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Factors Associated with Treatment Satisfaction in Korean Patients with Psoriasis

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Purpose: Treatment satisfaction among patients with psoriasis can vary significantly based on available treatment options and individual patient characteristics.

Patients and Methods: This cross-sectional study utilized psoriasis-specific questionnaires to assess treatment satisfaction and identify the factors associated with treatment satisfaction in Korean patients. The study included 350 eligible patients aged 19 or older from a nationwide psoriasis group. Participants completed a self-reported web-based questionnaire assessing socioeconomic and clinical status, quality of life, and treatment satisfaction. Linear regression models were employed to analyze the factors associated with treatment satisfaction.

Results: The results showed that patients with mild to moderate psoriasis, as determined by the body surface area involvement, had higher satisfaction scores for treatment effectiveness. Moreover, patients receiving biologic therapies reported significantly higher total satisfaction scores and scores across all domains than those not utilizing biologics. However, patients reporting poorer quality of life or experiencing anxiety exhibited lower satisfaction scores.

Conclusion: Findings suggest that while biologic treatments may confer greater satisfaction to patients with psoriasis, diminished quality of life and anxiety can negatively impact satisfaction levels. The study underscores the importance of understanding the factors associated with patient satisfaction to optimize treatment outcomes in psoriasis management.

Keywords: patient satisfaction, psoriasis, biologics, treatment types, quality of life

Introduction

Psoriasis, a chronic, immune-mediated inflammatory skin disease, affects approximately 0.4% of the Korean population and has a global prevalence of around 3% among adults.[1–4] This condition is associated with comorbidities such as cardiovascular diseases, metabolic syndrome, anxiety, and depression that adversely affect physical functions and quality of life (QoL).[5,6] Cultural factors are critical in how societies perceive and manage skin diseases like psoriasis. While Western countries often focus on clinical treatment, in Korea and other Eastern Asian cultures, clear skin is viewed as a marker of health and social status.[7] This cultural emphasis on flawless skin intensifies stigma, leading to psychological distress and social isolation for those with visible conditions.[8,9] These cultural differences also influence patients' treatment responses and QoL, underscoring the need for culturally tailored approaches to care.[10]

Treatment options for patients with psoriasis include topical medication, phototherapy, systemic therapeutics, and, most recently, biologic treatment.[11] The guidelines for psoriasis treatment recommend topical corticosteroids as first-line treatment for mild to moderate plaque psoriasis or as part of a treatment regimen for more severe cases.[12] Clinical trials and real-world data have demonstrated that biologic drugs targeting proinflammatory cytokines provide clinical benefits in managing severe psoriasis.[13–16] However, access to biologics, such as tumor necrosis factor (TNF)-alpha inhibitors and interleukin (IL)-12/23 inhibitors, is limited due to their high cost. A study using health insurance claim data in Korea reported that 88% of patients with psoriasis were untreated

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or treated topically, and only 3% of patients receiving systemic treatment were treated with biologics. Moreover, patients with low socioeconomic status are less likely to receive expensive biologic therapies.[17]

As psoriasis requires long-term treatment and regular follow-up visits, patient satisfaction with their treatment is a critical determinant of compliance and health outcomes. In addition, various factors, including treatment options, disease duration, and comorbidities, influence patient treatment satisfaction.[18] Studies have reported nonadherence and frustration among patients undergoing treatment for psoriasis, in addition to poor satisfaction with treatments.[19,20] Higher patient satisfaction with treatment can improve health-related QoL (HRQoL), while low patient satisfaction can lead to poor adherence to the treatment regime and, consequently, poor health outcomes.[21]

To enhance patient satisfaction with treatment, it is essential to identify the main factors influencing satisfaction, encompassing patient-related factors such as socio-demographic characteristics, disease severity, and treatment modalities.[22,23] However, to the best of the researchers' knowledge, no study has investigated the factors associated with treatment satisfaction in Korean patients with psoriasis. Hence, this study evaluated treatment satisfaction and determined the factors affecting treatment satisfaction among Korean patients with psoriasis using psoriasis-specific satisfaction questionnaires.

Materials and Methods

Study Design and Setting

This cross-sectional study utilized a web-based survey to collect data on various variables of interest simultaneously. Prior to the comprehensive web-based survey, face-to-face interviews with ten patients with psoriasis were conducted to evaluate a draft questionnaire form and provide advice on questions. This process allowed for the assessment and modification of the questionnaire's readability, validity, and question order. The final web-based survey was designed to be user-friendly, enabling participants to access the questionnaire directly through a web address, with responses automatically stored in a web-based database.

