

# 1 **Electronic screening for mental illness in patients with psoriasis**

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1 **Conflicts of interest:** None to declare.

2 **Data availability:** All data are held on a restricted server at King's College Hospital NHS  
3 Foundation Trust behind the Trust firewall and in line with Trust policies like all other clinical  
4 data. Data held on the IMPARTS server is only accessible to staff members working on the  
5 IMPARTS programme, and data processors by approval. Information relevant to patient care is  
6 added to the patient's electronic care record. Data may be used to monitor the delivery of the  
7 IMPARTS programme, for clinical audit and service evaluation. Aggregated IMPARTS data may  
8 be used to publish research at various levels.

9 **Ethics statement:** IMPARTS programme ethical approval (IMPARTS Research Database REC  
10 reference: 12/SC/0422). All applications to use data collected routinely under the IMPARTS  
11 programme are scrutinized by a patient-led oversight committee to ensure that the use of data  
12 is appropriate and in line with ethics committee approval.

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15 Dear Editor, Individuals with psoriasis have an increased risk of depression, anxiety, and severe  
16 mental illness.<sup>1,2</sup> National guidelines recommend assessing for mental health alongside  
17 psoriasis disease severity and disease impact (NICE). Systematic screening for depression and  
18 anxiety symptoms in tertiary centres has identified a significant burden of disease<sup>3</sup> and has led  
19 to increased use of mental health care and improvement in psoriasis and quality of life.<sup>1,4</sup>

20

21 This cross-sectional study examined the use of screening for mental illness in a large centre  
22 serving London and Southeast England. Individuals with a confirmed psoriasis diagnosis  
23 attending Guy's and St Thomas' NHS Foundation Trust and King's College Hospital, London  
24 (January 2017 to January 2020) were invited to answer a series of questions about their health  
25 at every outpatient visit. A touchscreen tablet-based programme, Integrating Mental and  
26 Physical Healthcare: Research Training and Services (IMPARTS) was used to collect  
27 patient-completed screening questionnaires including the Patient Health Questionnaire (PHQ-  
28 9)<sup>5</sup>, Generalized Anxiety Disorder scale (GAD-7)<sup>6</sup> and Dermatology Life Quality Index (DLQI)<sup>7</sup>.  
29 IMPARTS is a multifaceted platform of clinical and research services that integrates mental

1 healthcare into routine care<sup>3</sup> Completed questionnaire data automatically populates the  
2 patient's electronic health record with advice on mental health referral if questionnaire scores  
3 suggest a possible mental health condition. We performed statistical analyses using Stata. We  
4 assessed cross-sectional correlations between screening questionnaires using Spearman's  
5 correlation coefficient. We used linear regression, adjusting for age, sex and year of visit and  
6 clustering for repeat questionnaires by individual patients to examine the relationship between  
7 DLQI and mental health.

8  
9 Engagement in screening for mental illness rose gradually over time with substantial month-to-  
10 month variation (Figure panel A). In total 285 individuals provided data. Of these, 217 provided  
11 data at more than one visit (median number of visits 3, interquartile range [IQR] 2-4) over a  
12 median time of 1.5 years (IQR 0.9-2). Median age was 42 years (IQR 31-53), with a slight male  
13 predominance (n=147, 52%). On the first recorded visit, a third of the cohort screened positive  
14 for psoriatic arthritis (Psoriasis Epidemiology Screening Tool).

15  
16 At first visit, 84% (n=238) of the cohort reported that their psoriasis had affected their quality of  
17 life (DLQI score >2). Quality of life impairment was reported as very large (DLQI score 11-20) by  
18 32% (n=90) or extremely large (DLQI score 21-30) by 17% (n=47). The depression screen,  
19 defined by a positive answer to either of the first PHQ9 questions, was present in 35% (n=100).  
20 The anxiety screen, defined by a GAD7 score >5 was positive in 29% (n=82). Severe depressive  
21 symptoms (PHQ-9  $\geq 20$ ) were reported by 22% (n=60) and severe anxiety symptoms (GAD-7  
22  $\geq 15$ ) were reported by 23% (n=64).

