Published in final edited form as:
J Dermatolog Treat. 2013 February ; 24(1): 13–24. doi:10.3109/09546634.2011.631979.

How Psoriasis Patients Perceive, Obtain, and Use Biologic Agents: Survey from an Academic Medical Center

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Abstract

The availability of new biologic agents for the treatment of psoriasis provides hope for improved quality of life outcomes. However, the way patients come to use biologics, potential barriers they encounter, and their attitudes towards using these medications are still not well studied. Here, we conducted a survey of 106 psoriasis patients at an academic medical center to discern patient attitudes towards biologics. We found that most patients learn of biologics through their physician and perform follow-up research using the Internet. Most patients did not find it difficult to make the decision to start a biologic. Difficulty in obtaining biologics was associated with age less than 55 (p=0.01), lower income level (p=0.007), and lack of insurance (p=0.04). Patients were found to have high satisfaction and compliance rates on biologics. Of patients who missed a dose of their biologic, this was mainly due to logistical reasons such as not having the medication or forgetting to take it, rather than being depressed or overwhelmed. Patients with lower income levels had increased cutbacks in personal expenses due to co-payments (p=0.001). Among respondents, the mean annual out of pocket expense for a biologic was $557.12 per year, with a range of $0 to $7,000.

Keywords

Psoriasis; biologics; education; barriers; cost; compliance

Introduction

Psoriasis is an inflammatory skin disease affecting approximately 2-3% of the population. Approximately one-third of these patients suffer from generalized psoriasis (1). Patients with psoriasis suffer from pruritic, inflammatory plaques with a chronic, remitting and relapsing disease course. Psoriasis tends to remain active throughout a patient's lifetime or becomes gradually more widespread. Psoriasis is associated with a high degree of morbidity,

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Declaration of Interest
The authors declare no conflicts of interest.

and has a tremendous impact on the lives of patients, affecting them physically, psychologically, and socially, and often requires long-term systemic treatments.

Psoriasis can negatively affect a patient's psychological, social, and occupational well-being, often to the point where their quality of life (QoL) decreases significantly (2). Studies have shown that psoriasis patients often experience psychological and social difficulties including poor self-esteem, embarrassment regarding their physical appearance, and feelings of stigma and shame (3). Patients suffering from psoriasis are more likely to be depressed when compared to the general population, which can lead to increased suicidal ideation (4). The frequently quoted study by Rapp et al(5) showed that patients with psoriasis suffer just as much disability and negative QOL impact as patients with other serious medical illnesses such as heart disease, diabetes, and cancer. Furthermore, psoriasis can create a negative impact in the workplace, as patients with psoriasis are more likely to miss work due to their psoriasis or due to treatment, and may be less productive at work (5).

The availability of new biologic treatments with targeted mechanisms of action has transformed the treatment landscape for psoriasis. Currently, five biologic medications are FDA approved for the treatment of psoriasis in the United States. These include the TNF-alpha antagonists etanercept, adalimumab, and infliximab; the IL12/23 inhibitor ustekinumab, and the T-cell inhibitor alefacept. Additionally, the TNF-alpha antagonist golimumab is approved for the treatment of psoriatic arthritis. Efalizumab, a T-cell inhibitor, was withdrawn from the U.S. market in April 2009 due to several case reports of progressive multifocal leukoencephalopathy. The increasing use of the biologic medications may reflect their generally high efficacy rates (6, 7), relatively good safety profiles (6), and demonstrated improvement on quality of life (8, 9). However, it is not well understood how patients come to learn about biologics as a treatment option, the logistical and financial obstacles they encounter in obtaining treatment, and their perceptions about treatment once started. We conducted a survey of psoriasis patients treated with biologics to address these questions.

Methods

Patient-directed questionnaire

An anonymous questionnaire was distributed to adult psoriasis patients at the UCSF Psoriasis Center who were identified as having been treated with one or more biologic agents. Questionnaires with identical content were distributed by mail, in person during clinic visits, and by email between October 2010 and February 2011. Potential subjects were informed of the goals of the survey and invited to participate on a voluntary basis. The response rate was 106/207=51.2%. The questionnaire consisted of 34 multiple-choice or free text questions (Table II). All research was approved by the institutional review board at UCSF.

