Surgery 166 (2019) 785–792

Contents lists available at ScienceDirect

Surgery

journal homepage: www.elsevier.com/locate/surg

Presented at the Academic Surgical Congress 2019

Race, gender, and language concordance in the care of surgical patients: A systematic review

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ARTICLE INFO

Article history:
Accepted 11 June 2019
Available online 30 July 2019

ABSTRACT

Background: No consensus exists on whether patient-provider race, gender, and language concordance provides benefits to surgical patients. We report a systematic review of the association between patient-provider concordance and patient preferences and outcomes in surgery.

Methods: A systematic review of the literature was performed in Medline and PubMed using defined search terms to identify studies related to patient-provider concordance in surgical patients. We included studies with full manuscripts published in English within the United States (1998 to July 2018).

Results: Out of 253 titles screened, 16 studies met inclusion criteria. Five studies had level 4 evidence and 11 studies had level 3 evidence. The majority of patients preferred providers with a similar background ($n = 4/6$). Race, gender, and language-concordance had no effect on adherence to provider recommendations ($n = 3/3$). No effect of race concordance on the quality of care was seen ($n = 2/3$). Gender concordance was associated with improved quality of care ($n = 2/3$). There were mixed effects of concordance on the effectiveness of communication ($n = 2$).

Conclusion: Few studies examine patient-provider concordance. Most patients prioritize culturally, technically, and clinically competent providers over concordance. Future research is needed regarding the influence of concordance on patient outcomes in surgery within specific patient populations and clinical settings.

Introduction

Surgical disparities are widespread[1] and have important consequences for patients. Black race is associated with lower rates of indicated surgeries,[2–4] higher operative mortality and morbidity,[5–7] and worse outcomes.[8,9] Similarly, even after adjusting for hospital- and patient-level factors, low socioeconomic status (SES) correlates with fewer indicated surgeries[10,11] and higher mortality rates.[7] Surgical disparities have financial implications, raising the cost for American health care systems.[12]

Haider et al recently reviewed extant surgical disparities literature and organized 5 broad themes of potential contributing factors: (1) patient factors, (2) provider factors, (3) system factors, (4) clinical care and quality, and (5) postoperative care and rehabilitation.[13] We focus on oft-overlooked provider factors because research has shown that disparities are not due entirely to lack of health care or modifiable risk factors (eg, lifestyle choices). Even with universal insurance and stratified by access and risk, racial minorities still receive less minimally invasive hysterectomies and have worse outcomes in thyroid and parathyroid surgeries.[14,15]

In particular, we address the role of patient-provider concordance. This subject was one of the top research priorities identified during a national summit held by the American College of Surgeons and the National Institute of Health to inform surgical disparities research.[16] We know that the patient-provider relationship is important for its effect on informed consent, social history-taking, and adherence to postoperative care instructions.[17] We also know that racial and ethnic minorities are more likely to receive racially discordant health care.[1,18] The key question then becomes whether patient-provider racial discordance contributes to worse patient-provider communication and patient

Presented at the 14th Annual Academic Surgical Congress at Houston, TX, February 5–7, 2019.

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https://doi.org/10.1016/j.surg.2019.06.012
0039-6060/

outcomes, as has been frequently posited. Atlhough race and ethnicity concordance tend to receive more attention, a similar question can be posed for gender and language concordance.

In nonsurgical fields, the impact of concordance on patient outcomes has been asked, but a 2009 and 2018 systematic review of patient-provider race concordance both found inconclusive results.[19,20] To our knowledge, there is no summary of the results of individual research studies asking these questions within Surgery. Hence, in this systematic review, we summarize the association between patient-provider concordance—race, gender, or language—with patient preference and outcomes in surgery.

