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Factors associated with a positive experience at US fertility clinics: the male partner perspective

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Abstract

Objective To determine factors associated with a positive male patient experience (PMPE) at fertility clinics among male patients.

Design: Cross-sectional study

Setting: Not applicable

Patients: Male respondents to the FertilityIQ questionnaire (www.fertilityiq.com) reviewing the first or only US clinic visited between June 2015 and August 2020.

Interventions: None

Main outcome measures: PMPE was defined as a score of 9 or 10 out of 10 to the question, "Would you recommend this fertility clinic to a best friend?". Examined predictors included demographics, payment details, infertility diagnoses, treatment, and outcomes, physician traits, and clinic operations and resources. Multiple imputation was used for missing variables and logistic regression was used to calculate adjusted odds ratios (aORs) for factors associated with PMPE.

Results Of the 657 men included, 60.9% reported a PMPE. Men who felt their doctor was trustworthy (aOR 5.01, 95% CI 0.97–25.93), set realistic expectations (aOR 2.73, 95% CI 1.10–6.80), and was responsive to setbacks (aOR 2.43, 95% CI 1.14–5.18) were more likely to report PMPE. Those who achieved pregnancy after treatment were more likely to report PMPE; however, this was no longer significant on multivariate analysis (aOR 1.30, 95% CI 0.68–2.47). Clinic-related factors, including ease of scheduling appointments (aOR 4.03, 95% CI 1.63–9.97) and availability of same-day appointments (aOR 4.93, 95% CI 1.75–13.86), were associated with PMPE on both univariate and multivariate analysis. LGBTQ respondents were more likely to report PMPE, whereas men with a college degree or higher were less likely to report PMPE; however, sexual orientation (aOR 3.09, 95% CI 0.86–11.06) and higher educational level (aOR 0.54, 95% CI 0.30–1.10) were not associated with PMPE on multivariate analysis.

Conclusion Physician characteristics and clinic characteristics indicative of well-run administration were the most highly predictive of PMPE. By identifying factors that are associated with a PMPE, clinics may be able to optimize the patient experience and improve the quality of infertility care that they provide for both men and women.

Keywords Patient-centered care · Patient satisfaction · Males · Predictors

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Introduction

Infertility is present in approximately 10% of all couples and is partly or completely attributable to a male factor in approximately 50% of cases [1–3]. However, male factor infertility is often overlooked by the literature, media, and healthcare providers [1, 4]. Although male factor infertility has a substantial impact on physical and emotional health and quality of life for male patients, these measures have been studied far less in men compared to women [3–5].

Additionally, though men feel the loss associated with a failure to conceive, resources available for infertile men are both limited and underutilized [4].
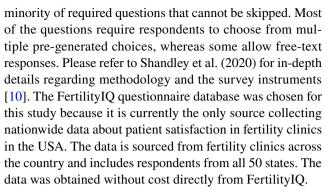
Patient experience is known to be a key quality indicator in healthcare and is associated with improved patient safety and clinical efficacy [6]. However, there is limited data regarding the male partner experience in infertility clinics [5]. Available studies have either been performed outside the USA, sampled a disproportionately lower number of men, or been limited by relatively small sample sizes overall [7–9]. Our group was among the first to evaluate factors associated with a positive patient experience at US fertility clinics for female patients [10]. The study utilized data from FertilityIQ, a web-based platform created in 2015 which connects patients to information about infertility treatment and infertility clinics across the country and simultaneously collects data from patients about their care experiences through structured questionnaires.

The present manuscript utilizes FertilityIQ data to evaluate the male partner experience in US infertility clinics. We hypothesized that male patients would be more likely to report positive male patient experience (PMPE) if they felt that their physician was empathetic, trustworthy, and involved them in decision-making, as well as if they experienced shorter wait times, positive interactions with ancillary staff, and more robust clinic administration. Prior literature has demonstrated that male patients consistently report higher overall satisfaction with healthcare than female patients, across a variety of clinical settings [11–14]. A good provider-patient relationship, in particular, was more positively associated with patient satisfaction for male patients than female patients [11, 12]. Therefore, we additionally hypothesized that PMPE rates would be higher in male patients compared to female patients, and more provider-related characteristics would be associated with PMPE for male patients compared to female patients.

Methods

Data source and study cohort

The FertilityIQ website (www.FertilityIQ.com) is a publicly available resource designed to link individuals or couples interested in pursuing fertility treatment with relevant informational materials and nearby clinics. In addition to resources, the website features a voluntary 115 item questionnaire (https://www.fertilityiq.com/survey-intro) for individuals pursuing fertility treatment to report type of treatment(s) received, review their doctors and fertility clinics, and differentiate personal preferences regarding the infertility treatment experience. The questionnaire requires respondents to answer one question at a time, along with a

minority of required questions that cannot be skipped. Most of the questions require respondents to choose from multiple pre-generated choices, whereas some allow free-text responses. Please refer to Shandley et al. (2020) for in-depth details regarding methodology and the survey instruments [10]. The FertilityIQ questionnaire database was chosen for this study because it is currently the only source collecting nationwide data about patient satisfaction in fertility clinics in the USA. The data is sourced from fertility clinics across the country and includes respondents from all 50 states. The data was obtained without cost directly from FertilityIQ.

