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Permalink

https://escholarship.org/uc/item/3cp826c9

Journal

Journal of General Internal Medicine, 35(12)

ISSN

0884-8734

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Publication Date

2020-12-01

DOI

10.1007/s11606-020-06239-6

Peer reviewed

Physician and Nurse Practitioner Attitudes on Generic Prescribing of Oral Contraceptive Pills and Antidepressants

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IMPORTANCE: As prescription drug costs rise, it is important to understand attitudes among primary care physicians and nurse practitioners (NPs) towards generic drugs.

OBJECTIVE: We aimed to examine the generic skepticism index (GSI) among primary care clinicians, and their willingness to discuss and prescribe generic antidepressants (ADs) and generic oral contraceptives (OCPs).

DESIGN: We used a factorial vignette design survey to test 4 factors: message source, message, brand preference, and drug class. Participants were randomized to different combinations of factors.

SETTING: This was a cross-sectional study.

PARTICIPANTS: Physicians registered with the American College of Physicians (ACP) and NPs registered with the American Association of Nurse Practitioners (AANP) participated in the study.

MAIN MEASURES: The primary outcomes were generic skepticism as measured using the generic skepticism index (GSI), and clinician willingness to discuss and prescribe generics.

RESULTS: Surveys were completed by 56% of physicians ($n = 369/661$) and 60% of NPs ($n = 493/819$). Compared with physicians, NPs were younger ($p < 0.001$), predominantly female ($p < 0.001$), and differed in the race ($p < 0.001$). According to the GSI, 16% ($n = 138/862$) were identified as generic skeptics (18.5% of NPs and 12.7% of physicians, $p = 0.023$). Generic skeptics had lower odds of willingness to discuss switching (OR 0.22, 95% CI (0.14–0.35), $p < 0.001$) or prescribe (OR 0.18, 95% CI (0.11–0.28), $p < 0.001$) generic OCPs. Participants had lower odds of willingness to prescribe generic drugs to patients with brand preference compared with brand-neutral patients (OR 0.64, 95% CI 0.50–0.82, $p < 0.001$).

CONCLUSIONS AND RELEVANCE: Generic skepticism was associated with lower willingness to discuss or prescribe generic drugs. Clinicians reported lower willingness to discuss switching or prescribe generics for OCPs than for ADs. Patient brand preference hindered generic prescribing. Message source and message type were not significantly associated with outcomes.

KEY WORDS: generic skepticism; oral contraceptives; antidepressants; nurse practitioners; patient brand preference.

Key Points

Question: What attitudes do primary care clinicians have about generic drugs? What factors influence clinicians' willingness to prescribe generic oral contraceptive pills (OCPs) and antidepressants (ADs)?

Findings: In this vignette-based survey of 862 physicians and nurse practitioners, 16% were identified as generic skeptics using the generic skepticism index (GSI). These clinicians had lower odds of willingness to prescribe generic drugs. Clinicians had lower odds of willingness to discuss switching or prescribe generic OCPs compared with generic ADs.

Meaning: As the primary care workforce diversifies, it is important to understand the factors that influence generic prescribing among different clinicians. Educational messaging to promote generic prescribing should target skepticism.

INTRODUCTION

Generic drugs are required by the Food and Drug Administration (FDA) to be bioequivalent to their brand name counterparts and are interchangeable in clinical practice.[1] Studies comparing the bioequivalence across therapeutic categories have shown no differences between brand and generic drugs.[2] While greater use of generic drugs has been shown to reduce costs and increase medication adherence, use of generic drugs

by clinicians can be improved.[3] Prior work has shown a generic fill rate of 81% for antidepressants in Medicare Part D and 73% for OCPs in a nationally representative sample.[4,5]

Recent surveys demonstrate that knowledge of generic drugs among clinicians has improved. This along with other factors may have led to increased use of generic drugs.[6] However, using the generic skepticism index (GSI), 32% of practicing physicians were skeptical of generic drugs.[6] In order to decrease generic skepticism, it is important to understand how clinicians perceive and respond to recommendations from professional societies and regulatory bodies. It is equally important to understand how clinicians respond to patient preferences about generic drugs.

