# ROLE OF CLINICAL PHARMACIST IN ASSESSMENT OF MEDICATION ADHERENCE AMONG PSORIASIS PATIENTS

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**ABSTRACT**

**Aim: To study the Role of clinical pharmacist in assessment of medication adherence among psoriasis patients.**
**Objectives : The objective of the study is to assess the Impact of clinical pharmacist in improvingthe medication adherence among psoriasis patients.**
**Methodology: A cross sectional observational study was carried out for 6 months and collected a total of105 cases. The data was recorded in the specific designed standardized Performa, analysed using Microsoft Excel.**
**Results: In our study, we have collected the patient data in dermatology department outpatient. In age- wise distribution of total population, the dominant age group was 40-50 years(33.33%) followed by 29- 39 years(29.52%).In this study population(N=105), Psoriasis Vulgaris (36.1%) is the most common typeof the psoriasis observed, with least being Plantar psoriasis(1.38%) and Scalp with Guttate type(1.38%).Mean and standard deviation of MMAS-8 score at baseline was 3.81731±2.03257 and at first follow-up was 1.10577 ± 0.55590, MMAS-8 score has compared at baseline and first follow-up. Atbaseline none has high adherence, 33 patients have medium adherence and 72 patients has low adherence .At first follow- up 10 patients have high adherence, 95 patients have medium adherence and none has low adherence. The medication adherence was increased from low adherence to medium adherence mainly in the age group of 40-50years. The p -value comparison of medication adherence at baseline was 1.35 and at follow up was 0.00426.**

**Conclusion: This study helps to understand the need of a pharmacist for better medication adherence. This study had shown the positive impact among the participants which improves theoutcomes and influences greater health benefits in management of chronic diseases like psoriasis.In our study we approved a positive result of adherence, as it is increased from baseline (low adherence) to first follow up(medium adherence). Hence there is a need of clinical pharmacist in improvingthe medication adherence for better health of psoriasis patient.**

**Keywords: Psoriasis, Medication Adherence, MMAS-8, Clinical pharmacist.**

## INTRODUCTION:

Psoriasis is an autoimmune, chronic inflammatory skin disorder characterized by recurrent exacerbations and remissions of thickened, erythematous, and scaling plaques. The clinical appearance ofpsoriasis can be cosmetically disfiguring, and the disease can be physically and emotionally debilitating,especiallyfor patients with severe disease.[(1)] It actually starts underneath the skin and can range from mild to severe. Like other chronic conditions, psoriasis can be brought about by other illnesses such as cardiovascular diseases, Type 2 diabetes, and psoriatic arthritis. Psoriasis is universal in occurrence and affects nearly 7 million Americans with approximately 14 million physician visits over the 12-yearperiodfrom 1990 to 2001.The disorder occurs in all racial groups but is most prevalent in whites. It is equally common in males and females.

Psoriasis is a complex and multifactorial disease that is apparently associated with interaction between environmental factors (exogenous or endogenous antigens) and a specific genetic background. The pathophysiology of psoriasis is multifactorial and involves epidermal hyperproliferation, abnormal differentiation of epidermal keratinocytes, and inflammation with immunologic alterations in the skin. The hyperproliferation is characterized by increased DNA synthesis and a markedly decreased turnover rate for the epidermis. Abnormal keratinocytes differentiation involves increased expression of certain keratins (6 and 16) and a delay in expression of other keratins (1 and 10) that are expressed in normally differentiating skin. Inflammation results from an infiltrate of neutrophils in the epidermis and superficialdermis and an infiltrate of T lymphocytes in the dermis with a predominance of CD8+ cells 4. It is believed to result from abnormal immune system. The triggers of psoriasis are: Family history Bacterial, viral, or fungal infections Injury to the skin such as a cut or severe burn Stress, Obesity, Smoking, Alcohol abuse Vitamin deficiency Medications such as beta blockers, anti malarials, and lithium Cold weather[(2)].