Statistical Analysis

Statistical analysis was performed using SAS software. Association testing was performed using chi-square and Fisher's exact tests. To evaluate whether there was a collinear relationship between variables identified as significant by association testing, Spearman rank correlation coefficients and tolerance values from linear regression were used.

Results

Patient Population

One hundred and six patients responded to the survey. The demographics of our survey respondents are shown in Table I. The mean age of survey respondents was 43.4 years (SD 12.6) and the mean age of onset of their psoriasis was 23.4 years (SD 12.78). 59% of patients were male, and 41% were female. Psoriatic arthritis was diagnosed by a medical professional in 40% of patients. The majority of our patients were self identified as Caucasian (59%), or Asian/Pacific Islander(32%). This population was highly educated, as 86% had at least an undergraduate degree. With regard to household income, 8 % had income less than $15,000, 22% had income between $15,000-$60,000, and 69% had income of $60,000 or above. 93% of patients had health insurance. Nearly all respondents lived in an urban or suburban area (97%) with very few rural patients (3%). The survey respondents were highly experienced with use of biologic medications with 51% having used 2 or more biologics. The main biologics used by our population were etanercept (70%) and adalimumab (62%), with the remainder (alefacept, efalizumab, infliximab, ustekinumab, and golimumab) counting for less than 13% each.

Awareness, Education, and Decision Making

We asked survey respondents how they first learned of biologic agents, the types of further research they did, the ease of decision making, and their expectations regarding improvement when starting a biologic medication. The responses are shown in Table II. We found that most patients in our survey learned of biologics from a physician (74.5%) and that the vast majority of our patients did further research on their own (89.5%), primarily using the Internet (88.5%). Eighty-five percent of respondents stated the difficulty level in making the decision to start a biologic was easy to moderate. Nearly half the respondents, 47.7%, indicated that they expected significant or complete improvement from the biologic prior to starting the treatment.

Difficulties faced in obtaining biologic medication

We asked questions evaluating the difficulty level in obtaining biologic medications. Results are reported in Table II. For 81.5% of patients, the time interval from when the prescription was written for a biologic medication to the time of receiving the first injection was one month or less. Regarding opinions on difficulty level in obtaining biologic medications, 64.1% of patients stated this was “not difficult at all” to “minimally difficult”. The most commonly reported obstacle in obtaining biologic medications was “difficulty with insurance approval,” followed by “being too expensive,” and “problems with the pharmacy in filling the prescription.” On univariate analysis, difficulty in obtaining medications was associated with age less than 55 years (p=0.01), income level less than $100,000 (p=0.007), and lack of medical insurance (p=0.04) (Table III). Further analysis revealed that age and income level were independent risk factors, whereas lack of insurance was correlated with lower income. In addition, a sensitivity analysis of income levels showed that difficulty in obtaining biologics was not just associated with income less than $100,000, but also income less than $60,000 (p=0.030) and less than $40,000 (p=0.027). No association was found between difficulty in obtaining biologics and psoriatic arthritis status (p=0.206), gender (p=0.161), and education level (p=0.898) (Table III).

Patient satisfaction

The survey assessed patient expectations, satisfaction, and concerns. Results are also reported in Table II. As previously stated, 47.7% of patients expected “significant” or “complete” improvement of their psoriasis prior to starting the biologic. After starting a

biologic, 75.2% rated their improvement as “significant” or “complete,” indicating a higher rate of improvement than originally expected. When asked about overall satisfaction with using biologics, 62.6% of respondents stated “very satisfied” with biologics. In our population we found that a large percentage had tried more than one biologic medication. The most common reason stated for stopping a previous biologic was “not as effective as desired,” followed by “experienced a side effect,” and then by “medication too expensive.”

