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Identifying Gender Barriers for Colorectal Cancer Screening and Assessing the Need for a Multigender Endoscopy Team: A Prospective Multicenter Study

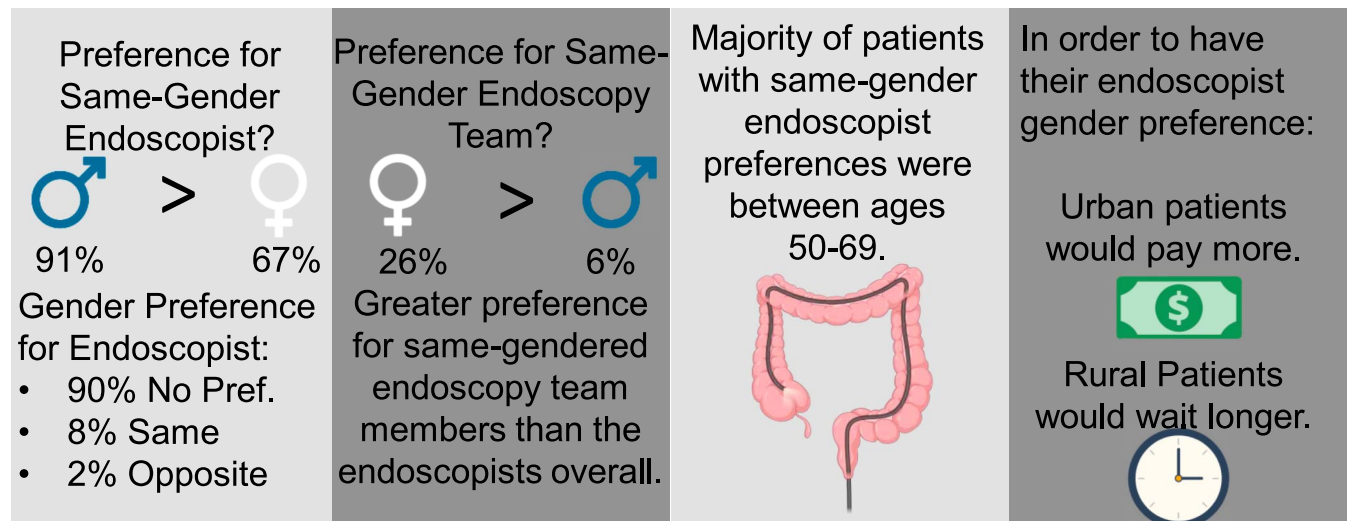
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INTRODUCTION: Gender preferences have been reported as a barrier to colorectal cancer screening, particularly among women. We aim to identify the role of patients' gender preferences for endoscopists and endoscopy team members, with the effect of age-related and regional differences.

METHODS: We conducted an anonymous, voluntary survey of all adult outpatients presenting at our endoscopy centers before their procedures.

Identifying Gender Barriers for CRC Screening and Assessing the Need for a Multi-Gender Endoscopy Team

Anonymous surveys completed by 2138 patients presenting at Endoscopy Centers reveal...



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RESULTS: We received 2,138 (1,207 women, 905 men, and 26 undisclosed; 50% urban and 50% rural) completed surveys. The majority of the patients (89%) did not have an endoscopist gender preference, while 8% preferred a same-gender endoscopist, and 2% preferred an opposite gender endoscopist. Among patients who expressed a gender preference, men more commonly preferred a same-gender endoscopist than women (91% vs 67%, $P < 0.05$). More patients preferred a same-gender endoscopy team member than a same-gender endoscopist (17% vs 8%, $P < 0.05$), and women more commonly preferred a same-gender endoscopy team member than men (26% vs 6%, $P < 0.05$). Most patients who expressed same-gender endoscopist preference were between the ages of 50–69 years as compared to other age groups ($P < 0.05$). Of the urban patients, 9% expressed a same-gender endoscopist preference and 3% expressed an opposite gender preference, compared with 7% and 2% of rural patients ($P < 0.05$). Among patients with any endoscopist gender preference, rural patients were more willing to wait longer (41% vs 21%, $P < 0.05$), whereas urban patients were willing to pay more (64% vs 14%, $P < 0.05$) to have their preferences met.

DISCUSSION: Contrary to previous studies, most patients did not have an endoscopist gender preference. Interestingly, men had more same-gender endoscopist preference, whereas women had more same-gender endoscopy team member preference. Age-related and regional differences exist among patients' gender preferences for their endoscopist and endoscopy team member, and addressing these preferences while creating an environment of a multigender endoscopy team may be beneficial in improving colorectal cancer screening.

SUPPLEMENTARY MATERIAL accompanies this paper at <http://links.lww.com/AJG/C35>

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INTRODUCTION

Screening and surveillance colonoscopy examinations have shown to reduce the incidence and mortality of colorectal cancer (CRC) (1). Despite well-published guidelines from various societies, there is still lack of adherence to screening protocols from patients because of various reasons (2–6). One of the barriers to undergoing colonoscopy, particularly among women, has been the endoscopists' gender (4,7). Many studies have demonstrated that women prefer same-gender endoscopists to perform their endoscopic procedures and that they may be willing to delay their procedure or incur additional personal expense to ensure their gender concordant endoscopist (4,7–12). Additional investigations have also identified that there is gender preference for endoscopy nurses/assistants among women which may also influence successful CRC screening (13).

