A multidimensional assessment of the burden of psoriasis: results from a multinational dermatologist and patient survey*

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Summary

Background Psoriasis is a chronic, immune-mediated disease, characterized by symptoms that include itching and skin pain and is often associated with comorbidities. Patients have a substantial detriment to quality of life (QoL) and work productivity with associated cost burden.

Objectives To investigate the incremental burden of comorbidities, itch and affected body areas among systemic eligible patients with psoriasis, using a multinational survey of dermatologists and their patients with psoriasis.

Methods Multinational data from the Growth from Knowledge (GfK) Disease Atlas Global Real-World Evidence program were used. Eligible patients were identified as those who were currently having or had ever had moderate-to-severe psoriasis, and must have been receiving prescription treatments at the time of the survey. Multivariable regression analyses were conducted to assess the incremental burden among psoriasis patients with physical and psychological comorbidities, itch and affected visible and sensitive body areas vs. psoriasis patients without these conditions, respectively.

Results The study enrolled 3821 patients with psoriasis, from nine countries, with an average Psoriasis Area and Severity Index score of 6.4. The presence of comorbidities was associated with a significant increase in the likelihood of skin pain, lower QoL, greater work impairment and increased usage of medical resources (except in psoriasis patients with obesity and type 2 diabetes). Psoriasis patients suffering from itch and those with visible and sensitive affected body areas also had impaired QoL vs. those without these conditions.

Conclusions Psoriasis patients with physical and psychological comorbidities, itch and affected visible and sensitive body areas had lower QoL and greater work impairment compared to those without these conditions.

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Psoriasis is a chronic, immune-mediated skin disease, accompanied by symptoms such as skin pain, itching, burning and scaling. The reported prevalence of psoriasis ranges between 0.09% and 11.4%. The disease typically begins between the ages of 15 and 35 years and its chronic nature requires lifelong management and support. Overall, patients with psoriasis experience a reduction in their quality of life (QoL) similar to or worse than patients with other chronic diseases such as ischaemic heart disease and diabetes. In addition to the functional, psychological and social burden related to psoriasis, medical resource utilization and healthcare costs have also been reported to be substantial.

It is now recognized that manifestations of psoriasis can occur beyond the skin. Patients with psoriasis show an increased prevalence of comorbid conditions including cardiovascular disease (CVD), metabolic syndrome, obesity and psoriatic arthritis (PsA). They also have a greater likelihood of psychological disorders particularly anxiety and depression. In turn, these physical and psychological comorbidities are associated with reduced QoL, social stigmatization, high stress levels, physical limitations, low self-esteem and employment difficulties. In addition, itch has been shown to be one of the most common and bothersome symptoms for people with psoriasis, but the incremental burden associated with it has been underinvestigated. Finally, the type and surface of body areas affected by psoriasis can also have a varying impact on patient outcomes, in particular, when it affects visible or sensitive skin areas.

This large and multinational real-world survey aimed to investigate the incremental burden of physical and psychological comorbidities (CVD, PsA, obesity, type 2 diabetes and anxiety or depression), itch and involvement of visible and sensitive body areas among systemic therapy eligible patients with psoriasis compared to those without these conditions.

Patients and methods

Data source

We used data from the Growth from Knowledge (GfK) Disease Atlas Global Real-World Evidence program in psoriasis, which is a syndicated, retrospective, cross-sectional survey among dermatologists and their systemic therapy eligible patients with psoriasis across nine countries (Germany, U.K., France, Spain, Italy, South Korea, Brazil, Mexico, Russia), conducted between September 2015 and January 2016. Dermatologist and patient eligibility criteria, in addition to the survey design are summarized in Figure 1. The Disease Atlas sample is obtained from more than two million physicians who engage with the community mainly for medical education purposes. Dermatologists who have opted into market research activities were then approached randomly; and the survey remained open until the quotas were achieved. This survey captured patient data through online patient-record forms completed by the dermatologist, and a paper survey completed by patients at the end of the consultation for collection of patient-reported outcomes (PROs) data. All responses were anonymized to preserve patient confidentiality and to avoid bias at the data collection and analysis phases.

Evaluation subgroups and outcomes

Patients with psoriasis were grouped by the presence or absence of CVD, PsA, obesity, type 2 diabetes and anxiety or depression, to assess the incremental impact of different conditions.
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Voluntary, not all PRFs have a corresponding PSC but all PSCs can be matched to the physician-reported PRF. Record form (PRF) for their patient and asked that patient whether they would like to complete a patient self-completion (PSC) form. As it is.