To date, most of the data regarding generic prescribing focuses on physicians and largely excludes nurse practitioners (NPs), who also contribute to high-quality primary care.[7] Prior research has described general prescribing and practice patterns between NPs and physicians using Medicare claims data. However, generic drug skepticism among NPs and their responsiveness to messaging promoting generic prescribing compared with physicians is still unknown.

As the primary care clinical workforce in the USA continues to diversify, it is important to understand attitudes among different types of healthcare clinicians about generic drugs.[8] Furthermore, to create educational messages to decrease generic drug skepticism, it is important to identify factors that promote or hinder clinicians to discuss generics with their patients and ultimately prescribe generic drugs. This study aimed to examine generic drug skepticism among both physicians and nurse practitioners. We also aim to assess their willingness to discuss and prescribe two common drug classes—antidepressants and oral contraceptives.

METHODS

Data Sources

We designed a cross-sectional study using an online survey targeted towards physicians and NPs.[9] Physicians were recruited using the American College of Physicians' Survey Research Panel and NPs from the American Association of Nurse Practitioners Network for Research. Members of these organizations account for 76% and 37% of the total number of primary care physicians and nurse practitioners in the U.S.[10–13] Participants were sampled from a panel representative of each organization's membership. Reminders were sent in order to target a > 50% response.

Survey Design

Clinicians were categorized as generic skeptics using the Generic Skepticism Index. The generic skepticism index is the most widely accepted instrument that has been applied to primary care clinicians. Kesselheim et al. developed and used this scale to describe generic skepticism among internal medicine physicians.[6] This index has also been used in surveys of patient attitudes towards generic drugs.[14,15] The scale asks respondents to respond to the following three statements about generic drugs on a 5-point Likert scale (strongly disagree, somewhat disagree, neither agree nor disagree, somewhat agree, strongly agree): Generic drugs are as follows: (1) as effective as, (2) as safe as, or (3) do not cause more adverse events than their brand counterparts.[16] Participants who responded strongly disagree, somewhat disagree, or neither nor disagree to any one of the three statements were determined to have a "negative or neutral response." These participants were defined as generic skeptics.[6]

A factorial vignette design describing a hypothetical patient encounter was used to assess provider willingness to discuss switching from brand to generic and willingness to prescribe a generic drug across four domains. Each participant was randomized to one of four blocks. Each block had one of four combinations of message source (A-WHOM) and patient brand preference (C-PATIENT BRAND PREFERENCE) (Fig. 1): block 1 (message from FDA with a brand-neutral patient), block 2 (message from FDA with a patient with brand preference), block 3 (message from a professional society with a brand-neutral patient), and block 4 (message from a professional society with a patient with brand preference). Once assigned to a block, each participant received two vignettes (vignette 1 and vignette 2). After vignette 1, a participant received two questions: (1) how likely are you to discuss switching from a brand name to a generic antidepressant with your patient and (2) how likely are you to prescribe this patient a generic antidepressant? After vignette 2, a participant received two questions: (1) how likely are you to discuss switching from a brand name to generic oral contraceptive with your patient and (2) how likely are you to prescribe this patient a generic oral contraceptive? Antidepressants and oral contraceptives were selected because they are classes of drugs that are commonly prescribed in primary care, are widely available as generic, and have a relatively low generic substitution rate.[4,5] Order of the vignettes and questions were randomized.

Statistical Analysis

Responses to discussing and prescribing generics questions were converted into 3 level ordinal variables: with "extremely unlikely" and "somewhat unlikely" combined together; "neither likely nor unlikely" as the second level; and "somewhat likely" and "extremely likely" combined to form the third level. We then performed multivariate ordinal logistic regression, with robust standard errors to account for clustering of observations by the respondent, to test associations between (1) drug class, (2) brand preference, (3) type of message, and (4) source of the message with the likelihood of discussing and prescribing generics. We controlled for age, gender, clinician type, frequency of prescribing ADs, frequency of prescribing OCPs generic

[a- WHOM]

