ORIGINAL REPORT

Patient-centred Preferences for Biologic Therapies in Moderate to Severe Psoriasis in Vietnam: A Discrete Choice Experiment

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Psoriasis is a chronic autoimmune disease that significantly impairs patients' quality of life. With the growing availability of biologic drugs – each varying in efficacy, safety, dosing, and cost – treatment decisions have become increasingly complex. A study conducted from March to July 2024 surveyed 302 Vietnamese patients with moderate to severe psoriasis to assess preferences for biologic therapies. Using a discrete choice experiment (DCE), participants evaluated 6 treatment attributes: short-term efficacy, long-term efficacy, sustained efficacy after drug withdrawal, frequency of administration, copayment, and risk of serious infection. Preference data were analysed using conditional logit models. Analysis revealed that treatment cost (relative importance [RI]: 31.4%) and long-term efficacy (RI: 25.3%) were the most critical factors influencing patient decisions, while sustained efficacy after withdrawal and early onset of efficacy were less impactful. Long-term efficacy and cost consistently ranked highest across all patient subgroups, with variations depending on demographic and clinical characteristics. These findings provide practical guidance for clinicians to incorporate patient preferences into the selection of biologic therapies, with particular emphasis on treatment cost and long-term efficacy. The significant influence of treatment cost also highlights the need for healthcare policymakers in Vietnam to enhance reimbursement policies and financial support programmes, improving access and equity in psoriasis care.

Key words: biologics; psoriasis; patient preferences; decision-making.

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SIGNIFICANCE

These findings provide valuable insights into the perspectives of Vietnamese patients regarding the selection of biologic therapies. Incorporating these preferences into shared decision-making between physicians and patients may enhance patient satisfaction and improve treatment outcomes.

Psoriasis is an immune-mediated inflammatory disease that affects more than 125 million people worldwide (1, 2). The prevalence of psoriasis ranges from 0.91% (United States) to 8.5% (Norway) (2). Statistics on the global prevalence of psoriasis published in 2020 estimated 288,580 adult cases of psoriasis in Vietnam (3). The disease is characterized by skin lesions in many clinical forms, of which plaque psoriasis is the most common, accounting for more than 80% of all psoriasis cases (4). Psoriasis significantly affects patients' quality of life and often leads to social stigma (5). Current treatment strategies for psoriasis are tailored to disease severity and individual patient factors. Biologics are novel, effective drugs that aid patients in obtaining "almost complete" skin clearance, reducing systemic inflammation, and positively impacting comorbid conditions (6, 7). Current treatment guidelines emphasize the importance of considering patient preferences when selecting biologic medications (8). Inappropriate treatment can lead to high patient dissatisfaction and low patient compliance (9, 10). Reports indicate that almost 50% of patients diagnosed with moderate to severe plaque psoriasis express high dissatisfaction with their current treatment methods (11). Evidence suggests that aligning physician recommendations with patient preferences enhances satisfaction, adherence, and outcomes (12).

Similar challenges are evident in Vietnam, where biologic therapies have been available for over a decade. As of 2024, four classes of biologic agents are approved for use, including TNF-alpha inhibitors, IL-12/23 p40 inhibitors, IL-17A inhibitors, and IL-23 p19 inhibitors. Despite their advantages in efficacy, safety, and adherence compared with systemic therapies, biologic use remains limited. These drugs offer diverse characteristics, such as efficacy, cost, and administration frequency, catering to different patient needs. However, Vietnam lacks standardized guidelines for selecting biologics, and patient preferences are often overlooked due to time constraints during consultations. Research on biologic therapies for psoriasis in Vietnam remains scarce. Recently, a real-world study evaluating the use of secukinumab in Vietnamese patients demonstrated high efficacy and a favourable safety profile. The study also highlighted that patients receiving financial support through health insurance exhibited better treatment adherence compared with those who had to pay out-of-pocket