Methods

We performed a comprehensive electronic review of the English language literature using PubMed and Ovid MEDLINE, 1998 to July 2018. Original published human studies were identified using the following search terms: ((("race ethnicity" [All Fields] OR "gender" [All Fields]) AND ("physician patient relations" [All Fields] OR "professional patient relations" [All Fields])) OR (("race concordance" [All Fields] OR "race concordant" [All Fields] OR "race concordant relationships" [All Fields] OR "race concordant visits" [All Fields]) OR ("gender concordance" [All Fields] OR "gender concordant" [All Fields]) OR ("language concordance" [All Fields] OR "language concordance status" [All Fields] OR "language concordant" [All Fields] OR "language concordant care" [All Fields] OR "language concordant group" [All Fields] OR "language concordant patients" [All Fields] OR "language concordant physicians" [All Fields] OR "language concordant provider" [All Fields] OR "language concordant providers" [All Fields]))) AND "surgery" [All Fields]. Relevant systematic literature reviews were separately flagged so that all articles cited within each review could be manually screened for inclusion.

Screening process

All titles were screened (C.Z.) to exclude animal studies, case reports, editorial letters, and manuscripts published in languages other than English. Given our interest in the adult patient-provider relationship within the United States, titles of studies performed outside of the United States and those that focused on a pediatric population were also excluded, as were studies that did not include physician providers (see Definitions). Review articles were screened for relevant articles before exclusion (C.Z.). Where titles did not provide enough information, abstracts were screened (C.Z.) for these same criteria. Abstracts were further excluded if data was not provided at the patient-provider level (see Study Selection for Data Extraction.) Full-text articles were then screened (C.Z.) to select manuscripts for data abstraction. Publications that lacked a complete article were excluded. Titles and abstracts of uncertain status were discussed prior to exclusion (C.Z. and R.R.K.).

Study selection for data extraction

Studies that contained qualitative or quantitative data at the patient-provider level on race, gender, or ethnicity concordance were selected for data extraction if information on associated patient preferences, adherence to management recommendations, or clinical results of treatment were included.

Definitions

Our definition of physician providers included residents but not medical students, nurses, or dentists. We included all surgical specialties (ie, we did not limit our search to General Surgery) and permitted studies related to any of the 5 phases of surgical care (preoperative, perioperative, intraoperative, postoperative, post-discharge)[21] as long as there was a direct connection to surgery. For example, studies in a general primary care or emergency room setting were not included unless they included were deemed related to surgical care. Cancer screening studies were included since this type of preoperative care would lead to a surgical procedure. Data from surveys were categorized as quantitative if the results could be directly analyzed with statistical analyses.[22]

Data extraction

Each article was reviewed by 2 different members of the study team. All members of the investigative team participated in data extraction.

Data items collected were categorized into study and source information, study characteristics, patient characteristics, clinical area, and outcomes. Study and source information included study title, author(s), publication year, publication journal, publication volume, and database. Study characteristics included the study objective, study design, assigned evidence grade, study setting, number of sites, study time period, number of providers, and number of patients. Patient characteristics included a description of the patient population, the breakdown of patient race, gender, and sexuality per availability, the average patient age, and the type of concordance studied. The clinical area detailed the specialty, disease(s) studied, and the surgical phase of care. Finally, the outcome measures included the nature of the data (qualitative versus quantitative), primary and secondary outcomes, significance levels, a description of the summary of findings, a flag for whether the study reported patient preference, a reason described by patients who preferred provider concordance, if provided, and a flag for whether better outcomes were associated with patient-provider concordance.

Assessment of risk of bias in individual studies

Using the Oxford Centre for Evidence-Based Medicine guidelines outlined in Table I,[23] members of the review team assigned a level of evidence (1 best to 5 worst) to each study (C.Z., P.D., L.C., and R.R.K.).

Analysis

Only data from the studies included in the extraction subset were analyzed. The analysis was divided into studies reporting patient preferences and those reporting patient outcomes. Descriptive statistics were performed. Studies that reported patient outcomes other than patient preference were classified into 5 categories: patient decision-making, quality of care, adherence, patient knowledge, and quality of provider communication (C.Z. and

Table I
Oxford quality rating scheme for studies and other evidence*

Evidence level	Oxford Centre for evidence-based medicine criteria
1	Properly powered and conducted randomized clinical trial; systematic review with meta-analysis
2	Well-designed controlled trial without randomization; prospective comparative cohort trial
3	Case-control studies; retrospective cohort study
4	Case series with or without intervention; cross-sectional study
5	Opinion of respected authorities; case reports

* The Oxford Levels of Evidence 2. The Oxford Centre for Evidence-Based Medicine. 2013. Available from: http://www.cebm.net/index.aspx?o=5653.