Approximately 3% of the respondents to the questionnaire were self-reported as male. We analyzed de-identified data from men who completed the FertilityIQ questionnaire between June 2015 to August 2020 and who reviewed their first or only clinic visit. The study was approved by our institutional IRB.

Outcomes

A positive male patient experience (PMPE) was defined as a score of 9/10 or 10/10 to the question, "Would you recommend this fertility clinic to a best friend?" We examined demographic factors, including age, race/ethnicity, education level, employment status, and LGBTQ status. Other predictors examined included payment details, infertility diagnoses and treatment, physician traits, and clinic operations and resources.

Data analysis

Descriptive statistics were used to analyze the population of FertilityIQ respondents, comparing those reporting PMPE versus those reporting a non-positive patient experience (NPE) at a fertility clinic. Multiple imputations were used for missing variables that were missing 5% of observations. Analysis of these variables was performed to ensure they met criteria for missing at random before performing imputation. Logistic regression was used to calculate odds ratios (OR) for factors associated with PMPE. A multivariate logistic regression was performed to calculate adjusted ORs (aOR). Three variables were forced into the model a priori: male factor infertility, use of donor sperm, and pregnancy resulting from treatment. Additional variables were selected for inclusion in the multivariable model based on causal considerations. Change in estimate criterion was applied to reduce the number of variables in the model [15, 16]; variables were removed one at a time to explore how exclusion of each variable affected the remaining variables. Variables were included in the model if they altered the aOR's of the other variables by > 10%.

Results

Descriptive statistics

There were 1001 survey responses from individuals who identified as male. Of those, 58 were duplicate responses and were excluded. Each survey response had a unique identifier, which was cross-referenced with respondents' IP addresses in order to identify and remove duplicates. Of the remaining responses, 282 reviewed more than one clinic; for these, the review of the first clinic was included in the analysis. Finally, four survey responses completed by individuals who went to a clinic outside of the USA were excluded. The remaining total of 657 male respondents were included in the final analysis.

Of the 657 men included in the study, 400 patients (60.9%) reported a PMPE. The mean age at questionnaire was 36.9 +/− 6.8 years, and the mean age at time of fertility treatment was 35.2 +/− 6.7 years (Table 1).

Patient factors

Patient demographics and treatment characteristics stratified by PMPE are summarized in Table 1, and unadjusted odds ratios for the association of each factor with PMPE are summarized in Supplemental Table 1. Men who were older at time of fertility treatment (35 years or older compared to under 35 years old) were less likely to report a PMPE (OR 0.67, 95% CI 0.49–0.92).

Men with a college degree or higher were less likely to report a PMPE than those who did not have a college degree (OR 0.55, 95% CI 0.37–0.80). Among men who ultimately contributed to a pregnancy versus those who did not, those with a college education or higher were more likely to report a PMPE.

Region of residence, residing in a state with mandated insurance coverage, and having insurance coverage of any portion of treatment all did not significantly impact patients reporting a positive or negative experience. Employment status and annual income also did not appear to impact reported PMPE.

Patients who self-identified as lesbian, gay, bisexual, transgender, and queer (LGBTQ) were more likely to report a PMPE (OR 2.75, 95% CI 1.36–5.57) than patients who did not identify as LGBTQ.

Diagnosis and treatment characteristics

There was no significant association between patients reporting PMPE and their underlying diagnosis of infertility, including female factor infertility, male factor infertility, or unexplained infertility. However, those who reported a pregnancy as a result of treatment were more likely to report a PMPE (OR 2.44, 95% CI 1.69–3.50).

Physician characteristics

Men who felt their doctor was a good communicator (OR 30.21, 95% CI 15.38–59.35), was trustworthy (OR 77.73, 95% CI 21.31–241.46), and showed compassion (OR 26.9, 95% CI 14.05–51.55) were more likely to have a PMPE than those who felt negatively about their patient-physician relationship. The men who felt that they received individualized attention from their provider were more likely to report PMPE (OR 22.27, 95% CI 12.57–39.45).

Clinic characteristics

Physician and clinic characteristics, stratified by PMPE, are summarized in Table 2.

A clinic with well-run administration, determined by characteristics such as "no wait time to speak to a provider" (OR 16.74, 95% CI 9.27–30.23), greater ease of seeing a physician that day (OR 12.63, 95% CI 6.75–23.63), and a direct line of communication to a physician (OR 3.6, 95% CI 2.08–6.23), was all significantly associated with PMPE.

