared as well as how comfortable the physician made the respondent feel. Moreover, these findings were significant in the domains of trustworthiness, caring and how comfortable the physician made the respondent feel in all pairwise comparison testing to other forms of attire (p<0.05). For the rating of approachability, formal attire with a white coat was not statistically different from scrubs with a white coat or formal without a white coat in pairwise comparison. Scrubs with white coat ranked second overall, with a mean composite score of 7.6 (SD=1.9) followed by formal attire without a white coat with a mean composite score of 7.5 (SD=2.0) (**Figure 2**).

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Preferences for Physician Attire by Care Settings

When examining preferences for physician attire by care setting, important differences emerged. Formal attire with white coat was preferred by respondents for their primary care (44%) and hospital physician (39%). Conversely, scrubs were rated highest for emergency room physicians (40%) and surgeons (42%). In both emergency and surgery settings, scrubs alone were followed in preference by scrubs with white coats (34% and 23%, respectively). When asked, "Overall, which clothes do you feel that your doctor should wear?" most respondents preferred formal attire with white coat (44%) followed by scrubs with white coat (26%) (**Table 2**). Excluding surgeons, respondents indicated no preference for a white coats. When evaluating surgeons, respondents indicated no preference for a white coat on female physicians (p=0.85), but preferred male physicians without white coats (p<0.001). No differences in preference by physician gender in other clinical care settings were noted (**Figure 3**).

Perceived Influence on Satisfaction, Importance and Appropriateness of Physician Attire

More than half (53%) of the patients surveyed agreed with the statement that how their doctor dresses was important to them, while 36% of respondents agreed with the statement that physician attire influenced how happy they were with the care they received. Views regarding appropriateness of casual attire when physicians see patients on the weekends were mixed: 44% of respondents stated this was appropriate while 56% were either neutral or disagreed with the practice.

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Specific questions regarding when physicians should don a white coat elicited various preferences. Most respondents (55%) indicated that they agreed or strongly agreed with the statement that doctors should wear a white coat when seeing patients in the office. In the emergency room, however, 44% agreed with the statement that physicians should wear a white coat when seeing patients vs. 56% that indicated either no preference (38%) or disagreement (18%). When asked whether doctors should wear a white coat when seeing patients (62%) agreed or strongly agreed with this statement (**Table 3**).

Variations in Patient Preferences of Physician Attire

Important variations in patient preferences for attire were noted. For example, female respondents more often preferred scrubs with white coats in emergency room and hospital settings than males (41% vs. 31% [p<0.001] and 32% vs. 27% [p=0.001], respectively). However, both genders indicated formal attire with white coat was overall most preferred (43% and 44%, respectively). In hospital settings, respondents 65 years of age or older frequently preferred formal attire with white coats than younger patients (44% vs. 36%, p<0.001). Conversely, younger patients more often preferred scrubs and white coats than formal attire overall (28% vs. 21%, p<0.001). Some differences in preferences regarding physician dress based on respondent education level were also noted. Specifically, respondents with a college degree preferred formal and white coat for their primary care provider more often than those without a college degree (48% vs. 42%, p<0.001).

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No differences in preferences between those with three or more physician visits in the preceding year vs. those with less frequent visits were noted. Similarly, preferences for attire did not vary by setting in which respondents were polled, although respondents in the outpatient setting more often preferred doctors in the hospital to wear scrubs and a white coat compared to hospitalized respondents (32% vs. 27%, p=0.002). However, preferences for attire did vary by geographic region. For example, while formal attire and white coats were preferred across all regions, 50% of respondents in the West and 51% in the South selected this as their preferred option compared to 38% and 40% in the Northeast and Midwest, respectively. Conversely, over half of all respondents in the Northeast selected scrubs as their preferred attire for surgeons compared to a quarter of respondents in the South (54% vs. 25%, p<0.001).

DISCUSSION

This study of over 4,000 patients receiving medical care in diverse academic medical centers is the largest to report preferences regarding physician attire in the US. Over half of the participants indicated that how a physician dresses was important to them, with over one in three stating that this influenced how happy they were with care received. Overall, respondents indicated that formal attire with white coats was the most preferred form of physician dress. However, in settings such as surgery or emergency rooms, scrubs with white coats were most preferred. Although variation in preferences by respondent age, gender, education and geography were noted, these findings indicate that not only do most patients have expectations regarding doctor attire, but that a "professional" look matters most. Given the size, methodological rigor and

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representativeness of these data, policies addressing physician attire should be considered to improve patient satisfaction.

Previous studies have shown that patients harbor conscious and unconscious biases when it comes to provider dress.^{10 11} Thus, our finding that patients have specific preferences regarding physician attire was not surprising. What this study highlights, however, is the potential importance of physician attire to the physician-patient relationship. Indeed, specific clinical and contextual aspects appear to influence a patient's preconceived notion of 'professional attire'. For instance, we found that the locale where care is delivered (e.g., hospital vs. clinic) as well as context of care (e.g., emergency room or surgery) affected preferences. Similarly, we observed that certain respondent characteristics such as age, gender, and education also influenced their preferences. These findings can potentially be used to improve the patient experience. For instance, providers engaged in care of elderly patients (e.g., geriatric clinics, hospital settings or extended-care facilities) may consider donning formal attire more so than surgeons or emergency room physicians where scrubs may be more important. Similarly, hospitals in southern regions of the US may wish to endorse formal attire and white coats as their preferred policy. For providers in the emergency room and surgical arenas, such attire may in fact be viewed as out of place – and thus different rules might be necessary. These examples illustrate how policies for specific doctors, settings or patients can be leveraged to focus on patient-centered care.