Table I. Selection of attributes and levels in discrete choice experiment

Step	Description
Attribute identification	Literature review on patient preferences for biologic psoriasis treatments identified 10 potential attributes. This ensured that relevant characteristics were included and facilitated meaningful trade-offs during decision-making
Patient validation	Semi-structured interviews with 10 patients validated and ranked attribute importance, with additional suggestions
Expert consultation	Five dermatologists (with > 5 years of experience in biologic therapy) ensured clinical relevance in Vietnam
Final attribute selection	To simplify responses, 6 attributes were chosen: • Short-term efficacy • Long-term efficacy • Sustained efficacy after drug withdrawal • Frequency of administration • Co-payment • Risk of serious infection
Level assignment	Defined attribute levels based on real-world biologic treatments in Vietnam: adalimumab, infliximab, secukinumab, ustekinumab, and guselkumab

(13). However, to date, no prior research in Vietnam has systematically investigated the key factors that influence the decision-making process regarding biologic therapy selection from both patient and physician perspectives. To address this gap, a study conducted at Ho Chi Minh City Hospital of Dermato-Venereology, a leading centre for biologic treatment, explores patient preferences and examines how clinical and socioeconomic factors influence biologic drug selection. These findings aim to support a more personalized approach to treatment by aligning biologic selection with individual patient needs in Vietnam.

MATERIALS AND METHODS

Development of DCE

Discrete choice experiments (DCE), a quantitative method for stated preference analysis, are used to quantify the preferences for treatment attributes (14). This experiment helps identify the key attributes of treatment methods that influence patient decision-making and ranks the significance of these attributes based on their priority in the choices made. The choice task requires respondents to make trade-offs (similar to real-life decision-making) among various treatment modalities described by attributes and levels to ascertain their treatment priorities (15). Participants with moderate to severe psoriasis were asked to imagine starting biologic therapy and to choose between 2 hypothetical treatment options, each defined by specific attributes (choice profiles). Statistical modelling of their choices determined the relative importance of each attribute.

Attributes and levels

As highlighted in the DCE literature and good-practice guidelines, selecting attributes and their levels is critical in designing a DCE study (15). According to DCE guidelines, to ensure that participants can consider attributes without confusion, there should be fewer than 10 attributes, with a general expectation of including 5–7 attributes (15). A systematic approach was used to identify attributes and levels for the study. Six attributes were selected to reduce respondent burden, with levels reflecting current biologic treatments in Vietnam, as detailed in **Tables I and II.**

Table II. Attributes and levels in discrete choice experiment

Attributes	Definition of attributes	Levels
Short-term efficacy (PASI 90)	Proportion of patients achieving a 90% improvement in symptoms (erythema, thickening, scaling) after 4 weeks of treatment	5% 10% 20%
Long-term efficacy (PASI 90)	Proportion of patients achieving a 90% improvement in symptoms (erythema, thickening, scaling) after 52 weeks of treatment	40% 60% 80%
Efficacy after drug withdrawal	Time to relapse after stopping treatment (not reaching PASI 50 or PGA ≥ 3 after treatment cessation)	20 weeks 26 weeks 28 weeks 40 weeks
Risk of serious infection	Annual incidence of patients experiencing severe infections requiring hospitalization	2% 3% 4%
Co-payment	Out-of-pocket treatment costs for patients during the maintenance phase	Monthly 10 million VND Monthly 13 million VND Monthly 16 million VND
Frequency of administration	Interval between treatment sessions during the maintenance phase	2 weeks 4 weeks 8 weeks 12 weeks

PASI 90: 90% reduction in the Psoriasis Area and Severity Index score; PASI 50: 50% reduction in the Psoriasis Area and Severity Index score; PGA: Physician Global Assessment; VND: Vietnamese dong.