Study Participants

The target population comprised adult patients diagnosed with psoriasis who had received treatment. The inclusion criteria were: (a) age 19 years or older, (b) diagnosed with psoriasis in a clinical or hospital setting, (c) signed an informed consent form, and (d) completed responses regarding treatment satisfaction. In March 2015, with the cooperation of the Korea Psoriasis Association, the largest nonprofit organization for patients with psoriasis in Korea, Email invitations were extended to 1685 regular members aged 19 or older, imploring their participation in the survey. Initially, 352 agreed to participate and completed the survey. In February 2020, a follow-up invitation Email was sent to the remaining members who had yet to respond to the initial survey, resulting in an additional 68 responses and a total response rate of 24.9%. Among the 420 respondents, 70 patients were excluded due to a lack of responses pertinent to treatment satisfaction, yielding a final sample size of 350 patients with psoriasis for subsequent analysis. This study was approved by the Institutional Review Board of Chung-Ang University (1041078–201501-HRSB-007-01).

Study Data Collection

Data were collected using self-administered web-based questionnaires sent to study participants via email. Socio-demographic characteristics, such as age, sex, education level, employment status, marital status, and residence, were collected from the patients, along with information on treatment duration, satisfaction, psoriasis site, disease severity, and treatment history.

In assessing psoriasis severity, patients were asked to estimate their body surface area (BSA) involvement using the "palm method".[24] This method involves equating the surface area of the patient's palm to approximately 1% of their total BSA.[25] Standardized instructions for using the palm method were provided to ensure consistency across participants. This approach allows for patient-reported outcomes without external influence, making it suitable for web-based surveys.[26] Psoriasis severity was categorized based on BSA involvement: patients with BSA of less than 5% (< 5%) were classified as having mild psoriasis, those with BSA of greater or equal to 5% but less than 10% (5% ≤ BSA < 10%)

were categorized with moderate psoriasis, and those with a BSA of 10% or higher (≥ 10%) were categorized as having severe psoriasis.[24,25]

The types of psoriasis treatments were also evaluated using the provided questionnaires. Treatment types were classified as topical treatments, prescribed oral medications, herbal medications, phototherapy, injections (except for biologics), and biological therapy. Specifically, patients were asked to select and indicate all treatment options used during the past year. Due to the difficulty patients may face in remembering and reporting the exact names of drugs in a web-based self-administration questionnaire, detailed questions asking for specific drug names were not included. Instead, the questionnaire contained questions to identify all treatment methods prescribed by a physician or oriental medicine doctor that had been attempted within the past year. Response options included biologic injections and general injections, excluding biologics. To provide a better, clearer understanding, the questionnaire described biologic injections as "Injectable drugs costing hundreds of thousands of Korean won, including product names such as Humira, Stelara, Enbrel, and Remicade".

The Dermatology Life Quality Index (DLQI) was employed to assess the relationship between treatment satisfaction and HRQoL. The DLQI is a dermatology-specific QoL assessment tool with 10 questions measuring patients' HRQoL impairment because of their skin disease during the past week. It encompasses six subdomains: symptoms/feelings, daily activities, leisure, work/school, personal relationships, and treatment. The total DLQI score, ranging from 0 to 30, is derived from the summation of the item scores,[27,28] with higher scores indicating more severe HRQoL impairment. The total DLQI score is interpreted as follows: 0–1 indicates "no effect on the patient's life", 2–5 suggests "less effect on the patient's life", 6–10 implies "moderate effect on the patient's life", 11–20 signifies a "significant effect on the patient's life", and 21–30 represents an "extreme effect on the patient's life". This interpretation establishes that a DLQI score exceeding 10 can adversely impact a patient's QoL, a classification utilized in previous studies.[29,30]

Drawing from the psoriasis-specific satisfaction questionnaires developed by van Cranenburgh et al,[23] five items were formulated to assess treatment satisfaction: general satisfaction, safety, convenience, information, and effectiveness. Patients rated their level of satisfaction with their current treatment for each item on a five-point Likert-type scale, wherein 1 indicated "very dissatisfied", 3 for neutrality, and 5 indicated "very satisfied". The total satisfaction score was calculated by adding the scores for all items, thus ranging from 5 to 25.

Statistical Analysis

The patients were stratified into three groups based on the severity of their psoriasis, as measured by BSA involvement. Descriptive analyses compared socio-demographic and clinical characteristics among these groups. Chi-squared tests were employed for categorical variables to assess the differences among these groups, while analysis of variance (ANOVA) tests were utilized for continuous variables. When ANOVA tests yielded statistically significant results, post hoc Tukey's test was performed to identify specific group differences.

Mean scores for overall patient satisfaction were calculated to compare patient treatment outcomes. These mean satisfaction scores for each domain were then compared using the severity level of BSA involvement, the use of biologics, and the QoL. To assess score differences, *t*-tests were used to compare means between two groups, and ANOVA tests were used to compare means among three or more groups.