When asked about how worried patients are that the biologic medication will cause an adverse effect, 57.5% of patients responded “not worried at all” or “minimally worried.” 42.5% responded “somewhat worried” or “extremely worried.” Statistical analysis showed a trend towards association between being worried about side effects and female gender (p=0.057), but not with education level (p=0.126) or number of educational sources consulted before deciding to start a biologic (p=0.859).

Financial considerations

Financial considerations were also a major target of this survey, given that biologic medications are expensive. Patients were asked if the co-pay for biologics has caused them to cut back on other personal and household expenses, and the majority of respondents (78.8%) stated that it has not. However, when respondents were stratified by annual income level above or below $100,000, those with income level below $100,000 were significantly more likely to cut back on their household expenses compared to those above $100,000, 32.7% vs 5.0%, (p=0.001, OR 9.24 [2.00-42.66]) (Table III). A sensitivity analysis showed that this difference persisted using an income level cutoff of $60,000 (p=0.033, OR 2.95 [1.06-8.17]), but not a cutoff of $40,000 (p=0.671, OR 1.31 [0.37-4.62]). The average for yearly out-of-pocket expense for current biologics was $557.12 dollars per year, with a median of $180, and range of $0 to $7,000.

Patient Compliance

Although patients were generally satisfied with using biologics, we examined their self-reported compliance with these medications. Patients were asked how frequently they miss a dose of their biologic. Two-thirds (66.6%) of the respondents reported that they “never” or “rarely” missed a dose, while 27.3% reported “sometimes” and 6.1% reported “often.” The most frequently cited reason for missing a biologic medication dose was “ran out of medication,” followed by “forgot,” “illness,” and “too busy.” Patients were also asked how often they intentionally changed the frequency of taking their biologic without consulting their physician. 14.1% of patients responded “sometimes” or “often.” Among those that ever changed the frequency, the most common reasons were “ran out of medication” or “psoriasis was under good control so I needed it less.” Less often was the change in frequency due to “concern about side effect,” “medication too expensive,” or patient being “depressed or overwhelmed.”

Opinion of Pharmaceutical Companies

Patients were also questioned about their opinion regarding pharmaceutical companies that produce the biologic medications. The majority of patients, 63.6%, stated that their opinion of these pharmaceutical companies was neutral. The majority of patients stated that they had not contacted the pharmaceutical companies directly for questions or other services, whereas 37.4% reported that they had. From respondents who had contacted pharmaceutical companies in the past, the majority stated that they were “somewhat satisfied” overall with the services provided, and the response was split evenly between respondents not satisfied and very satisfied.

Discussion

This survey explored how patients with psoriasis become aware of biologics, the barriers they face in obtaining these medications, their compliance, and their perceptions towards efficacy and potential adverse effects. The majority of the respondents with psoriasis had learned of biologic medications from their physicians, rather than from family or friends, or from advertisements. This suggests that physicians and other medical providers are the primary source of providing awareness about treatment options. It highlights the importance of offering these medications to patients who can benefit from these treatments, and to discuss the risks and benefits. Our study found that patients further researched biologic medications using the Internet as a tool. Therefore, it may be beneficial for dermatologists to provide patients with reliable online sources to obtain information on these medications, as patients are currently using this medium to obtain much of their information.

Most respondents found the decision to start a biologic medication “easy” or “moderate.” Even though these medications are more complex than prior treatments, if patients receive thorough information regarding these medications, the decision to start the medication may become easier. It should be noted, however, that this survey targeted individuals who had chosen to start a biologic medication and did not include those who learned about biologics and declined to use them. This may self-select for a population who had an easier time making this decision.

The majority of respondents had high expectations regarding improvement prior to starting biologics, and reported even higher satisfaction rates than expected after initiating therapy. The fact that patients tended to underestimate the degree of improvement on biologics suggest that perhaps the treating physicians undersold the potential benefits of biologics, or that patients may have downgraded their expectations due to previous treatment failures or the chronic severity of their disease. Overall, the majority of respondents were very satisfied with biologics. This is consistent with previous studies that had reported high satisfaction rates amongst patients using biologic therapies(10, 11). Thus, physicians should not hesitate to tell patients who are considering starting biologics that despite the risks of adverse effects or not responding to these medications, the great majority of patients on biologics are satisfied with their treatment.

