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Variation in dermatologist beliefs about the safety and effectiveness of treatments for moderate-to-severe psoriasis

Katrina Abuabara, MD, MA¹, Joy Wan, MD¹, Andrea B. Troxel, ScD^{2,3}, Daniel B. Shin, MS^{1,3}, Abby S. Van Voorhees, MD¹, Bruce F. Bebo Jr., PhD⁴, Gerald G. Krueger, MD⁵, Kristina Callis Duffin, MD⁵, and Joel M. Gelfand, MD, MSCE^{1,2,3}

Katrina Abuabara: katrina.abuabara@uphs.upenn.edu; Joy Wan: joywan@mail.med.upenn.edu; Andrea B. Troxel: atroxel@mail.med.upenn.edu; Daniel B. Shin: dbshin@mail.med.upenn.edu; Abby S. Van Voorhees: abby.vanvoorhees@uphs.upenn.edu; Bruce F. Bebo: bbebo@psoriasis.org; Gerald G. Krueger: gerald.krueger@hsc.utah.edu; Kristina Callis Duffin: kristina.callis@hsc.utah.edu; Joel M. Gelfand: joel.gelfand@uphs.upenn.edu

¹Department of Dermatology, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA

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CORRESPONDENCE: Katrina Abuabara, MD, Department of Dermatology, University of Pennsylvania, 3600 Spruce Street, 2 Maloney, Philadelphia, PA 19104. Telephone: 408-497-1553, Fax: 215-746-6370, Katrina.Abuabara@uphs.upenn.edu.

REPRINT REQUESTS: Joel M. Gelfand, MD, Department of Dermatology, University of Pennsylvania, 1471 Penn Tower, One Convention Avenue, Philadelphia, PA 19104. Joel.Gelfand@uphs.upenn.edu

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CONFLICT OF INTEREST:

- Dr. Van Voorhees served on the advisory board of and was an investigator, speaker, and consultant for Amgen, receiving honoraria and grants; served on the advisory board of and was an investigator and speaker for Amgen, receiving honoraria; was a consultant for Incyte, Leo, VGX, and Xtrac, receiving honoraria; served on the advisory board and was a speaker for Abbott, Centocor, and Connetics, receiving honoraria; was an investigator for Bristol Myers Squibb, Warner Chilcott, Astellas, IDEC, and Roche, receiving grants; and served as a consultant for Synta receiving honoraria.
- Dr. Bebo has had relationships with Abbott, Amgen, Janssen, Galderma, Stiefel/GSK, and Wyeth, receiving other benefits.
- Dr. Krueger served on the steering committees for Centocor/Phoenix 2 and Golimumab/psoriatic arthritis, receiving no compensation; served on the steering committee for PSOLAR, receiving other financial benefit; served on the data monitoring board for Novartis and as chair of the data monitoring safety board for Pfizer, receiving other financial benefit; was a consultant and/or advisory board member for Abbott, Amgen, Anacor, Astellas, Boehringer Ingelheim, Bristol Myers Squibb, Centocor, CombinatoRx, Genzyme, Isis, Lilly, L'Oreal, Lupin Limited, MedaCorp, Medicis, Novartis, Nova Nordisk, Pfizer, Schering Plough, Somagenics, theDerm.org, Synviva, Warner Chilcot, UCB, Vascular Biogenics Limited, and ZARS, receiving honoraria or other financial benefit; was a stockholder in ZARS, receiving stock options; was a speaker for Abbott, Amgen, Astellas, Centocor, and the National Psoriasis Foundation, receiving honoraria; and was an investigator for Abbott, Amgen, and Centocor, receiving grants.
- Dr. Callis Duffin was an investigator, consultant, advisory board member, and speaker for Abbott and Amgen receiving honoraria, salary, and residency or fellowship funding; was an investigator, consultant, advisory board member, and speaker for Janssen/Centocor, receiving honoraria and salary; was an investigator and consultant for Pfizer/Wyeth receiving honoraria and salary; was a consultant for Eli Lilly receiving honoraria; was a consultant and investigator for Genzyme and Incyte receiving honoraria and salary; was an investigator for Celgene receiving salary; and was an investigator and consultant for Novonordisk, ApoPharma, and VBL, receiving honoraria and salary.
- Dr. Gelfand served as consultant and investigator with Abbott, Amgen, Centocor, Genentech, Novartis, and Pfizer, receiving grants and honoraria; was a consultant with Celgene, Covance, Galderma, Shire Pharmaceuticals, and Wyeth, receiving honoraria; and was an investigator with Shionogi, receiving grants.
- Drs. Abuabara and Troxel, Mr. Shin, and Ms. Wan have no financial disclosures to report.