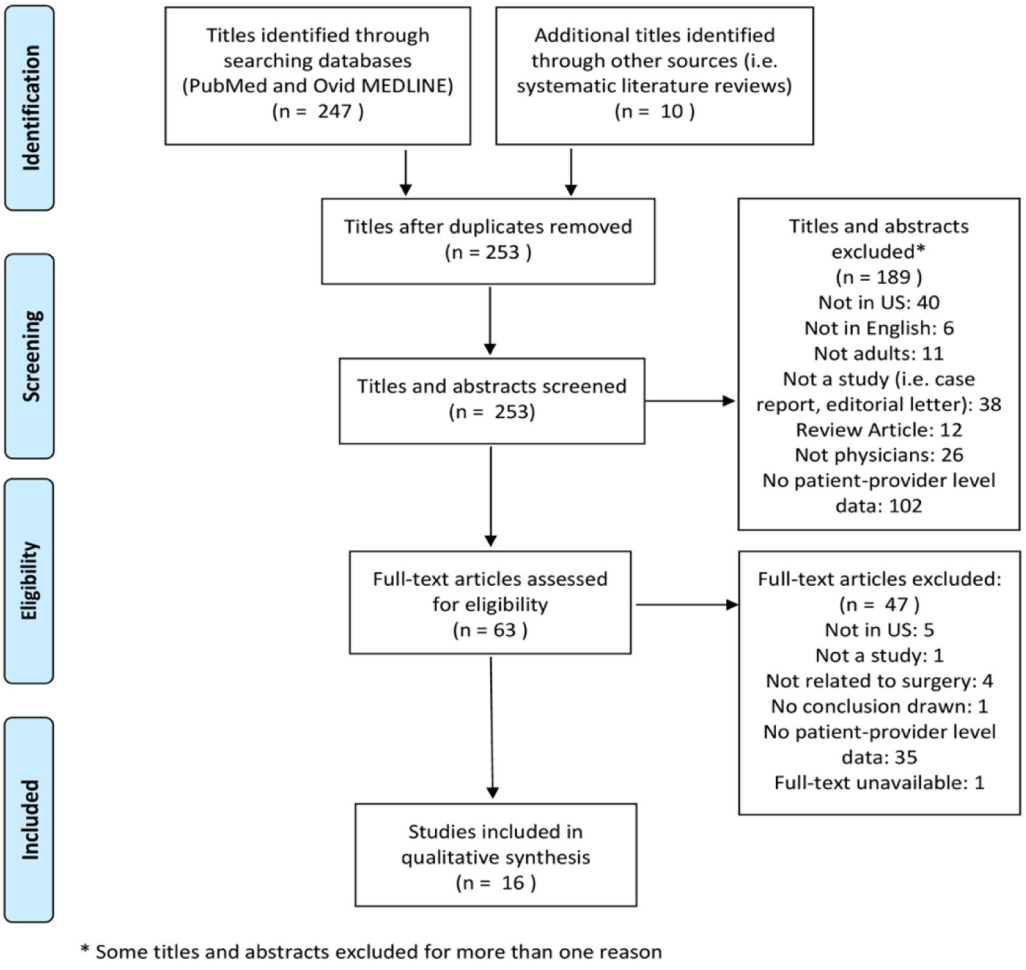

Fig 1. Process of study selection as illustrated by PRISMA flow diagram. PRISMA, preferred reporting items for systematic reviews and meta-analyses.[41]

R.R.K.). The principal summary measures fell into 1 of these 4 categories or patient preference. The type of concordance studied, the breakdown of specialties covered, and the evidence level grade were also examined. Dataset management and analyses were conducted in Microsoft Excel version 16.21 (Redmond, WA).

Results

After conducting the initial search, including records found in systematic reviews, and removing any duplicates, 253 articles were identified for screening. Of these 253 articles, 16 met inclusion criteria for data extraction and analysis. See Figure 1 for a detailed breakdown of the number of records excluded at each step.