Our study aims to identify significant gender preferences for endoscopists and endoscopy team members across 2 different healthcare systems. Our secondary outcomes were to compare gender preferences across different age groups, as well as rural vs urban environments to assess for regional variances. We also hope to understand the reasoning behind these preferences and how they may impact attitudes and beliefs toward further endoscopic procedures. Ultimately, addressing these barriers to endoscopy may lead to increased CRC screening compliance.

METHODS

A prospective, multicenter study was conducted across 2 different healthcare systems: Geisinger Health System (Danville, PA; Rural) and Nuvance Health Norwalk Hospital (Norwalk, CT; Urban). We define gender as one's self-perception of their identity as either male or female. We define an urban population by an area containing greater than 50,000 people and a rural population by an area of less than 5,000 people. The protocol was approved by the institutional review boards at both hospitals.

The surveys were anonymous, voluntary, and offered to all adult outpatients as they arrived at endoscopy centers before their procedures and not connected to the patient's health records in any way.

The survey contained an information sheet explaining the study and a 1-page questionnaire consisting of 17 questions. Survey questions queried demographic information including level of education, socioeconomic status, type of procedure being performed, and preference for their endoscopist's gender and/or endoscopy team member. Patients were additionally asked if they would be more likely to follow-up on repeat endoscopic procedures and if they would be willing to wait longer than 30 days or pay more money for the procedure for the availability of their gender preference. If patients did have a gender preference for their endoscopist, they were asked for the reasons behind it. Patients were asked if they would avoid colonoscopy altogether if their preferences were not available. In addition, patients were asked the gender of their primary care physician (PCP), gender of their gynecologist (if female patient), and payer details.

Statistical analysis

Categorical variables are described using frequency counts and percentages, and continuous variables are described using mean values and SDs. The number and percentage of missing responses are described but are excluded from tests of comparison between groups. The percentages described in the Results section are calculated based on the number of patients who responded to each question. In other words, nonresponse patients are excluded from the denominators when calculating percentages. Groups were compared using Pearson χ^2 tests or Fisher exact tests for categorical variables and Student t test for continuous variables. McNemar tests were used to compare dependent proportions. All values were rounded to the nearest whole number for presentation only. Close values were expressed as decimals to highlight differences.

RESULTS

Patient demographics

A total of 2,138 surveys were accepted from both centers with a response rate of 34%; 1,207 (57%) were female patients, 905 (42%) were male patients, and 26 (1%) patients did not report their gender (Table 1). The mean age was 57.1 years (SD = 13.4). Although a

Table 1. Patient Demographics: Overall and Rural vs Urban Communities

	Overall (n = 2,138)	Rural (n = 1,061)	Urban (n = 1,077)	P value
Age, mean (SD) n, missing = 12	57.1 (13.4)	56.4 (13.8)	57.8 (12.9)	<0.05
	n (%)	n (%)	n (%)	
Gender		0.34		
Female	1,207 (57)	608 (58)	599 (56)	
Male	905 (43)	437 (42)	468 (44)	
Missing	26 (1.2)	16 (1.5)	10 (0.9)	
Ethnicity				<0.05
White	1,860 (89)	989 (96)	871 (82)	
Nonwhite	233 (11)	47 (5)	186 (18)	
Missing	45 (2.1)	25 (2.4)	20 (1.9)	
Family income				<0.05
<\$50,000	714 (41)	515 (53)	199 (26)	
\$50,000 to \$100,000	520 (30)	312 (32)	208 (27)	
>\$100,000	496 (29)	138 (14)	358 (47)	
Missing	408 (19.1)	96 (9)	312 (29)	
Marital status				0.07
Single	303 (16)	178 (17)	125 (14)	
Married	1,317 (67)	686 (65)	631 (70)	
Divorced/separated	213 (11)	126 (12)	87 (10)	
Widowed	123 (6)	69 (7)	54 (6)	
Missing	182 (8.5)	2 (0.2)	180 (16.7)	
Education				<0.05
High school	1,044 (54)	742 (71)	302 (34)	
Bachelor's degree	478 (25)	166 (16)	312 (35)	
Postgraduate degree	404 (21)	133 (13)	271 (31)	
Missing	212 (9.9)	20 (1.9)	192 (17.8)	
Procedure route				<0.05
Upper GI only	582 (28)	322 (31)	260 (25)	
Lower GI	1,518 (72)	716 (69)	802 (76)	
Missing	38 (1.8)	23 (2.2)	15 (1.4)	

GI, gastrointestinal.

majority of the overall patients were white (89%), a larger proportion of urban patients were nonwhite compared with rural patients (18% vs 5%, $P < 0.05$). We received 1,077 (50%) surveys from the urban community and 1,061 (50%) from the rural community. Of the urban group, 47% earned more than \$100,000 compared with 14% of patients in the rural community ($P < 0.05$). In the rural area, there were significantly more patients whose highest level of education was at the high school level (71%), whereas the urban area had higher levels of education ($P < 0.05$). A majority of patients (72%) underwent a lower GI procedure.