How should one interpret these findings given concerns for infection transmission associated with physician dress? Previous studies have shown that bacteria and pathogens can be isolated from white coats, neckties and sleeves of medical

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providers.¹²⁻²⁰ These studies are one of the reasons why a "bare below the elbows" (BBE) policy exists in some countries. While we did not specifically ask respondents to consider this risk when choosing attire preferences, three aspects deserve discussion. First, despite the abundance of literature on infection prevention, we are unaware of any study that links physician dress to source or transmission of infection. Rather, one study randomly sampled physicians' fingertips and reported no association between BBEcompliant versus non-compliant attire and presence of bacterial colony-forming units or clinically significant organisms.²¹ Second, evidence suggests that other practices (e.g., hand hygiene) may be more relevant than physician dress in preventing infection. In an institution-wide study at Vanderbilt University Medical Center, direct observation combined with financial incentives for appropriate hand hygiene increased compliance with hand hygiene policies and decreased device-associated standardized infection ratios.²² Conversely, wearing a white coat has been associated with increased selective and sustained attentiveness to tasks.²³ These findings suggest that clothing may influence the wearer's own psychological processes, a phenomenon coined "enclothed cognition."²⁴ Therefore, attentiveness to hand hygiene may, in fact, be increased when physicians wear white coats or formal attire – improving patient care and satisfaction.²⁵ ²⁶ Third, we add to the growing body of evidence that suggests patients have important preferences regarding attire.^{9 10 27-47} As further demonstrated by a recent study, these preferences may evolve over time, as demonstrated by variation in preferences by respondent age.⁴⁸Physician attire may offer an important modifiable variable in the doctor-patient relationship that could improve patient experience and satisfaction and ultimately produce better outcomes.⁴⁹⁻⁵¹

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Our study has limitations. First, as with other studies of physician attire, we showed respondents pictures of providers and elicited preferences via a paper guestionnaire. Our providers were young, slender, Caucasian and all cared for in academic settings, which may have introduced bias into responses. Similarly, we did not record information for patients who refused to participate in the study, also potentially introducing bias. Second, while approaching patients as they were receiving care helps generate validity, it is possible that reported impressions may not reflect actual preferences on attire but rather current feelings related to their care. Prior studies have shown that the impact of attire on patient satisfaction has to be considered in the context of the behaviors and attitude of the physician during the encounter. The survey did not have questions to capture the other dynamics of the doctor-patient relationship, which may help further explicate responses.⁹ Third, we asked patients to report preferences via Likert scales and predefined categories. Although this allows for a range of answers (including a neither agree or disagree option), such categorizations may force respondents to answer in ways that do not capture their true feelings. Fourth, while the proportion of Caucasian respondents were similar to 2010 Census data estimates, a lower than expected number of Hispanic respondents (5% compared with 16% estimated by the Census data) participated.⁵² Thus, whether our findings will hold true across race or ethnicity is not known. Finally, we did not include questions regarding infection transmission given the lack of evidence supporting the notion that white coats or attire is associated with infections.

Our study also has important strengths. First, this is the largest study to examine patient preferences for physician attire. Given methodological strengths including

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randomization of instrument sequence, as well as inclusion of diverse regions and patient populations, our findings clarify possible dress codes in various healthcare settings. Second, in contrast to other studies, we specifically designed our study and survey instrument to avoid biases associated with images. For example, we hired a professional photographer and studio to ensure photographs of physicians were otherwise identical. Similarly we also used models of the same race (Caucasian) with identical postures and facial expressions so as to limit confounding associated with models of different backgrounds or appearance as has occurred in previous studies.^{29 36} ^{37 39 45} Additionally, we implemented strategies during survey collection such as randomizing order of delivery and images to minimize bias. These approaches help lend a high degree of internal validity to our findings. Third, our findings have policy implications: namely, patients appear to care about attire and may expect to see their doctor in certain ways. Hospitals, clinics, emergency departments and ambulatory surgical centers should consider using these data to set dress codes for physicians providing care in these settings.

In summary, while physician attire cannot replace excellent clinical care, our data suggest that it may impact how patients perceive care and perhaps how willing they are to trust their doctors. In an era of patient-centeredness and patient satisfaction, physician attire may be an important, modifiable component of patient care. As perceptions and expectations regarding physician dress by patients, context, and region exist, nuanced policies that target such factors appear relevant. Future studies implementing such policies in both hospital, clinic and emergency room settings appear necessary.



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TABLES

TABLE 1. Characteristics of Study Respondents and Sites*

Characteristics	N (%)
Age	N=3998
18-25	151 (4)
26-34	340 (9)
35-54	952 (24)
55-64	1103 (28)
65+	1452 (36)
Gender	N=3946
Female	1374 (35)
Male	2572 (65)
Education	N=3970
Less than High School	110 (3)
High School	1080 (27)
Some College	1101 (28)
College	1052 (27)
Graduate Degree or Above	627 (16)
Race	N=3974
White	2802 (71)
African American	731 (18)
Asian	79 (2)
Hispanic	181 (5)
Other/Mixed Race	181 (5)
Number of Different Doctors Seen in the Past Year	N=3987
0	29 (1)
1	250 (6)
2	496 (12)
3	637 (16)
4	606 (15)
5	440 (11)
6 or more	1529 (38)
Geographic Region	N =4062
Midwest	2225
Northeast	449
West	257
South	1131

TABLE 2. Respondent Preferences for Physician Attire (By Setting)

Preference for Physician Attire [by Setting]	Total
Which doctor would you prefer for your primary care physician?	N=3959
Casual	133 (3)
Casual & White Coat	417 (11)
Scrubs	201 (5)
Scrubs & White Coat	586 (15)
Formal	610 (15)
Formal & White coat	1758 (44)
Business Suit	254 (6)
Which doctor would you prefer to see when visiting the ER?	N=3966
Casual	54 (1)
Casual & White Coat	240 (6)
Scrubs	1577 (40)
Scrubs & White Coat	1351 (34)
Formal	113 (3)
Formal & White coat	592 (15
Business Suit	39 (1
Which doctor would you prefer when in the hospital?	N=3946
Casual	61 (2
Casual & White Coat	351 (9)
Scrubs	412 (10)
Scrubs & White Coat	1126 (29)
Formal	280 (7
Formal & White coat	1546 (39)
Business Suit	170 (4
Which doctor would you prefer for your surgeon?	N=3952
Casual	32 (1
Casual & White Coat	151 (4
Scrubs	1648 (42)
Scrubs & White Coat	926 (23)
Formal	150 (4
Formal & White coat	824 (21
Business Suit	221 (6
Overall, which clothes do you feel your doctor should wear?	N=3924
Casual	60 (2)
Casual & White Coat	292 (7
Scrubs	329 (8
Scrubs & White Coat	1013 (26
Formal	340 (9
Formal & White coat	1708 (44)
Business Suit	182 (5)