Obtaining biologic medications was “not difficult” to “minimally difficult” for the majority of respondents. The majority had received their biologic medication within one month of the time the prescription was written. The most common difficulties encountered included problems with insurance companies and with the pharmacy filling the prescription. It must be noted that our center is specialized in the treatment of psoriasis, and there is dedicated staff devoted to advocating for patients and following up with insurance companies and pharmacy issues, which were the main two challenges faced by patients. Obtaining insurance approval for a patient for a biologic medication, and the logistics of obtaining the medication after approval can be challenging, and a knowledgeable support staff is imperative in helping with this process, especially in populations that have the most difficulty obtaining these medications. We found that the populations that had the most difficulty in obtaining biologics included younger patients (less than 55 years old), patients with lower income, and patients with no insurance. Because our data were anonymized, we were unable to explore the hypotheses that the association with younger age was due to those age 65 and older having Medicare coverage, and that the association with lower income was due to a less favorable insurance plan.

Our patient population had significant experience with biologic medications, with more than half having used more than one biologic. This patient population had very good compliance

with biologic medications with the majority of patients reporting “never” or “rarely” missing a dose. The main reason for missing a dose of medication was running out of medication. This can be avoided with proper scheduling of patient visits and advance renewal of prescriptions. Other reasons stated for missing a dose included forgetting to take the medication, followed by difficult transport of medications due to vacations and travel. Since biologic medications consist of needle syringes and also require refrigeration, storage and transport of these medications is difficult while traveling. If patients wish to fly with these medications, storage in a hard-shell container with a cool pack and physician’s explanatory note is recommended. Other options include directly shipping the medication to the travel destination. Notably, only a small percentage of respondents cited depression and concerns about side effect as reasons for missing a dose of a biologic. This is in contrast to studies conducted with other therapies including topical and systemic therapies in which patient frustration and other psychosocial factors had significant influence on compliance(12).

Overall, respondents were not worried at all or minimally worried about possible adverse effects from their biologic medications. We explored whether certain demographic variables were associated with worrying about side effects and found a trend toward association with female gender, but not with number of educational sources consulted or education level.

Biologic medications are expensive as compared to previous psoriasis treatments(13-15). Studies have looked at populations who receive biologic medications and this population usually has a higher income level, and increased insurance coverage(16). The results of this survey were consistent with this finding as previously stated in the demographics the majority of patients in this study had higher incomes, were highly educated, and had health insurance coverage. The majority of our respondents stated that co-payments associated with biologic medications had not caused them to cut back on other personal or household expenses. As would be expected, respondents with higher income levels did not need to cut back on household expenses due to co-pays for biologic medications.

The majority of our respondents had never contacted the pharmaceutical companies that make their biologic medication, and the majority of respondents had a neutral opinion of the pharmaceutical companies. Of the minority who had contacted the pharmaceuticals the opinions were evenly split between dissatisfaction and satisfaction.

Study Limitations

First, since the response rate to our survey was 51.2%, there may have been a selection bias in those who chose to respond to the survey. These individuals might be more motivated to share their experiences with biologics due to good or bad experiences, be more educated, or be more facile with the Internet for those who chose to respond online. Second, the data from this survey was self-reported by respondents and is thus subject to recall bias. Third, our survey was administered to patients at a single site. The demographics of the population were such that the majority of respondents lived in an urban area, were highly educated, with increased income levels, and had health insurance. Results from this population may underestimate the burden of financial considerations regarding biologic medications. Finally, the survey was administered to patients who had received care at the UCSF Psoriasis Center. This is an academic center specializing in psoriasis, and there is dedicated staff to assist in the process of obtaining approval and renewals for biologic medications. Thus, the results of this study may not be generalizable non-academic sites or practices that do not have the same level of staff support.