Multivariate analysis

In the multivariate analysis (Table 3), physician characteristics, including trustworthiness (aOR 5.01, 95% CI 0.97–25.93), ability to set realistic expectations at the end of each appointment (aOR 2.73, 95% CI 1.10–6.80), and responsiveness to setbacks with treatment adjustments (aOR 2.43, 95% CI 1.14–5.18) were associated with PMPE after adjusting for potential confounders. Similarly, several clinic characteristics were still associated with PMPE, including ease of scheduling an appointment (aOR 4.03, 95% CI 1.63–9.97), ability to see a physician on the same day (aOR 4.93, 95% CI 1.75–13.86), and satisfaction with the billing department (aOR 4.98, 95% CI 2.74–9.04). Availability of genetic counseling was also found to be associated with PMPE (aOR 2.59, 95% CI 1.32–5.10). Of note, achieving pregnancy, having a college degree or higher, and self-reported LGBTQ status were no longer significantly associated with PMPE. Additionally, neither the use of donor sperm nor a diagnosis of male factor infertility was associated with a PMPE.

Discussion

Overall, among the male respondents included in this study, 61% reported PMPE, and 39% reported NPE. This rate was similar to the rate reported by women in Shandley

Table 1 Patient demographics among all male FertilityIQ questionnaire respondents evaluating the first or only clinic they visited, June 2015–August 2020

	Positive experience (n = 400)		Non-positive experience (n = 257)		Total (n = 657)	
Patient demographics						
Age at questionnaire, mean (years), SD	36.5	6.7	37.5	6.8	36.9	6.8
Age at fertility treatment, mean (years), SD	34.7	6.5	36.0	6.9	35.2	6.7
Region of residence[a], n (%)						
Northeast	106	26.5	64	24.9	170	25.9
Midwest	56	14.0	41	16.0	97	14.8
Southeast	102	25.5	58	22.6	160	24.4
Southwest	32	8.0	18	7.0	50	7.6
West	104	26.0	76	29.6	180	27.4
Live in state with mandated coverage, n (%)						
Yes	198	49.5	132	51.4	323	49.2
No	202	50.5	125	48.6	334	51.8
Racial or ethnic origin, n (%)						
European/Caucasian	166	41.5	127	49.4	293	44.6
Black or African American	21	5.3	7	2.7	28	4.3
South or East Asian	9	4.8	20	7.8	39	5.9
Other[c]	112	28.0	59	23.0	171	26.0
Multiracial	44	11.0	15	5.8	59	9.0
Prefer not to answer/missing[d]	38	9.5	29	11.3	67	10.2
Education, n (%)						
College degree or higher	282	70.7	209	81.6	491	75.0
Less than college degree	117	29.3	47	18.4	164	25.0
LGBTQ, n (%)	43	11.2	11	4.4	54	8.2
Self-described patient treatment preferences[e], mean (SD)						
Do you prefer that doctors present information in a blunt or delicate manner? (1 = blunt, 3 = neutral, 5 = delicate)	2.6	1.1	2.5	1.0	2.6	1.1
Is it important to you that your doctor has a "warm" bedside manner? (1 = not at all, 3 = neutral, 5 = very)	4.0	0.9	3.8	1.0	3.9	1.0
As a patient, how important is it for you to understand every detail of your treatment? (1 = not at all, 3 = neutral, 5 = very)	4.6	0.7	4.6	0.7	4.6	0.7
Employment status (at time of treatment), n (%)						
Employed	377	94.5	241	94.5	618	94.5
Stay-at-home caregiver	3	0.8	5	2.0	8	1.2
Student	8	2.0	4	1.6	12	1.8
Unemployed	11	2.8	5	2.0	16	2.5
Number of hours per week spent working, n (%)						
0–19	6	1.6	3	1.2	9	1.4
20–39	52	13.5	38	15.1	90	14.1
40–59	291	75.4	188	74.9	479	75.2
60–79	30	7.8	20	8.0	50	7.9
80+	7	1.8	2	0.8	9	1.4
Annual income (dollars), n (%)						
0–49K	41	10.8	17	7.1	58	9.3
50–99K	146	38.3	88	36.5	234	37.6
100–199K	130	34.1	85	35.3	215	34.6
200–499K	51	13.4	43	17.8	94	15.1
500K+	13	3.4	8	3.3	21	3.4
Insurance covered portion of treatment, n (%)						
Office visits	174	43.5	107	41.6	281	42.8
Tests	181	45.3	114	44.4	295	44.9
Medications	148	37.0	76	29.6	224	34.1
Procedures	115	28.8	68	26.5	183	27.9
No insurance coverage for any treatment, n (%)	138	34.5	88	34.2	226	34.4
Treatment characteristics						
First year of treatment, n (%)						

Table 1 (continued)

