

# Impact of Covid-19 on Mental Health and Treatment Compliance in Psoriasis Patients

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## ABSTRACT

**Objective:** This study was designed to determine the impact of COVID-19 on treatment compliance and mental health (anxiety and depression) in psoriasis patients.

**Methods:** A descriptive cross-sectional study was undertaken in the Department of Dermatology at York teaching Hospital from April to August 2020. One hundred and eleven patients diagnosed with psoriasis were asked to complete a questionnaire (HADS). Patients were also asked about their compliance or self-modifications in their treatment regime due to fear of Covid-19. Using SPSS version 26.0 all of the collected data was analysed together.

**Results:** 40 patients (36.03%) had depression and 52 patients (46.84%) anxiety on the basis of their HADS score. Twenty patients (18.01%) stopped treatment due to concerns regarding COVID-19. Prevalence of anxiety was more in female patients and those on traditional immuno-suppressants as compared to biological treatment or those receiving topical treatment only.

**Conclusion:** Depression and anxiety are common in patients with psoriasis. Female patients and those on systemic medications are worse affected compared to patients on topical treatment or those receiving phototherapy. Fear of COVID-19 has led to 18% of patients self-stopping their treatment altogether.

**Keywords:** Psoriasis, Mental Health, Covid-19, Compliance

## INTRODUCTION

Psoriasis is a common chronic inflammatory skin disease.<sup>1</sup> Besides skin manifestations it can be associated with mental health issues like depression and anxiety.<sup>2</sup> The presence of mental health problems is higher in psoriasis patients than in general population.<sup>3</sup> Approximate prevalence of depression in psoriasis ranges from 0 to 58% with the prevalence of anxiety higher than that of depression.<sup>2,3</sup>

Covid-19 pandemic has affected the entire humankind.<sup>4</sup> The general population across the globe has changed the way we live and different governments across the world have responded to this pandemic with total or partial lockdowns.<sup>4</sup> Concerns regarding this infection has impacted people's life and their mental health.<sup>4</sup>

With lockdown, liberties and livelihood have been affected and this has resulted in surge of mental health issues generally.<sup>4</sup> The annual incidence of depression in the general adult population is 6.7% and it is reported that to be up to 16.6% of adults can experience depression at least once during their lifetime.<sup>5</sup> Patients with psoriasis can have background mental health issues related to their skin disease<sup>3</sup> but they can be more vulnerable than the general population to develop or to have a deterioration of their pre-existing anxiety and depression with Covid-19 pandemic.<sup>6</sup> Additionally, with lock down there may be concerns regarding accessing the medical services, which can also impact the mental health and treatment compliance.<sup>6</sup>

Psoriasis has stronger links with mental health issues than other chronic skin diseases like eczema.<sup>2,3</sup> Psycho-social stress is a known factor that can flare up psoriasis and can also impact the compliance to the treatment.<sup>2,3,6</sup> The exact mechanisms how this impacts the disease is still unclear and is under research.<sup>7,8</sup> Postulated mechanisms are related to the proinflammatory cytokines and impact of psycho-social stress on their levels. High levels of pro-inflammatory cytokines impact and alter the metabolism of serotonin and dopamine in the limbic system leading to depression and flareup of psoriasis.<sup>9,10</sup>

Anxiety can also impact the flareups of psoriasis and treatment compliance.<sup>6</sup> Again, the exact mechanism how anxiety leads to worsening of the skin is unclear, but possible mechanisms include changes in sympathetic nervous system (SAM) activation due to high amounts of epinephrine and norepinephrine with lower levels of cortisol.<sup>9,11</sup> These changes result in dysregulation of

hypothalamus-pituitary-adrenal (HPA) axes<sup>9,11,12</sup>, resulting in changes to pro-inflammatory cytokines number and causing psoriasis flareups.<sup>1,8,9</sup>