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²Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA

³Department of Biostatistics and Epidemiology, University of Pennsylvania Perelman School of Medicine, Philadelphia, PA, USA

⁴National Psoriasis Foundation, Portland, OR, USA

⁵Department of Dermatology, University of Utah School of Medicine, Salt Lake City, UT, USA

Abstract

Background—Multiple systemic treatments are available for moderate to severe psoriasis, but dermatologists' perceptions of these treatments are unknown. Physician perceptions can influence prescribing patterns and patient outcomes, and may help to explain variations in clinical practice.

Objective—To describe the variation in dermatologist's beliefs about the safety and effectiveness of psoriasis treatments and evaluate how these relate to dermatologist characteristics and treatment preferences.

Methods—Cross-sectional mail survey of a random sample of 500 National Psoriasis Foundation (NPF) members and 500 American Academy of Dermatology (AAD) members who treat psoriasis.

Results—Of 989 clinicians who could be contacted, 246 NPF members and 141 AAD members returned the survey (39% response rate). Respondents perceived infliximab, ustekinumab, cyclosporine, and adalimumab to have the highest likelihood of skin clearance in three months (67–75%). Etanercept, adalimumab, UVB, and ustekinumab had the lowest perceived likelihood of side effects requiring treatment discontinuation (9–11%). Up to 49% of respondents “didn't know” the effectiveness or likelihood of side effects; calculated coefficients of variation were higher for perceived likelihood of side effects than perceived effectiveness. There were few significant associations between safety and effectiveness perceptions and respondent characteristics, and treatment preferences were not consistently predictive of perceptions.

Limitations—Only dermatologists with interest in treating psoriasis were surveyed and general perceptions were elicited via survey format. Perceptions may differ between survey respondents and nonrespondents.

Conclusions—Psoriasis providers demonstrate wide variation in their perception of the effectiveness and especially safety of systemic treatments.

Keywords

Psoriasis; systemic therapies; phototherapy; biologics; pharmacoepidemiology; comparative effectiveness

INTRODUCTION

Psoriasis is a costly and chronic disease that affects 2–4% of the population, significantly impacts patients' quality of life, and is associated with an excess risk of cardiovascular disease and mortality in patients with more severe disease.^{1–5} In addition to topical treatments used for mild disease, a variety of systemic treatment options are available for moderate-to-severe psoriasis including phototherapy, oral retinoids, traditional systemic treatments such as cyclosporine and methotrexate, and newer biological medications including the TNF-alpha, T-cell, and interleukin-12/23 blockers. Despite the armamentarium of treatment options available, current guidelines don't distinguish among first-line treatments⁶ and many patients feel that the treatment of their disease is inadequate. A large

national survey performed in 2004 found that nearly half of psoriasis patients surveyed are unsatisfied with their treatment, with higher levels of dissatisfaction among patients with more severe disease.⁷

Comparative effectiveness research (CER) aims to optimize value-based care for patients in real-world settings by comparing available treatment modalities. In addition to the generation and synthesis of evidence comparing treatments, the field of comparative effectiveness emphasizes the importance of input for decision-making and the dissemination of research to patients and providers.^{8,9} Given the disease burden attributable to psoriasis, variety of treatment options available, and relative lack of head-to-head comparisons of therapeutic options, psoriasis is an important disease for CER efforts.¹⁰ To date, however, little CER has focused on prescriber attitudes and beliefs about psoriasis treatment options.

Some authors have proposed a “value of information” approach to prioritize comparative effectiveness research, arguing that additional data are most valuable in areas where uncertainty exists.^{11–13} In order to guide future comparative effectiveness research in the field of psoriasis, we sought to investigate areas of physician uncertainty about treatment options. Our goal was not to estimate the actual safety or effectiveness of psoriasis treatments, which are likely to be highly dependent on the population studied. Rather, our aim was to describe *variation* in dermatologist attitudes or beliefs about the safety and effectiveness of psoriasis treatments. In addition, we examined whether dermatologist characteristics and prescription preferences were related to their beliefs.