Experimental design and survey

A fractional factorial design was employed to reduce the extensive number of questions derived from 6 attributes and their respective levels ($4^2 * 3^4$), resulting in 15 choice sets. The D-efficient design methodology, implemented using the Dcreate tool in the Stata 14 software (StataCorp LLC, College Station, TX, USA), ensures orthogonality, level balance, utility balance and minimal overlap. Thirty hypothetical treatment profile pairs were generated by combining the various attributes and levels. A full-profile task was used to display all 6 attributes of both alternatives within each choice set. Each choice scenario presented 2 hypothetical treatment options, biologic A and biologic B, ensuring that neither option was superior across all attributes. Visual representations of attribute levels were provided alongside numerical or textual descriptions to reduce cognitive burden and enhance participant engagement as presented in **Fig. 1.**

The questionnaire was pretested with a sample of 20 patients with moderate to severe psoriasis to evaluate whether trade-offs were made during treatment selection and to confirm participants' comprehension of the presented options. Data from this pilot study were used to refine the parameters and finalize the DCE questionnaire.

Face-to-face interviews were conducted to address the complexity of the questionnaires. This method allowed researchers to clarify challenging concepts, ensuring the participants fully understood the questions and provided more accurate data. Additionally, this approach enabled direct observation and assessment of the participants'

CHARACTERISTICS	BIOLOGICAL DRUG A	BIOLOGICAL DRUG B
Percentage of patients achieving 90% symptom reduction (e.g., reduction in redness, thickness, scales, etc.) after one month of treatment	 20%	 10%
Percentage of patients achieving 90% symptom reduction (e.g., reduction in redness, thickness, scales, etc.) after one year of treatment	 40%	 80%
Time to relapse after discontinuation of treatment	 40 weeks	 28 weeks
Percentage of patients experiencing severe infectious side effects requiring hospitalization annually	 2%	 3%
Out-of-pocket treatment costs during the maintenance phase	$$$$ **Monthly 13 million VND**	$$$ **Monthly 10 million VND**
Interval between treatment sessions during the maintenance phase	 8 weeks	 12 weeks

Fig. 1. Example of presented discrete choice experiment question.

clinical characteristics and psoriasis severity, thereby enhancing the study's reliability.

The survey began with questions on demographics and disease-related topics before participants proceeded to the DCE. After completing the 15 choice sets, the participants were asked to perform a stability validity test by answering an additional question (the 16th question, identical to question 1) to assess the internal validity of the DCE. The study was designed to ensure that the survey was completed within approximately 30 min.

Participants

Participants visiting the Ho Chi Minh City Hospital of Dermatology and Venereology between March 2024 and July 2024 were eligible for the study if they met the following criteria: (*i*) had a confirmed diagnosis of moderate to severe psoriasis (BSA > 10% or PASI > 10, and DLQI > 10, based on the EuroGuiDerm Guideline) (16); (*ii*) were aged 18 years or older; (*iii*) provided informed consent; (*iv*) were currently receiving either non-biologic or biologic treatment; and (*v*) were able to understand and respond to the survey questions fully. During the recruitment period, a total of 30 patients were excluded due to either refusal to participate or failure to complete the questionnaire, primarily citing the length and time-consuming nature of the survey as reasons.

Sample size and sampling

The sample size for the DCE was calculated using the rule of thumb proposed by Johnson et al. (17). The minimum sample size required for the main effects (n) was determined using the following equation:

$$n \times t \times a/c \geq 500$$

where t is the number of choice tasks, a is the number of alternatives per scenario, and c is the maximum number of levels for an individual attribute. Based on this formula, the minimum sample size was calculated to be 67, rounded to 70. However, to enhance the statistical power and generalizability of the findings, a larger sample size was targeted. According to the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) guidelines, the accuracy of DCE estimates increases rapidly with smaller sample sizes, up to 150, and then stabilizes at approximately 300 observations (18). A sample size of 300 enhances the robustness and reliability of the estimated preferences while enabling meaningful subgroup analyses by demographic and clinical characteristics. This allows for a more comprehensive understanding of preference heterogeneity. Moreover, given the limited research on biologic treatment preferences in Vietnam, a larger sample strengthens the external validity and applicability of the findings to clinical practice and policy decisions.