Overall patient preferences

Most patients (89%, 1,902/2,138) indicated that they did not have an endoscopist gender preference, while 8% (172/2,138) expressed a same-gender endoscopist preference, 2% (48/2,138) expressed a preference for the opposite gender, and 1% (16/2,138) were missing a

response (Table 2 and Supplementary Table 1, Supplementary Digital Content 1, <http://links.lww.com/AJG/C35>). It was significantly more common for men (11%, 95/905) to prefer a same-gender endoscopist compared with women (6%, 77/1,207; $P < 0.05$; Figure 1). For endoscopy team preferences, more patients preferred same-gender teams than same-gender endoscopists (17% vs 8%, $P < 0.05$). Of the patients with any endoscopist gender preference, 41% were more likely to follow-up on repeat endoscopic procedures, 31% were willing to wait longer, and 42% of patients would pay more for the availability of their preference. Furthermore, 27% indicated they would avoid colonoscopy if they could not get their preferred gender.

Characteristics of patients with same-gender endoscopist preferences

A total of 172 patients preferred a same-gender endoscopist (Table 3). Patients undergoing a lower GI procedure were more likely to have a

Table 2. Overall patient preferences and rural vs urban comparisons

	Overall (n = 2,138) n (%)	Rural (n = 1,061) n (%)	Urban (n = 1,077) n (%)	<i>P</i> -value
Endoscopist gender preference				<0.05
Same-gender preference	172 (8)	71 (7)	101 (9)	
Opposite gender preference	48 (2)	18 (2)	30 (3)	
No preference	1,902 (89)	963 (92)	939 (88)	
Missing/Unknown	16 (0.7)	9 (0.8)	7 (0.6)	
Any gender preference among women with a gender preference				<0.05
Male	38 (33)	10 (19)	28 (45)	
Female	77 (67)	43 (81)	34 (55)	
Any gender preference among men with a gender preference				<0.05
Male	95 (91)	28 (78)	67 (97)	
Female	10 (10)	8 (22)	2 (3)	
Prefer the same gender on team				0.84
Yes	368 (17)	181 (17)	187 (18)	
Does not make a difference	1,742 (83)	867 (83)	875 (82)	
Missing	28 (1.3)	13 (1.2)	15 (1.4)	
If able to choose, more likely to follow up (among those with any preference)				0.59
Yes	87 (41)	34 (39)	53 (43)	
Does not make a difference	124 (59)	53 (61)	71 (57)	
Missing	11 (5)	3 (3.3)	8 (6.1)	
If gender preference, willing to wait longer (among those with any preference)				<0.05
Yes	51 (31)	34 (41)	17 (21)	
No	114 (69)	49 (59)	65 (79)	
Missing	57 (25.7)	7 (7.8)	50 (37.9)	
If gender preference, pay more (among those with any preference)				<0.05
Yes	56 (42)	8 (14)	48 (64)	
No	78 (58)	51 (86)	27 (36)	
Missing	88 (39.6)	31 (34.4)	57 (43.2)	

The bold entries highlight the statistically significant *P* values.

same-gender endoscopist preference compared with patients undergoing an upper GI procedure (10% vs 4%, $P < 0.05$). Among patients who knew the gender of their endoscopist, those with female endoscopists were more likely to express a same-gender preference than patients with male endoscopists (19% vs 8%, $P < 0.05$). In addition, 23% of patients who preferred same-gender team members also preferred a same-gender endoscopist compared with 5% of patients who did not have team member preferences ($P < 0.05$). Among men with same-gender endoscopist preferences, 12% had male PCPs compared with 5% that had female PCPs ($P < 0.05$). Among women with same-gender endoscopist preferences, 8% had female PCPs compared with 6% that had male PCPs; however, this was not found to be statistically significant ($P = 0.41$). Among female patients who saw a gynecologist, it was more common for those with female

gynecologists to have a same-gender endoscopist preference than patients with male gynecologists (9% vs 3%, $P < 0.05$). The proportion of patients with same-gender endoscopist preferences that would be more likely to follow-up if given their preference, wait longer, or pay more for their preference were 44%, 32%, and 45%, respectively.

Same-gender endoscopist preferences based on patients' gender

Women with a same-gender preference more frequently expressed willingness to wait for their chosen endoscopist gender than men (42% vs 22%, $P < 0.05$) (Table 4). Among patients with a same-gender endoscopist preference, men more frequently cited "better skills" as a reason for their preference (57% vs 40%,

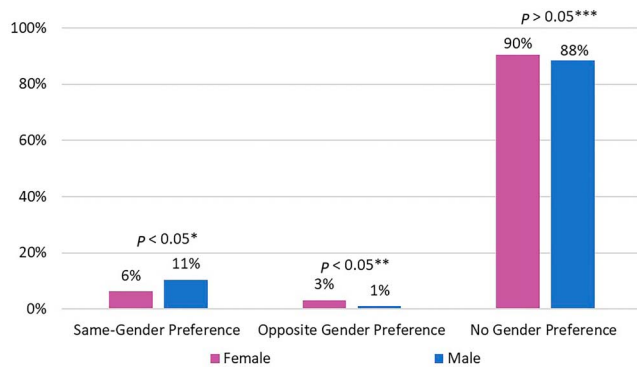


Figure 1. Patient preferences for endoscopist's gender. *Same-gender preference vs other preferences. **Opposite gender preference vs other preferences. ***No gender preference vs other preferences.

$P < 0.05$), whereas women more frequently cited “more compassionate” (20% vs 10%) and “less embarrassing” (41% vs 31%) as reasons for their preference ($P = \text{NS}$).