	Positive experience (n = 400)		Non-positive experience (n = 257)		Total (n = 657)	
Pre-2010	9	2.3	2	0.8	11	1.7
2010–2012	16	4.0	7	2.8	23	3.5
2013–2015	68	17.1	43	16.9	111	17.0
2016–2018	229	57.5	152	59.8	381	58.4
2019–2020	76	19.1	50	19.7	126	19.3
Numbers of doctors seen, mean (SD)	1.3	0.7	1.6	0.9	1.4	0.8
Infertility diagnosis[g], n (%)						
Female factor[h]	179	44.8	111	43.2	290	44.1
Male factor	123	30.8	65	25.3	188	28.6
Unexplained infertility[i]	98	24.5	74	28.8	172	26.2
No diagnosis listed[i]	86	21.5	57	22.2	143	21.8
Used donor sperm, n (%)	23	5.8	15	5.8	38	5.8
Infertility Treatment, n (%)						
Intrauterine insemination with own sperm, n (%)	171	42.8	125	48.6	296	45.1
Intrauterine insemination with donor sperm, n (%)	11	2.8	8	3.1	19	2.9
In vitro fertilization with own sperm, n (%)	160	40.0	93	36.2	253	38.5
In vitro fertilization with donor sperm, n (%)	13	56.5	6	2.3	19	2.9
Had clinical pregnancy, n (%)	155	38.8	53	20.6	208	31.7
Had a child as a result of treatment, n (%)	90	22.5	24	9.3	114	17.4
Did you get the results that you wanted under the care of this doctor? n (%)						
Yes	210	52.5	43	16.8	253	38.6
No	75	18.8	143	55.9	218	33.2
Too early to say	83	20.8	45	17.6	128	19.5
Unsure	32	8.0	25	9.8	57	8.7

[a]Northeast: ME, NH, VT, MA, CT, RI, NJ, NY, PA, MD, DE, DC; Midwest: OH, MI, IN, IL, KS, WI, ND, SD, MN, MO, NE, IA; Southeast: VA, WV, KY, TN, AR, LA, MS, AL, GA, NC, SC, FL; southwest: OK, TX, NM, AZ; west: CO, WY, MT, ID, UT, NV, CA, OR, WA, AK, HI

[b]States that require infertility treatment be covered by insurance, including AR, CA, CT, HI, IL, LA, MD, MA, MT, NJ, NY, OH, RI, TX, WV

[c]Other race includes individuals who responded "yes" to Ashkenazi Jewish, Latino, Native American, Middle Eastern, Other

[d]A total of 47 individuals (23 with a positive experience and 24 with a non-positive experience) selected that they chose not to answer the question regarding race/ethnicity. Completely missing values were present for 21 individuals (15 with a positive experience and 6 with a non-positive experience)

[e]Questions were asked on a 1-to-5 Likert scale with the above-mentioned question-specific guidance. Aggregate data is presented as an average score 1 to 5

[f]States that require infertility treatment be covered by insurance include AR, CA, CT, HI, IL, LA, MD, MA, MT, NJ, NY, OH, RI, TX, WV

[g]Categories are not mutually exclusive

[h]Female infertility diagnoses include diminished ovarian reserve, polycystic ovary syndrome, endometriosis, anovulation, immunologic diagnoses, tubal factor, uterine factor (e.g., fibroids, structural anomalies or abnormalities [e.g., uterine septum], endometrial hyperplasia, endometrial polyps), poor egg quality, recurrent pregnancy loss, genetic diseases

[i]Unexplained infertility includes all those who reported that their fertility was unexplained after work-up; as opposed to no diagnosis listed where respondents reported no diagnosis of male factor, female factor, or unexplained infertility

et al. of 63% [10]. As hypothesized and demonstrated in prior studies, some of the strongest predictors of PMPE for males were related to physician characteristics, including physicians who were rated as being good communicators, appearing trustworthy and compassionate, and setting accurate expectations. These associations were found to persist even after controlling for potential confounding variables, such as demographic characteristics including age, race, region, education status, and income level. Other strong predictors of PMPE included highly rated clinic characteristics—namely, clinics with no wait times to speak to a doctor or nurse, availability of same-day appointments, and direct lines of communication with providers. A significant proportion of male respondents reported NPE, consistent with NPE rates reported by female respondents. This highlights the utility of the present study in analyzing factors related to

Table 2 Physician and clinic characteristics of clinics among all male FertilityIQ questionnaire respondents evaluating the first or only clinic they visited, June 2015–August 2020