Psoriasis area and severity index (PASI) score and dermatology life quality index (DLQI) are commonly used to determine the severity of the disease.<sup>13,14</sup> Patients with mild disease receive topical treatment, while patients who have not responded to topical treatment or are in moderate severity group move onto phototherapy as the second line option.<sup>13,15</sup> Patients who are in severe disease category or fail phototherapy move onto systemic traditional immunosuppressants or biological treatment.<sup>13,15</sup>

Psoriasis treatment related immune-suppression or perception of the hospitals being high risk areas to visit for phototherapy may lead to increased anxiety and stress in these patients due to fear of COVID-19.<sup>9,16</sup> This can then have an impact on the treatment compliance.<sup>4,9,17</sup> Increased anxiety and stress may also be compounded by the fact that there was relatively little data available about the safety of these treatment modalities at the start of this pandemic.<sup>5,9,18</sup> Additionally, patients may also be anxious or reluctant to move through the psoriasis treatment ladder due to safety concerns or delay the start or switch to more potent agents in the current pandemic.<sup>9,13,14</sup>

There is relatively little data available on the impact of COVID-19 on mental health in psoriasis patients. A recent study published from the Czech Republic has shown increased anxiety in patients taking biological treatment compared to those on topical treatment.<sup>6</sup>

Keeping in view of the lack of previous studies, we designed this study to determine the impact of Covid-19 on mental health in psoriasis patients.<sup>6</sup> We also wanted to understand and compare this impact amongst patients who were receiving different psoriasis treatment modalities.<sup>5,6,18</sup>

In-addition we wanted to see the impact of Covid-related mental health issues on the compliance of the treatment<sup>6</sup>, especially in patients on immunosuppressants or those who had to travel to the hospital every week to receive phototherapy.<sup>17</sup> Patients may perceive psoriasis immune-suppressants risky<sup>6,11</sup> leading to increased stress, anxiety and compliance issues.<sup>5,6</sup> Additionally, patients may be reluctant to travel to the hospitals, to receive phototherapy.<sup>17</sup>

We also conducted additional data analysis based on gender and distribution of psoriasis on the skin in relation to anxiety and depression. It is reported in the literature that patients with visible disease like on hands or face have higher prevalence of depression. Incidence of anxiety is more in female psoriasis patients. This was to identify the highest risk group so additional psychological support, if needed could be provided.

## METHODOLOGY

We undertook this study from April to August 2020 at the York Teaching Hospital, York, England. This was cross-sectional study and non-probability consecutive sampling technique was used to recruit one hundred and eleven patients. All patients had a diagnosis of psoriasis. Our study period corresponded to the first peak of the COVID-19(4). The age range was 19–82 and patients belonging to either gender were recruited.

We excluded patients with diagnosis other than psoriasis, patients with history of another major psychiatric illness e.g. schizophrenia, patients having sudden job loss and patients with other chronic illnesses like COPD.

After patients had been seen in the clinic in an outpatient setting, they were asked to complete a standardized Hospital Anxiety and Depression Scale (HADS) questionnaire to detect depression and anxiety. Scores were calculated for each patient to determine the presence of anxiety and depression. We also collected data on patient demographics like age, gender, duration of psoriasis, severity of disease, type and duration on treatment on pre-designed pro-forma. Additional information regarding the type of psoriasis treatment like topical treatment or systemic treatment or phototherapy was collected. We collected data on type of immunosuppressants and biological treatment that patients were receiving.

We also asked about the fear of catching COVID-19 and concerns about having a more severe disease due to being on treatment. Finally, we asked patients about compliance or self-modification to their treatment due to fear of Covid-19.

We defined HADS-D of  $\geq 8$  to diagnose depression and score of  $\geq 8$  on HADS-A to screen anxiety. Mean and standard deviation were done for continuous variables like age and percentages were computed for categorical variables like gender. Comparative analysis was done amongst different treatment groups to determine anxiety, depression and treatment compliance. All data were collated and analysed together using SPSS 26.0.