General Health Survey (SF-12), the EuroQol-5 Dimensions health problem. 18 Sleep disturbance was assessed only in patients with psoriasis. All patients were invited, on a voluntary basis, to complete a patient self-completion form at the end of their consultation. All responses provided by patients and their dermatologists were linked.

Statistical analyses
Multivariable generalized linear regression models with appropriate statistical distributions and link functions were developed in each subgroup of patients with psoriasis to assess the incremental impact of comorbidities, itch and the type of body areas affected, on psoriasis symptoms, QoL measures, percentage of overall work impairment and medical resource utilization. All models controlled for the effect of patient demographics and characteristics (age, gender, country of origin, body mass index, smoking status and alcohol use), time since diagnosis and type of treatment received (i.e. biologics, conventional systemic agents, topical agents). All models also controlled for psoriasis severity, based on whether the patient was currently experiencing an exacerbation in psoriasis (yes/no) and current Psoriasis Area and Severity Index (PASI)-based severity for models on QoL measures, symptoms and WPAI at the time of the survey. The number of exacerbations in the past 12 months (0, 1, 2+), were assumed to be a reasonable proxy for psoriasis severity, for models on medical resource utilization outcomes which related to the past 12 months prior to the survey.

Bivariate comparisons between the subgroups were conducted using t-tests for continuous or count variables, and Pearson’s chi-square tests were used when comparing groups on categorical variables. Linear regression models were used.
for QoL variables (DLQI, SF-12 and EQ-5D) and a negative binomial regression model with a log-link function was used for overall percentage of work impairment. Logistic regression models were developed for binary outcomes (i.e. binary healthcare resource utilization variables and presence of itch/skin pain/exacerbations at the time of the survey). A Poisson regression model with log-link function was used for number of psoriasis consultations in the past 12 months. Adjusted odds ratios (ORs) from logistic models, adjusted mean scores from linear models and adjusted percentage of change from Poisson and negative binomial models were reported along with P-values and 95% confidence intervals (CIs). All statistical analyses were conducted in SPSS Statistics v22 (IBM Corp, Armonk, NY, U.S.A.) and R (R Foundation, Vienna, Austria).

Results

The study sample included 524 dermatologists and 3821 patients with psoriasis from nine countries. Characteristics of the overall study sample and by country are shown in Table S1 (see Supporting Information). The majority of participants had plaque psoriasis (79%; data not shown) and the mean ± SD PASI in the sample was 6.4 ± 7.0 (Table S1; see Supporting Information).

Incremental burden of physical and psychological comorbidities

From the sample of 3821 participants, 105 (3%) had CVD, 624 (16%) had PsA, 248 (7%) had obesity, 186 (5%) had type 2 diabetes and 539 (14%) had anxiety or depression (Table S1; see Supporting Information). The prevalence of physical (except type 2 diabetes) and psychological comorbidities increased with greater psoriasis severity and this increase was statistically significant (P < 0.05; data not shown).

There was a statistically significant increase in the likelihood of skin pain in psoriasis patient with PsA, type 2 diabetes or anxiety or depression (adjusted OR 1.42, 95% CI 1.09–1.85 for PsA, adjusted OR 1.54, 95% CI 1.00–2.34 for type 2 diabetes and adjusted OR 1.52, 95% CI 1.16–1.96 for anxiety or depression). Psoriasis patients with anxiety or depression also had a statistically significant increase in the likelihood of itch (adjusted OR 2.09, 95% CI 1.68–2.61) compared to psoriasis patients without anxiety or depression (data not shown).

Psoriasis patients with CVD, PsA or anxiety or depression had a statistically significant worsening of QoL (as demonstrated by SF-12 physical and mental scores, DLQI score and EQ-5D utility weight; P < 0.05) compared to psoriasis patients without these comorbidities (Table 2). To a lesser extent, obesity and type 2 diabetes were also associated with worse QoL; however, this was only confirmed with generic QoL scores. Obesity was associated with a significant worsening of SF-12 physical and mental scores (−3.0, P < 0.05 and −2.5, P < 0.05, respectively) and type 2 diabetes was only associated with a significant decrease of the SF-12 physical score (−2.8, P < 0.05).