- **a0 FDA – "from/by the FDA"**

- **a1 professional societies – "from/by your professional society"**

[b – MESSAGE]

- **b0 "equally as effective as"**

- **b1 "bioequivalent to"**

[c – PATIENT DRUG PREFERENCE]

- **c0 neutral – "has never expressed a preference for brand or generic drugs"**

- **c1 brand name preference – "expressed concern that the generic drug will not work for her"**

[d – DRUG]

- **d0 "antidepressants"**

- **d1 "oral contraceptives"**

	VIGNETTE 1		VIGNETTE 2	
BLOCK 1 (A_0C_0)	$a_0b_0 c_0d_0$	$a_0b_1 c_0d_0$	$a_0b_0 c_0d_1$	$a_0b_1 c_0d_1$
BLOCK 2 (A_0C_1)	$a_0b_0 c_1d_0$	$a_0b_1 c_1d_0$	$a_0b_0 c_1d_1$	$a_0b_1 c_1d_1$
BLOCK 3 (A_1C_0)	$a_1b_0 c_0d_0$	$a_1b_1 c_0d_0$	$a_1b_0 c_0d_1$	$a_1b_1 c_0d_1$
BLOCK 4 (A_1C_1)	$a_1b_0 c_1d_0$	$a_1b_1 c_1d_0$	$a_1b_0 c_1d_1$	$a_1b_1 c_1d_1$

Figure 1 Factorial vignette design. This figure illustrates the factorial vignette design of the study. Four categories (A–D) were tested by arranging different combinations of vignettes within four blocks. Clinicians were randomized to one of four blocks. The source of the message (A-WHOM) as "FDA" was held constant across blocks 1 and 2 denoted as A0 while the source of the message (A-WHOM) as "professional societies" was held constant across blocks 3 and 4 denoted as A1. Patient drug preference (C-PATIENT DRUG PREFERENCE) as "neutral" was held constant across blocks 1 and 3 denoted as C0 while patient drug preference (C-PATIENT DRUG PREFERENCE) as "brand name preference" was held constant across blocks 2 and 4 denoted as C1. Vignette 1 involved antidepressants (D-DRUG) denoted as d0. Vignette 2 involved oral contraceptives (D-DRUG) denoted as d1. Within each vignette, two scenarios were presented which differed by message types (B-MESSAGE) with b0 for "equally as effective as" and b1 for "bioequivalent to."

skepticism, and presence of mandatory generic substitution state laws. States were assigned mandatory substitution status using a 2012 survey of Pharmacy law.[17] The data was analyzed using Stata 14 (College Station, TX). We used a Bonferroni correction because our statistical analysis involved multiple comparisons, specifically 6 models. Therefore, we used a corrected significance level of $\alpha = 0.05/6 = 0.008$.

RESULTS

Demographics

A total of 862 individuals completed the survey, representing a response rate of 60%. Of these participants, 369 were physicians (56% response rate) and 493 were NPs (60% response rate). Overall, physicians and NPs had significant demographic differences. Compared with physicians, NPs were significantly younger ($p < 0.001$), predominantly female ($p < 0.001$), and differed in the race ($p < 0.001$) (Table 1). Both groups were geographically diverse and approximately one-third of respondents (33% of physicians and 30% of NPs) practiced in states with mandatory generic substitution laws.

Prescribing Behavior and Generic Skepticism

Overall, both physicians and NPs prescribed oral contraceptives (OCPs) less frequently than antidepressants (ADs) (51.2% vs 81.8%) (Table 1). Prescribing frequency of OCPs did not differ significantly between physicians and nurse practitioners; however, physicians prescribed ADs more frequently than NPs (93.7% vs 72.8%, $p < 0.001$) (Table 1). Generic skepticism was reported in 16% ($n = 138/862$) of respondents (Table 1). NPs were more likely to be generic skeptics compared with physicians (18.5% vs 12.7%, $p = 0.023$).