Characteristics of patients who prefer a same-gender endoscopy team member

Of 2,138 surveys, 2,110 patients (99%) responded to the same-gender endoscopy team member preference question (Table 5). Of these, 368 patients (17%) expressed a preference for a same-gender endoscopy team member, without any significant differences between the 2 sites. It was more common for women to prefer a same-gender endoscopy team member than men (26% vs 6%, $P < 0.05$) (Figure 2). Regarding ethnicity, 24% of nonwhite individuals had a same-gender preference for endoscopy team member as compared to 17% of white patients ($P < 0.05$).

Patients who underwent a lower GI procedure, compared with an upper GI procedure, were more likely to prefer a same-gender endoscopy team member (19% vs 14%, $P < 0.05$). Patients who had a same-gender endoscopist preference were more likely to also prefer a same-gender endoscopy team member than patients who had no preference for their endoscopists' gender (49% vs 15%, $P < 0.05$). Women who preferred female endoscopists were more likely to also prefer a same-gender endoscopy team member compared with women who either preferred a male endoscopist or had no preference (70% vs 23%, $P < 0.05$). Patients who preferred both same-gender endoscopists and team members reported that the most common reason for their preference was for it to be “less embarrassing” compared with those without a same-gender endoscopy team member preference (40% vs 22%, $P < 0.05$), and these patients were also more likely to say they would avoid a colonoscopy if they were unable to get their gender preference (36% vs 19%, $P < 0.05$).

Characteristics and patient preferences based on age group

Of the 2,138 respondents, 2,126 patients (99%) reported their age (Table 6). There were 455 (21%) patients aged 18–49 years, 720 (34%) aged 50–59 years, 588 (28%) aged 60–69 years, and 363 (17%) aged 70 years and older. Of the 172 patients with same-gender endoscopist preferences, 9% were aged 50–59 years, 9% were aged 60–69 years, 8% were aged 70 years and older, and 6% were aged 18–49 years ($P < 0.05$). The proportion of patients with no preference ranged from a high of 94% in the youngest age group

to a low of 88% in the oldest age group. Among women with an endoscopist gender preference, the age group 70 years and older had the highest proportion (68%) of opposite gender preferences and the age group 18–49 years had the highest proportion (93%) of same-gender preferences, compared with other age groups ($P < 0.05$). There were no overall differences in patient preference for a same-gender team member by age group ($P = 0.55$).

Younger women in age group 18–49 years had the highest proportion of same-gender PCPs (53%) and gynecologists (55%) as compared to other age groups ($P < 0.05$). Women aged 70 years and older had predominately male PCPs (67%) as compared to other age groups ($P < 0.05$). The age group 18–49 years had the highest proportion (47%) of upper GI procedures, and the 50–59 years' age group had the highest proportion (84%) of lower GI procedures compared with other age groups ($P < 0.05$).

Comparison of patient preferences and characteristics: rural vs urban communities

We received 50% (1,077/2,138) surveys from the urban community and 50% (1,061/2,138) from the rural community (Table 2 and Supplementary Table 1, Supplementary Digital Content 1, <http://links.lww.com/AJG/C35>). Of the urban patients, 9% (101/1,077) expressed a same-gender preference and 3% (30/1,077) expressed an opposite gender preference, compared with 7% (71/1,061) and 2% (18/1,061) of rural patients ($P < 0.05$) (Figure 3). However, women in the rural community with an endoscopist gender preference were more likely to prefer same-gender endoscopists compared with women with an endoscopist preference at the urban community (81% vs 55%, $P < 0.05$). Alternatively, among men with an endoscopist gender preference, those from the urban community were more likely to prefer same-gender endoscopists compared with men from the rural community (97% vs 78%, $P < 0.05$). There were no significant differences in endoscopy team member preferences or likelihood to follow-up for subsequent procedures between both communities.

Among patients with any endoscopist gender preference, the rural patients were more willing to wait longer (41% vs 21%, $P < 0.05$), whereas the urban patients were more willing to incur higher expense (64% vs 14%, $P < 0.05$) to have their preferences met.

Urban patients with any endoscopist gender preference were more likely to cite “better skills” as the reason for their preference (70% vs 14%, $P < 0.05$), while the rural patients were more likely to cite “less embarrassing” for their preference (61% vs 11%, $P < 0.05$). Among patients with any endoscopist gender preference, a greater proportion of patients from the urban community reported they would avoid a colonoscopy if they could not get their gender preference (40% vs 11%, $P < 0.05$).

Among rural female patients, 53% had same-gender PCPs compared with 39% in the urban community, and among urban male patients, 86% had same-gender PCPs compared with 69% in the rural community ($P < 0.05$). Furthermore, most female patients at both sites had female gynecologists (49%).