TABLE 3. Respondent Opinions Regarding Importance of Physician Attire

Opinions Pagarding Influence and Appropriateness of Physician Pross	T
How my doctor dresses is important to me	N=4
Diagrae or Strongly Diagrae	502
Noither Agree per Disagree	1295
Agree or Strengly Agree	2 127
How my doctor drosses influences how happy Lam with the care Lrossive	2,137
Disagree or Strongly Disagree	031
Neither Agree nor Disagree	1620
Agree or Strongly Agree	1 / 59
It is appropriate for a doctor to dress casually when seeing patients over the weekend	N=4
Disagree or Strongly Disagree	857
Neither Agree nor Disagree	1372
Agree or Strongly Agree	1.774
Doctors should wear a white coat when seeing patients in their office.	N=4
Disagree or Strongly Disagree	485
Neither Agree nor Disagree	1321
Agree or Strongly Agree	2,201
Doctors should wear a white coat when seeing patient in the ER.	N=4
Disagree or Strongly Disagree	704
Neither Agree nor Disagree	1519
Agree or Strongly Agree	1,782
Doctors should wear a white coat when seeing patients in the hospital.	N=4
Disagree or Strongly Disagree	346
Neither Agree nor Disagree	1188
Agree or Strongly Agree	2,472
Doctors should always wear a white coat when seeing patients in any setting.	N=4
Disagree or Strongly Disagree	1,022
Neither Agree nor Disagree	1641
Agree or Strongly Agree	1,344

Note: Percentages may not add up to 100 due to rounding.

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FIGURES

Figure 1. Photographs of Model Male and Female Physician in Various Attire Used in Survey Instrument

and Female Physician in Various.

Lence Dom. Figure 2. Rating of Physician Attire Across Preference Domains

Figure 3. Preference for white coat by clinical care setting and physician gender

Le setting a.



Figure 1. Photographs of Model Male and Female Physician in Various Attire Used in Survey Instrument

80x50mm (300 x 300 DPI)

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Average Composite Rating Score 8 8 9 8	I	Ţ	Ţ	I	I	I	I
0							
Domains, mean (SD)	Ŷ						ŶŶ
Knowledgeable	5.4 (2.8)	7.0 (2.3)	6.9 (2.3)	7.4 (2.1)	7.4 (2.1)	8.2 (1.9)	7.3 (2.2)
Trustworthy	6.0 (2.7)	7.3 (2.2)	7.2 (2.3)	7.5 (2.1)	7.5 (2.1)	8.1 (1.9)	7.2 (2.3)
Caring	6.4 (2.6)	7.4 (2.2)	7.5 (2.2)	7.5 (2.1)	7.5 (2.1)	8.0 (2.0)	6.9 (2.4)
Approachable	6.7 (2.6)	7.7 (2.1)	7.6 (2.1)	7.7 (2.1)	7.7 (2.1)	8.0 (2.0)	7.0 (2.4)
Comfortable	6.3 (2.8)	7.5 (2.3)	7.5 (2.3)	7.6 (2.1)	7.5 (2.2)	8.0 (2.0)	6.9 (2.5)

*All comparisons of the composite score are significantly different when compared to the referent group (formal attire + white coat) at p<0.05.

Figure 2. Rating of Physician Attire Across Preference Domains

338x190mm (300 x 200 338x190mm (300 x 300 DPI)



Figure 3. Preference for white coat by clinical care setting and physician gender

80x45mm (300 x 300 DPI)

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BMJ Open 1.A.0 Understanding the Role of Physician Clothing on Patient Opinion

Thank you for taking the time to complete this survey. Your answers will be the us better understand whether physician dress influences patients' opinions of th喜聲的ctor.

Your responses are very important to us. There are no right or wrong a signature and we are interested only in your honest opinions. This survey is brief and should take no more than 5 minutes to complete.

del

In Section A please provide a rating by circling the number on the scale that com/ and similar corresponds to your answer.

In Sections B, C, and D, please provide your one best answer to each autom.

All of your answers will be kept confidential. We will not use names in any notes, reports, or summaries. Your responses will also not be shared with any of your doctors or care providers. bliographique

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Section A – Physician Attire - R	atings							en-20 byrigh		1.	.A.0
Please rate the doctor for each o	f the following questions by circling t	he nu	mber t	hat co	orresp	onds to	o your	angweg			
								cludin			
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	5) How <u>comfortable</u> does this doctor make you feel?	1 So	2 mew	3 hat	4	5	6	12, 2025 at Agen chnoloĝtes.	8 E	9 Extrer	10 mely
	Page 2 of	5	m/cito/		quide	in or ve	tml	ice Bibliographique de l			

136/bmjopen-2017-02123 on 29 May 2018. D Enseignem cted by copyright, including for uses related **BMJ** Open Section B - Physician Attire - Preferences Please provide your ONE best answer to each of the following questions 0 đ text and 5 http://bmjopen.bmj.com/ on June12, 2025jat BES) . mining, Al training, and similar technologies. C A В D E G 6) Which doctor would you prefer for your primary care doctor? (Please select only ONE option) Π П Π A B C D E G 7) Which doctor would you prefer to see when visiting the emergency room? (Please select only ONE option C D Е G В A 8) Which doctor would you prefer to see when in the hospital? (Please select only ONE option) June 12, 2025 at Agence Bibliographique de l Ε C D G A В 9) Which doctor would you prefer for your surgeon? (Please select only ONE option) A B C D Ε G 10) Overall, which clothes do you feel doctors should wear? (Please select only ONE option) С Ε G Α В D Page 3 of 5 For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1		BMJ Open	servinger	
Section C – General Pl	nysician Attire		opyrigi	1./
Please indicate your lev	el of agreement with the	following statements by checking ONE	box to the left of your a	swer.
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12) How my doctor dres	ses influences how happy	I am with the care I receive.	s rela	
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		Page 4 of 5		
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Section D –	- Demographics				pyright.	en 1.A.0	
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0 🗆 0		□ 2	□ 3	□ 4	□ 5 similar te	6 or more	
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44		BMJ Open by copyrig	
	ST	ROBE 2007 (v4) Statement—Checklist of items that should be included in reports of cress-sectional studies	
Section/Topic	ltem #	Recommendation	Reported on page
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract ឆ្លូ ក្នុង	3
		لة من خرج (b) Provide in the abstract an informative and balanced summary of what was done and what متهج المعامي (b) Provide in the abstract an informative and balanced summary of what was done and what متهج المعادي المعادي (b) المعادي المعادي (b) المعادي المعادي (b) المع	3
Introduction	•	aner-	
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported 6	5-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods		a eried and eried	
Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, by -up, and data collection	6-7
Participants	6	(<i>a</i>) Give the eligibility criteria, and the sources and methods of selection of participants	6-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers Give diagnostic criteria, if	8-9
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (meas greenent). Describe comparability of assessment methods if there is more than one group	8-9
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	N/A
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which gould be a solution of the solu	8-9
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	9
		(b) Describe any methods used to examine subgroups and interactions	9
		(c) Explain how missing data were addressed	9
		(d) If applicable, describe analytical methods taking account of sampling strategy	N/A
		(e) Describe any sensitivity analyses	N/A
Results			