Table 1 Participant Characteristics

		Overall	Physicians	NPs	*p* values
Participants, *n* (%)		862	369 (42.8%)	493 (57.2%)	
Sex, *n* (%)	Female	565 (65.6%)	129 (35.0%)	436 (88.4%)	< 0.001
	Male	278 (32.3%)	228 (61.8%)	50 (10.1%)	
Age	25–34	93 (10.8%)	25 (6.8%)	68 (13.8%)	< 0.001
	35–44	189 (21.9%)	85 (23.0%)	104 (21.1%)	
	45–54	239 (27.7%)	86 (23.3%)	153 (31.0%)	
	55–64	243 (28.2%)	106 (28.7%)	137 (27.8%)	
	> 65	46 (5.3%)	27 (7.3%)	19 (3.9%)	
Race, *n* (%)	African American	53 (6.1%)	14 (3.8%)	39 (7.9%)	< 0.001
	White	597 (69.3%)	214 (58.0%)	383 (77.7%)	
	Asian	113 (13.1%)	96 (26.0%)	17 (3.4%)	
	Other	66 (7.7%)	31 (8.4%)	35 (7.1%)	
Geographic region, *n* (%)	Northeast	180 (20.9%)	93 (25.2%)	87 (17.6%)	< 0.001
	Midwest	191 (22.2%)	70 (19.0%)	121 (24.5%)	
	South	285 (33.1%)	106 (28.7%)	179 (36.3%)	
	West	187 (21.7%)	95 (25.7%)	92 (18.7%)	
	Other	19 (2.2%)	5 (1.4%)	14 (2.8%)	
Skepticism, *n* (%)	Skeptic[*]	138 (16.0%)	47 (12.7%)	91 (18.5%)	0.023
	Not skeptic	724 (84.0%)	322 (87.3%)	402 (81.5%)	
Practice in states with mandatory substitution		273 (31.7%)	125 (33.9%)	148 (30.0%)	0.229
Prescribing OCPs[†]		441 (51.2%)	181 (49.1%)	260 (52.7%)	0.284
Prescribing ADs[†]		705 (81.8%)	346 (93.8%)	359 (72.8%)	< 0.001

Percentages do not always add to 100 due to missing data
[*]*Clinicians were determined to be generic skeptics if they "strongly disagreed," "somewhat disagreed," or "neither agree nor disagreed" that generic drugs were as safe, as effective, or had the same side effect profile as their brand name counterparts*
[†]*Clinicians who reported prescribing "sometimes," "usually," and "always" were included as prescribing and providers who reported "never" were determined to not have prescribed either OCP or AD*

Provider Willingness to Discuss and Prescribe Generics

Overall, we found significant differences in respondent odds of willingness to discuss and prescribe generic ADs and OCPs that varied depending on the variables featured in the patient vignette. Compared with OCPs, respondents had greater odds of willingness to discuss generic ADs (OR 1.51, 95% CI (1.29–1.77), *p* < 0.001) and prescribe generic ADs (OR 1.47, 95% CI (1.25–1.72), *p* < 0.001). For both drug classes, respondents categorized as generic skeptics had lower odds of willingness to discuss (OR 0.22, 95% CI (0.14–0.35), *p* < 0.001) and prescribe (OR 0.18, 95% CI (0.11–0.28), *p* < 0.001) generic drugs compared with non-skeptics (Tables 2 and 3).

Compared with frequent prescribers, respondents who infrequently prescribed OCPs (OR 0.49, 95% CI (0.36–0.67), *p* < 0.001) had lower odds of expressing willingness to discuss switching to generic OCPs (Table 2). Similarly, compared with frequent prescribers, respondents who infrequently prescribed OCPs (OR 0.42, 95% CI (0.31–0.57), *p* < 0.001) had lower odds of expressing willingness to prescribe generic OCPs (Table 3). NPs who were infrequent AD prescribers had lower odds of prescribing generic ADs (Tables 2 and 3). Of note, there was a significant negative interaction between frequency and skepticism for antidepressants, such that infrequent AD prescribers who were also generic skeptics had lower odds of willingness to discuss or prescribe ADs than predicted by frequency or skepticism alone (Table 2). In contrast, the interaction terms of infrequent OCP prescribers * generic skepticism was greater than 1 for willingness to discuss (Table 2) and prescribe (Table 3) generic OCPs.