## RESULTS

We collected data from one hundred and eleven patients who met the inclusion criteria. We had more male patients ( $n=58$  52.25%) compared to the female patients ( $n=53$  47.75%). The age range in our study was 19–82 years and the mean age of the patients was  $52.25 \pm 6.91$  years. The mean duration of psoriasis was  $5.35 \pm 2.7$  years. The shortest duration of psoriasis was 6 months while the longest duration of disease was twenty-one years.

Table 1: Demographics, HADS Score and Treatment sub-groups of the Patients.

Characteristics	Biological	Conventional Immunosuppressants	Phototherapy	Topical's
Male (n=58)	26	24	6	2
Female (n=53)	23	20	5	5
HADS-A $\geq 8$ , (n=52)	23	26	2	1
HADS-D $\geq 8$ (n=40)	22	14	3	1

We divided patients into subgroups depending on the treatment they were receiving (Table-1). Out of 111 patients, 49 patients (44%, 26 Males and 23 Female) were on the biological

treatment, 44 patients (39.63%, 24 males and 20 females) on conventional immunosuppressive therapy, 11 patients (9.90%, 6 males and 5 females) were receiving phototherapy and 7 patients (6.30%, 2 males and 5 females) were on topical therapy. This roughly represented the severity of the disease. Patients with severe disease were on biological/systemic treatment 93/111, while patients with moderate disease were receiving phototherapy 11/111 and patients with mild disease were on the topical treatment (7/111).

Out of 111 patients, 52 patients (46.84%) had anxiety and 40 (36.03%) had depression as determined by HADS score. (Table-1).

Further analysis was done among 52 patients with anxiety on treatment subgroup basis. 23 patients (44.3%) were in the biological group of the treatment, 26 patients (50%) in the traditional immunosuppressant group, 2 patients in the phototherapy group (3.84%) and one patient (1.92%) in the topical treatment group.

Our study demonstrated that patients on traditional immunosuppressants were more anxious 26/111 (23.42%) than patients on biological treatment 23/111 (20.72%). This was significantly higher than in patients on phototherapy (2/111) or topical therapy (1/111). Additionally, female patients 31/52 (59%) had more anxiety than male patients 21/52 (40.38%).

Our study showed depression score (HADS-D) of  $\geq 8$  was in 36.03% of the patients (40/111). In terms of sub groups, 22/40 (55%) were in the biological treatment group, 14/40 (35%) on conventional systemics, 3/40 (7.5%) in patients receiving phototherapy and only 1/40 (2.5%) on topical therapy. (Table-1)

Our study highlighted that patients on biological treatment 22/111 (19.81%) had more prevalence of depression in comparison to immune-suppressant treatment 12.61% (14/111,  $p=0.54$ ) and significantly greater than in patients on phototherapy or topical therapy ( $p<0.01$ ). Table-1.

We collected data on the types of biological treatment and types of immunosuppressants patients were receiving. In the biological treatment group as shown in (Table-2), 26/49 (53.01%) were male patients and (23/49) 46.93% were female patients. 14 male patients were receiving anti-TNF $\alpha$  treatment and 12 male patients were receiving Anti-IL treatment. In female patients on biological treatment, 13 patients were receiving anti TNF $\alpha$  and 10 patients were receiving anti-IL Treatment.

Table-2: Gender distribution and characteristics of biological treatment group

Biological Treatment Group (n=49)	Anti-TNF $\alpha$ *	Anti-IL**
Male n=26/49 (53.01%)	14/26	12/26
Female n=23/49 (46.93%)	13/23	10/23

\*Anti-TNF $\alpha$  includes, Etanercept, Adalimumab, Certolizumab.

\*\*Anti-IL includes, Ustekinumab, Secukinumab, Ixekizumab, Rizankizumab.

Out of 111 patients, 44 patients were on traditional immunosuppressants which included either methotrexate or ciclosporin as shown in table 3.