METHODS

Study population and setting

We surveyed 1000 practicing dermatologists across the U.S., of whom 500 were randomly selected from the National Psoriasis Foundation’s (NPF) list of 922 dermatologists with active memberships as of March 29, 2010, and the other 500 were randomly selected from the American Academy of Dermatology’s (AAD) list of 1417 dermatologists who had identified themselves as treating psoriasis. All respondents were AAD members; if a dermatologist appeared on both lists, he/she was included in the NPF group for the purposes of selection and analysis.

Study design

We conducted a cross-sectional survey of U.S. dermatologists as described above. The survey instrument was a four-page questionnaire developed by dermatologists expert in the care of psoriasis with input from the steering committee members of the Dermatology Clinical Effectiveness Research Network (DCERN). It assessed dermatologists’ practices, preferences, and beliefs with respect to the treatment of moderate-to-severe psoriasis (see appendix). Pilot studies conducted with a convenience sample of 12 dermatologists at the 2010 annual AAD meeting showed that fewer than 5 minutes were required to complete the survey.

We used a modified Dillman Tailored Design method of sending postcard reminders and duplicate surveys to non-respondents.^{14,15} Survey packets were also randomized to include one of three financial incentives (\$0, \$5, or \$10) as part of a sub-study on survey response incentives.¹⁶ The survey study was conducted from May 2010 to August 2010, and all responses received within 15 weeks after the initial questionnaire mailing were included in the results. The study was approved by the University of Pennsylvania Institutional Review Board.

Outcomes

The primary outcomes of interest were dermatologists' beliefs about the safety and effectiveness of treatments for moderate-to-severe psoriasis. We included 10 systemic therapies that were approved at the time of the study by the U.S. Food and Drug Administration (FDA): psoralen UVA phototherapy (PUVA), UVB phototherapy, acitretin, cyclosporine, methotrexate, adalimumab, alefacept, etanercept, infliximab, and ustekinumab. To assess each treatment's effectiveness, we asked: "What percent of patients treated with each of the following therapies will have clear or almost clear skin after three months?" To facilitate ease of survey response, we created 9 categories for respondents to choose from: <20%, 21–30%, 31–40%, 41–50%, 51–60%, 61–70%, 71–80%, >80%, and "don't know". To assess each treatment's safety, we asked: "What percent of patients will have to discontinue each of the following therapies due to side effects (i.e., lab abnormalities, adverse effects or general tolerability issues)?" Response categories included: <10%, 11–20%, 21–30%, 31–40%, 41–50%, 51–60%, 61–70%, >70%, and "don't know". Respondents were asked to base their responses on the "average" patient with moderate-to-severe psoriasis.

Respondent characteristics

Sex, practice setting, and number of psoriasis patients treated in the last 3 months were assessed directly via the questionnaire. Information on duration of practice was obtained for all dermatologists surveyed using Vitals (<http://www.vitals.com/>, accessed 26 July 2010). We imputed the number of years in practice for 33 subjects in whom it was missing by subtracting four from years since medical school graduation, which we obtained from HealthGrades (<http://www.healthgrades.com/>, accessed 26 July 2010). We used the subjects' mailing addresses to determine their geographical region of practice as defined by the U.S. Census Bureau (<http://www.census.gov/popest/geographic/>, accessed 21 November 2010).

Prescription preferences

Respondents' prescription preferences were measured by two methods. First, they were asked to indicate the number of patients treated with each psoriasis therapy over the prior three months. Second, we identified first-line treatment preferences for a standardized patient via two vignettes describing a "typical" healthy adult male or female of childbearing age with moderate-to-severe psoriasis.

Study size

A sample size of 1000 was calculated to be sufficient to give precise confidence intervals around our primary outcomes: if the standard deviation of the perceived effectiveness of a particular treatment was 15%, then the width of the 95% confidence interval about the mean estimate would be 3.4%, or 2.9%, assuming response rates of 30%, or 40%, respectively.

Statistical analysis

Data on respondent characteristics and safety and effectiveness beliefs were summarized descriptively. Responses to the safety and effectiveness questions were re-coded to reflect the median of each numerical category (i.e., 25% if a respondent selected 21–30%), which were then used in further analyses. The non-parametric Skillings-Mack test was used to test whether there was any overall difference between average responses for all of the ten treatments within the safety and effectiveness categories.¹⁷ We then tested for significant differences between average responses to each possible pairwise comparison of treatments using the Wilcoxon signed rank sum test.