Vignettes describing a patient with brand preference were not associated with lower odds of willingness to discuss generics. However, these vignettes were associated with lower odds of prescribing generics (OR 0.64, 95% CI 0.50–0.82, *p* < 0.001). There were no differences between physicians and NPs. Notably, source or type of message, practicing in states with mandatory generic substitution, or age of the clinician was not associated with differences in odds of willingness to discuss or prescribe generic drugs.

DISCUSSION

Our study demonstrated several key findings in generic drug skepticism among both physicians and nurse practitioners. First, NPs had greater odds of reporting skepticism of generic drugs compared with physicians. Second, NPs and physicians who endorsed skepticism of generic drugs had lower odds of willingness to discuss switching or prescribe generics in hypothetical vignettes. Third, physicians and NPs had lower odds of willingness to discuss switching to or prescribe generic OCPs compared with antidepressants. Interestingly, patient brand preference was associated with lower odds of willingness to prescribe generics but not with lower willingness to discuss switching to generics. Compared with frequent prescribers, clinicians who infrequently prescribed either ADs or OCPs expressed lower willingness to discuss and prescribe generics. Lastly, the source and type of message presented to clinicians or state mandatory generic substitution laws were not associated with overall willingness to discuss or prescribe generic drugs in hypothetical vignettes. While generic drug

Table 2 Clinician Willingness to Discuss Generics

	Overall	Physicians	NPs
Generic skeptic[a]	OR 0.22, 95% CI (0.14–0.35), $p < 0.001$	OR 0.24, 95% CI (0.12–0.48), $p < 0.001$	OR 0.20, 95% CI (0.11–0.36), $p < 0.001$
Infrequent OCP prescribers[b]	OR 0.49, 95% CI (0.36–0.67), $p < 0.001$	OR 0.56, 95% CI (0.36–0.88), $p = 0.01$	OR 0.42, 95% CI (0.28–0.65), $p < 0.001$
Infrequent AD prescribers[c]	OR 0.74, 95% CI (0.49–1.12), $p = 0.16$	OR 1.05, 95% CI (0.44–2.50), $p = 0.92$	OR 0.67, 95% CI (0.42–1.08), $p = 0.10$
Infrequent OCP * skeptic[d]	OR 1.95, 95% CI (1.06–3.61), $p = 0.03$	OR 2.12, 95% CI (0.75–6.03), $p = 0.16$	OR 1.82, 95% CI (0.87–3.83), $p = 0.11$
Infrequent AD * skeptic[e]	OR 0.75, 95% CI (0.36–1.56), $p = 0.44$	OR 0.13, 95% CI (0.02–0.76), $p = 0.02$	OR 1.21, 95% CI (0.55–2.68), $p = 0.63$
Patient brand preference[f]	OR 1.12, 95% CI (0.87–1.45), $p = 0.37$	OR 0.98, 95% CI (0.67–1.42), $p = 0.92$	OR 1.29, 95% CI (0.91–1.83), $p = 0.15$
Prescribe AD[g]	OR 1.51, 95% CI (1.29–1.77), $p < 0.001$	OR 1.84, 95% CI (1.46–2.31), $p < 0.001$	OR 1.27, 95% CI (1.02–1.60), $p = 0.04$
State mandate[h]	OR 0.92, 95% CI (0.70–1.19), $p = 0.52$	OR 1.05, 95% CI (0.72–1.53), $p = 0.79$	OR 0.74, 95% CI (0.51–1.07), $p = 0.11$
NPs[i]	OR 1.01, 95% CI (0.74–1.38), $p = 0.97$		-
Message source[j]	OR 0.93, 95% CI (0.72–1.19), $p = 0.55$	OR 0.84, 95% CI (0.58–1.21), $p = 0.35$	OR 1.01, 95% CI (0.71–1.42), $p = 0.97$
Message type[k]	OR 1.01, 95% CI (0.91–1.11), $p = 0.90$	OR 0.91, 95% CI (0.80–1.05), $p = 0.20$	OR 1.10, 95% CI (0.95–1.28), $p = 0.19$
Female[l]	OR 1.08, 95% CI (0.79–1.48), $p = 0.63$	OR 1.27, 95% CI (0.84–1.94), $p = 0.26$	OR 0.87, 95% CI (0.49–1.53), $p = 0.62$
Age < 35	OR 0.68, 95% CI (0.41–1.14), $p = 0.14$	OR 0.73, 95% CI (0.32–1.69), $p = 0.46$	OR 0.66, 95% CI (0.35–1.26), $p = 0.21$
35–44	-	-	-
45–64	OR 0.86, 95% CI (0.58–1.28), $p = 0.47$	OR 0.90, 95% CI (0.50–1.63), $p = 0.74$	OR 0.83, 95% CI (0.48–1.42), $p = 0.50$
55–64	OR 0.73, 95% CI (0.50–1.07), $p = 0.11$	OR 0.74, 95% CI (0.44–1.27), $p = 0.28$	OR 0.72, 95% CI (0.42–1.22), $p = 0.22$
65+	OR 0.98, 95% CI (0.52–1.85), $p = 0.95$	OR 1.27, 95% CI (0.53–3.06), $p = 0.59$	OR 0.64, 95% CI (0.26–1.56), $p = 0.33$
Unknown	OR 0.82, 95% CI (0.47–1.42), $p = 0.47$	OR 0.84, 95% CI (0.42–1.67), $p = 0.62$	OR 0.75, 95% CI (0.26–2.15), $p = 0.60$