Of the 16 studies selected for data extraction, a total of 12,614 patients (mean 788; range 18–4,157) were included. The studies were performed in several specialties: surgical oncology ($n = 6$), including 2 in plastic surgery, obstetrics and gynecology (OB/GYN; $n = 3$), cardiothoracic surgery ($n = 2$), and other ($n = 5$). Six studies discussed race-concordance, 11 discussed gender-concordance, and 3 discussed language-concordance (note that some studied more than one). Several outcomes were examined: patient preferences ($n = 6$), patient adherence to physician recommendations ($n = 3$), quality of care ($n = 5$), effectiveness of communication ($n = 2$), and decision-making regarding the patients' willingness to undergo an elective operation ($n = 1$). See Table II[24–39] for a summary of the included studies.

Five studies were rated as having level 4 evidence (1 best to 5 worst), with the remaining 11 studies rated as having level 3 evidence (Table II).

Of the 16 studies, 6 studied patient preference and 10 primarily studied other patient outcomes. In the 6 studies on patient preference, patients preferred providers with some type of concordance in only 2 of the studies ($n = 2/6$). Three studies analyzed patient adherence to provider recommendations and found that in all 3 studies, race, gender, and language-concordance had no effect on adherence ($n = 3/3$). We saw no effect of race concordance on the quality of care ($n = 2/3$), although gender concordance was associated with improved quality of care ($n = 2/3$). There were mixed effects of concordance on the effectiveness of communication ($n = 1/2$). In a single study, patients treated by gender concordant physicians were more likely to undergo elective breast reconstruction ($n = 1$). See Tables III and IV for the results of each study by outcomes, patient preferences and outcomes, respectively.

Eleven studies reported risk-adjusted outcome measures. In Figure 2, we report these outcomes categorized by concordance type.

Figure 3 summarizes the limited data available about patient preference for patient-provider concordance. In aggregate, a majority of patients expressed no preference for a specific provider gender. Yet, a single qualitative study did find that patients' preferred concordant providers.[25] The qualitative study revealed that select populations may benefit from patient-provider concordance given increased sensitivity—in this example,

Table II
Study characteristics and assigned level of evidence, all included studies

Citation	Primary study objective	Study design	Evidence grade	Specialty	Surgical phase of care	Concordance type	Outcome examined
Chandler et al 2000[24]	To evaluate patient reasons and preferences for gender selection of their OB/GYN	Written survey	4	OB/GYN	All	Gender	Patient preference
Agénor et al 2015[25]	To understand facilitators of and barriers to cervical cancer screening	Focus group	4	General practitioners and OB/GYN	Preoperative	Race, Gender	Patient preference
Iskandar et al 2015[26]	To evaluate the influence of patient variables versus physician variables on the incidence and type of breast reconstruction performed	Retrospective study	3	Breast and plastic surgery	Preoperative	Gender	Patient decision-making
Bickell et al 2012[27]	To assess key predictors of women's perceived quality of their breast cancer care and actual guideline-concordant quality of care received	Telephone survey	3	Breast surgery	All	Race	Quality of care
Jibara et al 2011[28]	To identify the characteristics of patients who adhere to their physician's recommendation to have a screening colonoscopy	Cross-sectional survey with face-to-face interview	3	Primary care	Preoperative	Race, language	Patient preference, Patient adherence
Walsh et al 2009[29]	To examine factors associated with colorectal screening	Telephone survey	3	Primary care	Preoperative	Race, language	Patient adherence
Liang et al 2009[30]	To determine if the rate at which physicians recommend cancer screening to older Chinese American women differ according to the language used	Cross-sectional study from telephone survey	3	56% family medicine or general practitioner, 44% other	Preoperative	Gender, language	Quality of care
Hawley et al 2008[31]	To evaluate the association between provider characteristics and racial/ethnic minority patients' knowledge of breast cancer treatment risks/benefits	Cross-sectional survey	3	Breast surgery	Preoperative	Gender	Effectiveness of communication
Flocke et al 2005[32]	To understand the role of patient and physician gender on delivery of preventive services	Cross-sectional survey with direct observation and medical record review	3	Primary care	Preoperative	Gender	Patient adherence
Silliman et al 1999[33]	To examine the relationship between surgeon gender and therapy received	Cross-sectional observational study	3	Breast surgery	Preoperative	Gender	Quality of care
van Ryn et al 2006[34]	To examine the factors mediating the relationship between patient race/ethnicity and provider recommendations for coronary artery bypass graft surgery	Survey	3	Cardiac surgery	Preoperative	Race	Quality of care
Gordon et al 2006[35]	To determine whether doctor-patient differs by race	Audiotaped observational study	3	Thoracic surgery or oncology	Preoperative	Race	Effectiveness of communication
Schnatz et al 2007[36]	To assess the qualities and attributes desired in menopause clinicians	Survey	4	OB/GYN	All	Gender	Patient preference
Dusch et al 2014[37]	To determine patient perception of female surgeons and patient preference for surgeon demeanor and type of surgery	Survey	4	Breast cancer or lung cancer surgery	All	Gender	Patient preference
Crosby et al 2016[38]	To evaluate the influence of physician and patient gender on the timing of inpatient do-not-resuscitate orders	Retrospective cohort study	3	N/A	Postoperative	Gender	Quality of care
Ettner et al 2016[39]	To assess the importance attached to various factors involved in selecting a surgeon to perform gender affirmation surgery	Retrospective survey	4	Plastic or reconstructive surgery	All	Gender	Patient preference