23  
24 When examining across all visits, quality of life impairment was frequently reported (78% of  
25 visits had a DLQI score >2). Median DLQI score was 8 (IQR 2-16). Depression screen was positive  
26 on 30% of visits and anxiety on 25% of visits. Median PHQ-9 score was 1 (0-5) and GAD-7 was 2  
27 (0-10). Severe depression and anxiety symptoms were more frequently reported by women  
28 than men [PHQ-9: women 24%, men 15%, GAD-7: 25% versus 14%], as was severe quality of life  
29 impairment [47% versus 33%].

1  
2 Across all visits, the DLQI score moderately correlated with the PHQ-9 score (Rho 0.52) (Figure  
3 panel B) and weakly correlated with the GAD-7 scores (Rho 0.41) (Figure panel C). In linear  
4 regression, depression and anxiety were associated with DLQI scores (PHQ-9:  $\beta=0.48$ , 95% CI:  
5 0.38 to 0.56,  $p<0.001$ , GAD7:  $\beta= 0.29$ , 95% CI: 0.21 to 0.36,  $p<0.001$ ). For each one unit increase  
6 in PHQ9, DLQI score increased by half a point (R-squared 0.27), and for each one unit increase  
7 in GAD7, DLQI increased one third of a point (R-squared 0.18).

8  
9 Our study has demonstrated increasing engagement in the screening of psychological wellbeing  
10 over time, and the burden of depression and anxiety in people with psoriasis. We  
11 demonstrated a strong relationship between mental health and quality of life. Our findings  
12 emphasise the importance of holistic care and managing individual's mental health alongside  
13 their psoriasis to improve overall quality of life.

## 14 15 **References**

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1 **Figure legend**

2 Figure 1 (a) Monthly IMPARTS engagement in absolute number of visits between 2017 and  
3 2020; (b) Scatter plot of DLQI and PHQ9 score with regression prediction line; (c) Scatter plot of  
4 DLQI and GAD7 scores with regression prediction line.