Statistical analysis

After data cleaning, the respondents' socioeconomic factors and choice data were imported into STATA v.14 for analysis. DCE analysis was conducted using a conditional logit model in which all characteristics were treated as categorical variables. The model is estimated using the following utility specifications:

$$U_i = V(\beta, Xi) + \varepsilon$$

Here, U_i represents the utility of option i, V is a function of the levels of attributes for option i, X is a vector of the levels of attributes that define option i, and β is a vector of estimated coefficients. The error term (ε) is assumed to follow a Gumbel distribution. Each estimated coefficient (β) serves as a preference weight, representing the relative contribution of an attribute to the overall utility (19).

Patient preferences were assessed using preference weights and relative importance (%). Relative importance (RI) was calculated based on the difference between the highest and lowest preference weights for each attribute divided by the total of all differences across attributes. The clinical and epidemiological characteristics of the patients were analysed using descriptive statistics. Subgroup analyses were also performed to investigate how these characteristics influenced patient decisions when selecting biologic drugs.

Ethical considerations

The participants provided written informed consent, and their anonymity was preserved through methods approved by the Ethics Committee. The study was conducted in accordance with the principles of the Declaration of Helsinki and approved by the Ethics Council of the University of Medicine and Pharmacy at Ho Chi Minh City (approval number: 23631 – DHYD).

RESULTS

Demographics

A total of 302 patients with moderate to severe psoriasis completed the survey. The mean age was 39.8 years, with the majority being male (70.5%). Most participants had a university or postgraduate education and resided in Ho Chi Minh City. Over half had lived with psoriasis for more than 10 years, and 42.4% had psoriatic arthritis as a comorbidity. More than half had prior experience with biologic therapies. Detailed demographic and clinical characteristics are presented in **Table III.**

Patients' preferences

The preference weights for long-term efficacy and treatment costs were statistically significant, with patients preferring lower costs and greater long-term efficacy. Additionally, patients prioritized medications with

Table III. Demographic and clinical characteristics of participating patients

Item	Characteristics	Respondents, *n* = 302
Age, mean (SD), year		39.8 (12.5)
Age group, *n* (%)	≥ 60 years	27 (8.9)
Gender, *n* (%)	Male	213 (70.5)
Occupation, *n* (%)	Intellectual labour	170 (56.3)
	Manual labour	95 (31.5)
	Unemployed	37 (12.3)
Monthly household income, n (%)	≥ 20 million VND (≥ 790 USD)	150 (49.7)
Educational attainment, *n* (%)	University or postgraduate	176 (58.3)
Region, *n* (%)	Ho Chi Minh City	162 (53.6)
Age at diagnosis, years, mean (SD)		27.4 (12.8)
Duration of psoriasis, years, mean (SD)		12.4 (8.7)
Duration of psoriasis, years, *n* (%)	< 1 years	14 (4.6)
	1–9 years	110 (36.4)
	≥ 10 years	178 (58.9)
Comorbid conditions, *n* (%)	Psoriatic arthritis	128 (42.4)
	Hypertension	55 (18.2)
	Hyperlipidaemia	36 (11.9)
	Diabetes mellitus	25 (8.3)
Previous exposure to biologic therapy, *n* (%)	Biologic experienced	162 (54.0)
PASI score, mean (SD)		10.7 (10.8)
DLQI score, mean (SD)		8.1 (7.3)
Total DLQI score, *n* (%)	0–1	83 (27.5)
	2–5	50 (16.6)
	6–10	58 (19.2)
	11–20	98 (32.5)
	21–30	13 (4.3)

PASI: Psoriasis Area and Severity Index score; DLQI: Dermatology Life Quality Index; SD: standard deviation; VND: Vietnamese dong; USD: United States dollar.

infrequent administration because biweekly injection schedules pose adherence challenges.