gynecologic care for black lesbian, gay, bisexual, transgender, or queer women. These patients voiced a preference for providers of similar backgrounds due to a sense of shared connection: as represented by one patient, "I felt an instant connection with the surgeon. She went through transition." Likewise, another woman explained her rationale for preferring female providers when undergoing pelvic care: "Every time I've had a Pap smear, I'm reminded of why I have female practitioners. I would just feel so uncomfortable, extremely uncomfortable, having a man conducting a Pap smear…".

The single study that inquired into patient preference for language concordance in Hispanic patients found that one existed (47.1% had a preference vs 10.8% had no preference) but did not report a significance level.

Discussion

We sought to identify the association between patient-provider concordance and patient preferences and outcomes. Overall, we found scant robust evidence available on the role of patient-provider concordance in surgery. The majority of studies examined gender concordance, but even these were limited in number ($n = 11/16$). Patients, on the whole, preferred provider competence over concordance, though none of these 6 studies reported significant findings.

Table III
Results of individual studies, patient preferences

Citation	Study setting	No. of patients	Patient population	Concordance type	Summary of findings	Patient preference? (with reason, if provided)
Chandler et al 2000[24]	Outpatient OB/GYN clinic at a military base medical center	203	Women either in the military themselves of dependent on a military personnel	Gender	Overall, 52% of patients preferred female provider, 4% preferred males, and 44% had no preference.	No
Agénor et al 2015[25]	Community-based organizations in Boston and Cambridge, MA	18	Black lesbian, bisexual, or queer women	Race, gender, and sexuality	Majority preferred providers who identified as a woman, a person of color, or a lesbian, gay, bisexual, transgender, or queer individual.	Yes; expressed discomfort having a man conduct a Pap smear and easier connection with those of a similar background
Jibara et al 2011[28]	3 East Harlem health clinics and several community-based sites	280	Hispanic men and women in East Harlem (27.1% M, 71.8% F)	Language	More patients prefer that their provider speak Spanish as compared to those who preferred English (47.1% vs 10.8%).	Yes
Schnatz et al 2007[36]	1 inner-city clinic and 12 private practice office rooms (both inner-city and surburban)	72	Women >45 years of age	Gender	Patients have no preference for gender concordance, including during gynecologic surgery, except during pelvic exams.	NO
Dusch et al 2014[37]	General medicine clinic in San Francisco	476	Patients at a primary care clinic (33.3% M, 66.6% F)	Gender	Patients expressed no overt preference for surgeon gender, but rather for surgeon demeanor.	NO
Ettner et al 2016[39]	Not reported	101	Transwomen who had undergone gender affirmation surgery and cisgender patients who had undergone plastic or reconstructive surgery	Gender	Patients had no preference for gender-concordant surgeons.	NO

Two studies suggested that in specific circumstances (ie, gender concordance in gynecology or language concordance for Hispanics), patients might prefer concordant providers.