In order to describe the variation in responses, we calculated the coefficient of variation and the ratio of the 75th to 25th percentile. The coefficient of variation is the ratio of the standard deviation to the mean multiplied by 100.¹⁸ This variable is unitless, thus allowing for comparison across safety and effectiveness perceptions. The ratio of 75th to 25th percentile reflects the amount of dispersion around the median. For both measures, higher values correspond to greater variability.

We analyzed whether there were differences in safety and effectiveness perceptions by respondent characteristics and prescription preferences for each of the top four preferred first-line therapies. The most commonly preferred first-line treatments for either a male or female in standardized patient vignettes included UVB (57%), etanercept (22%), methotrexate (17%), and adalimumab (14%); details are reported elsewhere.¹⁹ We used Fisher's exact tests for categorical variables, t-test or one-way analysis of variance (ANOVA) for normally-distributed continuous variables, and Wilcoxon-Mann Whitney or Kruskal-Wallis tests for nonparametric continuous variables.

We used two-sided tests of statistical significance ($\alpha=0.05$) for all analyses. No adjustments for multiple comparisons were made, as hypotheses were not interdependent.^{20, 21} Data analysis was performed using Stata/IC 11.0 (College Station, TX).

RESULTS

Of the 1000 physicians surveyed, six were unreachable due to undeliverable mailings and five were considered ineligible for study inclusion because they were non-dermatologists or not in current practice. Of the remaining 989 dermatologists, 387 returned the survey (246 NPF members and 141 AAD members), yielding a 39.1% response rate. Survey respondents were similar to non-respondents with respect to sex, duration of practice, and region. NPF members were, however, more likely to respond than AAD members (odds ratio (OR) 2.37, 95% confidence interval (CI) 1.81–3.11).

As shown in Table 1, respondents were mostly male (277/387, 72%) and they represented all regions of the U.S. Most were in private practice (272/387, 70%), had been in practice for over 20 years on average, and had seen a median of 30 patients with moderate-to-severe psoriasis in the last 3 months.

As shown in Table 2, infliximab was perceived to have the highest mean effectiveness, followed by ustekinumab, cyclosporine, and adalimumab (75–67%). Overall, there was a statistically significant difference between average perceived effectiveness by treatment category (Skillings-Mack $p<0.000$), though the difference between infliximab and ustekinumab was not statistically significant (Wilcoxon signed rank sum $p=0.388$). All other pairwise comparisons between these four treatments were significant at the $p<0.05$ level. Etanercept was perceived to have the lowest likelihood of side effects requiring discontinuation of treatment, followed by adalimumab, UVB, and ustekinumab (9–11%). Overall, there was a statistically significant difference between average perceived likelihood of side effects between treatment categories (Skillings-Mack $p<0.000$), though the differences between adalimumab and UVB, adalimumab and ustekinumab, and UVB and ustekinumab were not statistically significant (Wilcoxon signed rank sum $p=0.473$, $p=0.286$, and $p=0.095$; respectively). The three traditional oral systemic treatments acitretin, cyclosporine, and methotrexate were thought to have the highest discontinuation rates due to side effects (22–35%).

The percentage of respondents who reported they “don’t know” the effectiveness or likelihood of side effects for a particular treatment ranged from 6–38% and 7–49%, respectively. Among respondents who indicated a numerical belief, there was considerable

variation in responses, particularly for safety perceptions. The coefficient of variation for effectiveness ranged from 22 to 62, and that for likelihood of side effects ranged from 62 to 114. The traditional systemic treatments including cyclosporine, methotrexate, and acitretin had the lowest coefficients of variation for the likelihood of side effects (62–73), while the coefficients for phototherapy and the biologics ranged from 75 to 114.

For each of the four most commonly preferred first-line treatments we analyzed effectiveness and safety perceptions by respondent characteristics and prescription preferences (Table 3). We found only two significant differences in perception by respondent characteristics out of 56 tested associations, and there were no consistent trends across medications. Prescription preferences were only significantly correlated with safety and effectiveness perceptions in the case of UVB phototherapy. In addition to the analyses by median presented in Table 3, we compared safety and effectiveness perceptions between respondents above and below the median, above and below the 25th percentiles, and including respondents who answered “don’t know”. In each case, the results were similar (data not shown).