A statistically significant worsening in the percentage of overall work impairment due to psoriasis was observed among psoriasis patients with CVD, PsA or anxiety or depression compared to those without these comorbidities (Table 3). The percentage of overall work impairment due to psoriasis was higher, by 73% (95% CI 6–190%) among psoriasis patients with CVD compared to those without CVD, by 27% (95% CI 6–54%) among psoriasis patients with PsA compared to those without and by 32% (95% CI 8–62%) among psoriasis patients with anxiety or depression compared to those without.

Psoriasis patients with CVD, PsA or anxiety or depression had a statistically significant increase in the likelihood of...
having an outpatient visit in the past 12 months compared to those without these comorbidities (Table 3). Psoriasis patients with CVD were more likely to have another dermatologist (other than the GfK study dermatologist) involved in the management of their psoriasis. Psoriasis patients with PsA or anxiety or depression had a statistically significant increase in the likelihood of having a rheumatologist or another physician involved in management of the patient’s psoriasis compared to those without these comorbidities. Psoriasis patients with PsA also had a greater number of consultations for their psoriasis than those without PsA, with a statistically significant adjusted increase of 18% (95% CI 13–24%). Psoriasis patients with obesity or type 2 diabetes did not show any statistically significant increase in medical resource utilization (Table 3).

**Incremental burden associated with the presence and severity of itch**

The participating dermatologists reported that 41% \( (n = 1550) \) of their patients with psoriasis in the overall study sample experienced itch at the time of the survey (Table S1; see Supporting Information). This proportion was shown to increase with greater psoriasis severity: 28%, 50%, 59% and 60% patients had itch among those with clear/almost clear, mild, moderate and severe psoriasis, respectively \( (P < 0.0001; \) data not shown). Among psoriasis patients with itch, 6%, 26% and 8% experienced mild, moderate and severe itch, respectively \( (Table S1; \) see Supporting Information).

Compared to psoriasis patients without itch, those with itch were more likely to have skin pain (adjusted OR = 1.76, 95% CI 1.43–2.17, data not shown), and had a statistically significant worsening of their QoL \( (P < 0.01; \) Table 2). They also experienced a statistically significant increase in the percentage of overall work impairment due to psoriasis (17%, 95% CI 2–34%) and had a statistically significant decrease in visits to their dermatologist for their psoriasis in the past 12 months compared to psoriasis patients without itch \( (−11%, 95% CI −14% to −8%). \) However, psoriasis patients with itch were more likely to have another physician, including another dermatologist (other than the GfK study dermatologist) involved in the management of patient’s psoriasis (adjusted OR 1.28, 95% CI 1.09–1.50 and 1.48 95% CI 1.11–1.97, respectively; Table 3).

Among psoriasis patients with itch, sleep disturbance due to itch worsened as itch severity increased, with a statistically significant increase in the likelihood of sleep disturbance among psoriasis patients with moderate and severe itch compared to those with mild itch \( (adjusted OR 1.93, 95% CI 1.28–2.95 and 3.47, 95% CI 2.14–5.69, respectively; \) data not shown). Furthermore, greater severity of itch was also associated with...
Table 3  Impact of physical and psychological comorbid conditions, itch and localization of plaques, on work productivity and medical resource utilization