Conclusion

Moderate to severe psoriasis is associated with much psychosocial co-morbidity and biologic medications are quite effective in treating psoriasis and increasing the quality of life of patients. We found that the majority of patients learned of biologic medications from their physician and conducted further research using primarily the Internet as a source. It is imperative to provide information on these therapies to eligible patients and provide support in the decision making process to start a biologic. We found that the groups who have the most trouble obtaining biologics are younger patients, those with lower income levels, and those with no medical insurance. Having a support staff to follow up with insurance companies and pharmacies may facilitate the process of obtaining biologic medications. Patients have high satisfaction rates and high compliance rates on biologic medications. When they do miss a dose it is often related to logistical reasons such as running out of medication, traveling, or forgetting to take medication, as opposed to psychosocial factors such as depression. It is important to ensure that patients have access to their biologic medications by scheduling follow-up visits well in advance of when medications run out, and also educating patients on how to travel with their biologic medications.

Acknowledgments

We thank the patients who participated in this survey as well as the staff at the UCSF Psoriasis Center for making this study possible. W.L. is supported by a grant from National Institute of Arthritis, Musculoskeletal and Skin Diseases (K08AR057763).

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Table I

Characteristics of the study population

	No.(Total=106)	%
Age (years)		
18–29	14	14.2%
30–39	24	24.5%
40–49	24	24.5%
50–59	28	28.5%
60–69	7	7.3%
> 70	1	1%
Age diagnosed with Psoriasis		
<10	5	5.10%
10-19	34	34.69%
20-29	36	36.73%
30-39	10	10.52%
40-49	9	9.18%
50-59	2	2.04%
60-69	1	1.02%
>70	1	1.02%
Psoriatic Arthritis		
Yes	40	40.4%
No	50	50.5%
Not Sure	9	9.1%
Gender		
Male	58	58.6%
Female	41	41.4%
Race		
White	58	58.6%
African American	0	0.0%
Hispanic	5	5.1%
Asian/Pacific Islander	32	32.3%
Native American	1	1.0%
Other	3	3.03%
Education		
Less than high school	0	0.0%
High school graduate	14	14.1%
Undergraduate	51	51.5%
Graduate	34	34.3%
Living area		
Urban	66	66.7%
Suburban	30	30.3%
Rural	3	3.0%

	No.(Total=106)	%
Household income ($)		
< 15,000	8	8.4%
15,000–40,000	8	8.4%
40,001–60,000	13	13.7%
60,001-100,000	26	27.4%
>100,001	40	42.1%
Health insurance		
Yes	92	92.9%
No	7	7.1%
Number of Biologics used		
1	50	48.5%
2	33	32.0%
3	13	12.6%
> 3	7	6.8%
Biologics Currently Using		
Amevive	2	
Raptiva	0	
Enbrel	30	
Humira	48	
Remicade	3	
Stelara	4	
Simponi	0	
Biologics Previously Using		
Amevive	12	
Raptiva	13	
Enbrel	44	
Humira	18	
Remicade	7	
Stelara	2	
Simponi	2	

Biologics currently using or previously used		
	No. (n=103)	%
Amevive	13	12.6%
Raptiva	13	12.6%
Enbrel	72	69.9%
Humira	64	62.1%
Remicade	10	9.7%
Stelara	6	5.8%
Simponi	2	1.9%

Duration of medication use by number of patients

	Less than 3 months	3 months to 1 year	Greater than 1 year
Amevive	4	5	4
Raptiva	2	1	10
Enbrel	7	16	50
Humira	10	15	38
Remicade	4	1	5
Stelara	1	3	1
Simponi	1	1	0