A linear regression model was employed to explore factors associated with patient satisfaction regarding psoriasis therapies. Backward elimination was applied to select statistically significant and clinically relevant variables while checking for among variables and the variance inflation factors. As most survey responses were from 2015, a sensitivity analysis of linear regression analysis was performed, focusing only on respondents from that year. All statistical analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC, USA), with a significance level of 0.05.

Results

Table 1 presents participants' socio-demographic and clinical characteristics stratified by psoriasis severity. Among the 350 participants, 28.3% were female, with a mean age of 44.8 years. Notably, no significant differences in gender or age were observed across psoriasis severity levels. However, as psoriasis severity increased, several noteworthy trends emerged. Patients with more severe psoriasis tended to have a longer duration of the disease, experienced a greater

Table 1 Patient Characteristics by the Severity of Psoriasis

Variables	Total	Severity of Psoriasis (BSA Involvement)			*p*
		Mild (<5%)	Moderate (5%–9%)	Severe (≥10%)	
	N (%)	N (%)	N (%)	N (%)	
Gender					0.424
Male	251 (71.7)	118 (68.6)	51 (76.1)	82 (73.9)	
Female	99 (28.3)	54 (31.4)	16 (23.9)	29 (26.1)	
Age (years)					0.993
20–44	177 (50.6)	83 (48.3)	39 (58.2)	55 (49.5)	
45–54	111 (31.7)	56 (32.6)	19 (28.4)	36 (32.4)	
55–79	62 (17.7)	33 (19.2)	9 (13.4)	20 (18.0)	
Mean, SD	44.8 (±10.1)	45.4 (±10.2)	43.5 (±10.1)	44.7 (±9.9)	0.412
Marital status					0.184
Single	82 (23.4)	31 (18.0)	18 (26.9)	33 (29.7)	
Married	233 (66.6)	121 (70.3)	44 (65.7)	68 (61.3)	
Divorced/widowed	35 (10.0)	20 (11.6)	5 (7.5)	10 (9.0)	
Education level					0.249
≤ High school	80 (22.9)	44 (25.6)	9 (13.4)	27 (24.3)	
College	216 (61.7)	99 (57.6)	47 (70.1)	70 (63.1)	
Graduate school	54 (15.4)	29 (16.9)	11 (16.4)	14 (12.6)	
Employment status					0.091
Full time	245 (70.0)	126 (73.3)	45 (67.2)	74 (66.7)	
Part-time	31 (8.9)	12 (7.0)	11 (16.4)	8 (7.2)	
Unemployed/student/homemaker	74 (21.1)	34 (19.8)	11 (16.4)	29 (26.1)	
Experience of quitting jobs due to psoriasis					0.001
No	230 (65.7)	124 (72.1)	48 (71.6)	58 (52.3)	
Yes	120 (34.3)	48 (27.9)	19 (28.4)	53 (47.7)	
Annual income (USD)					0.242
< 24,000	44 (12.6)	19 (11.0)	6 (9.0)	19 (17.1)	
24,000–47,999	117 (33.4)	59 (34.3)	19 (28.4)	39 (35.1)	
48,000–71,999	107 (30.6)	58 (33.7)	24 (35.8)	25 (22.5)	
≥ 72,000	82 (23.4)	36 (20.9)	18 (26.9)	28 (25.2)	
Duration of psoriasis (years)					0.016
1–9	41 (11.7)	22 (12.8)	8 (11.9)	11 (9.9)	
10–19	116 (33.1)	59 (34.3)	32 (47.8)	25 (22.5)	
20–29	101 (28.9)	46 (26.7)	17 (25.4)	38 (34.2)	
≥ 30	92 (26.3)	45 (26.2)	10 (14.9)	37 (33.3)	
Mean, SD	22.2 (±11.2)	21.8 (±11.0)	19.3 (±10.4)	24.6 (±11.4)	0.007[a]
Site of psoriasis					
Head	279 (79.7)	127 (73.8)	54 (80.6)	98 (88.3)	0.013
Face	171 (48.9)	59 (34.3)	36 (53.7)	76 (68.5)	<0.001
Neck	96 (27.4)	21 (12.2)	16 (23.9)	59 (53.2)	<0.001
Shoulder	131 (37.4)	36 (20.9)	22 (32.8)	73 (65.8)	<0.001
Chest/abdomen	228 (65.1)	84 (48.8)	47 (70.1)	97 (87.4)	<0.001
Back/buttocks	274 (78.3)	114 (66.3)	57 (85.1)	103 (92.8)	<0.001

(*Continued*)

Table 1 (Continued).

