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Association of the quality of interpersonal care during family planning counseling with contraceptive use



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BACKGROUND: Health communication and interpersonal skills are increasingly emphasized in the measurement of health care quality, yet there is limited research on the association of interpersonal care with health outcomes. As approximately 50% of pregnancies in the United States are unintended, whether interpersonal communication influences contraceptive use is of public health importance.

OBJECTIVE: The aim of this study was to determine whether the quality of interpersonal care during contraceptive counseling is associated with contraceptive use over time.

STUDY DESIGN: The Patient—Provider Communication about Contraception study is a prospective cohort study of 348 English-speaking women seen for contraceptive care, conducted between 2009 and 2012 in the San Francisco Bay Area. Quality of communication was assessed using a patient-reported interpersonal quality in family planning care measure based on the dimensions of patient-centered care. In addition, the clinical visit was audio recorded and its content coded according to the validated Four Habits Coding Scheme to assess interpersonal communication behaviors of clinicians. The outcome measures were 6-month continuation of the selected contraceptive method and use of a highly or moderately effective method at 6 months. Results were analyzed using mixed effect logistic regression models controlling for patient demographics, the clinic and the provider at which the visit occurred, and the method selected.

RESULTS: Patient participants had a mean age of 26.8 years (SD 6.9 years); 46% were white, 26% Latina, and 28% black. Almost two-thirds of participants had an income of <200% of the Federal Poverty Level. Most of the women (73%) were making visits to a provider whom they had not seen before. Of the patient participants, 41% were still using their chosen contraceptive method at 6-month follow-up. Patients who reported high interpersonal quality of family planning care were more likely to maintain use of their chosen contraceptive method (adjusted odds ratio [aOR], 1.8; 95% CI, 1.1–3.0) and to be using a highly or moderately effective method at 6 months (aOR, 2.0; 95% CI, 1.2–3.5). In addition, 2 of the Four Habits were associated with contraceptive continuation; “invests in the beginning” (aOR, 2.3; 95% CI, 1.2–4.3) and “elicits the patient’s perspective” (aOR, 1.8; 95% CI, 1.0–3.2).

CONCLUSION: Our study provides evidence that the quality of interpersonal care, measured using both patient report and observation of provider behaviors, influences contraceptive use. These results provide support for ongoing attention to interpersonal communication as an important aspect of health care quality. The associations of establishing rapport and eliciting the patient perspective with contraceptive continuation are suggestive of areas of focus for provider communication skills training for contraceptive care.

Key words: contraception, counseling, family planning, health communication, patient-centered care

Helping women to achieve their reproductive goals, including assisting them in choosing how to prevent undesired pregnancies, is essential to optimize the health of women and their families.¹ Unfortunately, over the past several decades, the proportion of pregnancies in the United States (US) that are unintended has remained stubbornly high, at approximately 50%.² The persistence of this discouraging statistic indicates the importance of understanding ways to support women who wish to prevent pregnancy.

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The increasing attention to health communication as a component of health care quality³ suggests that family planning providers’ interactions with women are an opportunity to contribute to women’s ability to use contraception consistently and effectively, with the goal of decreasing their risk of unintended pregnancy. Limited data support a relationship between counseling quality and contraceptive use, with 1 cross-sectional study finding that women who reported receiving personalized counseling were more likely to be using contraception,⁴ and a longitudinal study finding that women were more likely to discontinue the implant if they had felt pressured to use this method.⁵ In the health care literature more generally, although studies have documented an association between patients’ ratings of the quality of interpersonal care and

health outcomes, there is limited research documenting an association between the quality of observed communication behaviors and outcomes or identifying which aspects of communication are influential.⁶⁻⁸

This study longitudinally examined whether the interpersonal quality of a contraceptive counseling visit, measured from the patient’s perspective and from observation of clinician communication practices, influenced women’s continuation of their chosen contraceptive method and use of effective methods.

Materials and Methods

The Patient—Provider Communication about Contraception (PPCC) study is a cohort study of women presenting for contraceptive care with the primary aim of assessing the relationship between interpersonal quality of care

and contraceptive outcomes, using audio recordings of contraceptive counseling visits and postvisit surveys to assess interpersonal quality of care, and follow-up surveys at 3 and 6 months to assess contraceptive use. The study received human subjects approval from the Committee on Human Research at the University of California, San Francisco.