Characteristics of patients with opposite gender preference for endoscopist

Overall, there were 48 patients who expressed an opposite gender endoscopist preference. These patients were predominantly female (79%), were older than men (mean age 67.9 vs 52.6, $P < 0.05$), and more frequently located in the urban community (74% vs 20%, $P < 0.05$). The majority of these women had male PCPs (81%) and male

Table 3. Characteristics of patients with same-gender endoscopist preferences

	All with same-gender preference or no preference (n = 2,074) ^a	Same-gender preference (n = 172)	No gender preference (n = 1,902)	P value
Age, mean (SD) n, missing = 9	56.9 (13.3)	57.6 (12.5)	56.9 (13.4)	0.47
	n (%)	n (%)	n (%)	
Site				<0.05
Rural	1,034 (50)	71 (7)	963 (93)	
Urban	1,040 (50)	101 (10)	939 (90)	
Procedure route				<0.05
Upper GI only	561 (28)	24 (4)	537 (96)	
Lower GI	1,477 (73)	141 (10)	1,336 (91)	
Missing	36 (1.7)	7 (19.4)	29 (80.6)	
Endoscopist gender when known				<0.05
Male	1,486 (90)	120 (8)	1,366 (92)	
Female	171 (10)	33 (19)	138 (81)	
Prefer the same gender on team				<0.05
Yes	358 (17)	81 (23)	277 (77)	
Does not make a difference	1,697 (83)	83 (5)	1,614 (95)	
Missing	19 (0.9)	8 (42.1)	11 (57.9)	
Gender of primary care physician among men				<0.05
Male	684 (78)	80 (12)	604 (88)	
Female	174 (20)	9 (5)	165 (95)	
Both	7 (1)	2 (29)	5 (71)	
Do not see one	15 (2)	3 (20)	12 (80)	
Missing	11 (1.2)	1 (9.1)	10 (90.9)	
Gender of primary care physician among women				0.41
Male	593 (52)	34 (6)	559 (94)	
Female	537 (47)	42 (8)	495 (92)	
Both	1 (0.1)	0 (0)	1 (100)	
Do not see one	21 (2)	1 (5)	20 (95)	
Missing	9 (0.8)	0 (0)	9 (100)	
If female, gender of gynecologist				<0.05
Female	554 (59)	51 (9)	503 (91)	
Male/both	379 (41)	13 (3)	366 (97)	
Missing or do not see one	228 (19.6)	13 (5.7)	215 (94.3)	

The bold entries highlight the statistically significant *P* values.

GI, gastrointestinal.

^a48 patients who expressed an opposite gender preference and 16 patients with missing data are excluded from the comparison.

gynecologists (41%). Men and women did not differ in their reasoning for choosing opposite gender endoscopists.

DISCUSSION

Many studies have previously suggested that gender preferences strongly influence the pursuit of endoscopic evaluation, particularly among women (4,7–12). Our study is the largest conducted to date evaluating the relationship between patients’ gender

preferences for not only their endoscopists but also for endoscopy team members. Our survey pool consisted of 2 unique groups which ultimately allowed for evaluation of a broader socioeconomic, ethnic, and cultural population, not previously reported.

Most patients in our study (89%) did not have endoscopist gender preferences, wherein only 8% had same-gender endoscopist preferences and 2% had opposite gender endoscopist preferences. Moreover, 11% of men had a same-gender endoscopist preference compared with 7% of women (*P* < 0.05). This observation was

Table 4. Same-gender endoscopist preferences based on patients' gender

	Patients with a same-gender endoscopist preference (n = 172) n (%)	Female (n = 77) n (%)	Male (n = 95) n (%)	P value
If gender preference, willing to wait longer				<0.05
Yes	43 (32)	28 (42)	15 (22)	
No	92 (68)	39 (58)	53 (78)	
Missing	37 (21.5)	10 (13)	27 (28.4)	
Reasons for gender preference				
More compassionate				0.12
Yes	21 (15)	13 (20)	8 (10)	
No	122 (85)	53 (80)	69 (90)	
Missing	29 (16.9)	11 (14.3)	18 (18.9)	
Better skills				<0.05
Yes	70 (49)	26 (39)	44 (57)	
No	73 (51)	40 (61)	33 (43)	
Missing	29 (16.9)	11 (14.3)	18 (18.9)	
Less embarrassing				0.23
Yes	51 (36)	27 (41)	24 (31)	
No	92 (64)	39 (59)	53 (69)	
Missing	29 (16.9)	11 (14.3)	18 (18.9)	

The bold entries highlight the statistically significant *P* values.

unexpected and contradictory to previous studies conducted that predominantly demonstrate women having more same-gender endoscopist preferences than men, ranging from 32% to 95% (4,7–15). These overall preferences may differ from previous literature as our study had more socioeconomic diversity, higher power, and involved a multicenter patient population.

Unsurprisingly, patients who underwent lower GI procedures were more likely to prefer same-gender endoscopists, given the invasive and exposing nature of the procedure. Although some women cited “less embarrassing” and “more compassionate” as reasons for their endoscopist gender preferences, it is plausible that there may have been feelings of fear or previous trauma associated with the procedure (16). In a study assessing beliefs and attitudes among men and women in regards to CRC screening by flexible sigmoidoscopy, participants who did not report being frightened about the procedure had higher odds of being up to date with CRC screening compared with those who reported higher levels of fear (odds ratio = 3, 95% confidence interval = 1.4–6.3). In addition, women were more willing to have a flexible sigmoidoscopy performed if they had a same-gender endoscopist ($P < 0.05$) (7). In addition, being accustomed to receiving medical care from same-gender healthcare providers in other disciplines may create a preference in having a same-gender endoscopist. Women with female gynecologists were found to prefer same-gender endoscopists more than women with male gynecologists ($P < 0.05$) and would be willing to wait longer for their preferences than men ($P < 0.05$). In a questionnaire provided to 202 women, 43% preferred a female endoscopist, and of these, 87% would be willing to wait an additional 30 days, and 14% would be willing to pay more for their preference. The primary reason women cited for same-gender

endoscopists was that it would be less embarrassing (4). Addressing patient concerns and attitudes about screening are paramount in improving CRC screening adherence.