With respect to outcomes other than preference, the most significant finding was the increased likelihood of women electing to undergo breast reconstruction and primary tumor removal or adjuvant systemic therapy when treated by women physicians. Otherwise, outside of gynecologic and breast surgery settings, patient-provider concordance had no impact on most outcomes, including adherence to screening recommendations by both patients and providers.

Data on the role of concordance on communication measures was more equivocal. We interpret these results to suggest that patient-provider concordance may play a larger role in communication between patients and providers than in patient outcomes, although more robust evidence is needed to prove this hypothesis. Some preliminary data, however, suggests that differing explanatory models of illness and perceived racism may influence patients' perception of their relationship with their provider.[27,32,34]

One implication of these results is that in order to target surgical disparities, cultural competency training highlighting the need for increased sensitivity in key patient populations and clinical domains—especially as related to female reproductive organs in historically vulnerable patient populations—may be effective. Although patients overall do not seem to have much preference for patient-provider concordance, select patients in particular situations may have inclinations to seek similar providers. Although not studied here, the possibility also remains that subconscious biases and differences in understanding illness may contribute to disparities in surgical care, and cultural competency training should target this possibility as well.

Finally, societal biases impact the surgeon-patient relationship, which may influence how patients rated their preferences in hypothetical scenarios of surgeon gender. In fact, Schnatz et al 2007 and Dusch et al 2014 showed some subvariations of patient perceptions of surgeon competency.[36,37] They found that although overall survey respondents had no preference for provider gender, women had differing rates of preferences for providers and surgeons depending on the nature of the surgery. For example, survey respondents tended to prefer more masculine surgeons for lung cancer surgery and more feminine surgeons for breast surgery. Recent work suggests that this phenomenon influences not only patient perceptions of surgeons of differing genders, but also referral rates from other physicians.[40]

Notably, subanalyses by acculturation level in Hispanic immigrants found that contrary to previous speculations that lower acculturation in immigrants may contribute to more disparities, acculturation seems to be associated with less adherence to provider recommendations. Even though overall neither the preferred nor actual spoken language was significantly associated with differences in adherence to colonoscopy screening recommendations, younger age, being born in the United States, and a preference for English language were associated with less follow through with provider recommendations.[28] The evidence for this finding is only moderate, but the notion warrants further investigation. Given the limited number of studies investigating the preference for language concordance in general, the possibility remains that the role of language concordance and subgroup variation may have different effects than that of gender and race concordance.

Future efforts should also be made to study the impact of concordance on patients who identify as lesbian, gay, bisexual, transgender, or queer. Furthermore, little research has been done on the effect of concordance on patient outcomes outside of adherence, and more studies should look at the impact of gender concordance in surgical diseases that do not involve reproductive organs.

Finally, a number of studies comment on potential mechanisms in which patient-provider concordance could contribute to disparities, including perceived racism, differing explanatory models of illness, and subconscious biases that influence decision-making