This table represents the results of an ordinal logistic regression that examines the association between covariates below and willingness to discuss generic drugs represented as a 3-level outcome: (1) unlikely, (2) neutral, (3) likely. Additional models are stratified by physicians only or nurse practitioners only
OCP, oral contraceptive; AD, antidepressant; NP, nurse practitioner
[a]*Generic skeptics are compared with non-skeptics*
[b]*Infrequent OCP prescribers compared with frequent OCP prescribers*
[c]*Infrequent AD prescribers compared with frequent AD prescribers*
[d]*Infrequent OCP prescriber by skeptic interaction*
[e]*Infrequent AD prescribers by skeptic interaction*
[f]*Patient with brand preference compared with those who are brand-neutral*
[g]*Prescribing ADs to OCPs*
[h]*State mandate compared with no state mandate*
[i]*NPs compared with physicians*
[j]*Professional society compared with FDA*
[k]*Effective compared with bioequivalent*
[l]*Female compared with male/unknown*

skepticism among physicians has been described in previous studies, generic skepticism for physicians in our study was lower than previous estimates.[6] One explanation for this finding may be differences in the ratio of internists and subspecialists between these studies. In contrast to a prior study, our physician sample consisted of mostly primary care physicians.[6] Furthermore, society guidelines from the American College of Physicians and the ABIM Foundation's Choosing Wisely™ campaign have increased clinician awareness of generic prescribing as part of providing high-value care.

Of note, this is the first study to describe generic skepticism among NPs, which represent a significant portion of the primary care workforce.[11] Since NPs have prescribing authority to varying degrees in all states in the USA, understanding generic skepticism and associated behaviors among NPs is important as they are a critical stakeholder in improving generic prescribing. We found that NPs were more likely to be generic skeptics than physicians, highlighting the importance of improving understanding generic drugs among this group. Moreover, NPs at younger and older ages were also less likely to discuss generics compared with physicians at similar ages. This bimodal reluctance to discuss generic drugs may be explained by the fact that NPs often enter the workforce at 2

distinct times: (1) right out of school and (2) later career after having completed a career as a nurse.