Study setting

The PPCC study was conducted between 2009 and 2012 at 6 clinics in the San Francisco Bay Area. Clinics types included family planning clinics, primary care clinics, and general gynecology clinics. All clinics were either safety net clinics with access to Family PACT, the state-funded family planning program, or private clinics with comprehensive contraceptive coverage.

Study cohort

Provider participants included nurse practitioners, physician assistants, certified nurse midwives, and physicians who performed contraceptive counseling. Provider participants were told that the study was designed to improve understanding of women's experience with contraceptive counseling. They were asked to provide usual care.

Eligible patient participants were women presenting for medical care with a participating provider. Inclusion criteria for patients were speaking English, wishing to discuss starting or changing contraceptive methods at the upcoming visit, not currently pregnant or wishing to become pregnant, and self-identifying as black, white, or Hispanic/Latina. Limiting the sample to English-speaking patients was necessary to prevent variations in counseling related to clinicians' language proficiency or use of interpreters. The race/ethnicity criterion was due to the fact that the clinics included in the study provided care to few individuals in other racial/ethnic groups. As other analyses will explore disparities in communication, we limited our sample to those racial/ethnic groups for which we anticipated having adequate recruitment. All patients and providers completed written informed

consent and received reimbursement for their time.

Measures

Patients' baseline demographic information was collected using a previsit survey immediately before the visit. The key independent variables were patient evaluation of the interpersonal quality of care measured in the postvisit survey and communication behaviors coded from audio recording of the clinical visit.

The patient-reported Interpersonal Quality in Family Planning care (IQFP) scale was developed for this study using a review of domains related to patient-centered care included in patient-reported quality measures,⁹⁻¹⁴ previous qualitative work on women's preferences for contraceptive counseling,¹⁵ and factor analysis. Originally, 17 items were included in the postvisit survey encompassing all identified domains related to patient-centered care. Each item was rated on a 5-point Likert scale, ranging from poor (1) to excellent (5). Item distributions and intercorrelations among items were reviewed with elimination of items highly intercorrelated ($r > 0.80$). This resulted in the final IQFP scale, which is an 11-item, 1-factor scale (Table 1). Using standard factor analysis techniques,¹⁶ we tested the internal validity of the scale by conducting principal components factor analysis with promax rotation, a technique to identify the underlying relationships between the measured items. All items had factor loading scores > 0.70 . The final 11-item IQFP scale had a Cronbach's alpha of 0.95, suggesting good internal consistency of the scale. The scores were highly negatively skewed toward high ratings of interpersonal care: half of the study participants rated their clinicians as excellent on every item. We therefore dichotomized the scale to compare participants giving their providers the highest rating of interpersonal care to those with lower scores.

Audio recordings of visits were coded using a modified version of the Four Habits Coding Scheme (4HCS). This instrument is a previously developed evaluative instrument based on the tenets of patient-centered care that

describes clusters of clinician behaviors and skills believed to be associated with effective clinical practice and positive health outcomes.¹⁷ This model has been validated using a variety of complementary measures, including the Roter Interaction Analysis System.¹⁷ For the purpose of this study, the research team worked with 1 of the developers of the original scale (E. Krupat) to adapt the instrument for our research and clinical context (Table 1). No changes were made for Habit 1, "Invest in the beginning," or Habit 4, "Invest in the end." For Habit 3, "Demonstrate empathy," it was necessary to eliminate 1 item, "Displays effective nonverbal behavior," because of the use of audio recordings in the PPCC study as opposed to video recordings. Habit 2, "Elicit the patient's perspective," was adapted to be specific for contraceptive care, with 2 of the original items, "Interested in patient's understanding of problem" and "Asks about patient's goals for visit" being replaced with "Elicits patient's experiences around contraception" and "Elicits patient's preferences around contraception," respectively. At initiation of coding, a training was conducted with Dr Krupat and the principal investigator (C.D.), the primary coder, and the research coordinator (K.L.). A total of 22 visits were then coded by the primary coder, the principal investigator, and the research coordinator, with discussion of areas of disagreement. This process generated a codebook that was then used by the primary coder to code all recordings (including the original 22). The primary coder and principal investigator met regularly to resolve areas of ambiguity in coding. Scores for each of the habits were based on the sum of the items, coded on a 5-point Likert scale, as done with the original instrument.¹⁷ All were coded to compare those scoring in the top quartile of effectiveness for the habit to those scoring lower.