Table II

Survey Responses

	No.	%
Q1. How did you first learn about biologics for psoriasis?		
TV Commercial	3	2.8%
Printed Advertisement	1	0.9%
From your physician	70	74.5%
From other patients, family or friends	12	11.3%
Other	11	10.4%
Q2. After hearing about your biologic did you do further research to learn more about the medication?		
Yes	95	89.5%
No	11	10.4%
Q3. If yes, what sources did you use?		
Patient brochure	44	45.8%
Internet	85	88.5%
Medical Journal	20	20.8%
Personal contact with friends of family	17	17.7%
Other	16	16.7%
Q4. How easy was it to make the decision to start a biologic?		
Easy	57	54.3%
Moderate	32	30.5%
Difficult	14	13.3%
Extremely difficult	2	1.9%
Q5. Before starting the biologic, what was your expectation as to how much you would improve?		
None	1	1.0%
Very little	10	9.5%
Somewhat	44	41.9%
Significantly	45	42.9%
Completely	5	4.8%
Q6. Now having been on your current biologic, how would you rate your improvement?		
None	4	3.8%
Very little	6	5.7%
Somewhat	16	15.2%
Significantly	65	61.9%
Completely	14	13.3%
Q7. In your experience, from the date the prescription was written by your physician, how long did it take to actually get your first injection or infusion of the biologic medication you are currently using?		
1 week or less	19	18.4%
1-2 weeks	34	33.0%
2-4 weeks	31	30.1%
1-3 months	17	16.5%
Greater than 3 months	2	1.9%
Q8. How difficult was it to get this medication?		

	No.	%
Not difficult at all	39	37.9%
Minimally difficult	27	26.2%
Somewhat difficult	28	27.2%
Extremely difficult	9	8.7%
Q9. What difficulties did you encounter in obtaining your biologic?		
None	39	38.6%
Doctor did not want to prescribe	0	0.0%
Difficulty with insurance approval	48	47.5%
Too expensive	24	23.8%
Problem with pharmacy filling your prescription	22	21.8%
Problem with delivery of biologic	11	10.9%
Other	10	9.9%
Q10. At this point, how many different biologics have you used for the treatment of your psoriasis?		
1	50	48.5%
2	33	32.0%
3	13	12.6%
>3	7	6.8%
Q11. Please choose biologics you have previously used and are currently using: (Choose all that apply)		
Responses in Table I		
Q12. For all the medications you selected in the previous question please provide the duration of use:		
Responses in Table II		
Q13. What were your reasons for stopping these previous biologics? (Choose all that apply)		
No applicable-I did not stop a previous biologic	34	36.2%
Not as effective as desired	27	28.7%
Experience a side effect (infections, allergy, etc.)	15	16.0%
Developed a malignancy (cancer)	0	0.0%
Medication was too expensive	6	6.4%
Other (n=29, 30.9%):		
Q14. How worried are you that your biologic will cause an adverse effect or an unexpected problem?		
Not worried at all	13	13.1%
Minimally worried	44	44.4%
Somewhat worried	31	31.3%
Extremely worried	11	11.1%
Q15. Has your co-pay for biologics caused you to cut back on other personal and household expenses?		
Yes	21	21.2%
No	78	78.8%
Q16. What is your yearly out-of-pocket expense for your current biologic?		
Dollars per year Mean: $557.12		
Dollars per year Range: ($0-$7,000)		
Dollars per year Median: $ 180		
Total or Responses (n=85): $47,355		
Q17. Overall, how would you rate your satisfaction with using biologics?		