Table IV
Results of individual studies, patient outcomes

Citation	Study setting	No. of patients	Patient population	Concordance type	Summary of findings	Outcome examined	Better outcome if concordant?
Iskandar et al 2015[26]	Urban multidisciplinary cancer center	258	Female patients undergoing mastectomy	Gender	Patients with female breast surgeons were more likely to undergo reconstruction.	Rate of breast reconstruction	YES
Bickell et al 2012[27]	8 hospitals in New York City	374	Inner-city women with newly diagnosed and surgically treated early-stage breast cancer requiring adjuvant treatment (45% White, 20% Black, 30% Hispanic, 4% Asian, 1% other)	Race	No significant difference in rating of quality of care regardless of racial concordance with physician.	Patient rating of overall medical care	NO
Jibara et al 2011[28]	3 East Harlem health clinics and several community-based sites	280	Hispanic men and women in East Harlem (27.1% M, 71.8% F)	Race; language	Neither the preferred language nor preferred race/ethnicity was associated with adherence.	Adherence to screening recommendation	NO
Walsh et al 2009[29]	Public hospital in California with 5 primary care sites	808	Vietnamese men and women with no history of cancer (35% M, 65% F)	Race; language	Gender concordance was associated with being up-to-date for fecal occult blood test screening only. Gender, ethnicity, and language concordance were not otherwise associated with overall CRC screening.	Adherence to screening recommendation	NO
Liang et al 2009[30]	Community-based venues in DC	507	Chinese American women >50 years old able to communicate in Chinese or English	Gender; language	Patients who communicated in English (rather than Chinese) were 1.71 (95% CI, 1.00–2.96) and 1.73 (95% CI, 1.00–3.00) times more likely to report having received mammography and CRC screening recommendations, respectively.	Adherence to screening recommendation	NO
Hawley et al 2008[31]	Population-based sample from 2 metropolitan areas' SEER registries	1,132	Women whose documented summary stage in SEER was DCIS or nonmetastatic invasive breast cancer	Gender	Neither surgeon gender nor surgeon breast procedure volume changed racial/ethnic differences in survival knowledge, nor were any of these independently associated with survival knowledge.	Patient knowledge of survival and recurrence	NO
Flocke et al 2005[32]	Outpatient visits to family physicians in Northeast Ohio	3,256	Adult patients (36% M, 64% F)	Gender	Patients did not get more screening if gender concordant.	Adherence to screening, health behavior counseling, and immunization recommendations	NO
Silliman et al 1999[33]	5 academic medical centers in Boston, MA	303	Older women with early-stage breast cancer	Gender	Women cared for by female surgeons are more likely to receive standard therapies.	Receipt of definitive primary tumor therapy or systemic adjuvant therapy	YES
van Ryn et al 2006[34]	NY state hospitals	532	Appropriate candidates for CABG (34% White, 30% Black, 36% Hispanic)	Race	No relationship between physician recommendation for CABG and patient or provider race.	Rate of physician recommendation for CABG	NO
Gordon et al 2006[35]	Thoracic surgery or oncology clinics at a large southern VA hospital	137	Patients with pulmonary nodules or lung cancer (78.1% White, 21.9% Black)	Race	Black patients and patients in racially discordant interactions prompt doctors for info less and in turn receive less info from doctors.	Amount of information received by patient	YES
Crosby et al 2016[38]	MD Anderson Cancer Center	4,157	Patients with a cancer diagnosis (50.7% M, 49.3% F)	Gender	Female physicians were 1.5 times more likely to write early DNR orders with their female patients than their male patients (OR 1.48; 95% CI 1.13–1.94). Same gender physician-patient dyads were not found between male physicians and their patients.	Time to early DNR order	YES

CRC, colorectal cancer; *CABG*, coronary artery bypass graft; *DCIS*, ductal carcinoma-in-situ; *DNR*, do not resuscitate; *SEER*, Surveillance, Epidemiology, and End Results Program, 2 metropolitan areas were Detroit and Los Angeles.
Note: Crosby et al 2016 considered early DNR order to be better quality of care.

by either patients or providers. The significance of these mechanisms has not yet been established but would need to be further explored in order to properly target our efforts to address disparities in surgery.

There are several limitations to this comprehensive review of patient-provider concordance. Most significantly, the heterogeneity of the studies limit the ability to draw broad conclusions regarding issues related to patient-provider