The gender of endoscopy team members was also found to be integral to the patient's endoscopy experience. It was interesting that more patients in our study preferred a same-gender team member (17%) than they did for a same-gender endoscopist (8%, $P < 0.05$). This may indicate that the presence of a multigender endoscopy team may be more important to patients than the gender of the endoscopists themselves. Our study demonstrated that women were more likely to have an endoscopy team member gender preference than men ($P < 0.05$), and women who preferred a same-gender endoscopist were more likely to prefer a same-gender team member compared with women with opposite or no gender preference of the endoscopist ($P < 0.05$).

Oftentimes, patients undergoing endoscopic procedures have more interaction with the endoscopy team than the endoscopists themselves, and this may influence their screening and surveillance. We found that patients cited “less embarrassing” as a reason for their endoscopy team member gender preference as compared to those without team member preferences ($P < 0.05$). In a study of 470 individuals, women expressed a higher gender preference for the assistants (overall 75%; female [73%] and male [1%]) than for the endoscopists (overall 70%; female [68%] and male [2%]). Overall, a third of the participants would decline screening colonoscopy if their gender preferences for either endoscopist or assistants were not met (13). Similarly, our study demonstrated that those with both endoscopist and team member gender preferences were more likely to follow-up if their preferences were available ($P < 0.05$) and would avoid a colonoscopy if their preferences were not available ($P < 0.05$). This

Table 5. Characteristics of patients with preference for same-gender endoscopy team members

	Preference or no preference for the same gender on team (n = 2,110) ^a n (%)	Preference for the same gender on team (n = 368) n (%)	No preference for the same gender on team (n = 1,742) n (%)	P value
Site				0.84
Rural	1,048 (50)	181 (17)	867 (83)	
Urban	1,062 (50)	187 (18)	875 (82)	
Gender				<0.05
Female	1,193 (57)	307 (26)	886 (74)	
Male	891 (43)	55 (6)	836 (94)	
Missing	26 (1.2)	6 (23.1)	20 (76.9)	
Ethnicity				<0.05
White	1,841 (89)	307 (17)	1,534 (83)	
Nonwhite	226 (11)	55 (24)	171 (76)	
Missing	43 (2)	6 (14)	37 (86)	
Procedure route				<0.05
Upper GI only	578 (28)	80 (14)	498 (86)	
Lower GI	1,496 (72)	280 (19)	1,216 (81)	
Missing	36 (1.7)	8 (22.2)	28 (77.8)	
Endoscopist gender preference				<0.05
Same-gender preference	164 (8)	81 (49)	83 (51)	
Opposite gender preference	43 (2)	4 (9)	39 (91)	
No preference	1,891 (90)	277 (15)	1,614 (85)	
Missing	12 (0.6)	6 (50)	6 (50)	
Any endoscopist gender preference among women				<0.05
Female	74 (6)	52 (70)	22 (30)	
No preference/male	1,113 (94)	251 (23)	862 (77)	
Missing	6 (0.5)	4 (66.7)	2 (33.3)	
Any endoscopist gender preference among men				<0.05
Male	90 (10)	29 (32)	61 (68)	
No preference/female	799 (90)	26 (3)	773 (97)	
Missing	2 (0.2)	0 (0)	2 (100)	

The bold entries highlight the statistically significant *P* values.

GI, gastrointestinal.

^a28 patients who did not respond to the question about same-gender endoscopy team member preferences are excluded.

further supports that a multigender endoscopy team may enhance overall CRC screening.

Age differences among patients were found to be influential in their preferences. Overall, patients aged 50 years and older had a higher proportion of same-gender endoscopist preferences, and they more often underwent lower GI procedures compared with the younger age group ($P < 0.05$ and $P < 0.05$, respectively). These findings could suggest that older generations may be more sensitive to the exposure of genitalia compared with younger generations. Furthermore, the proportion of patients with no preference was highest among the youngest age group (94%, $P < 0.05$).

On the other hand, the youngest female age group with an endoscopist gender preference predominately preferred a same-

gender endoscopist (93%, $P < 0.05$). This female age group was also found to have predominately female PCPs (53%) and female gynecologists (55%, $P < 0.05$). Interestingly in these age group comparisons, same-gender endoscopy team member preferences were not found to be statistically significant. Acknowledging the presence of age-related attitudes and beliefs toward endoscopic procedures may allow physicians to address these concerns.