Variables	Total	Severity of Psoriasis (BSA Involvement)			*p*
		Mild (<5%)	Moderate (5%–9%)	Severe (≥10%)	
	N (%)	N (%)	N (%)	N (%)	
Arm	264 (75.4)	110 (64.0)	51 (76.1)	103 (92.8)	<0.001
Hand	172 (49.1)	67 (39.0)	32 (47.8)	73 (65.8)	<0.001
Leg	309 (88.3)	143 (83.1)	62 (92.5)	104 (93.7)	0.013
Foot	148 (42.3)	49 (28.5)	29 (43.3)	70 (63.1)	<0.001
Treatment for psoriasis					
Topical treatment	287 (82.0)	138 (80.2)	55 (82.1)	94 (84.7)	0.636
Prescribed oral medication	162 (46.3)	69 (40.1)	28 (41.8)	65 (58.6)	0.007
Herbal medication	100 (28.6)	54 (31.4)	17 (25.4)	29 (26.1)	0.514
Phototherapy	175 (50.0)	78 (45.3)	40 (59.7)	57 (51.4)	0.129
Injections except biologics	53 (15.1)	24 (14)	9 (13.4)	20 (18.0)	0.590
Biological therapy	48 (13.7)	18 (10.5)	8 (11.9)	22 (19.8)	0.074
DLQI total score					0.006
0–10 (better QoL)	153 (43.7)	89 (51.7)	28 (41.8)	36 (32.4)	
11–30 (worse QoL)	197 (56.3)	83 (48.3)	39 (58.2)	75 (67.6)	
Mean, SD	12.7 (±7.8)	11 (±7.3)	13.6 (±8.0)	14.9 (±7.9)	<0.001[b]
Comorbidity					
Hypertension	65 (18.6)	26 (15.1)	16 (23.9)	23 (20.7)	0.229
Dyslipidemia	63 (18.0)	30 (17.4)	11(16.4)	22 (19.8)	0.819
Psoriatic arthritis	69 (19.7)	27 (15.7)	13 (19.4)	29 (26.1)	0.098
Diabetes	26 (7.4)	8 (4.7)	6 (9.0)	12 (10.8)	0.135
Depression	63 (18.0)	26 (15.1)	14 (20.9)	23 (20.7)	0.386
Anxiety	44 (12.6)	15 (8.7)	8 (11.9)	21 (18.9)	0.041
Insomnia	56 (16.0)	26 (15.1)	15 (22.4)	15 (13.5)	0.267

Notes: [a] In the Tukey's test, a significant difference was found between the moderate and severe groups at the 0.05 level. [b] In the Tukey's test, significant differences were found between the mild and moderate groups and between the mild and severe groups at the 0.05 level.
Abbreviations: BSA, body surface area; DLQI, Dermatology Life Quality Index; QoL, quality of life; SD, standard deviation; USD, United States Dollar.

deterioration in dermatology-related QoL, were more likely to have experienced job loss due to psoriasis, and exhibited a higher prevalence of anxiety. Furthermore, patients with severe psoriasis were more frequently prescribed oral medications. Nevertheless, no statistically significant differences were found in marital status, education level, employment status, or annual income in relation to psoriasis severity.

As presented in Table 2, the overall mean scores for treatment satisfaction were significantly lower in patients with psoriasis on the head (12.0 ± 4.4, $p = 0.039$), arm (12.0 ± 4.4, $p = 0.031$), or foot (11.6 ± 4.3, $p = 0.015$), and in those

Table 2 Mean Satisfaction Scores of Psoriasis Therapies by Patient Characteristics

Variables	No. Of Patients	Total Score[a] (Mean ± SD)	*p*
All participants	350	12.3 ± 4.4	
Gender			0.254
Male	251	12.4 ± 4.4	
Female	99	11.8 ± 4.1	
Age (years)			0.276
20–44	177	12.0 ± 4.1	
45–54	111	12.8 ± 5.0	
55–79	62	12.0 ± 3.9	

(*Continued*)

Table 2 (Continued).