		BMJ Open by copyrig	Pag
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, exangined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	9-10
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information of the social social and information of the social social and information of the social social and potential confounders	9-10
		(b) Indicate number of participants with missing data for each variable of interest	Table 1-3
Outcome data	15*	Report numbers of outcome events or summary measures	10-13
Main results	16	(<i>a</i>) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precasion end of the set of	10-13
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful the gradient of the second	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses \mathbf{R}	10-13
Discussion			
Key results	18	Summarise key results with reference to study objectives	14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Dia both direction and magnitude of any potential bias	16
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	15-17
Generalisability	21	Discuss the generalisability (external validity) of the study results	16
Other information		ar te	
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, growth original study on which the present article is based	N/A – No funding

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in controls in case-control studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published exan bless of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine 💁 rg/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.secobe-statement.org.

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Understanding Patient Preference for Physician Attire: A Cross-Sectional Observational Study of Ten Academic Medical Centers in the United States

Journal:	BMJ Open
Manuscript ID	bmjopen-2017-021239.R2
Article Type:	Research
Date Submitted by the Author:	29-Mar-2018
Complete List of Authors:	Petrilli, Christopher; University of Michigan, Internal Medicine Saint, Sanjay; Veterans Affairs Ann Arbor Healthcare System, Internal Medicine; University of Michigan, Internal Medicine Jennings, Joseph; Georgetown University School of Medicine, Internal Medicine Caruso, Andrew; Baylor College of Medicine, Internal Medicine Kuhn, Latoya; University of Michigan, Internal Medicine; Veterans Affairs Ann Arbor Healthcare System, Internal Medicine Snyder, Ashley; University of Michigan, Internal Medicine Chopra, Vineet; University of Michigan, Medicine; Veterans Affairs Ann Arbor Healthcare System, Internal Medicine
Primary Subject Heading :	Patient-centred medicine
Secondary Subject Heading:	Health policy, Communication, Sociology
Keywords:	Health policy < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Protocols & guidelines < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Quality in health care < HEALTH SERVICES ADMINISTRATION & MANAGEMENT, Infection control < INFECTIOUS DISEASES, PUBLIC HEALTH, QUALITATIVE RESEARCH
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Understanding Patient Preference for Physician Attire: A Cross-Sectional Observational Study of Ten Academic Medical Centers in the United States

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- Andrew Caruso, MD (4)
- Latoya Kuhn, MPH (2, 1)
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OBJECTIVE: Several large studies have shown that improving the patient experience is associated with higher reported patient satisfaction, increased adherence to treatment and clinical outcomes. Whether physician attire can affect the patient experience—and how this influences satisfaction— is unknown. Therefore, we performed a national, cross-sectional study to examine patient perceptions, expectations and preferences regarding physicians dress.

SETTING: Ten academic hospitals in the United States.

PARTICIPANTS: Convenience sample of 4,062 patients recruited from June 1, 2015 to October 31, 2016.

PRIMARY AND SECONDARY OUTCOMES MEASURED: We conducted a questionnaire-based study of patients across ten academic hospitals in the United States. The questionnaire included photographs of a male and female physician dressed in seven different forms of attire. Patients were asked to rate the provider pictured in various clinical settings. Preference for attire was calculated as the composite of responses across five domains (knowledgeable, trustworthy, caring, approachable, and comfortable) via a standardized instrument. Secondary outcome measures included variation in preferences by respondent characteristics (e.g., gender), context of care (e.g., inpatient vs. outpatient) and geographic region.

RESULTS: Of 4,062 patient responses, 53% indicated that physician attire was important to them during care. Over one third agreed that it influenced their satisfaction with care. Compared to all other forms of attire, formal attire with a white coat was most highly rated (p=0.001 vs. scrubs with white coat; p<0.001 all other comparisons). Important differences in preferences for attire by clinical context and respondent characteristics were noted. For example, respondents \geq 65 years preferred formal attire with white coats (p<0.001) while scrubs were most preferred for surgeons.

CONCLUSIONS: Patients have important expectations and perceptions for physician dress that vary by context, and region. Nuanced policies addressing physician dress code to improve patient satisfaction appear important.

TRIAL REGISTRATION: Observational study, not registered

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STRENGTHS AND LIMITATIONS OF THIS STUDY

- This is the largest study to date that examines patient preferences for physician attire.
- The study design and survey instrument were carefully designed to limit biases associated with physician images.
- The providers pictured in our survey instrument were young, slender, and Caucasian, which may limit generalizability of findings.
- While soliciting patient responses while hospitalized helps generate validity, it is possible that reported impressions may not reflect actual preferences.