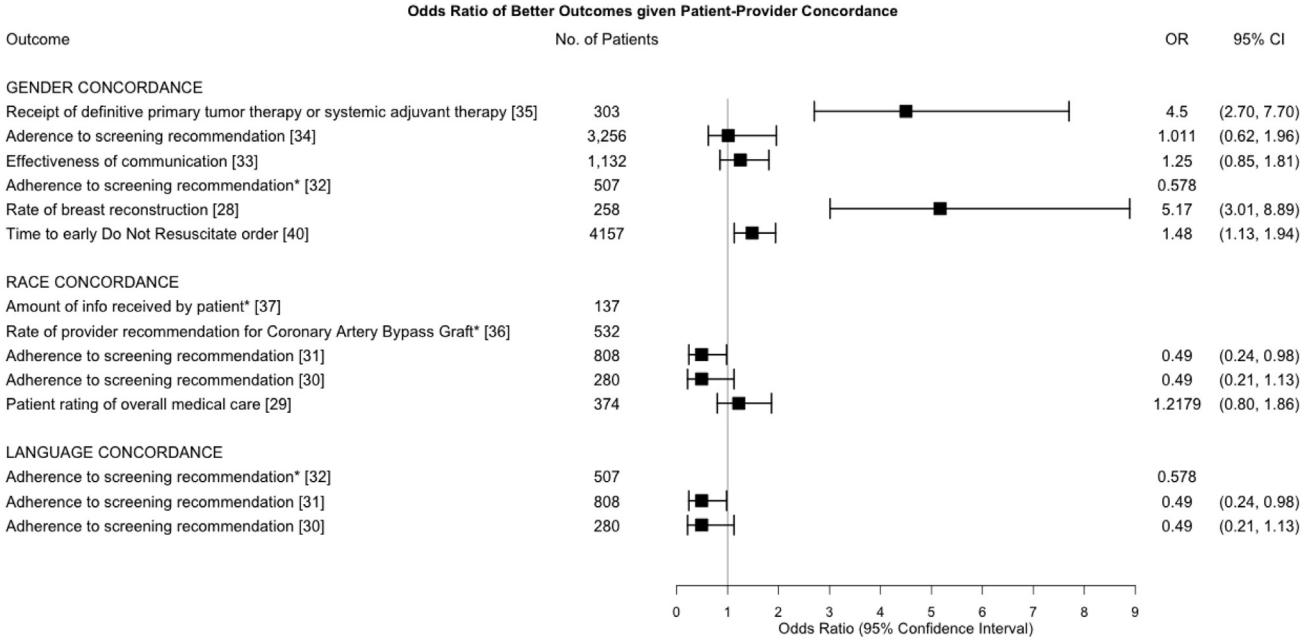

Fig 2. Forest plot of quantitative studies on patient outcomes. Note: These studies (*) do not provide sufficient data to determine odds ratio or 95% confidence intervals.

concordance. Studies cast a wide net and targeted race and ethnicity, gender, and language as potential opportunities where concordance might be able to improve patient satisfaction and outcomes. As many of the studies were survey-based, the level of evidence was rated as moderate at best. Thus, the weak evidence heralds a call for future research in an important area of surgical disparities. We demonstrated that the publications that studied gender concordance asked women in the setting of a disease related to the reproductive tract; women may feel differently in these situations than if they were to see providers of a different specialty. Hence, the results for gender concordance may be less generalizable to other specialties within surgery. Moreover, the studies on gender concordance were limited to those studying women, failing to provide information on the importance of gender concordance for men, intersex, and transgender patients. We did not investigate the intersection of identities, such as the interaction between race and gender concordance, which could be significant but is left unknown. We were also unable to capture the impact of societal biases, and this remains an important consideration for future studies.

Based on the moderate level of evidence, the data should be considered preliminary. This evidence suggests that patients prioritize culturally, technically, and clinically competent care over concordance. The number of studies examining the role of patient-provider race, gender, and language concordance in patient preference or outcomes is limited, and more studies are needed to provide robust evidence on the importance of patient-provider concordance in eradicating surgical disparities. Until more studies can be completed to indicate otherwise, efforts to address surgical disparities by patient-provider concordance should focus on the findings from women's health where the evidence suggests that gender concordance is associated with differences in the receipt of surgery and adjuvant therapy.

Citation	Sample Size	Patient Preference?	Proportion Preferring Concordance	95% CI	p value
GENDER CONCORDANCE					
Chandler 2000[34]	195	**NO**	0.52	(0.45, 0.60)	0.62
Schnatz 2007[30]	72	**NO**	0.13	(0.06, 0.26)	-
Agenor 2015[25]	18	**YES**	"vast majority"	-	-
Ettner 2016[41]	101	**NO**	-	-	-
Dusch 2014[31]	476	**NO**	-	-	0.76
RACE CONCORDANCE					
Agenor 2015[25]	18	**YES**	"vast majority"	-	-
LANGUAGE CONCORDANCE					
Jibara 2011[33]	280	**YES**	0.49	-	0.143

Fig 3. Summary table for data on patient preferences.

Funding/Support

C.Z. received funding from The New York Academy of Medicine David E. Rogers Fellowship and the Agnew Surgery Society First Year Research Fellowship for author support. No other authors have funding sources to report.

Conflict of interest/Disclosure

The authors report no conflicts of interest.

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