Table 3: Gender distribution and immune-suppressants characteristics

Immunosuppressant's n=44/111(39.63%)	Methotrexate	Cyclosporin
Male n=24/44 (54.54%)	16/24	8/24
Female n=20/44 (45.45%)	9/20	11/20

There was no significant statistical association noted with depression with the age and gender of study participants ( $p>0.05$ ). However, there was a statistically significant relationship between depression and anxiety and the duration of psoriasis ( $p<0.05$ ).

There was a higher prevalence of both anxiety and depression in patients with a longer duration of the disease,

patients who had disease on the visible parts like hands and face. This was statistically significant ( $p < 0.05$ ).

Twenty out of 111 patients (18.01%) stopped treatment because of anxiety related to their treatment and COVID-19 infection. Five out of 11 (45.45%) patients stopped attending for phototherapy due to concerns about COVID-19 perceiving hospitals as a high-risk area. Patients receiving topical treatment

had least concerns about the virus. This group had a low incidence of depression and anxiety as highlighted in table-1 and none of the patients stopped their treatment.

Additional questions about fear of catching COVID-19 or concerns about having a more severe disease due to being on treatment were asked as shown in Table 4

Table 4: Additional questions and responses in the treatment subgroups.

Question: I am more concerned about Covid-19 due to my treatment	Strongly Agree	Agree	Neutral	Disagree	Strongly disagree
Patients on Biological treatments n= 49/111(44%)	15	22	12	0	0
Patients on systemic treatments n= 44/111 (39.63%)	11	18	15	0	0
Patients on Phototherapy n=11/111(9.90%)	0	05	01	04	01
Patients on topical treatment n=7/111(6.30%)	0	01	02	03	01

This additional feedback revealed biologics treated patients and patients on traditional immunosuppressants were more concerned about the safety of treatment during COVID-19 pandemic as compared to the topical treatment group (Table-4). Interesting observation was from phototherapy group, where 5/11 patients expressed concerns as they perceived hospitals as high-risk areas and were reluctant to come to the hospital to receive this modality of psoriasis treatment.

**DISCUSSION**

Psoriasis is associated with mental health issues<sup>2,3</sup> however there are significant concerns that current pandemic will have a negative impact on the mental health of these patients. There are several factors that can impact the flareup of psoriasis, including psycho-social stress and anxiety.<sup>2,3</sup> On one side there could be a flare-up of disease due to stress and psycho-mental factors and on the other hand, there may be concerns regarding the safety of the treatment in the current pandemic leading to treatment compliance issues.<sup>6,18</sup>

Of 111 patients, 40 (36.03%) were found to have depression and 52 patients (46.84%) anxiety on the basis of their HADS score in our study. There is a higher prevalence of anxiety than depression in our study. We believe patients were more anxious due to concerns regarding COVID-19 infection.

We did comparative analysis of different treatment modalities and our study highlighted that patients on systemic conventional immunosuppressants are more anxious (23.42%) compared with patients on the biological treatment (20.72%).

In July 2020, a similar study from Czech Republic<sup>6</sup> reported more anxiety in biological patients however, this study also highlighted that around 24% of biological treated patients had anxiety. This is broadly similar to the prevalence of anxiety in biological subgroup of our study. They also had similar findings to our study, where patients on the topical treatment group had least safety concerns and anxiety levels.<sup>6</sup>

Higher anxiety levels in traditional immunosuppressants may be related to the fact that the patient perceives being immunosuppressed as high risk in relation to Covid-19<sup>21,23</sup> and this may be compounded by the fact that in the early stages of Covid-19 there was limited data available on the safety of immunosuppressants in psoriasis.<sup>22,24,25</sup> Patients had genuine concerns about the safety and whether they would be better off stopping the treatment,<sup>18,21,23</sup> which might make them more prone to develop Covid related illness. With national lockdown in the UK, initially there was little guidance available and subsequently in March 2020, British association of dermatologist published guidelines for advising these patients.<sup>25</sup>

Our study highlighted that patients on biological treatment have more depression 19.81% than patients on the conventional immune medications 12.61%. Similar findings were reported in the literature in a study in September 2018 in psoriasis patients<sup>26</sup>

where patients on biological treatment (severe psoriasis) had highest risk of depression.