Contraceptive use was assessed at 3 and 6 months using telephone surveys. Because ongoing method use decreases the risk of unintended pregnancy through preventing gaps in use from contraceptive nonuse or method switching,^{18,19} the primary study

TABLE 1
Interpersonal communication scale descriptions

Modified Four Habits Coding Scheme ^a	Coding items
Habit 1 Invest in the beginning	Shows familiarity Greets patient warmly Makes small talk Uses primarily open-ended questions Encourages expansion of medical concern Elicits the full range of concerns
Habit 2 Elicit the patient's perspective	Elicits patient's experiences around birth control Elicits patient's preferences around birth control Shows interest in impact on patient's life of birth control use
Habit 3 Demonstrate empathy	Encourages appropriate expression of emotion Shows empathy for patient's experiences or feelings Helps to identify/label feelings
Habit 4 Invest in the end	Frames information using patient's perspective Allows time for information to be absorbed Explains clearly/uses little jargon Explains rationale for plan Effectively tests for comprehension Encourages involvement in decision-making Explores acceptability of plan Explores barriers to implementation Encourages additional questions Makes clear plan for follow up

Interpersonal quality of family planning care^b

Please rate the health care provider you saw today with respect to the following qualities:	Factor Loading ^c
Respecting me as a person	0.797
Showing care and compassion	0.836
Letting me say what mattered to me about my birth control method	0.849
Giving me an opportunity to ask questions	0.827
Taking my preferences about my birth control seriously	0.802
Considering my personal situation when advising me about birth control	0.858
Working out a plan for my birth control with me	0.870
Giving me enough information to make the best decision about my birth control method	0.847
Telling me how to take or use my birth control method most effectively	0.788
Telling me the risks and benefits of the birth control method I chose	0.774
Answering all my questions	0.855

^a Response categories: 1 = highly effective, 2 = effective, 3 = mixed, 4 = less effective, 5 = not effective; ^b Response categories: 1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent;

^c Factor loadings represent the correlation between each item and the factor with possible values ranging from -1 to +1.

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outcome was continuous use of the contraceptive method selected at the index visit at the time of 3- and 6-month follow-up surveys. Similar to the Contraceptive CHOICE project, method use

was considered continuous if women reported use of the method at the time of the survey and reported no gaps in use of this method of 1 month or longer.²⁰ To assess women's risk of pregnancy,

regardless of method switching, we also analyzed the proportion of participants using any moderately or highly effective method as defined by the World Health Organization at 6-month follow-up

(ie, hormonal methods, implant, or intrauterine contraception).²¹

Provider participants completed 1 survey at the completion of the study to collect their demographic information.

Sample size

A sample size of 414 patient participants was determined to provide 80% power in 2-sided tests with a type-I error rate of 5% to detect differences of 15%–20% in continuation for binary predictors that range in prevalence from 20%–50% in the sample. Sample size estimates were penalized for loss of precision due to adjustment for confounders, and accounted for 20% loss to follow-up, as well as intraclass correlation of responses of 0.03 among patients with the same provider.

Statistical analysis

We characterized the sample both overall and by 3- and 6-month contraceptive outcomes using means, standard deviations, and proportions as appropriate; differences in proportions were assessed using the Fisher Exact test. We used mixed effects logistic models to assess associations of IQFP and 4HCS behaviors with contraceptive continuation and use of highly or moderately effective methods. To account for clustering, the models included a random effect for provider and a fixed effect for clinic. We adjusted for theoretically important patient and provider characteristics such as patient age, race/ethnicity, and contraceptive method selected at index visit, and as well as potential additional correlates of continuation confounders identified in unadjusted bivariable analyses.