	Positive experience (n = 400)		Non-positive experience (n = 257)		Total (n = 657)	
Physician and nurse characteristics						
Doctor gender, n (%)						
Male	274	68.7	164	64.0	438	66.9
Female	125	31.3	92	35.9	217	33.1
Doctor quantitative scores, mean (SD)						
How similar were your results compared with the expectations your doctor set?[a]	4.02	1.03	2.73	1.06	3.52	1.21
Were you treated like a number or like a human?[b]	4.84	0.51	3.35	1.40	4.26	1.20
Was your doctor a good communicator?[c]	4.81	0.50	3.50	1.25	4.30	1.08
Do you feel your doctor was trustworthy?[c]	4.92	0.35	3.68	1.18	4.45	0.98
Did your doctor show compassion?[c]	4.81	0.52	3.48	1.23	4.30	1.08
Did your doctor fully explain potential risks?[c]	4.84	0.48	3.74	1.11	4.42	0.95
Did you leave each appointment with a full understanding of what to expect next?[c]	4.74	0.53	3.42	1.11	4.23	1.03
If setbacks occurred, did your doctor adjust the course of treatment?[c]	4.66	0.73	3.24	1.30	4.11	1.21
How frequently did you see your doctor?[d]	3.74	1.27	2.89	1.35	3.41	1.37
Assigned nurse or care coordinator, n (%)						
Yes	165	42.5	81	32.8	246	38.7
No	112	28.9	97	39.3	209	32.9
Not sure	111	28.6	69	27.9	180	28.4
Clinic characteristics						
Clinical errors (major/minor)						
Major error[e], n (%)	19	4.8	99	38.5	118	18.0
Minor error[f], n (%)	45	11.3	137	53.3	182	27.7
None of the above, n (%)	346	86.5	99	38.5	445	67.7
How easy was it to schedule appointments that were convenient for you?[g], mean (SD)	4.75	0.54	3.63	1.13	4.32	0.98
Wait time to speak to doctor or nurse, n (%)						
No wait	49	12.4	4	1.6	53	8.2
Within an hour	119	30.1	32	12.8	151	23.4
By end of day	146	37.0	88	35.1	234	36.2
Within 24 h	53	13.4	76	30.3	129	20.0
More than 24 h	7	1.8	36	14.3	43	6.6
Not sure	21	5.3	15	6.0	36	5.6
Ease of seeing a doctor, n (%)						
Immediately	36	10.0	3	1.3	39	6.5
That day	85	23.6	20	8.5	105	17.6
1–3 days	180	49.9	97	41.3	277	46.5
4–7 days	38	10.5	44	18.7	82	13.8
Over one week	22	6.1	71	30.2	93	15.6
Lines of communication, n (%)						
Direct line to nurse	224	56.0	93	36.2	317	48.3
Direct line to doctor	86	21.5	17	6.6	103	15.7
Doctor's personal cell phone	53	13.3	16	6.2	69	10.5
Group email (e.g. "info@clinic.com")	126	31.5	65	25.3	191	29.1
Nurse's direct email	195	48.8	91	35.4	286	43.5
Doctor's direct email	148	37.0	57	22.2	205	31.2
24-h on-call number	234	58.5	118	45.9	352	53.6
After hours access—who did you talk to? n (%)						
Your doctor	116	29.0	26	10.1	142	21.6

Table 2 (continued)

	Positive experience (n = 400)		Non-positive experience (n = 257)		Total (n = 657)	
Another doctor	64	16.0	24	9.3	88	13.4
Your nurse	128	32.0	42	16.3	170	25.9
Another nurse	105	26.3	49	19.1	154	23.4
Answering service attendance	123	30.8	86	33.5	209	31.8
Not sure	127	31.8	84	32.7	211	32.1
None of the above	21	5.3	27	10.5	48	7.3
Onsite resources, n (%)						
On-site genetic counseling	135	33.8	45	17.5	180	27.4
Mental health counseling	64	16.0	34	13.2	98	14.9
Nutrition counseling	73	18.3	22	8.6	95	14.5
Administering shots	136	34.0	62	24.1	198	30.1
Coordinating at-home nursing	16	4.0	3	1.2	19	2.9
Selling any medications on site	30	7.5	13	5.1	43	6.5
Providing backup medications	86	21.5	29	11.3	115	17.5
Acupuncture	68	17.0	34	13.2	102	15.5
None of the above	80	20.0	87	33.9	167	25.4
Satisfaction with billing department[h], mean (SD)	4.42	0.80	3.07	1.18	3.90	1.16

[a]Question was asked using a 1-to-5 Likert scale with guidance; 1 = completely different and 5 = exactly as expected

[b]Question was asked using a 1-to-5 Likert scale with guidance; 1 = like a number and 5 = like a human

[c]Question was asked using a 1-to-5 Likert scale with guidance; 1 = not at all or never and 5 = absolutely or always

dQuestion was asked using a 1-to-5 Likert scale with guidance 1=Once or twice and 5=Every visit.

[e]Major errors included: lost or damaged samples, lost results, cancelled a cycle due to a clinical error, scheduled for wrong procedure, failed to convey critical information, lost appointments, failed to order an appropriate test, failed to consider drug intolerance

[f]Minor errors included: failed to send your chart to another clinic, failed to call with results, provided conflicting information, failed to call in prescriptions to a pharmacy, failed to inform you of changes in protocol, lost paperwork

[g]Question was based on 1-to-5 Likert scale with guidance that 1 = very hard and 5 = very easy

[h]Question was based on 1-to-5 Likert scale with guidance that 1 = not at all and 5 = completely

PMPE to guide future intervention to maximize PMPE for both male and female patients.