When compared with antidepressants, we found that respondents were less likely either to discuss generics or to express willingness to prescribe generic OCPs. These differences underscore that clinician perceptions of specific classes of generic drugs are a potential barrier to generic prescribing. Previous studies have demonstrated inertia against switching patients to generics out of concern for patient non-adherence.[18–20] For OCPs specifically, patients have expressed worries about possible side effects after switching from brand to generic medications as well as differences in pill and packaging characteristics leading to confusion.[21] Subsequently, the American College of Obstetricians and Gynecologists supported and later reaffirmed in 2018 patient continuation of the same type of generic or brand OCP if there were concerns about differences in packaging leading to non-adherence among patients.[21] This highlights the importance of future education to specifically tailored towards improving generic OCP prescribing. Overall, clinicians were less willing to discuss and prescribe generic drugs if they infrequently prescribe ADs and OCPs compared with clinicians who frequently prescribed these drugs. This finding was amplified for

Table 3 Clinician Willingness to Prescribe Generics

	Overall	Physicians	NPs
Generic skeptic[a]	OR 0.18, 95% CI (0.11–0.28), $p < 0.001$	OR 0.15, 95% CI (0.07–0.29), $p < 0.001$	OR 0.18, 95% CI (0.10–0.34), $p < 0.001$
Infrequent OCP prescribers[b]	OR 0.42, 95% CI (0.31–0.57), $p < 0.001$	OR 0.41, 95% CI (0.25–0.68), $p < 0.001$	OR 0.42, 95% CI (0.28–0.62), $p < 0.001$
Infrequent AD prescribers[c]	OR 0.70, 95% CI (0.48–1.02), $p = 0.07$	OR 1.09, 95% CI (0.38–3.09), $p = 0.87$	OR 0.62, 95% CI (0.40–0.94), $p = 0.03$
Infrequent OCP * skeptic[d]	OR 1.87, 95% CI (1.03–3.39), $p = 0.04$	OR 2.72, 95% CI (1.00–7.36), $p = 0.05$	OR 1.42, 95% CI (0.66–3.04), $p = 0.36$
Infrequent AD * skeptic[e]	OR 0.86, 95% CI (0.42–1.79), $p = 0.70$	OR 0.19, 95% CI (0.02–1.75), $p = 0.14$	OR 1.29, 95% CI (0.58–2.87), $p = 0.54$
Patient brand preference[f]	OR 0.64, 95% CI (0.50–0.82), $p < 0.001$	OR 0.57, 95% CI (0.38–0.84), $p = 0.005$	OR 0.69, 95% CI (0.49–0.96), $p = 0.03$
Prescribe AD[g]	OR 1.47, 95% CI (1.25–1.72), $p < 0.001$	OR 2.20, 95% CI (1.70–2.86), $p < 0.001$	OR 1.12, 95% CI (0.91–1.37), $p = 0.29$
State mandate[h]	OR 0.99, 95% CI (0.75–1.29), $p = 0.92$	OR 1.32, 95% CI (0.87–1.99), $p = 0.19$	OR 0.76, 95% CI (0.53–1.07), $p = 0.12$
NPs[i]	OR 0.99, 95% CI (0.72–1.35), $p = 0.93$	-	-
Message source[j]	OR 0.94, 95% CI (0.74–1.21), $p = 0.65$	OR 0.86, 95% CI (0.58–1.26), $p = 0.43$	OR 1.04, 95% CI (0.75–1.45), $p = 0.82$
Message type[k]	OR 1.02, 95% CI (0.95–1.09), $p = 0.65$	OR 0.94, 95% CI (0.85–1.05), $p = 0.29$	OR 1.07, 95% CI (0.97–1.18), $p = 0.21$
Female[l]	OR 0.94, 95% CI (0.69–1.28), $p = 0.69$	OR 1.05, 95% CI (0.68–1.62), $p = 0.84$	OR 0.81, 95% CI (0.48–1.37), $p = 0.43$
Age < 35	OR 1.08, 95% CI (0.68–1.73), $p = 0.74$	OR 1.44, 95% CI (0.63–3.32), $p = 0.39$	OR 0.96, 95% CI (0.54–1.71), $p = 0.90$
35–44	-	-	-
45–64	OR 0.86, 95% CI (0.60–1.24), $p = 0.43$	OR 0.98, 95% CI (0.55–1.76), $p = 0.95$	OR 0.79, 95% CI (0.48–1.30), $p = 0.36$
55–64	OR 0.85, 95% CI (0.60–1.21), $p = 0.37$	OR 0.78, 95% CI (0.46–1.30), $p = 0.34$	OR 0.90, 95% CI (0.55–1.47), $p = 0.67$
65+	OR 0.87, 95% CI (0.51–1.49), $p = 0.62$	OR 1.06, 95% CI (0.48–2.33), $p = 0.90$	OR 0.74, 95% CI (0.37–1.46), $p = 0.38$
Unknown	OR 0.81, 95% CI (0.45–1.46), $p = 0.48$	OR 0.85, 95% CI (0.40–1.82), $p = 0.68$	OR 0.74, 95% CI (0.26–2.05), $p = 0.56$