Results

A total of 38 clinicians participated in the study, and 349 patients were recruited, with 1 patient providing no survey data, resulting in a sample size of 348 patients for this analysis. Seven participants were excluded from the analyses of the associations of 4HCS with contraceptive outcomes due to technical problems with the audio recordings. The number of eligible women who declined to participate was tracked over the study

period with the exception of a 2-month period at 1 clinic, during which 32 participants were recruited. Excluding these 32 women, of a total of 382 women invited to participate, 66 eligible women declined. The characteristics of patient study participants are described in [Table 2](#). At 3 and 6 months, 84% and 86% completed follow-up surveys respectively. Those lost to follow-up at 6 months were more likely to be of low income and to have lower education levels, but they did not differ statistically by age, race/ethnicity, or parity from participants with complete follow-up data. There were also no differences in attrition by the type of provider seen or contraceptive method selected.

Ages ranged from 16 to 53 years, with a mean age of 26.8 years (SD 6.9 years). More than half of the sample was between the ages of 20 and 29 years, and 46% were white. Almost two-thirds of participants had an income of <200% of the Federal Poverty Level. Most of the women (72.7%) were making visits to a provider whom they had not seen before.

All but 1 of the 38 providers of contraceptive counseling in the study were female, and the majority ($n = 26$) were non-Hispanic white. The majority ($n = 27$) were advanced practice clinicians (eg, CNM, NP, PA), but physicians specializing in family medicine ($n = 5$) and obstetrics and gynecology ($n = 6$) also participated in the study. The mean age was 50 years.

Overall, 41% of women reported having used the same method that they selected at the index visit continuously at 6 months, with 60% currently using a highly or moderately effective method ([Table 2](#)). Continuation of the chosen method and use of a highly or moderately effective contraceptive method at 6 months varied by patients' sociodemographic characteristics. Women with an income >200% of federal poverty and those with a college education were more likely than those with a lower income or less education to continue their method and to use a highly or moderately effective method at 6 months. Rates of highly or moderately effective method use at 6 months were higher among women who selected more effective methods at the

initial visit, with those choosing IUDs or implants having the highest use of a highly or moderately effective method.

In bivariable analysis, continuation of the chosen method at 3 months and use of a highly or moderately effective method at 6 months was significantly associated with high scores on the IQFP scale (odds ratio [OR], 1.74; 95% CI, 1.10–2.77, and OR, 1.78; 95% CI, 1.08–2.94, respectively), with a trend in the same direction for continuation of the chosen method at 6 months (OR, 1.57; 95% CI 0.97–2.54). In adjusted analysis, patients rating the interpersonal quality of care highest in the contraceptive counseling visit were more likely to be using the same method they selected at the index visit 6 months later (adjusted OR [aOR], 1.8; 95% CI, 1.1–3.0) ([Table 3](#)). They also had twice the odds of using a highly or moderately effective method at 6-month follow-up (aOR, 2.0; 95% CI, 1.2–3.5).

Observed provider communication behaviors also were associated with contraceptive continuation ([Table 4](#)). In both unadjusted and adjusted analyses, patients were more likely to report continuous use of their chosen method use at 6 months when seen by providers coded higher on “Invests in the beginning” (aOR, 2.3; 95% CI, 1.2–4.3) and “Elicits the patient perspective” (aOR, 1.8; 95% CI, 1.0–3.2). Neither “Demonstrates empathy” nor “Invests in the end” were associated with contraceptive continuation. There were no statistically significant associations between provider communication behaviors and use of a highly or moderately effective method at 6 months.

Comment

Our study provides evidence that the quality of interpersonal care, measured using both patient report and coding of audio recordings of counseling, influences contraceptive use. These results have implications for the practice of contraceptive counseling, as well as for the understanding of health communication in general.

In family planning care specifically, our findings that both patient-reported and objective measures of quality of

TABLE 2

Study participant and visit characteristics, and their associations with contraceptive continuation at 3 and 6 months and use of a highly or moderately effective method at 6 months (n = 348)