PMPE was found to be most strongly associated with multiple physician characteristics in our analysis. Patient satisfaction has previously been associated with achieving pregnancy and a good patient-physician relationship, whereas longer wait times, communication errors, and poor relationships with healthcare personnel were the main reasons for dissatisfaction [9, 10, 17, 18]. In this study, patients reported higher PMPE when they received individualized attention from providers, when providers set appropriate expectations for treatment, and when their treatment course was changed in response to setbacks. These measures may indicate a greater understanding of patients' situations, and responsiveness to setbacks may make patients feel as their concerns are being heard and managed appropriately. Previous studies have extensively investigated the patient-provider relationship for female patients receiving infertility care. One previous European study showed that less than half of women were satisfied with the infertility

treatment they received [9]. Another showed that 10 to 20% of women did not feel that their provider involved them in decision-making or was interested in them as a person [17]. Importantly, though pregnancy rates are generally deemed important for couples in choosing a fertility clinic, it has been shown that couples were willing to choose a clinic with a lower pregnancy rate if its providers were rated as more "patient-centered" [17]. This emphasizes the importance of the patient-physician relationship in infertility care, and it is crucial to make providers aware of these findings before any improvement in the patient experience is achievable. Physician characteristics should be an initial target for intervention in obtaining PMPE, particularly because these improvements can be made without significant costly infrastructural change [19, 20].

The characteristics of clinic administration that were associated with PMPE likely represent a longer-term target for intervention in infertility care. These findings are also supported by prior literature, which found that the ability to easily contact and schedule appointments with providers,

Table 3 Adjusted odds ratios (aOR) for patients reporting a positive experience at a US fertility clinic among all male FertilityIQ questionnaire respondents evaluating the first or only clinic they visited, June 2015–August 2020

Predictor	β	SE β	aOR for reporting a positive experience	95% CI
Used donor sperm[a]	− 0.072	0.613	0.93	0.28–3.10
Pregnancy[a]	0.263	0.327	1.30	0.68–2.47
Male factor infertility[a]	0.456	0.401	1.58	0.69–3.59
Racial or ethnic origin, n (%)				
European/Caucasian			Referent	
Black or African American	− 0.124	0.720	0.88	0.21–3.63
South or East Asian	0.003	0.630	1.00	0.29–3.48
Other[b]	0.077	0.349	1.08	0.54–2.14
Multiracial	0.698	0.586	2.01	0.64–6.34
Education				
College degree or higher	− 0.609	0.359	0.54	0.30–1.10
Less than college degree			Referent	
LGBTQ[a]	1.13	0.651	3.09	0.86–11.06
Income (annual)				
Less than 100K	0.098	0.335	1.10	0.57–2.13
100–200K			Referent	
More than 200K	− 0.813	0.431	0.44	0.19–1.03
Male doctor[c]	0.125	0.306	1.13	0.62–2.06
How similar were your results compared with the expectations your doctor set?[d]				
Similar	1.05	0.318	2.86	1.53–5.34
Not similar			Referent	
Were you treated like a number or like a human?[e]				
Human	0.560	0.532	1.75	0.62–4.98
Number			Referent	
Was your doctor a good communicator?[a,f]	0.860	0.575	2.36	0.77–7.29
Do you feel your doctor was trustworthy?[a,f]	1.613	0.838	5.01	0.97–25.93
Did your doctor show compassion?[a,f]	0.682	0.565	1.98	0.65–5.99
Did your doctor fully explain potential risks?[a,f]	− 0.311	0.687	0.73	0.19–2.84
Did you leave each appointment with a full understanding of what to expect next?[a,f]	1.004	0.465	2.73	1.10–6.80
If setbacks occurred, did your doctor adjust the course of treatment?[a,f]	0.888	0.386	2.43	1.14–5.18
How frequently did you see your doctor?[g]				
Frequently	− 0.278	0.299	0.76	0.42–1.36
Infrequently			Referent	
Clinical error made (major or minor)[a,h]	− 1.496	0.313	0.22	0.12–0.41
How easy was it to schedule appointments that were convenient for you?[i]				
Easy	1.395	0.462	4.03	1.63–9.97
Not easy			Referent	
Ease of seeing a doctor				
Same day	1.594	0.527	4.93	1.75–13.86
1–3 days	0.913	0.452	2.49	1.02–6.07
4–7 days	1.423	0.599	4.15	1.27–13.50
Over one week			Referent	
Lines of communication—nurse's email[a]	− 0.465	0.333	0.63	0.32–1.22
Genetic counseling[a]	0.953	0.344	2.59	1.32–5.10
Satisfaction with billing department[j]				
Satisfied	1.606	0.304	4.98	2.74–9.04
Not satisfied			Referent	
Test				

Table 3 (continued)

Predictor	β	SE β	aOR for reporting a positive experience	95% CI
Overall model evaluation				
Wald test[k]	$\chi 2 = 134.59$	df = 29	$p < 0.0001$	
Validations of predicted probabilities				
Somers' D	0.879			
Kendall's Tau-a	0.416			
c-statistic	0.939			

SE, standard error; *aOR*, adjusted odds ratio; *95% CI*, 95% confidence interval; *LGBTQ*, lesbian-gay-bisexual-transgender-queer; *df*, degrees of freedom