Among all the participants, the financial burden of therapy emerged as the most significant factor influencing the selection of biologic medications (RI: 31.4%), followed by maintenance efficacy (RI: 25.3%), treatment frequency (RI: 17.8%), and risk of serious infection (RI: 15%). In contrast, maintenance efficacy after drug discontinuation (RI: 8.1%) and early onset effectiveness (RI: 2.5%) were less critical to patient decision-making, as presented in **Fig. 2.**

A total of 89.7% of the patients successfully passed the stability validity test, which was based on the consistency of their responses to repeated questions. This high pass rate suggests that most respondents provided reliable and stable answers, supporting the internal validity of the study. Furthermore, the subgroup analysis of patients who did not pass the test revealed no significant changes in the priority levels of the attributes, indicating that their exclusion would not substantially alter the overall conclusions.

Results from subgroup analyses

Cost and long-term efficacy consistently emerged as the most important attributes across the subgroups. Patients placed less emphasis on short-term and maintenance efficacy after discontinuing medication when choosing biologic treatments **(Fig. 3)**

Treatment modality

Patients favoured biologics with higher long-term efficacy, lower costs, and less frequent injections (≥4 weeks). Biologic-experienced patients placed emphasis on long-term efficacy, lower cost, and reduced injection frequency, while biologic-naive patients prioritized lower cost and infection risk (Fig. S1).

Gender

Both genders prioritized lower costs, better long-term efficacy, and biologics with stable post-treatment efficacy (up to 40 weeks), serious adverse effects ≤2%, and injection intervals ≥4 weeks. Males valued the long-term efficacy and less frequent dosing, whereas females prioritized lower cost and infection risk (Fig. S2).

Educational attainment

Across all education levels, patients preferred biologics with sustained post-treatment efficacy (≥40 weeks) and serious infection rates ≤2%. Higher-educated participants emphasized long-term efficacy and convenience; less-educated participants prioritized cost and safety (Fig. S3).

Age

Patients ≥60 years focused on cost and safety, while younger patients valued long-term and post-treatment efficacy (Fig. S4).

Monthly household income

All income groups preferred biologics with lower costs, high long-term efficacy, infection rates ≤2%, and sustained efficacy (≥40 weeks). Higher-income patients emphasized long-term stability and convenience; lower-income patients prioritized cost and infection risk (Fig. S5).

DISCUSSION

Research findings

Treatment cost (RI: 31.4%) was identified as the most significant factor influencing patients' selection of biologics. This finding aligns with a study by Lang et al. (RI: 59.3%) (20), highlighting the economic burden of biologics in countries with lower per capita income and limited insurance coverage, such as Vietnam and China. However, this contrasts with research in Japan (21) and in Germany (22), where health systems provide broader reimbursement, and which reported that treatment cost was less impactful. In Vietnam, biologics remain expensive compared with alternative options, even with health insurance support. This highlights the substantial financial burden imposed on patients by