	Overall participant and visit characteristics	Continuation 3 months (n = 319)	Continuation 6 months (n = 304)	Use of a moderately or highly effective 6 months (n = 292) ^a
Proportion continuing method at 3 and 6 months and using highly or moderately effective method at 6 months, %		58.2	40.8	60.3
Patient demographics				
Mean age (SD)	26.8 (6.9)	27.4 (6.9)	27.8 (7.2)	26.9 (6.8)
Age categories, years, %				
16–20	11.8	45.7	32.4	57.6
20–24	33.2	56.6	39.2	61.5
25–29	26.1	58.3	41.5	67.1
30–34	12.0	52.6	40.5	55.6
35+	16.9	60.7	50.0	52.0
Race/ethnicity (%)				
Black, non-Hispanic	28.4	53.9	38.8	61.7
Hispanic or Latina	25.5	48.8	34.2	56.3
White, non-Hispanic	46.1	61.3	46.2	61.4
Federal poverty level (%):				
<100%	42.7	51.6 ^b	37.2 ^b	60.5 ^b
101%–200%	20.6	47.8 ^b	31.3 ^b	47.7 ^b
>200%	36.7	65.6 ^b	50.9 ^b	67.3 ^b
Highest level of education completed (%)				
High school or less	26.9	54.6	34.7 ^b	60.3 ^b
Some college	37.5	51.2	35.6 ^b	51.8 ^b
College or higher	35.5	62.2	50.9 ^b	69.1 ^b
Highest level education completed by parent/guardian (%):				
High school or less	37.1	57.0	35.0^b	60.0
Some college	25.6	49.4	36.3^b	50.7
College or higher	37.4	60.2	50.0^b	67.5
Pregnancy history (%)				
Never pregnant	47.6	57.3	45.0	63.5
At least 1 pregnancy, no births	19.5	49.2	37.7	47.5
At least 1 birth	33.0	58.6	37.0	63.6
Visit and provider characteristics				
Contraceptive method selected at visit (%)				
LARC (IUC, implant)	25.0	48.1	42.1	71.8 ^b
Injectable (DMPA)	9.5	62.1	48.2	66.7 ^b
Pill, ring, or patch	54.9	58.7	40.0	61.4 ^b
Condom, other, none	10.6	56.3	38.7	22.6 ^b

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(continued)

TABLE 2

Study participant and visit characteristics, and their associations with contraceptive continuation at 3 and 6 months and use of a highly or moderately effective method at 6 months (n = 348) (continued)

	Overall participant and visit characteristics	Continuation 3 months (n = 319)	Continuation 6 months (n = 304)	Use of a moderately or highly effective 6 months (n = 292) ^a
Type of provider seen at index visit (%)				
APC, other	59.8	48.9 ^b	34.6 ^b	52.6 ^b
APC, reproductive specialist	16.1	61.1 ^b	45.8 ^b	67.4 ^b
MD, Ob/Gyn	15.5	74.0 ^b	57.5 ^b	81.8 ^b
MD, family medicine	8.6	62.1 ^b	48.2 ^b	63.0 ^b
Race/ethnicity of provider seen at index visit (%)				
White, non-Hispanic	70.4	54.8	41.8	60.2
Other	29.6	59.6	39.3	60.5
Have had a previous visit with provider seen at index visit (%)				
Yes	28.3	59.8	42.1	61.0
No	71.7	54.7	40.7	60.1

APC = advanced practice clinician (ie, advanced practice nurse, physician assistant, certified nurse midwife); DMPA = depot medroxyprogesterone acetate; LARC = long-acting reversible contraception; MD = medical doctor.

^a Sample size is greater for contraceptive continuation at 6 months than for use of an effective method at 6 months, as those who had discontinued their method at 3 months were known discontinuers at 6 months, even if they did not complete a 6-month survey; ^b Statistical significance based on Fisher Exact test ($P < .05$).

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interpersonal care predicted improved contraceptive use underline the importance of the contraceptive counseling interaction. The ability to document an association with interpersonal quality of care is particularly noteworthy, given the complex social and relationship context

in which decisions about contraceptive use occur. Both the IQFP measure and the Four Habits Coding scheme are grounded in the principles of patient-centered care, an increasingly emphasized conceptual approach to health communication. A defining feature of

patient-centered care is an emphasis on treating patients as individuals, including being responsive to their needs and preferences.²² The finding that patients who experienced higher interpersonal quality of care were more likely to use the method that they

TABLE 3

Association of patient-evaluated interpersonal counseling quality (IQFP) with contraceptive continuation at 3 and 6 months and use of a highly or moderately effective method at 6 months, percentages and odds ratios

	Contraceptive continuation 3 months	Contraceptive continuation 6 months	Use of a moderately or highly effective method 6 months ^a
Patient evaluation of interpersonal quality of family planning care, n = 346 ^b			
Highest ratings (n = 173), %	62.2	45.6	66.0
Lower ratings (n = 173), %	49.7	36.1	55.0
Unadjusted ^c OR (95% CI)	1.74 (1.10–2.77) ^e	1.57 (0.97–2.54)	1.78 (1.08–2.943) ^e
Adjusted ^d OR (95% CI)	1.84 (1.13–3.00) ^e	1.81 (1.09–3.00) ^e	2.03 (1.16–3.54) ^e
Model n	317	302	290

CI, confidence interval; IQFP, interpersonal quality in family planning care; OR, odds ratio.