Significant differences were observed between our rural and urban regions. Patients in urban environments had more same-gender endoscopist preferences (9% vs 7%, $P < 0.05$) which may be due to the greater availability of healthcare options afforded to more densely populated areas. Women in the rural community,

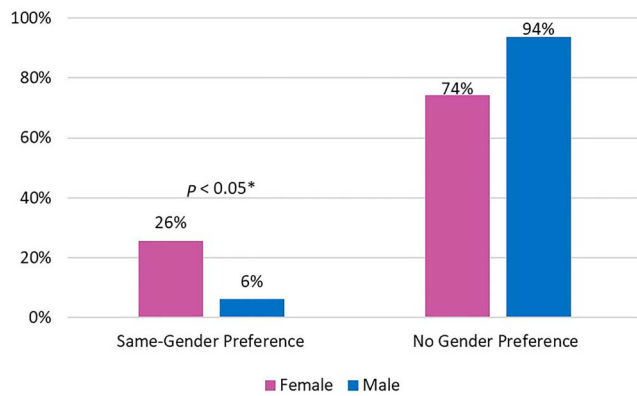


Figure 2. Patient preferences for the same-gender endoscopy team. *Same-gender preference vs no gender preference.

however, were more likely to prefer a same-gender endoscopist, and rural patients overall were more likely to wait longer for their preference and cite “less embarrassing” as a reason for their choice. It is possible in our rural community that female gender, lower socioeconomic status, and lower level of education may have contributed to these observed trends. In a prospective study of 500 patients scheduled for elective outpatient endoscopy, 33% had a preference for their endoscopist (165/500; 95% confidence

interval 29–37) and contributing factors were female gender, lower income level, and history of physical/emotional abuse. Of note, 59% had a high school education or less (16). In another prospective study of 946 individuals undergoing endoscopy, 25% preferred a same-gender endoscopist, and some of the factors associated with choosing a same-gender endoscopist were female gender and lower education (14). Alternatively, higher education and greater affluence as seen in our urban patients may have driven a greater willingness to pay more and even avoid CRC screening if their preferences were not available. In a prospective study of 358 women, 32% of women preferred a female colonoscopist and factors associated with same-gender preference was a higher education, younger age, being single, and employed (15). In regards to age, similar findings were found in our study in which the youngest female age group had the highest proportion of same-gender preference compared with other age groups ($P < 0.05$). Patients in our urban community were more likely to cite “better skills” as the reason for their preferences which may speak to the value placed on higher education and technical skills over feelings of embarrassment, based on gender alone.

Interestingly, of the 48 patients with opposite gender endoscopist preferences, we observed that these were predominantly older, urban, female patients, and they had mostly male PCPs (81%) and male gynecologists (41%). It is plausible that these women may have been accustomed to having male healthcare

Table 6. Characteristics and patient preferences by age group

	Overall (n = 2,138) n (%)	Age 18–49 years (n = 455) n (%)	Age 50–59 years (n = 720) n (%)	Age 60–69 years (n = 588) n (%)	Age 70 years and older (n = 363) n (%)	P value
Endoscopist gender preference						<0.05
Same-gender preference	172 (8)	25 (6)	67 (9)	52 (9)	27 (8)	
Opposite gender preference	48 (2)	4 (1)	14 (2)	13 (2)	16 (4)	
No preference	1,902 (90)	423 (94)	634 (89)	520 (89)	317 (88)	
Missing/unknown	16 (0.7)	3 (0.7)	5 (0.7)	3 (0.5)	3 (0.8)	
Any gender preference among women with a gender preference						<0.05
Male	38 (33)	1 (7)	10 (23)	12 (34)	15 (68)	
Female	77 (67)	14 (93)	33 (77)	23 (66)	7 (32)	
Any gender preference among men with a gender preference						0.21
Male	95 (91)	11 (79)	34 (90)	29 (97)	20 (95)	
Female	10 (10)	3 (21)	4 (11)	1 (3)	1 (5)	
Prefer the same gender on team						0.55
Yes	368 (17)	84 (19)	129 (18)	95 (16)	56 (16)	
Does not make a difference	1,742 (83)	366 (81)	579 (82)	487 (84)	303 (84)	
Missing	28 (1.3)	5 (1.1)	12 (1.7)	6 (1)	4 (1.1)	
Gender of primary care physician among men						0.33
Male	692 (78)	115 (72)	252 (78)	197 (79)	126 (81)	
Female	177 (20)	37 (23)	66 (20)	47 (19)	26 (17)	
Both	7 (0.8)	1 (0.6)	2 (0.6)	3 (1.2)	1 (0.6)	

Table 6. (continued)

	Overall (n = 2,138) n (%)	Age 18–49 years (n = 455) n (%)	Age 50–59 years (n = 720) n (%)	Age 60–69 years (n = 588) n (%)	Age 70 years and older (n = 363) n (%)	P value
Do not see one	16 (2)	6 (4)	4 (1)	3 (1)	3 (2)	
Missing	13 (1.4)	2 (1.2)	2 (0.6)	6 (2.3)	2 (1.3)	
Gender of primary care physician among women						<0.05
Male	624 (52)	129 (44)	190 (50)	168 (53)	132 (67)	
Female	547 (46)	153 (53)	183 (48)	148 (46)	63 (32)	
Both	2 (0.2)	0 (0)	0 (0)	1 (0.3)	1 (0.5)	
Do not see one	21 (2)	9 (3)	6 (2)	3 (1)	2 (1)	
Missing	13 (1.1)	2 (0.7)	4 (1)	4 (1.2)	3 (1.5)	
If female, gender of gynecologist						<0.05
Male	383 (33)	103 (36)	134 (36)	89 (29)	55 (30)	
Female	567 (49)	158 (55)	188 (50)	157 (50)	60 (33)	
Both	11 (1)	7 (3)	2 (1)	2 (1)	0 (0)	
Do not see one	200 (17)	17 (6)	52 (14)	64 (21)	67 (37)	
Missing	46 (3.8)	8 (2.7)	7 (1.8)	12 (3.7)	19 (9.5)	
Procedure route						<0.05
Upper GI only	582 (28)	209 (47)	114 (16)	141 (25)	114 (32)	
Lower GI	1,518 (72)	236 (53)	597 (84)	435 (76)	242 (68)	
Missing	38 (1.8)	10 (2.2)	9 (1.3)	12 (2)	7 (1.9)	

The bold entries highlight the statistically significant P values.
GI, gastrointestinal.

providers and thus preferred a male gender endoscopist. Men and women did not differ in their reasoning for having opposite gender endoscopist preferences.