This table represents the results of an ordinal logistic regression that examines the association between covariates below and willingness to prescribe generic drugs represented as a 3-level outcome: (1) unlikely, (2) neutral, (3) likely. Additional models are stratified by physicians only or nurse practitioners only

OCP, oral contraceptive; AD, antidepressant; NP, nurse practitioner
[a]*Generic skeptics are compared with non-skeptics*
[b]*Infrequent OCP prescribers compared with frequent OCP prescribers*
[c]*Infrequent AD prescribers compared with frequent AD prescribers*
[d]*Infrequent OCP prescriber by skeptic interaction*
[e]*Infrequent AD prescribers by skeptic interaction*
[f]*Patient with brand preference compared with those who are brand-neutral*
[g]*Prescribing ADs to OCPs*
[h]*State mandate compared with no state mandate*
[i]*NPs compared with physicians*
[j]*Professional society compared with FDA*
[k]*Effective compared with bioequivalent*
[l]*Female compared with male/unknown*

both physicians and NPs when discussing prescribing OCPs, but not evident when discussing ADs. These findings highlight the importance of repeated exposure to prescribing to engender trust towards use of generic drugs, especially for OCPs. One important finding was that even in the face of strong patient brand preference, clinicians reported willingness to discuss switching to generic drugs. Therefore, interventions to improve the effectiveness of such discussions could be impactful. This result is consistent with prior literature that shows that having a discussion with your doctor was associated with increased odds of switching to a cheaper drug.[22,23] This is especially important given the influence direct to consumer advertising has on patient preferences.[24]

The limitations of our study include the cross-sectional design of our study which was unable to show a temporal relationship between study variables and actual prescribing behavior. The respondents in our survey also had less experience prescribing OCPs compared with ADs which may have biased our results. Furthermore, due to socially desirable response bias, our participants may have had an inherent tendency to respond in favor of prescribing generics, which may have led us to underestimate the trends we observed. Apart from reporting generic skepticism, we were unable to delineate the degree or the drivers of generic skepticism among clinicians, and rates of generic skepticism may not be generalizable to non-ACP- and non-AANP-registered clinicians. Another limitation of our study is the absence of distinguishing brand prescribing behavior between "dispense as written" and simply writing for the brand drug. Since 2012, a higher number of states have adopted mandatory generic substitution laws, which require pharmacists to substitute a generic for a brand drug if "dispense as written" is not specified. While our results describe clinicians' intention to prescribe brand or generic drugs, these laws may have an effect on actual prescribing behavior in these states. Due to a technical error in survey administration, the survey was re-administered to 30 clinicians.

CONCLUSIONS

A better understanding of barriers to generic prescribing among primary care providers gives us the opportunity to develop evidence-based messaging that promotes generic prescribing. Future educational interventions should target misconceptions about generic drugs and provide best practices

about starting discussions about generic drugs with patients especially around OCPs. Targeted efforts should be made to promote discussion and prescription of generic OCPs among clinicians who are infrequent prescribers or endorse generic drug skepticism. As the USA employs more physician assistants and NPs to care for patients, helping all clinicians incorporate these practices in their prescribing behavior will be even more important.[8]

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Authors' Contributions *There are no contributors who do not meet the criteria for authorship.*

Compliance with Ethical Standards:

Conflict of Interest: *The authors declare that they do not have a conflict of interest.*

Disclaimer: *The views expressed in written materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services nor does any mention of trade names, commercial practices, or organization imply endorsement by the United States Government.*

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