[a]Odds ratio is comparing those who responded "Yes" to the question of interest to those who responded "No," with "No" being the reference variable

[b]Other race includes individuals who responded "yes" to Ashkenazi Jewish, Latino, Native American, Middle Eastern, Other

[c]Compares those who identified as LGBTQ to those who stated they were not LGBTQ

[d]Question was asked using a 1-to-5 Likert scale with guidance; 1 = completely different and 5 = exactly as expected. Answers 4 or 5 were grouped together as "Similar", while answers 1, 2, or 3 were grouped together as "Not similar"

[e]Question was asked using a 1-to-5 Likert scale with guidance; 1 = Like a number and 5 = Like a human. Answers 4 or 5 were grouped together as "Human", while answers 1, 2, or 3 were grouped together as "Number"

[f]Question was asked using a 1-to-5 Likert scale with guidance; 1 = not at all or never and 5 = absolutely or always. Answers 4 or 5 were grouped together as "Yes", while answers 1, 2, or 3 were grouped together as "No"

[g]The question, "How frequently did you see your doctor?" was asked using a 1-to-5 Likert scale with guidance; 1 = once or twice, 5 = every visit. Answers 4 or 5 were grouped together as "Frequently", while answers 1, 2, or 3 were grouped together as "Infrequently"

[h]Major errors included: lost or damaged samples, lost results, cancelled a cycle due to a clinical error, scheduled for wrong procedure, failed to convey critical information, lost appointments, failed to order an appropriate test, failed to consider drug intolerance. Minor errors included: failed to send your chart to another clinic, failed to call with results, provided conflicting information, failed to call in prescriptions to a pharmacy, failed to inform you of changes in protocol, lost paperwork

[i]Question was based on 1-to-5 Likert scale with guidance that 1 = very hard and 5 = very easy. Answers of 4 or 5 were grouped together was "Easy", while answers of 1, 2, or 3 were grouped as "Not easy"

[j]The question, "How satisfied were you with this clinic's billing department?" was based on 1-to-5 Likert scale with guidance that 1 = not at all, 3 = somewhat, 5 = completely. Answers of 4 or 5 were grouped together as "Satisfied", while answers of 1, 2, or 3 were grouped as "Not satisfied"

[k]Median *p* value ruled applied using the median *p* value of the significance tests conducted in each imputed dataset

even outside of business hours, was associated with higher patient satisfaction. Several studies have proposed the use of patient portals and online scheduling tools to seamlessly connect patients with their providers [21, 22]. Though the use of these tools should be balanced with the risk of placing additional burden on providers in some infertility clinics, they may be applied to many clinics to enhance the patient experience with infertility care nationally. Further, similar to the Shandley et al.'s study, availability of genetic counseling and satisfaction with the billing department were found to be one of the strongest predictors on multivariate analysis, even after controlling for confounders related to patients' socio-economic level, including income level, education level, and insurance coverage [10]. Therefore, it is likely that patients viewed the availability of ancillary services, such as genetic counseling, and interactions with the billing department, as components of the clinic administration, which further underlines the importance of seeking a more robust clinic administration.

Though prior literature has shown different factors associated with PMPE in male patients in other clinical settings [11–14], our findings align with the prior report by Shandley et al. [10], indicating that similar physician-related and clinic-related factors are associated with PMPE for both male and female patients receiving fertility care. Notably, in contrast to the Shandley et al.'s study, on multivariate analysis, PMPE in the male population was not associated with achievement of pregnancy, patient education level, and provision of certain ancillary services, including availability of acupuncture.

Achievement of pregnancy was one of the few non-modifiable factors found to be associated with PMPE on univariate analysis. However, this was surprisingly not found on multivariate analysis, unlike the results from the Shandley et al.'s study [10]. Further, modifiable factors, including provider and patient characteristics, are stronger predictors of PMPE than achievement of pregnancy for male patients. This highlights these factors as fruitful targets for

intervention to improve male patient satisfaction, even in a setting where the primary outcome of pregnancy may be difficult for providers to predict and control, and these interventions may be even more effective at improving patient satisfaction for male patients than female patients. Other factors that we predicted to affect PMPE based on the results from Shandley et al., including male factor infertility and use of donor sperm, were also initially included in the model. However, like for achievement of pregnancy, the exclusion of these factors from the model did not significantly affect the aORs of the other factors in the model (data not shown). Further research should include larger samples of male respondents to better quantify the magnitude of the association between achievement of pregnancy, male factor infertility, and use of donor sperm with PMPE in males.