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INTRODUCTION

At its core, the practice of medicine hinges on the patient-physician relationship. From initial introductions, physicians work to build rapport to foster a partnership to provide patient-centered care, defined as that which is: "respectful of, and responsive to, individual patient preferences, needs and values."¹ Not surprisingly, medical school curricula often include courses aimed at improving the patient experience.² Similarly, since 2007, the Centers for Medicare and Medicaid have required hospitals to collect, submit and publicly report the results of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey or risk financial penalties.³ These data are also important because they have been linked to clinical outcomes. For example, a positive correlation between patient satisfaction, improved mortality and reduced 30-day readmissions have been reported.⁴⁻⁸

Although improving the patient experience, and consequently satisfaction, is an important target for many hospitals, how best to do this is unclear. One approach is to understand how physician attire influences the patient experience and develop guidelines based on patients' preferences. Indeed, some healthcare systems across the country have adopted stringent dress codes. In a recently published article, we contacted human resource professionals and administrators at top US News & World Report Hospitals,⁹ and found that five had written guidelines endorsing formal and professional attire. Yet patient preferences for physician attire are not straightforward. In a systematic review, we found that while patients preferred formal attire and white coats overall, attire such as scrubs or casual dress were preferred in specific settings.⁹ These findings make intuitive sense: patients often have notions of how a "professional" should

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> dress and are more likely to respond positively to those that meet these stereotypes. Strategies targeting physician dress may therefore enhance trust and satisfaction.

To date, no studies have examined expressed preferences to physician attire, association to satisfaction, and influencing contextual factors. Therefore, we performed a cross-sectional survey of patients receiving care across the US using a standardized questionnaire to better understand patients' perceived preferences of physician attire across different clinical settings (e.g., hospitalized vs. ambulatory clinic visits). In addition, we aimed to analyze a larger sample of patients from multiple health systems than has been previously reported in the literature.

METHODS

Study design and population

Between June 1, 2015 to October 31, 2016, a total of 6,280 surveys were provided to ten academic medical centers in the United States (US) of which 4,062 surveys were filled and available for analyses (response rate = 65%). The participating sites spanned four main geographic regions of the US. The questionnaire consisted of 22 questions and included photographs of a male and a female physician in various forms of attire. The questionnaire was administered to adult patients that were receiving care in clinics (outpatients) or admitted to the hospital (inpatients). Outpatients were approached in waiting rooms of general medicine and medical subspecialty clinics, while inpatients were approached in their hospital rooms when admitted to non-surgical units. At all sites, the questionnaire was administered by research staff using paper instruments. The surveys were administered during normal

business hours at times convenient to each sites' research staff. Respondents were allowed to request help filling out the form from any visitor accompanying them. The research staff delivered the paper instrument and returned approximately 5-10 minutes later to pick-up the completed form. Respondents provided verbal consent. No identifying information was collected from those that completed the study.

Sample size calculation

It was assumed that responses between two attire forms would be normally distributed on the 1-10 scale between attire types. An estimated standard deviation of 2.2 was used. If our study included at least 816 patients, (assuming a two-sided alpha error of 0.05), we expected to have 90% power to detect differences for effect sizes of 0.50 on the 1-10 scale. Fewer subjects would be needed if the standard deviation were iez smaller.

Patient and Public Involvement

The study was designed to understand patient experience and preferences. However, patients were not included in the design of the survey instrument, recruitment, or conduct of the study. Patients who participated did so anonymously, and therefore the study team will be unable to disseminate the results to study participants.

Study design and data collection

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The questionnaire was developed from a systematic review that examined the role of physician attire on patient preferences and satisfaction.⁹ A multidisciplinary team of psychometricians, research scientists, choice architects, survey experts, and bioethicists developed the study instrument. Each question sought to elicit preferences regarding various forms of physician attire, including: casual, casual with white coat, scrubs, scrubs with white coat, formal, formal with white coat, and business suit (**Figure 1**). Photographs of the same Caucasian male and female physician donning such attire were taken by a professional photographer (Scott Soderberg, Michigan Photography, University of Michigan) with strict attention to facial expressions, pose, lighting, and other non-verbal cues as these may influence preference or likability. The male and female physician models were volunteer members of the research team, and each provided expressed written consent to allow the publication of their photographs.

To avoid bias, 14 different versions of the study instrument were created, and distribution of the questionnaires was randomized to participants. In each version, the gender and attire of the first physician model varied to prevent ordering, priming or anchoring effects (**Supplementary File**). The questionnaire had four sections: in the first section, respondents were asked to rate the physician depicted across five domains including knowledge, trust, care, approachability, and comfort. In the second section, respondents were presented with seven photographs of the same physician wearing different attire and asked to select their preference in various clinical settings. The third and fourth sections sought respondents' general opinions regarding physician attire, demographic data and frequency of interactions with physicians.

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Before administration, the survey instrument was pilot-tested with a convenience sample of patients at the lead site to ensure photographs, questions, ratings, and randomly generated order of the 14 surveys at each site would functioned as desired.

Measurements

Ratings regarding how knowledgeable, trustworthy, caring, and approachable each physician appeared, as well as how comfortable the physician made the respondent feel, were measured using a 1-10 scale, where 1 indicated "somewhat preferred" vs. 10 "extremely preferred." Preference of attire within specific care settings (e.g., primary care, emergency room, hospital, surgery, and overall) was assessed using photos for each of the 7 attire categories. Respondent opinions regarding importance of dress and white coats were collected using a 1-5 Likert scale, where 1 indicated "strongly disagree" and 5 indicated "strongly agree." We assessed patient satisfaction based on agreement with two guestions: "How my doctor dresses is important to me," and "How my doctor dresses influences how happy I am with the care received." For analyses, responses were trichotomized as follows: agreement = strongly agree and agree; neither agree nor disagree; and disagreement = disagree or strongly disagree. Demographics including age, gender, education level, race, and number of physician encounters were collected. Preferences for attire and demographics were dichotomized for bivariate comparison. Questions that were unanswered or where more than one response was entered were excluded.

Outcomes

The primary outcome of interest – preference for attire -- was calculated as the composite average of the five individual rating domains (knowledgeable, trustworthy, caring, approachable, and comfortable). Additionally, variation in preferences for physician attire by respondent characteristics (e.g., gender, age), context of care (e.g., inpatient vs. outpatient) and geographical region (e.g., Northeast, Midwest, South, and West) were also assessed.