It is reported in literature<sup>27</sup> that biological treatment reduces the risk of depression symptoms in psoriasis. However, our study highlighted higher incidence of depression in the biological treatment group. We believe this finding reflects additional Covid related impact on the patient's mental health.<sup>27</sup>

Additionally, with lockdown, regular face to face appointments were disrupted.<sup>28,30</sup> Immuno-suppressants and biological psoriasis patients need to attend hospitals regularly for monitoring and blood tests.<sup>30</sup> A study from Italy,<sup>28</sup> reported 80-90 percent reduction in dermatology consultations in the early stages of pandemic. In our hospital we also had significant disruptions and cancellations of regular face to face appointments and this had impact on the compliance to the treatment.<sup>28</sup> As highlighted in our study, 20 out of 111 patients (18.01%) stopped their treatment altogether because of anxiety related to their treatment and COVID-19 infection. This can then have an impact on the flare up of disease and worsening of mental health.<sup>6</sup> Therefore, treating dermatologists need to be aware of these compliance factors that may result in worsening of psoriasis in the current pandemic.

There were also concerns regarding the safety of regular attendance to receive phototherapy in the hospital for psoriasis. For narrow band UVB treatment, patients had to attend three times per week. Psoriasis patients may perceive hospitals as a high-risk area<sup>17</sup> and may not be willing to come to the hospital regularly to attend light treatment. In June 2020, a study from America reported up to 42 percent reduction in patients visiting emergency department due to concerns regarding Covid-19 exposure.<sup>17</sup>

As shown in our study, 5 out of 11 (45.45%) patients stopped attending for phototherapy due to concerns about COVID-19. This is a significant number of patients who stopped treatment. These patients needed treatment in the hospital to improve their skin as normally we proceed to phototherapy only if they have failed to topical treatment for psoriasis or patients are in the moderate to severe category. For dermatologists, this highlights the need to think differently as to how we manage patients requiring phototherapy in the current pandemic. Photo-therapy is generally considered a safe treatment however patients may be reluctant to attend healthcare facilities regularly due to anxiety of catching COVID-19 infection. This may then lead to wastage of hospital time and appointment resources.

Dermatologists also need to be conscious of the fact that certain groups of patients, like females or those having visible disease like psoriasis on the face or patients with long duration or severe disease may have more mental health issues as highlighted in our study. These patients' group may need additional support to help their skin disease and related mental health issues. Study conducted in Spain<sup>19</sup> highlighted similar high-risk group of patients in their study, where quality of life decreases with severity of psoriasis and mental health issues are proportional to severity

and distribution of psoriasis, having more impact on the female patients.

The results of our study also highlight that although patients on systemic treatment (both biological and conventional) had more anxiety and treatment safety concerns compared to patients on other treatment modalities, majority (79.99%) continued with the treatment. This finding is also similar to the published data<sup>6</sup> where despite safety concerns majority of patients continued the treatment.

Patients on the topical treatment had least mental health and compliance issues. This is in keeping with the published previous data.<sup>6,19</sup> In the current pandemic this finding is useful for the dermatologist in treating patients who want to discontinue their systemic treatment or phototherapy due to safety concerns. Optimizing the topical treatment in this scenario may be the best possible way to help these patients as there is a higher possibility that this cohort of patients will be happy to try or continue topical treatment as highlighted in our study.

## CONCLUSION

Our study gives useful insight into the mental health of psoriasis patients in the current pandemic. It identifies high-risk groups like patients on systemic treatments, female patients and those having visible disease. Patients also had concerns about phototherapy, which is generally considered a safe treatment, due to the need for regular hospital attendance. Our study will help dermatologists in managing psoriasis holistically, keeping in view compliance and mental-health issues that can arise due to the current COVID-19 pandemic.

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