DISCUSSION

We conducted a large national study of dermatologists self-identified as having an interest in psoriasis, and found variation in beliefs about effectiveness and safety of treatments for moderate-to-severe disease. We found few significant associations between respondent characteristics and beliefs. Of note, the significant associations may have occurred by chance; if 56 independent associations are examined for statistical significance, the probability that at least one of them will be found statistically significant with an α of 0.05 is 0.94 ($1-(1-\alpha)^n$).²² Prescription preferences were only significantly associated with beliefs in the case of UVB. National surveys of primary care providers also failed to find consistent correlations between beliefs about anti-hypertensive medications and prescription practices.^{23, 24} We focused on safety and effectiveness because these were reported to be of utmost importance in pilot testing and were ranked highest among factors influencing prescription practices in our survey.¹⁹ Taken together, these data suggest that prescription decisions are complex, and additional research is needed to understand how safety and effectiveness perceptions influence prescription choices among clinicians.

As with any study, ours is not without limitations. First, our results may be subject to misclassification bias. We assessed safety and effectiveness perceptions via generally-worded questions. It is possible that the questions were too general to capture nuances of opinion. For example, we only asked about side effects that would terminate treatment use and we did not differentiate between bothersome versus serious or life-threatening side effects or treatment dosages. Each time a physician encounters an individual patient, the precise nature of the risks and benefits discussed will vary. Nonetheless, our goal was to capture how physicians generally think about psoriasis treatments and evaluate how these related to prescription preferences for a general patient. Issues such as availability, cost, and ease of administration may influence real-life prescription practices, and we attempted to control for these factors in our survey by using patient vignettes that asked respondents to assume that all of the options are readily available and cost to the patient and insurance approval are not major issues. We were unable to test, however, whether respondent’s answers differed based on this assumption.

Second, we could not track actual treatment use but rather used self-reported data on frequency of psoriasis patient visits and medication use. In addition to self-reported data on actual use, we used vignettes to ask about preferences for a “typical” standardized patient, a method that has been shown to be a good proxy for clinical practice.²⁵ Results were similar

with both variables. Third, our response rate was 39%, which may limit generalizability of our results if non-respondents differ with respect to respondents; however, our response rate is not particularly low for a physician survey, especially within the field of dermatology which often has survey response rates from 29–38% and survey respondents were similar to non-respondents with respect to sex, duration of practice, and region.^{26–30} Finally, these results may be not generalizable to all dermatologists and subject to sampling bias since we only surveyed those who had an indicated an interest in psoriasis through the NPF and AAD. Of note, this group represents approximately 15% of the total AAD membership.

To our knowledge, this is among the first studies to examine dermatologist beliefs about safety and effectiveness of psoriasis medications. Physician beliefs may impact patient outcomes, and could help to explain variations in clinical practice, a topic central to health care reform. Our data indicate that there is variation among psoriasis providers' perceptions of treatments. Additional work is needed to contextualize the amount of variation in beliefs and to understand the causes of this variation, which was not explained by respondent characteristics or prescription preferences in our study. Variation in beliefs about treatments may be due to differences in the understanding of medical evidence or differences among the actual “real-world” experiences of providers.²⁵

A value of information approach would argue for additional comparative studies in psoriasis, especially those focusing on safety where variation in beliefs was greatest. Investigation of provider beliefs may prove to be an important addition to the field of CER, and can be used to guide future research and educational efforts.

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ABBREVIATIONS and ACRONYMS

NPF	National Psoriasis Foundation
AAD	American Academy of Dermatology
DCERN	Dermatology Clinical Effectiveness Research Network
PUVA	UVA phototherapy
OR	Odds ratio
CI	Confidence interval

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TABLE 1

Baseline characteristics of survey respondents (N=387)

Characteristic	n (%) ¹
Sex	
Female	110 (28)
Male	277 (72)
NPF member	
Yes	246 (64)
No	141 (37)
Region of practice in the United States	
Northeast	90 (23)
Midwest	90 (23)
South	135 (35)
West	72 (19)
Years in practice	
Mean (SD)	23.1 (11)
Missing ²	15 (4)
Practice type	
Private dermatology practice (size below):	272 (70)
Solo practice	133 (49)
< 5 dermatologists	97 (36)
5 dermatologists	37 (14)
No response	5 (2)
Academic	40 (10)
Multi-specialty, VA, HMO, other	51 (14)
No response	24 (6)
Number of moderate-to-severe psoriasis patients treated in last 3 months	
Median (IQR)	30 (15–60)
No response	10 (3)
Number of patients treated with UVB in last 3 months	
10 patients	267 (69)
> 10 patients	105 (27)
No response	15 (4)
Number of patients treated with etanercept in last 3 months	
10 patients	280 (72)
> 10 patients	90 (23)
No response	17 (4)
Number of patients treated with adalimumab in last 3 months	
10 patients	312 (81)
> 10 patients	62 (16)
No response	13 (3)
Number of patients treated with methotrexate in last 3 months	