| Patient subgroup comparisons | Adjusted % difference in % of overall work impairment due to psoriasisa | Adjusted % difference in number of psoriasis consultationsb | Medical resource utilization in the past 12 months | OR of other primary care physician involved in patient’s psoriasis managementc | OR of other dermatologist involved in patient’s psoriasis managementd | OR of rheumatologist involved in patient’s psoriasis managemente |
|-----------------------------|------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Comorbidities               |                                                                         |                                                          |                                                 |                                                 |                                                 |                                                 |
| Cardiovascular disease vs. no cardiovascular disease | 73 (6 to 190)*                                                        | −8 (−26 to 13)                                        | 1·66 (1·03 to 2·64)*                            | 1·41 (0·59 to 2·98)                            | 1·12 (0·72 to 1·76)                            | 1·90 (0·98 to 3·45)*                            | 0·92 (0·46 to 1·70)                             |
| Psoriatic arthritis vs. no psoriatic arthritis | 27 (6 to 54)**                                                       | 18 (13 to 24)**                                       | 1·40 (1·12 to 1·76)**                           | 1·12 (0·71 to 1·72)                            | 3·13 (2·51 to 3·91)**                           | 1·27 (0·89 to 1·78)                            | 2·65 (1·85 to 3·89)**                           |
| Obesity vs. no obesity     | −2 (−30 to 38)                                                        | −2 (−9 to 6)                                          | 1·21 (0·85 to 1·71)                            | 1·27 (0·67 to 2·30)                            | 1·21 (0·88 to 1·67)                            | 0·97 (0·56 to 1·63)                            | 1·17 (0·71 to 1·87)                             |
| Type 2 diabetes vs. no type 2 diabetes | 26 (−12 to 85)                                                       | 3 (−5 to 12)                                         | 1·38 (0·96 to 1·98)                            | 1·90 (0·98 to 3·50)*                           | 1·40 (0·99 to 1·97)                            | 1·32 (0·74 to 2·23)                            | 0·91 (0·53 to 1·51)                             |
| Anxiety or depression vs. no anxiety or depression | 32 (8 to 62)**                                                        | −10 (−18 to 0)*                                      | 1·47 (1·16 to 1·84)**                           | 0·97 (0·58 to 1·57)                            | 1·34 (1·08 to 1·67)**                           | 1·22 (0·83 to 1·76)                            | 1·43 (1·03 to 1·98)*                             |
| Itch                       |                                                                         |                                                          |                                                 |                                                 |                                                 |                                                 |                                                 |
| Itch vs. no itch            | 17 (2 to 34)*                                                         | −11 (−14 to −8)**                                     | 1·11 (0·94 to 1·32)                            | 1·33 (0·93 to 1·90)                            | 1·28 (1·09 to 1·50)**                           | 1·48 (1·11 to 1·97)**                           | 0·91 (0·68 to 1·21)                             |
| Moderate itch vs. mild itch | 66 (31 to 112)**                                                      | −4 (−14 to −8)**                                      | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              |
| Severe itch vs. mild itch   | 95 (46 to 163)**                                                      | −5 (−14 to −8)**                                      | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              | −11 (−14 to −8)**                              |
| Localization of plaques     |                                                                         |                                                          |                                                 |                                                 |                                                 |                                                 |                                                 |
| Visible and nonvisible areas vs. nonvisible areas only | 10 (−5 to 27)                                                        | 8 (4 to 12)**                                         | 1·16 (0·97 to 1·40)                            | 1·43 (0·96 to 2·17)                            | 1·26 (1·07 to 1·49)**                           | 1·14 (0·84 to 1·55)                            | 1·19 (0·88 to 1·63)                             |
| Sensitive and nonsensitive areas vs. nonsensitive areas only | 5 (−9 to 21)                                                          | 8 (4 to 12)**                                         | 0·97 (0·82 to 1·16)                            | 1·60 (1·11 to 2·32)**                           | 1·03 (0·88 to 1·21)                            | 1·15 (0·86 to 1·54)                            | 1·10 (0·83 to 1·46)                             |

*Adjusted % change derived from multivariable negative binomial regression model; **Adjusted % change derived from multivariable Poisson regression model; ***Adjusted odds ratio (OR) derived from multivariable logistic regression model. All multivariable models were adjusted for demographics (age, gender, country, body mass index, smoking status, drinking frequency), psoriasis severity (currently exacerbating and current severity, or exacerbations in past 12 months (0, 1, 2†)), time since psoriasis diagnosis and current regimens (conventional systemic, biologic, topical). P < 0·05; **P < 0·01; ***P < 0·0001.
a statistically significant incremental loss of QoL ($P < 0.0001$; Table 2).

** incremental burden according to affected body areas**

Overall, 59% of patients ($n = 2270$) had both nonvisible and visible body areas affected by psoriasis and 47% ($n = 1777$) had both nonsensitive and sensitive body areas affected by psoriasis (Table S1; see Supporting Information). There was a statistically significant association between the extent of body areas affected and disease severity ($P < 0.0001$; data not shown).

Compared to psoriasis patients affected on nonvisible body areas only, those affected on both visible and nonvisible body areas were more likely to have skin pain (adjusted OR 1.52, 95% CI 1.22–1.91; $P < 0.0001$, data not shown) and worsening of QoL ($P < 0.01$; Table 2), demonstrated by statistically significant decrease of adjusted mean SF-12 physical and mental scores, increase of adjusted mean DLQI score and decrease of adjusted mean EQ-5D utility weight. They also had a statistically significant increase in the number of consultations with their dermatologist (8% increase, 95% CI 4–12%) and greater likelihood of having additional physicians involved in the management of their psoriasis (adjusted OR 1.26, 95% CI 1.07–1.49). No statistically significant differences in the percentage of overall work impairment due to psoriasis and in the use of other types of medical resources (outpatient, inpatient, involvement of another dermatologist or a rheumatologist) were observed between the two patient subgroups (Table 3).