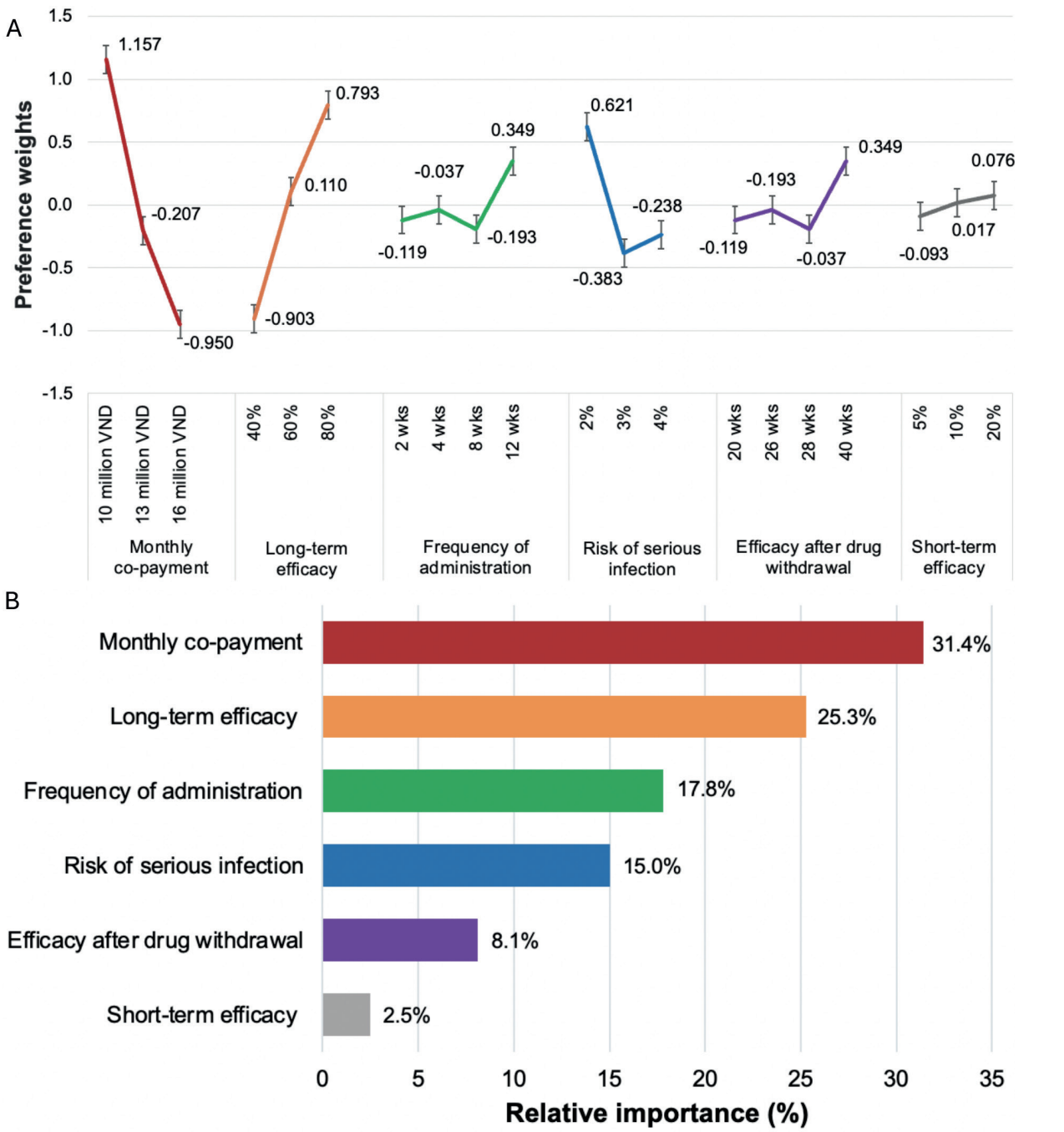

Fig. 2. (A) Preference weights for attribute levels (overall results, *n* = 302); (B) relative importance (RI) of attributes influencing patient selection of biologics (*n* = 302). Preference weights are represented on a vertical scale, describing the impact of each selected level within an attribute. Non-overlapping error bars indicate statistically significant differences between levels within an attribute. RI is calculated as the proportion of the total variation in preference weights, measured by the distance between the maximum and minimum levels of each attribute.

biologic treatments, which significantly affects their decisions. Strategies such as dose reduction or extended dosing intervals may offer cost-effective options without compromising efficacy.

Long-term effectiveness

Long-term effectiveness was another highly prioritized attribute (RI: 25.3%). This has consistently been reported as an important factor in previous studies in Japan and the USA (21, 23, 24). Sustaining long-term efficacy remains a challenge, as some therapeutic agents may lead to the development of drug-resistant antibodies. Patients with psoriasis frequently experience disease recurrence, making sustained symptom management a key concern. Patients often prioritized consistent maintenance efficacy over short-term benefits, which is consistent with the results of previous studies.