Characteristic	n (%) ¹
10 patients	302 (78)
> 10 patients	67 (17)
No response	18 (5)

¹Percentages may not total to 100% due to rounding

²As described in the methods section, attempts were made to impute the number of years in practice from publically available information, but in some cases it was unavailable.

TABLE 2

Variation in perceptions of treatment effectiveness and safety

	Clearance or discontinuation rate (%)				
	% Don't Know	Mean (Standard Deviation)	Median (Interquartile Range)	Ratio of 75 th to 25 th percentile	Coefficient of variation ^I
Perceived effectiveness (clear or almost clear skin after 3 months) ²					
PUVA ^{3,4}	16%	59 (20)	65 (45–75)	1.7	35
UVB	9%	53 (19)	55 (45–65)	1.4	36
Acitretin	12%	37 (19)	35 (25–55)	2.2	52
Cyclosporine	21%	69 (20)	75 (65–90)	1.4	29
Methotrexate ³	6%	56 (18)	55 (45–65)	1.4	32
Adalimumab	16%	67 (15)	65 (55–75)	1.4	23
Alefacept	36%	32 (20)	25 (10–45)	4.5	62
Etanercept ⁴	6%	60 (15)	65 (55–75)	1.4	25
Infliximab ⁵	26%	75 (16)	75 (65–90)	1.4	22
Ustekinumab ⁵	38%	72 (18)	75 (65–90)	1.4	25
Perceived likelihood of side effects requiring discontinuation of treatment ⁶					
PUVA ⁷	15%	18 (16)	15 (5–25)	5	90
UVB ^{8,9}	8%	11 (12)	5 (5–15)	3	112
Acitretin	11%	28 (18)	25 (15–35)	2.3	64
Cyclosporine	19%	35 (21)	35 (15–45)	3	62
Methotrexate	7%	22 (16)	15 (15–25)	1.7	73
Adalimumab ^{8,10}	17%	10 (10)	5 (5–15)	3	96
Alefacept	37%	13 (15)	5 (5–15)	3	114
Etanercept	9%	9 (8)	5 (5–15)	3	89
Infliximab ⁷	29%	17 (13)	15 (5–25)	5	75
Ustekinumab ^{9,10}	49%	11 (11)	5 (5–15)	3	101

Notes:

^I Coefficient of variation=(standard deviation/mean)*100.

- ² Skllings-Mack p<0.000
- ³ Wilcoxon signed rank sum p=0.071
- ⁴ Wilcoxon signed rank sum p=0.999
- ⁵ Wilcoxon signed rank sum p=0.388
- ⁶ Skllings-Mack p<0.000
- ⁷ Wilcoxon signed rank sum p=0.178
- ⁸ Wilcoxon signed rank sum p=0.473
- ⁹ Wilcoxon signed rank sum p=0.095
- ¹⁰ Wilcoxon signed rank sum p=0.286 All other pairwise comparisons Wilcoxon rank sum p<0.05.

TABLE 3

Perceptions of treatment effectiveness and safety by respondent characteristics and prescription preferences