Statistical analyses

Data from paper questionnaires were entered independently and in duplicate. Since respondents were not required to answer all questions, the denominator for individual questions (and associated response rate) varied. Descriptive statistics (means, percentage) and standard deviation (SD) were initially 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.² Differences in proportions for categorical data were compared using the Z-test. Bivariate comparisons between respondent age, gender, and level of education and corresponding respondent 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 deemed exempt from regulation by the University

of Michigan Institutional Review Board (HUM00085305).

RESULTS

A total of 4,062 questionnaires were completed by patients across ten academic medical centers in the United States. Respondents represented all parts of the United States including the Northeast, Midwest, South and West. Most patients were surveyed while admitted to the hospital (n=2,616 [64%]); however, a substantial proportion of outpatients were also included (n=1,446 [36%]). Respondents were most often white (71%)and male (65%). The plurality of patients was 65 years of age or older (36%). Seventy percent of those surveyed indicated having attended some college or having college degrees. With respect to interactions with the health system, 38% of respondents reported having seen 6 or more physicians in the past year (**Table 1**).

Ratings of Physician Attire

Respondents rated formal attire with white coat for both male and female physician models as the most preferred form of dress compared to other forms of attire with a mean composite score of 8.1 (SD 1.8) [all pairwise comparisons p<0.001]. Cronbach's alpha for the 5-items included in the composite score was 0. 96.. Ratings for formal attire with white coat were greatest across all domains including how knowledgeable, trustworthy, caring, and approachable the physician appeared as well as how comfortable the physician made the respondent feel. Moreover, these findings were significant in the domains of trustworthiness, caring and how comfortable the physician made the respondent feel in all pairwise comparison testing to other forms of

attire (p<0.05). For the rating of approachability, formal attire with a white coat was not statistically different from scrubs with a white coat or formal without a white coat in pairwise comparison. Scrubs with white coat ranked second overall, with a mean composite score of 7.6 (SD=1.9) followed by formal attire without a white coat with a mean composite score of 7.5 (SD=2.0) (Figure 2).

Preferences for Physician Attire by Care Settings

When examining preferences for physician attire by care setting, important differences emerged. Formal attire with white coat was preferred by respondents for their primary care (44%) and hospital physician (39%). Conversely, scrubs were rated highest for emergency room physicians (40%) and surgeons (42%). In both emergency and surgery settings, scrubs alone were followed in preference by scrubs with white coats (34% and 23%, respectively). When asked, "Overall, which clothes do you feel that your doctor should wear?" most respondents preferred formal attire with white coat (44%) followed by scrubs with white coat (26%) (**Table 2**). Excluding surgeons, respondents universally preferred physicians in white coats over no white coats. When evaluating surgeons, respondents indicated no preference for a white coat on female physicians (p=0.85), but preferred male physicians without white coats (p<0.001). No differences in preference by physician gender in other clinical care settings were noted (**Figure 3**).

Perceived Influence on Satisfaction, Importance and Appropriateness of Physician Attire

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More than half (53%) of the patients surveyed agreed with the statement that how their doctor dresses was important to them, while 36% of respondents agreed with the statement that physician attire influenced how happy they were with the care they received. Views regarding appropriateness of casual attire when physicians see patients on the weekends were mixed: 44% of respondents stated this was appropriate while 56% were either neutral or disagreed with the practice.

Specific questions regarding when physicians should don a white coat elicited various preferences. Most respondents (55%) indicated that they agreed or strongly agreed with the statement that doctors should wear a white coat when seeing patients in the office. In the emergency room, however, 44% agreed with the statement that physicians should wear a white coat when seeing patients vs. 56% that indicated either no preference (38%) or disagreement (18%). When asked whether doctors should wear a white coat when seeing patients (52%) agreed or strongly agreed with this statement (**Table 3**).

Variations in Patient Preferences of Physician Attire

Important variations in patient preferences for attire were noted. For example, female respondents more often preferred scrubs with white coats in emergency room and hospital settings than males (41% vs. 31% [p<0.001] and 32% vs. 27% [p=0.001], respectively). However, both genders indicated formal attire with white coat was overall most preferred (43% and 44%, respectively). In hospital settings, respondents 65 years of age or older frequently preferred formal attire with white coats than younger patients (44% vs. 36%, p<0.001). Conversely, younger patients more often preferred scrubs and

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white coats than formal attire overall (28% vs. 21%, p<0.001). Some differences in preferences regarding physician dress based on respondent education level were also noted. Specifically, respondents with a college degree preferred formal and white coat for their primary care provider more often than those without a college degree (48% vs. 42%, p<0.001).

No differences in preferences between those with three or more physician visits in the preceding year vs. those with less frequent visits were noted. Similarly, preferences for attire did not vary by setting in which respondents were polled, although respondents in the outpatient setting more often preferred doctors in the hospital to wear scrubs and a white coat compared to hospitalized respondents (32% vs. 27%, p=0.002). However, preferences for attire did vary by geographic region. For example, while formal attire and white coats were preferred across all regions, 50% of respondents in the West and 51% in the South selected this as their preferred option compared to 38% and 40% in the Northeast and Midwest, respectively. Conversely, over half of all respondents in the Northeast selected scrubs as their preferred attire for surgeons compared to a quarter of respondents in the South (54% vs. 25%, p<0.001).

DISCUSSION

This study of over 4,000 patients receiving medical care in diverse academic medical centers is the largest to report preferences regarding physician attire in the US. Over half of the participants indicated that how a physician dresses was important to them, with over one in three stating that this influenced how happy they were with care received. Overall, respondents indicated that formal attire with white coats was the most

preferred form of physician dress. However, in settings such as surgery or emergency rooms, scrubs with white coats were most preferred. Although variation in preferences by respondent age, gender, education and geography were noted, these findings indicate that not only do most patients have expectations regarding doctor attire, but that a "professional" look matters most. Given the size, methodological rigor and representativeness of these data, policies addressing physician attire should be considered to improve patient satisfaction.