Although psoriasis is a nonmalignant, hyperproliferative epidermal cell disorder, it results in accumulated, immature, excessively thickened skin that is manifested as plaques. Psoriatic lesions are relatively asymptomatic; however, pruritus is a complaint in

about 25% of patients. Severe, widespread psoriasis can involve symptomatology similar to that of exfoliative dermatitis, which can include fever and chills. In general, psoriatic lesions are characterized by sharply demarcated, erythematous papules and plaques often covered with silver-white scales. Initial lesions are usually small papules that enlarge over time and coalesce into plaques, sometimes as serpiginous or geographic forms. Psoriatic lesions varyin appearance depending on the anatomic site and the variant of psoriasis. The most common type of psoriasis is psoriasis vulgaris. Mostly by physical examination it can be diagnosed. However, tests like Biopsy, X-rays, Blood tests, Throat culture are useful to identify the type of psoriasis[3].A goal of therapyis to achieve resolution of lesions, but partial clearing is sometimes acceptable when using regimens withdecreased toxicity and increased patient acceptability [1]. Topical preparations for psoriasis includes Emollients (liquid paraffin ,mineral oils , skinetics lotion etc ) , Keratolytic agents ( coal tar ) Topical steroids, Vitamin D-like compounds, Calcium supplements, Dithranol, Calcineurin inhibitors, Tazarotenand Ultraviolet treatment like narrow ultraviolet B, Psoralen and ultraviolet A are available .Systemic non-biological and biological therapies include Methotrexate, cyclospirin, Acitretin, Apremilast, Cetirizene , Cefixime, Acrotac and Tumour necrosis factor-alpha (TNFα) inhibitors ,Interleukin 17,12 ,23(IL-17 IL-12 and IL-23 ) agents are used respectively [4].Medication adherence is defined by the World Health Organization as "the degree to which the person's behavior corresponds with the agreed recommendations from a health careprovider". Taking the medicineas prescribed or Medication Adherence is important for controlling chronic conditions , treating temporary conditions and overall long- term health and well being. Failure of Medication Adherence leads to complications of the disease such as Psoriatic arthritis, Eye conditions, such as conjunctivitis, blepharitis and uveitis ,Obesity ,Type 2 diabetes , High blood pressure and Cardiovascular diseases. Ourstudy mainly focuses on reducing the complications of psoriasis[5]. This is achieved by a proper drug compliance or Medication Adherence . So as to see the difference of medication adherence before and after the counselling received from clinical pharmacist regarding the disease, medication and life style modifications, we have used the Morisky Medication Adherence Scale-8(MMAS-8). It usually consists of 8 questions regarding intake of the medication by patients to measure their adherence to treatment .

**RESEARCH METHODOLOGY :**

**STUDY DESIGN:** Cross-sectional Observational study.

**STUDY SITE:** The present study was conducted in Department of dermatology, Government General Hospital, BudhawarpetRoad, Kurnool, Andhra Pradesh, India.

**STUDY DURATION:** 6 months (November 18 2021 to May 04 2022)

**STUDY POPULATION:** A total of 105 psoriasis patients of both genders.

**PATIENT ENROLLMENT:** Patients are randomly enrolled in the study based on inclusion andexclusion criteria.

**INCLUSION CRITERIA:**

**EXCLUSION CRITERIA:**

- Pregnancy & lactating mothers
- Not signing consent form

**STUDY MATERIALS:**

- Annexure -I (patient data collection proforma)
- Annexure-II (Morisky medication adherence scale -8)
- Annexure-III (Informed consent form)

**Ethical approval**

An institutional research ethical clearance was obtained.

**STUDY PROCEDURE:**

The study was begun with obtaining the informed consent form and selection of the subjects based on inclusion criteria and exclusion criteria followed by collection of all the required parameters of the patients using a self-prepared structural patient data collection proforma whichincludes patient demographic details, past medical history, Chief complaints, past medication history, personal habits, allergies, family history, laboratory investigations, Diagnosis, Treatment,Follow Up, MMAS-8 score. All the participants were asked to take medicines regularly during their treatment period. They were advised to come after one month after the initiation of therapy for follow-ups. During follow-up visits, the participants were thoroughly examined. Medication adherence was assessed by using the MMAS-8 questionnaire after initiation of the treatment andafter one month of therapy. MMAS-8 comprises eight questions.

**STATISTICAL ANALYSIS:**

The statistical analysis was carried out by using micro soft excel and information was subjected to descriptive statistical analysis and expressed as mean ± SD and percentages.

**RESULTS**

A cross sectional observational study was conducted in Out-patient Department of Dermatology, Government General Hospital,

Kurnool. A total of 105 subjects were recruited as per inclusion and exclusion criteria for a period of 6 months. Among 72(68.5%) were malesand 33(31.4%) were female subjects. In age-wise distribution of total population involved in this study (N=105). Majority of patients are in the age group of 40-50 years (33.33%).This was shown in table 4.