Variables	No. Of Patients	Total Score[a] (Mean ± SD)	*p*
Annual income (USD)			0.006
< 48,000	161	11.6 ± 4.1	
≥ 48,000	189	12.9 ± 4.5	
Experience of quitting jobs due to psoriasis			0.164
No	230	12.5 ± 4.1	
Yes	120	11.8 ± 4.8	
Marital status			0.019
Single/divorced/widowed	117	11.5 ± 4.5	
Married	233	12.7 ± 4.2	
Severity of psoriasis (BSA)			0.132
Mild to moderate (< 10%)	239	12.5 ± 4.2	
Severe (≥ 10%)	111	11.8 ± 4.6	
Site of psoriasis[b]			
Head	279	12.0 ± 4.4	0.039
Face	171	11.8 ± 4.6	0.064
Neck	96	11.9 ± 4.8	0.379
Shoulder	131	11.8 ± 4.7	0.125
Chest/abdomen	228	12.1 ± 4.4	0.228
Back/buttocks	274	12.1 ± 4.5	0.254
Arm	264	12.0 ± 4.4	0.031
Hand	172	11.9 ± 4.2	0.130
Leg	309	12.3 ± 4.4	0.399
Foot	148	11.6 ± 4.3	0.015
Treatment for psoriasis			
Topical treatment	287	12.1 ± 4.3	0.143
Prescribed oral medication	162	12.0 ± 4.4	0.219
Herbal medication	100	11.8 ± 4.5	0.210
Phototherapy	175	12.1 ± 4.4	0.500
Injections except biologics	53	12.5 ± 5.0	0.691
Biological therapy	48	15.6 ± 4.8	<0.001
DLQI total score			
0–10 (better QoL)	153	14.3 ± 4.2	<0.001
11–30 (worse QoL)	197	10.7 ± 3.8	
Comorbidity			
Hypertension	65	12.4 ± 4.9	0.721
Dyslipidemia	63	12.2 ± 4.5	0.846
Psoriatic arthritis	69	12.5 ± 4.1	0.616
Diabetes	26	10.7 ± 4.1	0.061
Depression	63	10.8 ± 4.0	0.004
Anxiety	44	9.9 ± 3.9	<0.001
Insomnia	56	10.6 ± 3.7	0.001

Notes: [a] This satisfaction score ranges from 5 to 25, with higher scores indicating higher satisfaction. [b] The p-values were tested by comparing individuals with and without psoriasis at each site.

Abbreviations: BSA, body surface area; DLQI, Dermatology Life Quality Index; QoL, quality of life; SD, standard deviation; USD, United States Dollar.

with comorbidities, such as depression (10.8 ± 4.0, $p = 0.004$), anxiety (9.9 ± 3.9, $p < 0.001$), or insomnia (10.6 ± 3.7, $p = 0.001$). Conversely, the mean scores were significantly higher in patients whose annual income was less than or equal to KRW 40 million (approximately USD 48,000) (11.6 ± 4.1, $p = 0.006$), married individuals, those reporting a better QoL (14.3 ± 4.2, $p < 0.001$), and patients who used biologics for psoriasis treatment (15.6 ± 4.8, $p < 0.001$).

Figure 1a illustrates patient satisfaction with the treatment through BSA involvement. The domain score for satisfaction with treatment effectiveness was notably higher among patients with mild and moderate psoriasis, characterized by less than 10% BSA involvement. Consequently, patients using biologics had significantly higher total satisfaction scores and higher scores in all domains compared to those who did not use biologics ($p < 0.01$, Figure 1b). Moreover, patients with better QoL had higher satisfaction for all domains than those with worse QoL ($p < 0.01$, Figure 1c).

In the model adjusted for age, gender, and severity of psoriasis shown in Table 3, patients treated with biologics had higher treatment satisfaction scores ($\beta = 3.75$, $p < 0.001$). However, lower satisfaction scores were seen in patients with worse QoL ($\beta = -3.13$, $p < 0.001$) and with anxiety as a comorbidity ($\beta = -1.46$, $p = 0.022$). Diagnostic tests for collinearity in the final adjusted model indicated that variance inflation factors were close to 1, and condition indices were in stable ranges below 5 (Tables 3 and S1). A sensitivity analysis, limited to respondents from 2015, revealed similar patterns in the unadjusted model to all respondents. However, in the adjusted model, biologics ($\beta = 3.76$, $p < 0.001$), worse QoL ($\beta = -3.16$, $p < 0.001$), and facial psoriasis ($\beta = -1.10$, $p = 0.016$) were identified as significant variables, with slight variations (Table S2).

Discussion

The present cross-sectional analysis reveals that treatment satisfaction among patients with psoriasis tends to be moderate, with key influences stemming from the utilization of biologics, QoL, and anxiety. Conversely, the severity of psoriasis, as measured by the extent of BSA involvement, did not significantly impact treatment satisfaction in areas other than effectiveness.