Compared to psoriasis patients affected on nonsensitive body areas only, those affected on both sensitive body areas and nonsensitive body areas were more likely to have skin pain (adjusted OR 1.47, 95% CI 1.20–1.81; $P < 0.0001$, data not shown) and statistically significant worsening in QoL as measured by an increase in DLQI score (0.8, 95% CI 0.3–1.4, $P < 0.01$) and a decrease in adjusted mean EQ-5D utility weight; however, this incremental worsening of utility weight was limited (−0.02, 95% CI −0.04 to 0.00, Table 2). Additionally, they also had a statistically significant increase in dermatologist consultations for their psoriasis (8% increase, 95% CI 4–12%) and a greater likelihood of being hospitalized because of their psoriasis (adjusted OR 1.60, 95% CI 1.15–2.32; Table 3). However, no statistically significant change in the percentage of overall work impairment due to psoriasis and in the use of other medical resources (outpatient visits and the involvement of another dermatologist or a rheumatologist), were observed between the two patient subgroups.

**Discussion**

This large, multinational study among patients with psoriasis and their dermatologists highlights that the burden of psoriasis is complex and not just determined by its physical severity. Other characteristics such as a patient’s comorbidity profile, symptoms such as itching and the anatomical localization of plaques on the body also determine the burden of psoriasis.

In this study enrolling patients who ‘currently have or have ever had moderate-to-severe psoriasis’, the condition in only 4% of the patients was characterized as severe and in 19% as moderate based on their PASI at the time of the survey. However, 40% of the patients were receiving conventional systemic antipsoriatic drugs, and 22% of them were receiving biologics. Therefore, it is reasonable to say that the study patient population represents patients with moderate-to-severe psoriasis. Results from the study showed that patients with (moderate-to-severe) psoriasis with physical or psychological comorbidities have a statistically significant increase in clinical (shown by increased presence and extent of itch), humanistic (shown by worsened QoL) and economic burden (shown by increased medical resource utilization; except in those with obesity and type 2 diabetes) compared to those without these comorbidities. Recent publications also revealed greater economic burden among patients with psoriasis with comorbidities vs. those without comorbidities. However, we did not find a significant increase in medical resource utilization and the percentage of overall work impairment due to psoriasis for psoriasis patients with obesity and type 2 diabetes as observed in Feldman et al.

Despite undergoing treatment at the time of this survey, more than 40% of the psoriasis patients experienced itch, and in 85% of these patients the extent of itch was moderate or severe. We found that psoriasis patients with itch had a statistically significant worsening of QoL and percentage of overall work impairment due to psoriasis compared to those without itch. Psoriasis patients with itch were also more likely to consult more than one dermatologist, suggesting that they may seek additional care when dealing with this symptom. As itch severity increased, QoL, the percentage of overall work impairment due to psoriasis and sleep disturbance due to itch worsened. These findings are aligned with those of Henry et al. who found that itch was associated with poor sleep.

Despite itch being common and bothersome to patients with psoriasis, there is relatively little literature describing how itch may have an impact on patients’ outcomes in the real-world setting. Zhu et al. suggested that itching is an important mediator of association between disease severity and QoL; therefore improvement in itch severity may be an important factor in measuring treatment success among patients with psoriasis.

Our results confirm that having visible psoriasis plaques also has a negative impact on a patient’s QoL as previously shown by Heydendaal et al. Similar results were observed with sensitive body areas; however, to a lesser extent than that seen among patients affected by lesions on visible body areas.

The prevalence of PsA among psoriasis patients in this study was 16% which is within the range reported by the World Health Organization (WHO) global report on psoriasis (1.3–34.7%) and other psoriasis studies (7–26%). However, it is possible that the PsA cases were under-reported by the dermatologists in this study, because several studies have shown that prevalence of PsA is usually higher when reported by rheumatologists than by dermatologists.
believe the lower prevalence rates of CVD, obesity and type 2 diabetes in this study compared to those observed in other studies in psoriasis can also be explained by underdiagnosis or misdiagnosis of these comorbid conditions by dermatologists.\(^2\)\(^,\)\(^3\)\(^,\)\(^9\)\(^,\)\(^10\) It also may be because of the difference in disease classification under the CVD cluster. Previous studies have demonstrated that CVD, diabetes and obesity are more prevalent in patients with severe psoriasis and in those with concomitant PsA.\(^11\)\(^,\)\(^32\)

In the absence of control groups without psoriasis in this study, we cannot conclude from these results if the effect on patient’s QoL is due to the comorbidities or due to the psoriasis disease. Moreover, the cross-sectional design of this study did not allow for investigating the changes in patient outcomes over time relative to the changes in their disease severity. Also, any causal relationship between disease burden and comorbidities, localization of plaques and itch could not be established.