**TABLE 1 AGE WISE DISTRIBUTION OF TOTAL POPULATION**

| AGE (YEARS) | MALE | PERCENTAGE(%) | FEMALE | PERCENTAGE(%) | TOTAL PERCENTAGE(%) |
|---|---|---|---|---|---|
| **18-28** | 7 | 9.72 | 5 | 15.15 | 11.42 |
| **29-39** | | 30.55 | 9 | 27.27 | 29.52 |
| **40-50** | 22 | 30.55 | 13 | 39.39 | 33.33 |
| **51-61** | 14 | 19.44 | 5 | 15.15 | 18.09 |
| **>62** | 7 | 9.72 | 1 | 3.03 | 7.61 |
| **Total** | 72 | 99.98 | 33 | 99.99 | 99.97 |

In this study population(N=50), Hypertension was the most common co-morbid condition seenin 7(9.72%) male patients and 5(15.15%) female patients, Diabetes mellitus was seen in 2(2.77%)male patients and 2(6.06%) female patients and Hyperthyroidism was seen in 1(3.03%) female patient. Table 2 Provided the details of comorbid conditionsamong total population of this study.This was shown in table 2.

**TABLE 2 CO-MORBID CONDITIONS AMONG THE TOTAL POPULATION**

| CO-MORBID CONDITION | MALE | PERCENTAGE (%) | FEMALE | PERCENTAGE (%) | TOTAL PERCENTAGE (%) |
|---|---|---|---|---|---|
| Hypertension | 7 | 9.72 | 5 | 15.15 | 11.42 |
| Diabetes mellitus | 2 | 2.77 | 2 | 6.06 | 3.80 |
| Hyperthyroidism | 0 | 0 | 1 | 3.03 | 0.95 |
| None | 63 | 87.5 | 25 | 75.75 | 83.80 |
| Total | 72 | 99.99 | 33 | 99.99 | 99.97 |

In this population (N=105), 2(1.9%) patients were smokers, 2(1.9%) patients were alcoholic, 1(0.9%) patient was both alcoholic + smoker and remaining 100(95.2%) patients does not have any habits. This was shown in the table 3.

**TABLE 3 DISTRIBUTION BASED ON PERSONAL HABITS**

| PERSONAL HABIT | NO OF PATIENTS | PERCENTAGE (%) |
|---|---|---|
| Smoker | 2 | 1.9 % |
| Alcoholic | 2 | 1.9% |
| Alcoholic +smoker | 1 | 0.9% |
| None | 100 | 95.2% |
| Total | 105 | 100% |

**TABLE 4 MEAN AND STANDARD DEVIATION IN BASELINE AND FOLLOW UP**

| MEDICATION ADHERENCE | MEAN ±SD |
|---|---|
| Baseline | 3.81731±2.03257 |
| First follow -up | 1.10577±0.55590 |

In this population, MMAS-8 score has compared at baseline and first follow-up. Mean andstandard deviation of MMAS-8 score at baseline was 3.81731±2.03257 and at first follow-up was 1.10577±0.55590. Low score indicates higher the medication adherence. This indicates that medication adherence has increased at second follow-up. This was shown in Table 4 and figure 1.

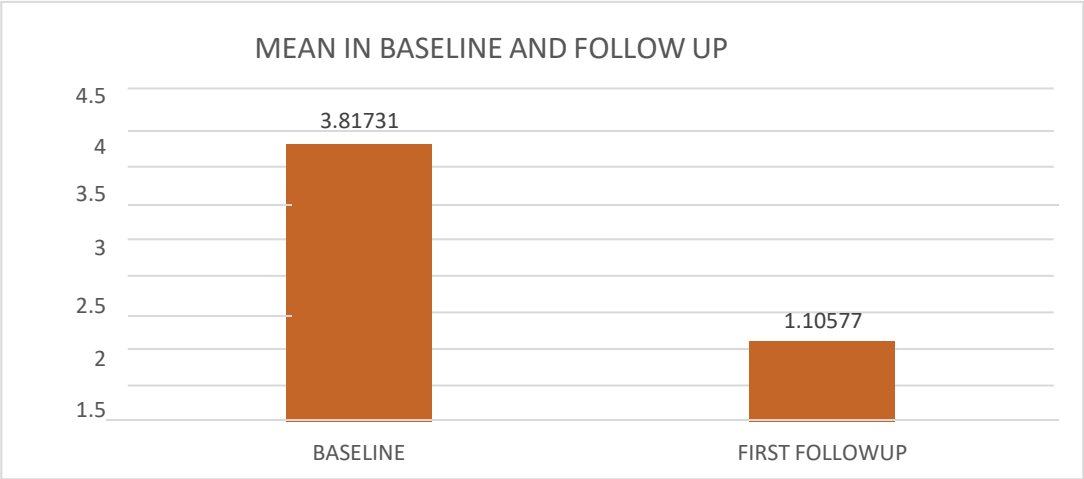


**FIGURE 1 MEAN AND STANDARD DEVIATION IN BASELINE AND FOLLOW UP**

Psoriasis vulgaris and Chronic plaque psoriasis were the most common types seen in thepatients. This was shown in Table 6.