Previous studies have demonstrated that disease severity is associated with patient satisfaction in psoriasis, with patients having moderate to severe psoriasis reporting significantly lower satisfaction levels compared to those with mild psoriasis.[31,32] Moreover, research suggests that biologic treatments can improve both disease severity and satisfaction, with a higher proportion of patients receiving biologics achieving improvement from severe to moderate or mild psoriasis, resulting in greater satisfaction than other treatments.[33] However, the cross-sectional design of the present study limited the ability to assess pretreatment disease severity, which may have obscured the relationship between current BSA and treatment satisfaction. Interestingly, this study found that QoL was more closely associated with treatment satisfaction than disease severity and BSA involvement, suggesting that BSA involvement can only reflect objective symptoms while QoL encompasses a broader range of subjective experiences.[34,35] Therefore, including patient-reported outcomes that reflect subjective experiences, such as symptoms and feelings, is crucial for a more comprehensive understanding of treatment satisfaction.

The multivariable model indicated that the use of biologics was the independent factor most strongly associated with treatment satisfaction, even after accounting for other variables. Patients using biologics reported significantly higher satisfaction levels across multiple domains, including overall satisfaction, safety, convenience, information, and effectiveness. The use of biologics is not only statistically significant but also meaningful due to its elastic nature, in contrast to patients' inherent factors. Consistent with the study's findings, a recent systematic review also highlighted that patients with psoriasis treated with biologics showed better treatment satisfaction than other treatment options.[36] Patients with severe psoriasis often face greater difficulties in their daily lives, contributing to heightened dissatisfaction with lengthy and complicated treatments.[37] These results suggest that satisfaction ratings of patients with psoriasis predominantly reflect their opinions on treatment effectiveness, with convenience playing a secondary role. Consequently, some patients with psoriasis might be undertreated and could benefit from a more aggressive treatment strategy. However, resource optimization is crucial to avoid unnecessarily using more advanced and aggressive agents, which could lead to financial burdens for patients and healthcare systems.[17]

Socioeconomic factors also influenced treatment satisfaction. Patients with lower incomes or those who had discontinued employment due to psoriasis reported lower satisfaction with their treatments, which might be due to