Generic PROs such as the EQ-5D, SF-12 or WPAI may not be sensitive enough to detect differences across the different groups of patients. For instance, results on the localization of plaques showed no impact on the overall work impairment due to psoriasis. This may be due to the definitions assigned for localization of plaques (i.e. visible/nonvisible and sensitive/nonsensitive areas affected by psoriasis) in the current analyses. We matched the body areas captured in the Disease Atlas to the types of psoriasis described by the Psoriasis Association of Great Britain and Ireland in order to define the different subgroups according to their localization of plaques.\(^13\)

For example, only genitalia, scalp and face captured in the Disease Atlas matched the definition of sensitive areas according to the Psoriasis Association. Further research in defining visible localization of plaques may ensure sensitivity in refining the assessment of the incremental burden, as well as in identifying patients affected the most by different localizations of plaques (e.g. according to gender, age, etc.). In addition, QoL outcomes were investigated using linear regression models despite truncated and positive QoL scores. This approach is standard in the literature and provides straightforward interpretation; however, further research using a modelling approach more appropriate to this type of data may be required. The models assessing the impact of itch on outcomes used the dermatologist-reported ‘itch’ variable. The results may differ if these models would rather use ‘itch’ as reported by the patients.

Finally, this study used data pooled from several countries, whereas psoriasis burden can be highly dependent on local disease management, access to medicines and the cultural concept of disease burden. However, descriptive and bivariate analyses were conducted for each of the participating countries separately, and showed in general a similar pattern of results to those reported here in the pooled multivariable models.

In conclusion, this multinational real-world study among patients with psoriasis confirmed that the burden of psoriasis is complex and multidimensional, and that common aspects of psoriasis such as associated physical and psychological comorbidities, itch and type of body areas affected by the disease can contribute to further increase this burden. Further research using longitudinal data will help to confirm these findings and to define and tailor patient-centric care programmes for psoriasis.

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Appendix

Conflicts of interest: C.E.M.G. is a paid advisor and/or in receipt of research grants from AbbVie, Actelion, BMS, GSK, Galderma, Janssen, Leo Pharma, MSD, Pfizer, Novartis, Sandoz, Eli Lilly, Regeneron, Roche, L’Oréal, DSM, Clarins, Walgreens Boots Alliance and UCB Pharma. S.-J.J. has received honorarium from Janssen Korea and participated as site principal investigator of clinical trials sponsored by Pfizer, Janssen, Boehringer Ingelheim, LEO Pharma Korea and Novartis. L.N. received honorarium as a scientific consultant from Novartis. R.R. is/has served as a scientific consultant or clinical study investigator for AbbVie, Janssen-Cilag, Eli Lilly, Leo Pharma, Novartis, UCB and Pfizer. E.G.-S. is/has served as a scientific consultant and/or investigator for Novartis and receives honorarium. T.H. is a full-time employee of GfK, London, U.K. G.P. is a consultant for GfK, London, U.K. I.G. is a full-time employee of Novartis Pharma AG, Basel, Switzerland. C.R. is a consultant of Novartis Pharma AG, Basel, Switzerland. H.T. is a full-time employee of Novartis Pharmaceuticals Corporation, East Hanover, U.S.A. M.A. has served as consultant to or paid speaker for or student participant in clinical trials sponsored by companies that manufacture drugs used for the treatment of psoriasis, including AbbVie, Almirall, Amgen, Biogen, Boehringer Ingelheim, Celgene, Centocor, Eli Lilly, GSK, Hexal, Janssen-Cilag, Leo, Medac, Merck, MSD, Mundipharma, Novartis, Pfizer, Sandoz, Schering-Plough, TEVA, UCB and Xenoprot.

Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher’s website:

Table S1 Demographics and psoriasis characteristics – overall and by country.

Powerpoint S1 Journal Club Slide Set.