Previous studies have shown that patients harbor conscious and unconscious biases when it comes to provider dress.^{10 11} Thus, our finding that patients have specific preferences regarding physician attire was not surprising. What this study highlights, however, is the potential importance of physician attire to the physician-patient relationship. Indeed, specific clinical and contextual aspects appear to influence a patient's preconceived notion of 'professional attire'. For instance, we found that the locale where care is delivered (e.g., hospital vs. clinic) as well as context of care (e.g., emergency room or surgery) affected preferences. Similarly, we observed that certain respondent characteristics such as age, gender, and education also influenced their preferences. These findings can potentially be used to improve the patient experience. For instance, providers engaged in care of elderly patients (e.g., geriatric clinics, hospital settings or extended-care facilities) may consider donning formal attire more so than surgeons or emergency room physicians where scrubs may be more important. Similarly, hospitals in southern regions of the US may wish to endorse formal attire and white coats as their preferred policy. For providers in the emergency room and surgical arenas, such attire may in fact be viewed as out of place – and thus different rules might

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be necessary. These examples illustrate how policies for specific doctors, settings or patients can be leveraged to focus on patient-centered care.

How should one interpret these findings given concerns for infection transmission associated with physician dress? Previous studies have shown that bacteria and pathogens can be isolated from white coats, neckties and sleeves of medical providers.¹²⁻²⁰ These studies are one of the reasons why a "bare below the elbows" (BBE) policy exists in some countries. While we did not specifically ask respondents to consider this risk when choosing attire preferences, three aspects deserve discussion. First, despite the abundance of literature on infection prevention, we are unaware of any study that links physician dress to source or transmission of infection. Rather, one study randomly sampled physicians' fingertips and reported no association between BBEcompliant versus non-compliant attire and presence of bacterial colony-forming units or clinically significant organisms.²¹ Second, evidence suggests that other practices (e.g., hand hygiene) may be more relevant than physician dress in preventing infection. In an institution-wide study at Vanderbilt University Medical Center, direct observation combined with financial incentives for appropriate hand hygiene increased compliance with hand hygiene policies and decreased device-associated standardized infection ratios.²² Conversely, wearing a white coat has been associated with increased selective and sustained attentiveness to tasks.²³ These findings suggest that clothing may influence the wearer's own psychological processes, a phenomenon coined "enclothed cognition."²⁴ Therefore, attentiveness to hand hygiene may, in fact, be increased when physicians wear white coats or formal attire – improving patient care and satisfaction.²⁵ ²⁶ Third, we add to the growing body of evidence that suggests patients have important
preferences regarding attire.^{9 10 27-47} As further demonstrated by a recent study, these preferences may evolve over time, as demonstrated by variation in preferences by respondent age.⁴⁸Physician attire may offer an important modifiable variable in the doctor-patient relationship that could improve patient experience and satisfaction and ultimately produce better outcomes.⁴⁹⁻⁵¹

Our study has limitations. First, as with other studies of physician attire, we showed respondents pictures of providers and elicited preferences via a paper questionnaire. Our providers were young, slender, Caucasian and all cared for in academic settings, which may have introduced bias into responses. Similarly, we did not record information for patients who refused to participate in the study, also potentially introducing bias. Second, while approaching patients as they were receiving care helps generate validity, it is possible that reported impressions may not reflect actual preferences on attire but rather current feelings related to their care. Prior studies have shown that the potential impact of attire on patient satisfaction has to be considered in the context of the behaviors and attitude of the physician during the encounter. The survey did not have guestions to capture the other dynamics of the doctor-patient relationship, which may help further explicate responses.⁹ Third, we asked patients to report preferences via Likert scales and predefined categories. Although this allows for a range of answers (including a neither agree or disagree option), such categorizations may force respondents to answer in ways that do not capture their true feelings. Fourth, while the proportion of Caucasian respondents were similar to 2010 Census data estimates, a lower than expected number of Hispanic respondents (5% compared with 16% estimated by the Census data) participated.⁵²

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Thus, whether our findings will hold true across race or ethnicity is not known. Finally, we did not include questions regarding infection transmission given the lack of evidence supporting the notion that white coats or attire is associated with infections.

Our study also has important strengths. First, this is the largest study to examine patient preferences for physician attire. Given methodological strengths including randomization of instrument sequence, as well as inclusion of diverse regions and patient populations, our findings clarify possible dress codes in various healthcare settings. Second, in contrast to other studies, we specifically designed our study and survey instrument to avoid biases associated with images. For example, we hired a professional photographer and studio to ensure photographs of physicians were otherwise identical. Similarly we also used models of the same race (Caucasian) with identical postures and facial expressions so as to limit confounding associated with models of different backgrounds or appearance as has occurred in previous studies.^{29 36} ^{37 39 45} Additionally, we implemented strategies during survey collection such as randomizing order of delivery and images to minimize bias. These approaches help lend a high degree of internal validity to our findings. Third, our findings have policy implications: namely, patients appear to care about attire and may expect to see their doctor in certain ways. Hospitals, clinics, emergency departments and ambulatory surgical centers should consider using these data to set dress codes for physicians providing care in these settings.

In summary, while physician attire cannot replace excellent clinical care, our data suggest that it may influence how patients perceive care and perhaps how willing they are to trust their doctors. In an era of patient-centeredness and patient satisfaction,

physician attire may be an important, modifiable component of patient care. As perceptions and expectations regarding physician dress by patients, context, and region exist, nuanced policies that target such factors appear relevant. Future studies implementing such policies in both hospital, clinic and emergency room settings appear necessary.

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TABLES

TABLE 1. Characteristics of Study Respondents and Sites*

Characteristics	N (%)
Age	N=3998
18-25	151 (4)
26-34	340 (9)
35-54	952 (24)
55-64	1103 (28)
65+	1452 (36)
Gender	N=3946
Female	1374 (35)
Male	2572 (65)
Education	N=3970
Less than High School	110 (3)
High School	1080 (27)
Some College	1101 (28)
College	1052 (27)
Graduate Degree or Above	627 (16)
Race	N=3974
White	2802 (71)
African American	731 (18)
Asian	79 (2)
Hispanic	181 (5)
Other/Mixed Race	181 (5)
Number of Different Doctors Seen in the Past Year	N=3987
0	29 (1)
1	250 (6)
2	496 (12)
3	637 (16)
4	606 (15)
5	440 (11)
6 or more	1529 (38)
Geographic Region	N =4062
Midwest	2225
Northeast	449
West	257
South	1131

TABLE 2. Respondent Preferences for Physician Attire (By Setting)