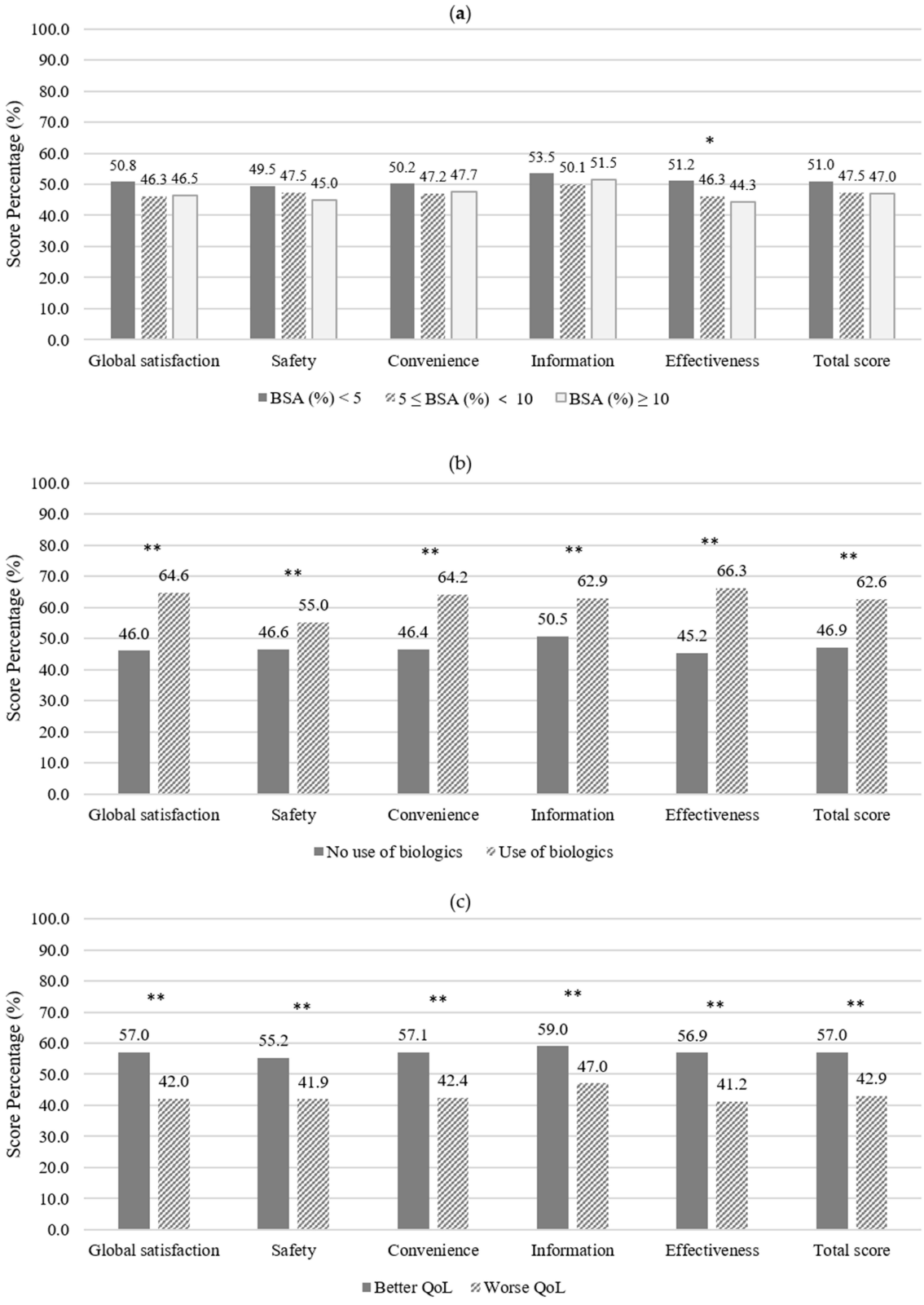

Figure 1 (**a**) Patient satisfaction with treatment for psoriasis by body surface area (BSA) involvement (*$p < 0.05$); (**b**) Patient satisfaction with treatment for psoriasis by use of biologic treatment (**$p < 0.01$); (**c**) Patient satisfaction with treatment for psoriasis by the QoL (**$p < 0.01$).

Table 3 Factors Associated with Treatment Satisfaction in Patients with Psoriasis

Variables	No. Of Patients	Unadjusted Model		Adjusted Model[a]		
		Coefficient	*p*	Coefficient	*p*	Variance Inflation
Gender						
Male	251	Ref.		Ref.		
Female	99	−0.59	0.254	0.10	0.834	1.075
Age (years)						
20–44	177	Ref.		Ref.		
45–54	111	0.79	0.134	0.34	0.469	1.187
55–79	62	−0.04	0.945	−0.37	0.511	1.150
Severity of psoriasis (BSA involvement)						
Mild to moderate (< 10%)	239	Ref.		Ref.		
Severe (≥10%)	111	−0.75	0.132	−0.44	0.329	1.058
Use of biologics						
No		Ref.		Ref.		
Yes	48	3.91	<0.001	3.75	<0.001	1.023
DLQI total score						
0–10 (better QoL)	153	Ref.		Ref.		
11–30 (worse QoL)	197	−3.52	<0.001	−3.13	<0.001	1.150
Comorbidity						
Diabetes	26	−1.66	0.061	–	–	
Depression	63	−1.74	0.004	–	–	
Anxiety	44	−2.73	<0.001	−1.46	0.022	1.096
Insomnia	56	−2.02	0.001			
Site of psoriasis						
Head	279	−1.20	0.039	–	–	
Face	171	−0.86	0.064	–	–	
Arm	264	−1.17	0.031	–	–	
Foot	148	−1.15	0.015	–	–	
Marital status						
Single/divorced/widowed	117	Ref.				
Married	233	1.15	0.019	–	–	
Annual income (USD)						
<48,000	161					
≥48,000	189	1.27	0.006	–	–	

Notes: [a] Through backward elimination, variables without significant adjusted p-values were removed from the multivariable model.
Abbreviations: BSA, body surface area; DLQI, Dermatology Life Quality Index; QoL, quality of life; USD, United States Dollar; Ref., reference.

difficulties in accessing expensive yet effective treatment options.[17] Moreover, patients with psoriasis lesions on their faces were less satisfied with their treatments, suggesting the need to consider more effective treatment options for such patients.[38]

Psychiatric comorbidities, particularly anxiety, significantly impacted treatment satisfaction. Recent studies suggest that psychiatric conditions, such as anxiety and depression, share a proinflammatory background with psoriasis.[39,40] Elevated cytokine levels (ie TNF-α and IL-6) contribute to both the skin inflammation of psoriasis and psychiatric symptoms by affecting neurotransmitters like serotonin and dopamine. This bidirectional relationship where the chronic inflammation in psoriasis exacerbates psychiatric conditions, and mental health disturbances, in turn, worsen psoriasis. The current study supports these findings by demonstrating that patients with anxiety and depression exhibited

significantly lower treatment satisfaction scores, suggesting that the psychological distress associated with psoriasis extends beyond visible symptoms and is linked to the underlying inflammatory processes.

Recent research on the impact of Coronavirus disease 2019 (COVID-19) and its vaccination on psoriasis has been published.[41–43] The survey responses were collected until February 25, 2020, shortly after the detection of the first COVID-19 patient in South Korea on January 20, 2020, and since the surge in COVID-19 cases occurred in late February 2020, the impact on the study's questionnaire responses is expected to be minimal.[44] In addition, as the COVID-19 vaccination program began on February 26, 2021, the effects of the vaccine were not reflected in the study.[45] Nonetheless, it remains an intriguing area of inquiry to investigate the potential impact of COVID-19 and its vaccination on psoriasis in Korea amid the pandemic.