	No.	%
Not satisfied	8	8.1%
Somewhat satisfied	29	29.3%
Very satisfied	62	62.6%
Q18. How often do you miss a dose of your biologic?		
Never	24	24.2%
Rarely	42	42.4%
Sometimes	27	27.3%
Often	6	6.1%
Q19. What is typically the reason you miss a dose of your biologic? (Choose all that apply)		
Never missed	23	23.5%
Forgot to take the medication	30	30.6%
Too busy to take the medication	11	11.2%
Medication was too expensive	5	5.1%
Ran out of medication	32	32.7%
Psoriasis was under control	9	9.2%
Illness	14	14.3%
Concerns about side effects	5	5.1%
Depressed or overwhelmed	2	2.0%
Other	24	24.5%
Q20. How often do you change the frequency of taking your biologic without consulting with your doctor?		
Never	64	64.6%
Rarely	21	21.2%
Sometimes	12	12.1%
Often	2	2.0%
Q21. What is typically the reason you change the frequency of taking your biologic? (Choose all that apply)		
Never changed the frequency	56	56.6%
Medication was too expensive	4	4.0%
Ran out of medication	20	20.2%
Psoriasis was under good control, so I needed it less often	17	17.2%
Concern about side effects	7	7.1%
Depressed or overwhelmed	2	2.0%
Other	13	13.1%
Q22. What is your opinion of the pharmaceutical companies that make biologics?		
Low opinion	9	9.1%
Neutral	63	63.6%
High opinion	27	27.3%
Q23. Have you ever contacted the pharmaceutical company directly for questions or other services?		
Yes	37	37.4%
No	62	62.6%
Q24. If yes, what was your overall experience with the services provided?		
Never contacted the pharmaceutical company directly	51	60.0%
Not satisfied	8	9.4%

	No.	%
Somewhat satisfied	18	21.2%
Very satisfied	8	9.4%

Q25-34. (Demographic questions, data summarized in Table I)

Table III

Evaluation of Characteristics Associated with Difficulty Obtaining Biologics, Worrying about Side Effects, Cutting Back on Personal Expenses, and Difficulty Deciding to Start a Biologic.

Characteristic	Difficulty Obtaining Biologics †	P-value*	OR (95% CI)
	(% Reporting Difficulty)		
Age			
≤55	53/77 (68.8%)	**0.010**	3.59 (1.31-9.79)
>55	8/21 (38.1%)		
Psoriatic Arthritis			
Yes	22/40 (55.0%)	0.206	—
No	34/50 (68.0%)		
Gender			
Male	33/58 (56.9%)	0.161	—
Female	29/41 (70.7%)		
Educational Level			
College or Less	41/65 (63.1%)	0.898	—
Graduate Degree	21/34 (61.8%)		
Income, Annual			
≤$100,000	41/55 (74.6%)	**0.007**	3.24 (1.36-7.71)
>$100,000	19/40 (47.5%)		
Insurance Status			
Yes	55/92 (59.8%)	**0.043**	10.14 (0.56-182.83) **
No	7/7 (100.0%)		
	Worried About Side Effect ††	**P-value** *	**OR (95% CI)**
	(% Worried)		
Gender			
Male	20/58 (34.5%)	0.057	2.2 (0.97-4.99)
Female	22/41 (53.7%)		
Educational Level			
College or Less	24/65 (36.7%)	0.126	—
Graduate Degree	18/34 (52.9%)		
No. of Educational Sources Consulted			
<2	16/34 (47.1%)	0.859	—
≥2	23/51 (45.1%)		
	Cut Back Personal Expenses	**P-value** *	**OR (95% CI)**
	(% Who Cut Back)		
Income, Annual			
≤$100,000	18/55 (32.7%)	**0.001**	**9.2 (2.0-42.7)**
>$100,000	2/40 (5.0%)		

Characteristic	Difficulty Obtaining Biologics †	P-value*	OR (95% CI)
	(% Reporting Difficulty)		
Insurance Status			
Yes	19/92 (20.7%)	0.637	—
No	2/7 (28.6%)		
	Difficulty of Decision-Making to Start a Biologic †††	**P-value** *	**OR (95% CI)**
	(% Reporting Difficulty)		
Expected Improvement			
≤Somewhat Improved	24/55 (43.6%)	0.654	—
≥Significantly Improved	24/50 (48.0%)		

† Percent reporting difficulty based on respondents who answered “Minimally Difficult” or greater to survey question #8.

†† Percent worried based on respondents who answered “Somewhat Worried” or “Extremely Worried” to survey question #14.

††† Percent reporting difficulty starting a biologic are those who responded “Moderate,” “Difficult,” or “Extremely Difficult” to survey question #4.

* P-values calculated by chi-square test or Fisher’s exact test.

** The estimated OR and 95% CI uses a correction of 0.5 in every cell of the contingency table that contains a zero.