^a Sample size is greater for contraceptive continuation at 6 months than for use of a moderately or highly effective method at 6 months, as those who had discontinued their method at 3 months were known discontinuers at 6 months, even if they did not complete a 6-month survey; ^b Two patient participants did not provide data for analysis of interpersonal quality of family planning care; ^c Unadjusted OR accounts for clustering by provider (random effect) and clinic (fixed effect); ^d Mixed effects logistic regression model adjusted for age (continuous), race/ethnicity, pregnancy history, percent federal poverty level, and contraceptive method selected at index visit. Adjusted OR accounts for clustering by provider (random effect) and clinic (fixed effect); ^e Statistically significant ($P < .05$) differences in outcome by level of interpersonal counseling quality based on mixed effects logistic regression (OR).

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TABLE 4

Association of provider interpersonal communication practices (Four Habits Coding Scheme) with contraceptive continuation at 3 and 6 months and use of a highly or moderately effective method at 6 months, percentages, and odds ratios

Four Habits Coding Scheme	Contraceptive continuation 3 months	Contraceptive continuation 6 months	Use of a moderately or highly effective method 6 months ^a
Invests in the beginning, n = 340^b			
Highly effective, n = 83, %	69.7	55.7	69.1
Less effective, n = 257, %	51.7	36.8	57.8
Unadjusted OR ^c (95% CI)	1.81 (1.02–3.21) ^e	1.89 (1.08–3.33) ^e	1.42 (0.77–2.62)
Adjusted OR ^d (95% CI)	1.80 (0.98–3.45)	2.32 (1.24–4.32) ^e	1.35 (0.67–2.69)
Model n	312	298	286
Elicits patient perspective, n = 341			
Highly effective, n = 96, %	64.0	48.8	63.9
Less effective, n = 245, %	52.7	38.1	58.8
Unadjusted OR ^c (95% CI)	1.91 (1.12–3.25) ^e	1.83 (1.07–3.15) ^e	1.53 (0.87–2.70)
Adjusted OR ^d (95% CI)	2.03 (1.16–3.57) ^e	1.79 (1.01–3.16) ^e	1.33 (0.71–2.47)
Model n	313	299	287
Demonstrates empathy, n = 341			
Highly effective, n = 79, %	55.1	43.1	61.5
Less effective, n = 262, %	56.2	40.6	59.9
Unadjusted OR ^c (95% CI)	1.01 (0.58–1.76)	1.20 (0.68–2.15)	1.20 (0.66–2.17)
Adjusted OR ^d (95% CI)	0.92 (0.5–1.65)	1.20 (0.66–2.19)	1.02 (0.54–1.96)
Model n	313	299	287
Invests in the end, n = 341			
Highly effective, n = 84 (%)	50.0	33.3	61.9
Less effective, n = 257 (%)	57.7	43.6	55.1
Unadjusted OR ^c (95% CI)	0.88 (0.51–1.52)	0.79 (0.44–1.40)	0.94 (0.52–1.67)
Adjusted OR ^d (95% CI)	0.86 (0.48–1.52)	0.71 (0.29–1.30)	0.66 (0.35–1.24)
Model n	313	299	287

CI, confidence interval; OR, odds ratio.

^a Sample size is greater for contraceptive continuation at 6 months than for use of a highly or moderately effective method at 6 months, since those who had discontinued their method at 3 months were known discontinuers at 6 months, even if they did not complete a 6-month survey; ^b One audio recording not included in analysis of Habit 1 because technical issue at start of recording; ^c Unadjusted OR accounts for clustering by provider (random effect) and clinic (fixed effect); ^d Mixed effects logistic regression model adjusted for age (continuous), race/ethnicity, pregnancy history, percent federal poverty level, contraceptive method selected at index visit. Adjusted OR accounts for clustering by provider (random effect) and clinic (fixed effect); ^e Statistically significant ($P < .05$) differences in outcome by level of interpersonal counseling quality based on mixed effects logistic regression (OR).