Preference for Physician Attire [by Setting]	Total
Which doctor would you prefer for your primary care physician?	N=3959
Casual	133 (3)
Casual & White Coat	417 (11)
Scrubs	201 (5)
Scrubs & White Coat	586 (15)
Formal	610 (15)
Formal & White coat	1758 (44)
Business Suit	254 (6)
Which doctor would you prefer to see when visiting the ER?	N=3966
Casual	54 (1)
Casual & White Coat	240 (6)
Scrubs	1577 (40)
Scrubs & White Coat	1351 (34)
Formal	113 (3)
Formal & White coat	592 (15
Business Suit	39 (1
Which doctor would you prefer when in the hospital?	N=3946
Casual	61 (2)
Casual & White Coat	351 (9)
Scrubs	412 (10)
Scrubs & White Coat	1126 (29)
Formal	280 (7)
Formal & White coat	1546 (39)
Business Suit	170 (4)
Vhich doctor would you prefer for your surgeon?	N=3952
Casual	32 (1)
Casual & White Coat	151 (4)
Scrubs	1648 (42)
Scrubs & White Coat	926 (23)
Formal	150 (4)
Formal & White coat	824 (21)
Business Suit	221 (6)
Overall, which clothes do you feel your doctor should wear?	N=3924
Casual	60 (2)
Casual & White Coat	292 (7)
Scrubs	329 (8)
Scrubs & White Coat	1013 (26
Formal	340 (9)
Formal & White coat	1708 (44)
Business Suit	182 (5)

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TABLE 3. Respondent Opinions Regarding Importance of Physician Attire

Opinions Regarding Influence and Appropriateness of Physician Dress	n
How my doctor dresses is important to me.	N=
Disagree or Strongly Disagree	593
Neither Agree nor Disagree	1286
Agree or Strongly Agree	2,137
How my doctor dresses influences how happy I am with the care I receive.	N=
Disagree or Strongly Disagree	931
Neither Agree nor Disagree	1620
Agree or Strongly Agree	1,459
It is appropriate for a doctor to dress casually when seeing patients over the weekend.	N=
Disagree or Strongly Disagree	857
Neither Agree nor Disagree	1372
Agree or Strongly Agree	1,774
Doctors should wear a white coat when seeing patients in their office.	N=
Disagree or Strongly Disagree	485
Neither Agree nor Disagree	1321
Agree or Strongly Agree	2,202
Doctors should wear a white coat when seeing patient in the ER.	N=
Disagree or Strongly Disagree	704
Neither Agree nor Disagree	1519
Agree or Strongly Agree	1,782
Doctors should wear a white coat when seeing patients in the hospital.	N=
Disagree or Strongly Disagree	34
Neither Agree nor Disagree	1188
Agree or Strongly Agree	2,472
Doctors should always wear a white coat when seeing patients in any setting.	N=
Disagree or Strongly Disagree	1,022
Neither Agree nor Disagree	1641
Agree or Strongly Agree	1,344

Note: Percentages may not add up to 100 due to rounding.

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FIGURES

Figure 1. Photographs of Model Male and Female Physician in Various Attire Used in Survey Instrument

and Female Physician in Various.

Lece Dom. Figure 2. Rating of Physician Attire Across Preference Domains

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Figure 3. Preference for white coat by clinical care setting and physician gender

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Figure 1. Photographs of Model Male and Female Physician in Various Attire Used in Survey Instrument. (Photo by Scott Soderberg, Michigan Photography, University of Michigan)

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Figure 3. Preference for white coat by clinical care setting and physician gender. (Photo by Scott Soderberg, Michigan Photography, University of Michigan)



BMJ Open 1.A.0 Understanding the Role of Physician Clothing on Patient Opinion

Thank you for taking the time to complete this survey. Your answers will below better understand whether physician dress influences patients' opinions of th喜聲的ctor.

Your responses are very important to us. There are no right or wrong a signature and we are interested only in your honest opinions. This survey is brief and should take no more than 5 minutes to complete.

In Section A please provide a rating by circling the number on the scale that com/ and similar corresponds to your answer.

In Sections B, C, and D, please provide your one best answer to each autom.

All of your answers will be kept confidential. We will not use names in any notes, reports, or summaries. Your responses will also not be shared with any of your doctors or care providers. bliographique

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Section A – Physician Attire - R	n-20 byrigt	1	A.0							
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Section C – General Ph	ysician Attire			oen-20
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Section/Topic	Item #	Recommendation	Reported on page #
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract ឆ្លូ ក្នុង	3
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Objectives	3	State specific objectives, including any prespecified hypotheses	6
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Study design	4	Present key elements of study design early in the paper	6
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, by -up, and data collection	6-7
Participants	6	(<i>a</i>) Give the eligibility criteria, and the sources and methods of selection of participants	6-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers Give diagnostic criteria, if	8-9
Data sources/	8*	For each variable of interest, give sources of data and details of methods of assessment (meas greenent). Describe	8-9
measurement		comparability of assessment methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	7
Study size	10	Explain how the study size was arrived at	N/A
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which gould be a solution of the solu	8-9
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	9
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	1	ht.	
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, exangined for eligibility,	9-10
		confirmed eligible, included in the study, completing follow-up, and analysed	
		(b) Give reasons for non-participation at each stage	N/A
		(c) Consider use of a flow diagram	N/A
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information $a = 1$	9-10
		(b) Indicate number of participants with missing data for each variable of interest	Table 1-3
Outcome data	15*	Report numbers of outcome events or summary measures	10-13
Main results	16	a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their prectation 25% confidence	10-13
		interval). Make clear which confounders were adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful and period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses.	10-13
Discussion		ning Sp:///	
Key results	18	Summarise key results with reference to study objectives	14
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and	16
		magnitude of any potential bias	
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from	15-17
		similar studies, and other relevant evidence	
Generalisability	21	Discuss the generalisability (external validity) of the study results	16
Other information		ar te ne	
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, fr the original study on	N/A – No fundir
		which the present article is based	

*Give information separately for cases and controls in case-control studies and, if applicable, for exposed and unexposed groups in common studies.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published exam bles of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine grg/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.sgrobe-statement.org.