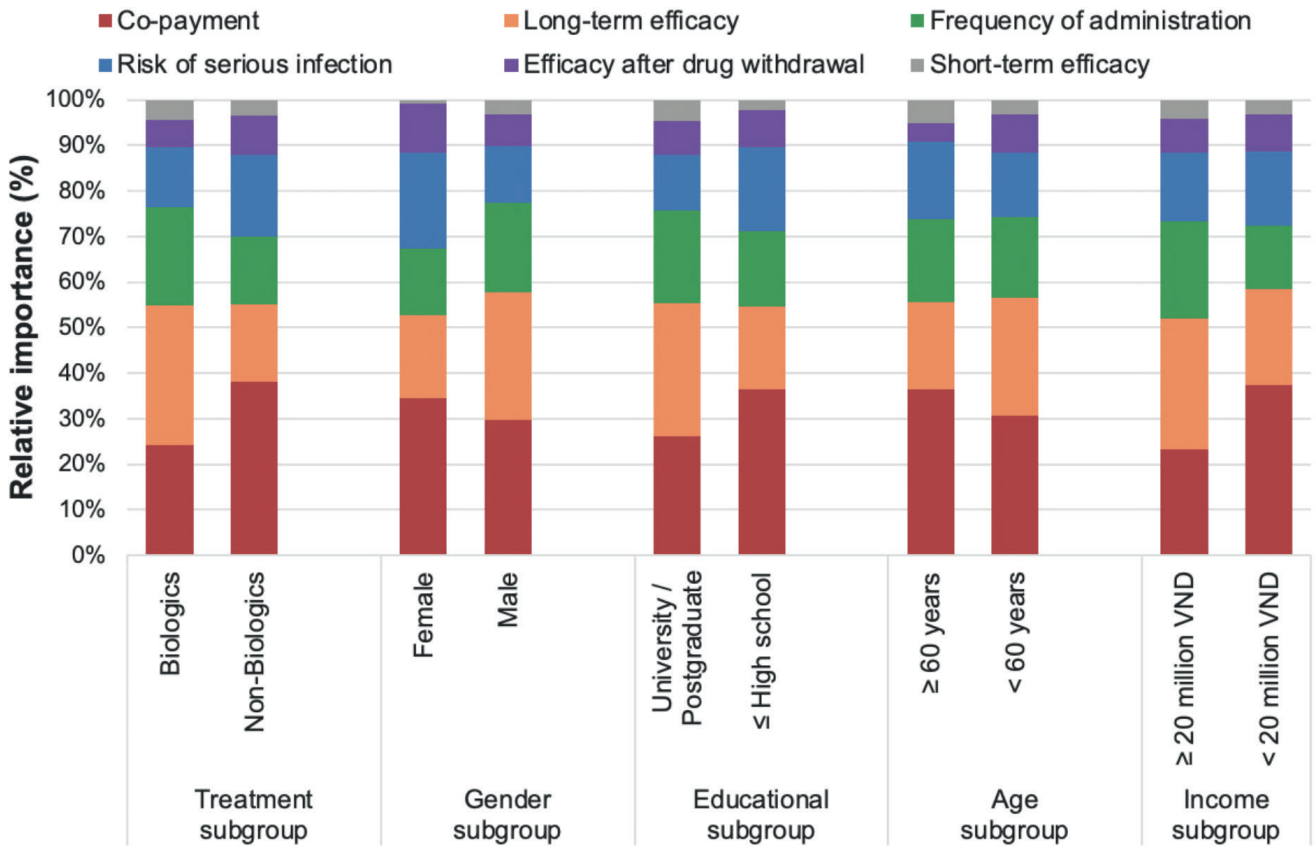

Fig. 3. Relative importance (RI) of attributes influencing patient selection of biologics by treatment subgroup ($n = 302$). The detailed numerical values of each attribute level, expressed in RI, are presented in more detail in the Supplementary Figs.

Treatment frequency

Treatment frequency also significantly influenced patient preferences for biologics (RI: 17.8%), aligning with findings by Tada et al. (21). Patients in this study preferred treatment with injection intervals of 4 weeks or longer, with no significant differences observed between the 4-, 8-, or 12-week intervals. However, due to the unavailability of self-injectable biologics in Vietnam, this study did not assess the impact of treatment location as an attribute.