Our study did have a few limitations. We did not assess whether individuals had any previous experience with endoscopy in the past. This may have altered attitudes and beliefs about their endoscopic procedure and ultimately influenced gender preferences. According to Lahat et al. (14), those who had a previous endoscopic procedure were significantly less likely to have a gender preference than unexperienced patients. Our study did not evaluate which patients were undergoing either a screening, surveillance, or therapeutic endoscopy which may have potentially altered the likelihood of having gender preferences. Surveys were accepted if the primary questions were answered, and although the missing responses were accounted for in the individual response analysis, this may have affected the final results. The proportion of missing data for our primary and secondary outcomes were as low as 0.7%–1.3% (eg, endoscopist gender and same-gender team member preference), whereas for some of our supplementary questions was between 25.7% and 39.6% (eg, willingness to wait longer or willing to pay more for gender preference). The generalizability of our obtained results to the international community may be variable as we had a significant number of white patients (89%), and thus, gender preferences may be different in other nonwhite cultural and societal norms. However, certain analyses, such as the rural vs urban comparison, may be applicable to similar regions internationally.

It is evident from our study that patients are more likely to express preference for a same-gender endoscopy team member than the endoscopist themselves. Increasing female gastroenterologists may help address female demand for a same-gender endoscopist; however, a study that offered female endoscopists to women did not find they were more likely to undergo CRC screening than those who were not offered a female endoscopist (17). Improving endoscopist gender transparency and creating an environment of multi-gender endoscopy teams may raise CRC screening. Arranging for

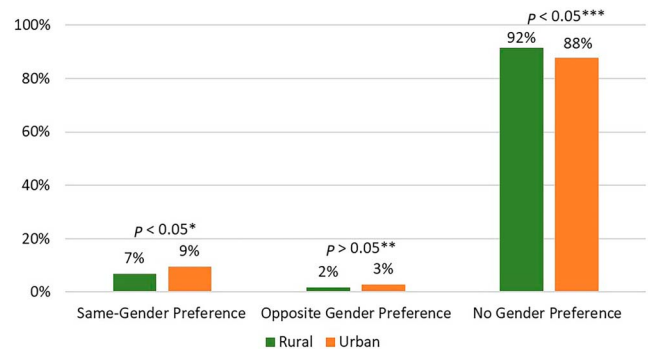


Figure 3. Rural vs urban patient preferences for the endoscopist's gender. *Same-gender preference vs other preferences. **Opposite gender preference vs other preferences. ***No gender preference vs other preferences.

Study Highlights

WHAT IS KNOWN

- ✓ Women may have more same-gender endoscopist preferences than men.
- ✓ Endoscopist gender preference may be a barrier to colorectal cancer screening.

WHAT IS NEW HERE

- ✓ Patients have more gender preferences for their endoscopy team members than the endoscopists themselves.
- ✓ Men have more same-gender endoscopist preferences than women.
- ✓ Women have more same-gender preferences for their endoscopy team members than men.
- ✓ Age-related differences exist in patients' gender preferences for their endoscopist.
- ✓ Regional differences exist among patients' gender preferences for their endoscopist and endoscopy team members.

gender-specific endoscopists and multigender endoscopy teams may pose a practical challenge, particularly in areas where endoscopic screening and healthcare access may be limited. Additional research in the implementation and success of such measures is warranted. Ultimately, addressing patients' attitudes and beliefs tailored to age-related and regional differences may be paramount in improving overall CRC screening adherence.

CONFLICTS OF INTEREST

Guarantor of article: Harshit S. Khara, MD, FACG, FASGE.

Specific author contributions: H.S.K.: planning and conducting the study, collecting and interpreting the data, drafting and editing the manuscript, and he has approved the final draft submitted. D.S.: collecting and interpreting the data, drafting and editing the manuscript, and he has approved the final draft submitted. M.B.: planning and conducting the study, collecting and interpreting the data, and she has approved the final draft submitted. A.B.: collecting and interpreting the data, drafting and editing the manuscript, and she has approved the final draft submitted. J.L.M.: planning and conducting the study, collecting and interpreting the data, and she has approved the final draft submitted. D.S.: planning and conducting the study, collecting and interpreting the data, editing the manuscript, and she has approved the final draft submitted. S.R.T.: editing the manuscript and he has approved the final draft submitted. M.K.: planning and conducting the study, editing the manuscript, and he has approved the final draft submitted. A.S.J.: planning and conducting the study, editing the manuscript, and he has approved the final draft submitted. D.R.V.C.: planning and conducting the

study, collecting and interpreting the data, and he has approved the final draft submitted. W.B.H.: planning and conducting the study, editing the manuscript, and he has approved the final draft submitted. R.M.: planning and conducting the study, editing the manuscript, and she has approved the final draft submitted.

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