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selected over time suggests that patient-centered communication practices may facilitate women finding a method that is aligned with their preferences.

The use of a highly or moderately effective method—all of which require either a procedure or a prescription from a provider—at 6 months was also associated with patient-reported interpersonal quality of care. Patients rating their experience of the interpersonal quality of

their counseling visit most highly may be more likely to return for care or contact their provider in the event of problems with their chosen method, and to obtain either reassurance or a more suitable method in the event of discontinuing the method selected at their index visit.

The associations of establishing rapport and eliciting the patient perspective with contraceptive continuation are suggestive of areas of focus for

provider communication skills training for contraceptive care. Although structured and scripted contraceptive counseling approaches focusing on information provision have been tested, they have not found robust or consistent results on contraceptive outcomes.^{23,24}

These current findings suggest that a focus on the interactive relationship between the provider and the patient, rather than on the approach to

information provision alone, may be beneficial. The lack of an association between empathetic communication (Habit 3) and communication focused on effectively concluding the visit (Habit 4) with any measure of contraceptive use suggests that these aspects of patient-centered care may have less impact in this context. Alternatively, we hypothesize that these communication behaviors may be responsive to providers' perceptions of patient needs. If this were the case, the modeled associations might be confounded by providers' assessments of increased need for empathy or more uncertainty about contraceptive use.

With respect to interpersonal quality of care and health communication generally, our study contributes to the evidence that the patient-reported experience of interpersonal care influences clinical effectiveness. Previous studies in other areas of care have found that patient assessments of care are associated with outcomes ranging from medication adherence to functional status and lower mortality.⁶⁻⁸ Relatively few previous studies, however, have found associations between the quality of observed communication behaviors and outcomes. One study of patients with type 2 diabetes found that health care providers' communication competence, which included observed rapport building as 1 of the domains, was associated with lower hemoglobin A1c levels.²⁵ However, this study was cross-sectional, with measurement of the clinical outcome preceding the measure of quality, making it difficult to draw conclusions about the directionality of the relationship. Although other studies have also found relationships between observed interpersonal quality and outcomes,²⁶⁻²⁹ they did not use multivariate analysis, and many other studies have not found associations.⁶⁻⁸

Research investigating associations between observed interpersonal care and communication on health outcomes faces considerable pragmatic and resource challenges, since it requires recording and coding health communication.³⁰ Although there is an ethical mandate to invest in improving

interpersonal quality of care regardless of research findings, our documentation of an association between interpersonal care quality and health outcomes highlights the health value of efforts to improve the quality of interpersonal care.

The primary limitation of our findings is the reliance on an intermediate outcome, contraceptive continuation, rather than on unintended pregnancy itself. There were too few events to assess differences in pregnancy rates with statistical precision (at 6-month follow-up, 14 participants reported a pregnancy since the index visit). A larger study would be necessary to assess for this relatively rare outcome. Our smaller than desired sample size may have limited our power to find true differences in some analyses in which we did not reject the null hypothesis, especially given consistency in the direction of effects observed. A further limitation is that our study providers were, with 1 exception, all female, making the generalizability to male providers unclear, especially as there is evidence that provider gender affects clinical interactions.³¹ In addition, being observed could have influenced providers' practices, although this would not be expected to influence associations between interpersonal quality and outcomes. The statistical approach taken to account for the clustering by provider and clinic could also affect our findings. Reassuringly, however, in sensitivity analyses examining different approaches to statistical modeling, our findings were robust regardless of the model structure used, and were generally conservative relative to other specifications. Finally, and most importantly, an association in an observational study cannot prove causation, as unmeasured confounding factors could be associated both with women's experiences of higher quality interpersonal communication and with contraceptive use. Nevertheless, the prospective, longitudinal study design has strengths over cross-sectional correlational studies.

In conclusion, our findings provide support for an association between the quality of interpersonal care and

important clinical outcomes. In the provision of family planning care, attention to relationship dynamics and the provision of patient-centered care has the potential to improve women's ability to prevent unplanned pregnancy through consistent use of contraception. ■

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