Risk of serious infections

After treatment cost, long-term efficacy, and injection frequency, the rate of serious infection was the fourth most important attribute. The patients in this study preferred biologics with a severe infection rate of 2% to those with higher rates, especially female patients, individuals over 60 years of age, and those currently receiving non-biologic therapies. This mirrors findings from previous studies (25, 26), though some studies have reported that patients were willing to accept higher risks for greater efficacy (21–23). These differences may reflect varying perceptions of safety and risk tolerance across populations.

Attributes with minimal influence

Two attributes had little influence on patients' decisions: time to relapse after treatment cessation (RI: 8.1%) and short-term efficacy (RI: 2.5%). While Tada et al. (21) reported sustained efficacy as the most important factor (RI: 25.4%), our findings align with prior studies by Tada et al. (21) and Komine et al. (23), which showed short-term efficacy had minimal influence (RI: 13% and 7%, respectively). These results suggest that patients prioritize long-term disease control over rapid symptom relief, likely reflecting an understanding of psoriasis as a chronic condition requiring sustained management.

Clinical implications

The findings of this study have important clinical implications for physician–patient communication and treatment selection in moderate to severe psoriasis. By explicitly incorporating patient preferences – particularly with regard to treatment cost and long-term efficacy – into the decision-making process, clinicians can foster more meaningful and transparent discussions with patients. This shared decision-making approach encourages patients to express their treatment priorities, thereby increasing their engagement, satisfaction, and adherence to the chosen therapy.

Subgroup analyses further underscore the need for physicians to consider individual patient factors, including socioeconomic status, prior experience with biologics, and demographic characteristics, when discussing biologic treatment options. Notably, biologic therapies that are covered by national health insurance or offer sustained long-term efficacy should be prioritized during consultations, as they align more closely with patient preferences and are likely to enhance adherence.

These insights support the integration of structured patient preference assessments into routine clinical practice, facilitating more personalized, patient-centred care. Additionally, the development of national guidelines that emphasize preference-based treatment selection could standardize and improve the quality of care across healthcare settings. Expanding insurance coverage and financial support mechanisms will be essential in reducing cost barriers and ensuring equitable access to biologic therapies, ultimately optimizing clinical outcomes for patients with psoriasis in Vietnam.

Strengths and limitations

This study has several notable strengths. First, data were collected through face-to-face interviews, allowing for clarification of complex concepts and ensuring that all participants fully understood the survey tasks. This approach likely enhanced the accuracy and reliability of the self-reported data compared with self-administered or online surveys. Additionally, all participants had moderate to severe psoriasis confirmed by clinical examination and medical records, further improving data validity. Notably, over 50% of participants had experience with biologics, allowing a comparison of perspectives between patients with and without prior exposure to these treatments – an area rarely explored in past research. Furthermore, a key strength was the validation of attributes through a pilot study, ensuring their real-world relevance. Subgroup analyses further examined the impact of clinical and sociodemographic factors on preferences.

Despite the valuable insights gained through the DCE methodology, the study is not without its constraints. While self-reported data may introduce recall or response bias, the face-to-face methodology helped mitigate these risks by providing opportunities for clarification and immediate feedback. Additionally, the DCE used hypothetical scenarios, which may not fully reflect real-world decision-making. The forced-choice format excluded open-ended responses, potentially limiting insights. Efforts to address these gaps included qualitative interviews and pilot studies to refine attributes and levels, ensuring relevance to patient experiences. Finally, the study limited the number of attributes analysed to reduce respondent burden, which may not fully capture individual patient characteristics.

Conclusion

The cost of treatment and long-term effectiveness are the most important attributes for patients with moderate to severe psoriasis in Vietnam. These findings provide valuable insights into the perspectives of Vietnamese patients regarding the selection of biologic therapies. Incorporating these preferences into shared decision-making between physicians and patients may enhance patient satisfaction and improve treatment outcomes.

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IRB approval status: The study was conducted in accordance with the principles of the Declaration of Helsinki and approved by the Ethics Council of the University of Medicine and Pharmacy at Ho Chi Minh City (approval number: 23631 – DHYD).

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