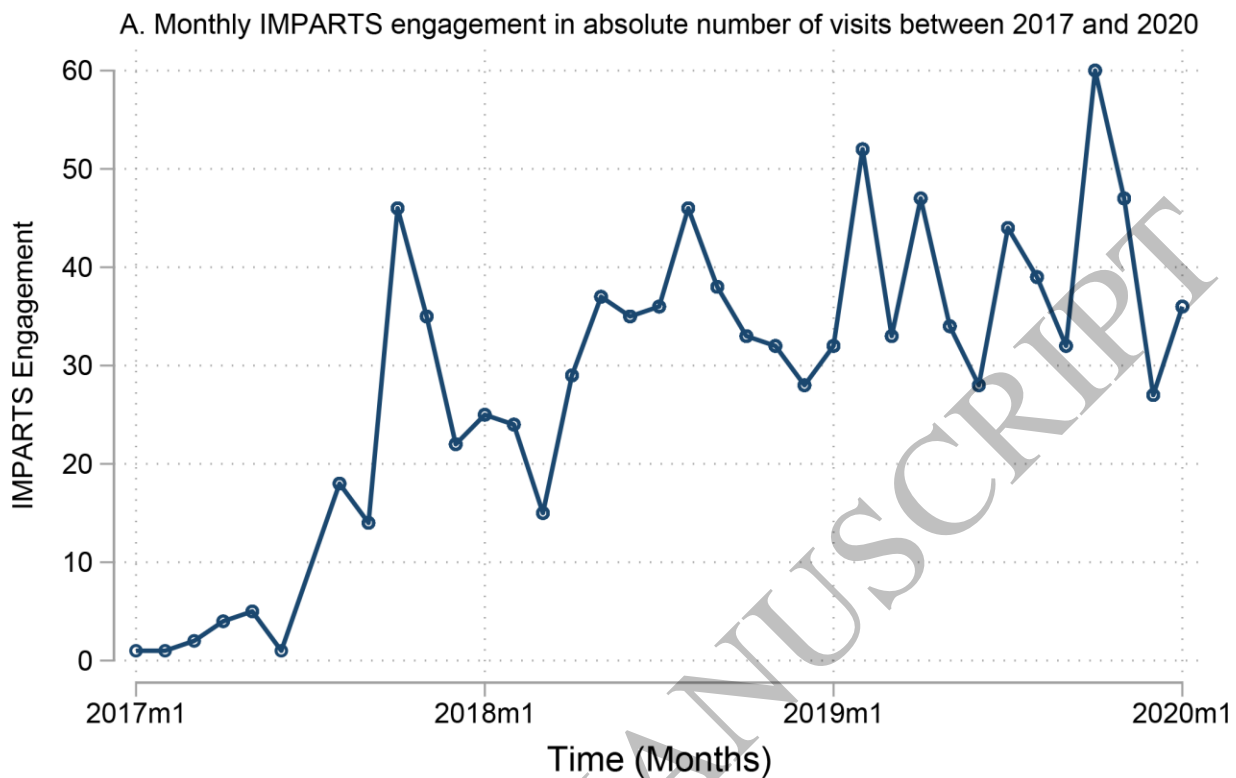
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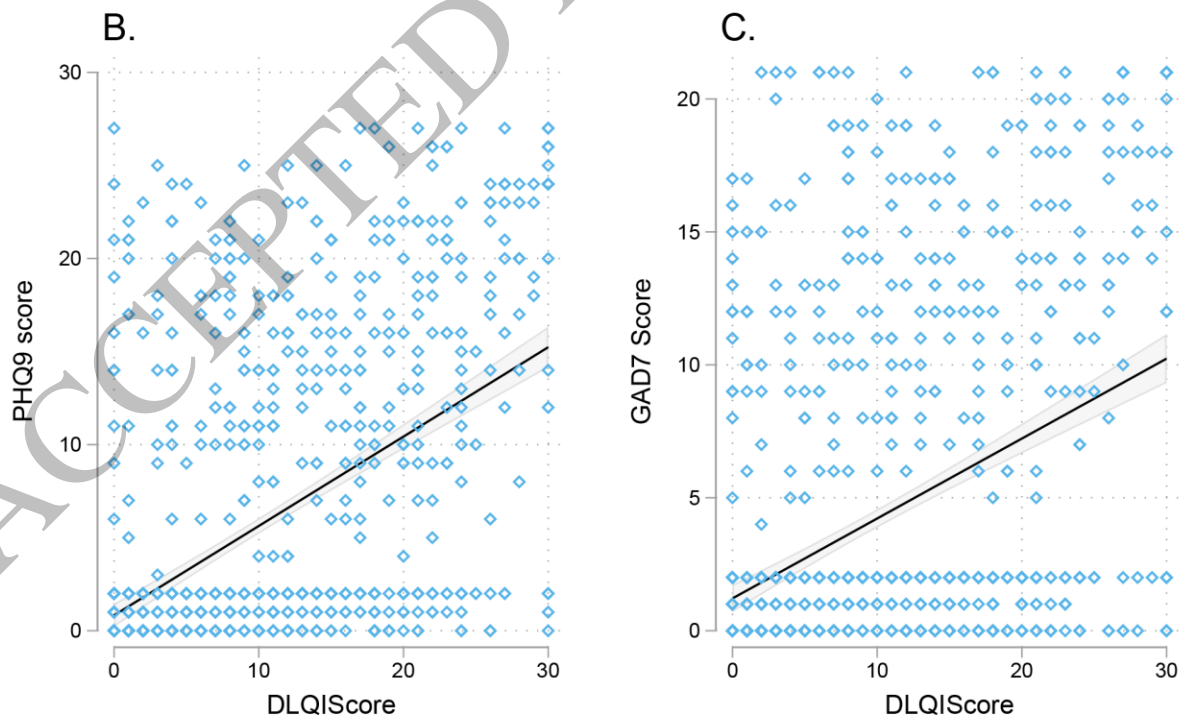
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Scatter plot of DLQI and (B)PHQ9 and (C)GAD7 scores with regression prediction line



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Figure 1  
173x230 mm (x DPI)