	UVB		Etanercept		Adalimumab		Methotrexate		UVB		Etanercept		Adalimumab		Methotrexate	
	Median (IQR)	p ^I	Median (IQR)	p ^I	Median (IQR)	p ^I	Median (IQR)	p ^I	Median (IQR)	p ^I	Median (IQR)	p ^I	Median (IQR)	p ^I	Median (IQR)	p ^I
Perceived effectiveness (clear or almost clear skin after 3 months)																
Perceived likelihood of side effects requiring discontinuation of treatment																
Respondent characteristics																
Male	55 (45–65)	0.01	65 (55–75)	0.29	65 (55–75)	0.45	55 (45–65)	0.33	5 (5–15)	0.91	5 (5–15)	0.77	5 (5–15)	0.83	15 (5–25)	0.19
Female	50 (35–65)		55 (45–75)		65 (55–75)		55 (45–65)		5 (5–15)		5 (5–15)		5 (5–15)		25 (15–35)	
NPF member																
Yes	55 (45–65)	0.08	65 (55–75)	0.48	65 (65–75)	0.38	55 (45–65)	0.74	5 (5–15)	0.81	5 (5–15)	0.80	5 (5–15)	0.89	25 (15–25)	0.58
No	55 (35–65)		65 (55–75)		65 (55–75)		55 (45–75)		5 (5–15)		5 (5–15)		5 (5–15)		15 (15–25)	
Region																
Northeast	55 (45–65)	0.83	65 (55–75)	0.96	65 (55–75)	0.48	55 (45–65)	0.96	5 (5–5)	0.74	5 (5–5)	0.62	5 (5–10)	0.38	15 (5–25)	0.19
Midwest	55 (45–65)		60 (45–75)		65 (55–75)		55 (45–65)		5 (5–15)		5 (5–15)		5 (5–15)		15 (15–25)	
South	55 (35–65)		65 (55–75)		70 (65–75)		55 (45–65)		5 (5–15)		5 (5–15)		5 (5–15)		25 (15–35)	
West	55 (35–65)		65 (55–65)		65 (55–75)		55 (45–65)		5 (5–15)		5 (5–5)		5 (5–5)		25 (5–35)	
Practice type																
Academic	55 (45–65)	0.08	65 (45–65)	0.58	65 (65–75)	0.72	55 (45–65)	0.54	5 (5–15)	0.25	5 (5–15)	0.42	5 (5–15)	0.29	15 (15–25)	0.70
Private	55 (35–65)		65 (55–75)		65 (55–75)		55 (45–65)		5 (5–15)		5 (5–5)		5 (5–15)		15 (15–25)	
Other	55 (55–65)		65 (55–75)		65 (65–75)		55 (45–65)		5 (5–15)		5 (5–15)		5 (5–15)		15 (15–35)	
Practice size (private practice only)																
Solo	55 (35–65)	0.73	65 (55–75)	0.14	65 (55–75)	0.83	60 (45–75)	0.31	5 (5–5)	0.86	5 (5–15)	0.77	5 (5–15)	0.70	15 (5–25)	0.40
<5 dermatologists	55 (35–65)		55 (45–65)		65 (65–75)		55 (40–65)		5 (5–15)		5 (5–5)		5 (5–15)		25 (15–35)	
5 dermatologists	55 (35–65)		55 (55–75)		65 (55–75)		55 (45–65)		5 (5–15)		5 (5–15)		5 (5–15)		25 (15–35)	
Years in practice ²	0.09	0.15	0.05	0.44	0.03	0.74	0.10	0.09	−0.04	0.58	−0.02	0.87	−0.09	0.16	−0.14	0.01
No psoriasis pts in last 3 mo ²	0.07	0.30	0.02	0.75	0.06	0.27	0.00	0.98	0.05	0.39	−0.05	0.37	0.00	0.99	0.07	0.19
Prescription preferences																
First line treatment choice ³																
No	45 (35–55)	<0.001	65 (55–75)	0.90	65 (55–75)	0.15	55 (45–65)	0.95	5 (5–15)	<0.001	5 (5–15)	0.49	5 (5–15)	0.10	25 (15–25)	0.11
Yes	55 (45–65)		65 (55–75)		75 (65–75)		55 (45–65)		5 (5–5)		5 (5–15)		5 (5–5)		15 (5–25)	
Heavy use of treatment ⁴																
No	55 (35–65)	<0.001	65 (55–75)	0.70	65 (55–75)	0.32	55 (45–65)	0.64	5 (5–15)	0.004	5 (5–15)	0.08	5 (5–15)	0.08	15 (15–25)	0.24
Yes	65 (55–75)		55 (55–65)		75 (65–75)		55 (45–65)		5 (5–5)		5 (5–5)		5 (5–5)		15 (5–35)	

Notes:

- ¹ Mann-Whitney test for comparisons between 2 groups, Kruskal-Wallis test for comparisons among 3 or more groups
- ² Spearman correlation coefficient and p-value
- ³ Chosen as a first-line treatment for either an adult male or female with moderate-to-severe psoriasis
- ⁴ Heavy use refers to use in more than 10 patients in the last 3 months