National rates of LGBTQ status reported in polls range widely, with recent estimates ranging between 4 and 8% [23]. In the present study, 8.2% of the included male respondents identified as LGBTQ. This rate is higher than the rate of self-reported LGBTQ status (4.7%) in Shandley et al. [10]. The percentages of LGBTQ individuals who identify as male versus female, as well as the rates at which self-identified male LGBTQ patients, seek fertility care, compared to the rates at which self-identified female LGBTQ patients do so, has not been well-studied. There is a need for future analysis to better understand the behaviors and needs of LGBTQ individuals seeking fertility care. Further, LGBTQ status was hypothesized to be negatively associated with PMPE because it is well-established that the population is more likely to experience discrimination and face systemic barriers when interacting with the healthcare system, leading to lower overall satisfaction with healthcare encounters [24, 25]. Interestingly, LGBTQ status was found to be positively associated with PMPE in our univariate analysis. It is possible that, in contrast to other clinical settings, fertility clinics may provide a more inclusive and non-biased environment for LGBTQ patients, where they are encouraged to candidly discuss their sexual preferences and concerns related to their sexual and gender orientations [26]. Still, this association was not noted on multivariate analysis, so further research to examine LGBTQ self-identification status and the patient experience in fertility clinics using other databases is warranted.

PMPE was associated with lower education level on univariate analysis, but was not found to be on multivariate analysis. Prior studies have found patients with high education levels are less likely to report PMPE, which has been proposed to be a result of the higher expectations of care from this population [27, 28]. However, this relationship was not found in this study after controlling for other potential confounding factors that are often associated with education level, including employment status and insurance coverage, which may be related to the highly variable costs and

coverage for infertility services across different insurance policies.

Strengths

This is the first study to analyze the experience at fertility clinics for a national sample of male patients and uses the largest national database reporting patient-centric data regarding fertility care to do so. In previous studies, men who had received an infertility diagnosis were found to experience loss of masculine identity and feelings of insignificance [29, 30]. In addition, many men reported feeling excluded or dismissed from the process of infertility treatment because women were seen as being placed at the epicenter of infertility treatment. Men also felt that they were not as supported as their female counterparts throughout the process [29–32]. Further, a recent qualitative study found that, in interviews with couples undergoing fertility treatment, the emphasis on the female partner throughout diagnosis and treatment could make some women feel as though their body was "abnormal" while leading to missed infertility diagnoses in the male partners [33]. Hence, the results of this study are particularly important to highlight in the context of these previous findings and the lack of any large-scale analyses of this issue within the USA.

Limitations

It is important to note that although the FertilityIQ questionnaire is publicly available for all patients, it is completed by more women than men, so our analysis involves a smaller sample size when compared to prior large-scale studies that evaluate the female experience with fertility clinics. The prior study by Shandley et al.'s study included over 7000 respondents, whereas the present study includes just over 1000 respondents after expanding the study period by 2 years [10]. The discrepancy in sample size limits direct comparability of the results of the two studies. Further, it is difficult to assess whether the study population accurately represents the national population of male patients seeking fertility treatment. In the Shandley et al.'s study, the study group was compared to the population receiving in-vitro fertilization (IVF) nationwide as listed in the 2016 Assisted Reproductive Technology (ART) National Summary Report from the CDC, and the two populations were found to reflect one another in overall characteristics [10]. However, the ART national summary reports do not detail patient characteristics by gender, so it remains difficult to accurately determine if the study group in the present study reflects the national male population receiving IVF treatment. Despite only 3% of respondents to the FertilityIQ questionnaire being male, FertilityIQ still provides the largest dataset of this kind nationwide in

terms of absolute numbers of male respondents. However, the limited proportion of male respondents demonstrates the lack of emphasis on the experience of the male partner in this space. The FertilityIQ questionnaire was not designed specifically for research purposes. As such, it includes questions that are difficult to interpret for the purposes of research analyses. Completed questionnaires also included missing data, which required imputation prior to statistical analysis. Finally, this study draws several comparisons between the male and female population using the results from Shandley et al. [10]. Because both of these studies are drawn from the same questionnaire, the same survey and response biases affect both studies. This may lead to a higher number of identified similarities in the male and female patient experience than in reality.

Finally, because of the size of the study population, FertilityIQ was unable to standardize the point during treatment at which each fertility clinic requested respondents to fill out the survey. Therefore, some surveys may have been completed while participants had ongoing treatment, whereas others may have been completed after pregnancy was achieved. As part of the survey, participants reported whether they received their desired results during their care, and those who were still undergoing treatment were given the option to respond "Too early to say". As Table 1 demonstrates, 20.8% of respondents who reported PMPE provide this response, whereas 17.6% of respondents who did not report PMPE did so. The similarity between these two proportions demonstrates that though these respondents may have still been undergoing treatment, it did not significantly affect their patient experience. Furthermore, our ultimate goal as providers is to provide a PMPE for patients at all stages of care regardless of eventual pregnancy outcome. Though the finding that PMPE is associated with pregnancy outcome is unsurprising, because we cannot always guarantee pregnancy at the conclusion of treatment, we should seek to have PMPE reported in all surveys irrespective of time of survey relative to fertility treatment.

Conclusion

Physician characteristics and ease of access to a physician or nurse were the most highly predictive of PMPE reported by male patients. By identifying factors that are associated with a PMPE, clinics may be able to optimize the patient experience and improve the quality of infertility care that they provide for both men and women.

Data sharing statement N/A

Trial registration N/A

Declarations

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