This study has several strengths. First, to the best of the researchers' knowledge, it pioneers investigated factors related to treatment satisfaction among Korean patients with psoriasis. Second, this study revealed the association of patient satisfaction with HRQoL in Korean patients with psoriasis using a dermatology-specific QoL measurement tool. However, several limitations must be acknowledged. This study used a self-reported questionnaire. Although these questionnaires have the disadvantage that they may differ or have discrepancies from the values measured by dermatologists for clinical indicators, such as BSA, questionnaires directly reported by patients are essential to measuring their QoL and treatment satisfaction. The severity of patients in this study was assessed using the BSA as it can be easily self-measured by patients using the area of their palms, making it applicable to web-based surveys.[26] However, as BSA only represents the entire affected area, a supplementary question regarding psoriasis in specific areas such as the head, face, and neck was added to the questionnaire to assess its impact on treatment satisfaction further. Moreover, using the palm method, the BSA self-assessment method may not accurately estimate areas that patients cannot easily reach or visualize, such as the back or buttocks, leading to an underestimation of the actual BSA values, especially in cases where the psoriasis lesions are extensive in these regions. More comprehensive measures, like the Psoriasis Area Severity Index (PASI), are regarded as the gold standard for quantifying psoriasis severity;[46] however, it requires evaluation by well-trained medical personnel and may not align with the patient's perception of the severity. Furthermore, PASI does not assess QoL in specific sites such as the hands or face and has a nonlinear scale, making interpretation challenging.[47,48] An alternative index, the Self-Administered PASI (SAPASI), was developed for patient self-measurement.[49] However, it proved challenging to implement in a web-based questionnaire as it relied on filling in body part silhouettes. SAPASI has also been reported to have a weak correlation with PASI.

This study also underscored the prevalence of anxiety as a comorbidity, indicating its negative influence on treatment satisfaction. Generally, the incidence of anxiety was considerably high; however, the study may not have fully captured this phenomenon due to reliance on subjective judgment rather than professional psychiatric diagnosis.

In addition, the study's sample was limited to members of the Korea Psoriasis Association, potentially resulting in a selection bias toward patients who are chronically ill and have strong opinions about the quality of healthcare. While this approach may have limitations, it is worth noting that existing hospital-based studies overestimate treatment satisfaction among patients with psoriasis and often fail to include those with limited access to medical care, potentially compromising the representativeness of the broader population of patients with psoriasis.

The response rate for this study was below 30%, and compared to prevalence studies using the existing National Health Insurance database, respondents included a higher proportion of men and had a slightly lower average age.[1] Assuming a 5% statistical significance and 80% power, this study's sample size is sufficient to demonstrate a 2.5-point difference in treatment satisfaction among groups, which corresponds to 10% of the total score of 25 in treatment satisfaction among groups with a standard deviation of 4.4 when the group size ratio is 1:9.[50] However, for characteristics where the group size ratio is as rare as 1:19, the sample size in this study may not be statistically adequate to detect significant differences.

Conclusion

From the patients' perspective, biologic treatments provide better health outcomes and satisfaction than other treatment options. However, the overall patient satisfaction with the current treatment was reported to be moderate, indicating substantial room for improvement in patient satisfaction levels by adopting a more systematic approach.

Recognizing and understanding the factors associated with patient satisfaction is crucial in improving the treatment and management of psoriasis. As satisfaction levels varied within the domains and the perceived importance differed between treatment types, physicians must understand patients' preferences before deciding on a treatment option. Implementing shared decision-making between physicians and patients may help physicians identify patients who are unsatisfied with their current treatments and require additional support. This collaborative approach allows physicians to provide more comprehensive information to patients and discuss their status in greater detail. Such patient-centered care can lead to more personalized treatment plans, potentially improving both clinical outcomes and patient satisfaction.

Abbreviations

QoL, quality of life; TNF, tumor necrosis factor; IL, interleukin; HRQoL, health-related quality of life; BSA, body surface area; DLQI, Dermatology Life Quality Index; ANOVA, analysis of variance; COVID-19, Coronavirus disease 2019; PASI, Psoriasis Area Severity Index; SAPASI, Self-Administered Psoriasis Area Severity Index.

Ethics Approval and Informed Consent

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Institutional Review Board of Chung-Ang University (IRB Number: 1041078-201501-HRSB-007-01). Informed consent was obtained from all subjects involved in the study.

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Disclosure

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