**TABLE 6 TYPES OF PSORIASIS**

| TYPE OF PSORIASIS | NO OF PATIENTS | PERCENTAGE |
|---|---|---|
| Chronic plaque psoriasis | 14 | 19.4 |
| Psoriasis vulgaris | 26 | 36.1 |
| Palmoplantar psoriasis | 12 | 16.6 |
| Guttate psoriasis | 6 | 8.3 |
| Scalp psoriasis | 3 | 4.1 |
| Plantar psoriasis | 1 | 1.38 |
| Palmar psoriasis | 3 | 4.1 |
| Pustular psoriasis | 2 | 2.7 |
| Psoriasis vulgaris +scalp | 2 | 2.7 |
| Inverse psoriasis | 2 | 2.7 |
| Scalp+ Guttate psoriasis | 1 | 1.38 |
| Total | 75 | 99.97 |

In this study population (N=105), MMAS-8 score has compared at baseline and first follow-up. At baseline none has high adherence ,33 patients have medium adherence and 72 patients has low adherence. At first follow-up 10 patients have high adherence,95 patients have medium adherence and none has low adherence. This was shown in table 7 and figure 2.

**TABLE 7 ASSESSMENT OF ADHERENCE IN TOTAL POPULATION**

| | BASELINE | | | FIRST FOLLOW UP | | |
|---|---|---|---|---|---|---|
| | **High** | **Medium** | **Low** | **High** | **Medium** | **Low** |
| **No of patients** | **0** | **33** | **72** | **10** | **95** | **0** |

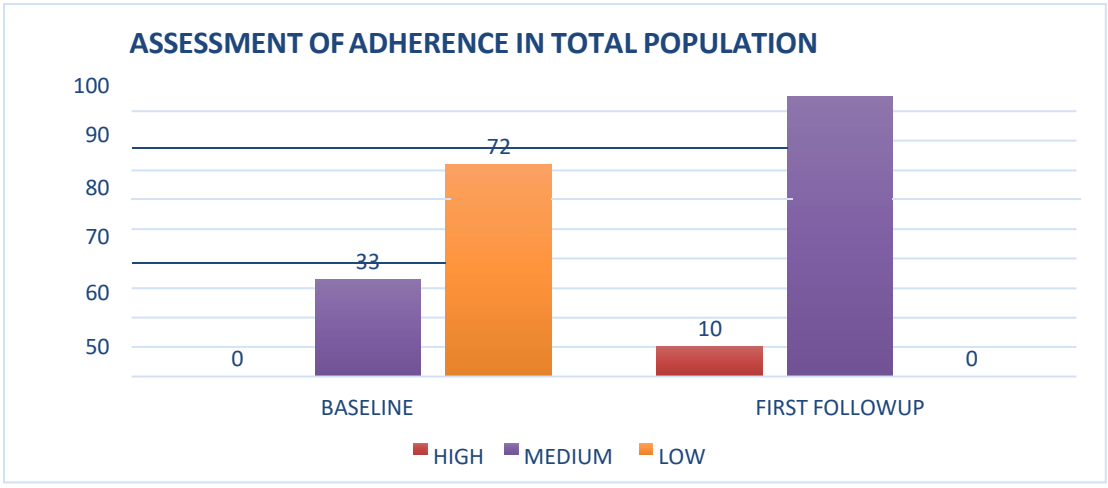


**FIGURE 2 ASSESSMENT OF ADHERENCE IN TOTAL POPULATION**

At first follow -up one patient of age group 18-28, 3 patients of age group 29-39 ,2 patients ofage group 40-50, 3 patients of age group 51-61, one patient of age group >62 has high adherence and 11 patients of age group 18-28, 28 patients of age group 29-39 ,34 patientsof age group 40-50, 15 patients of age group 51-61 had medium adherence ,7 patients of age group >62 has medium adherence and none has low adherence. According to MMAS-8, the lowscoreindicates the high adherence. This was shown in figure 3.

**FIGURE 3AGE WISE ADHERENCE IN TOTAL POPULATION**

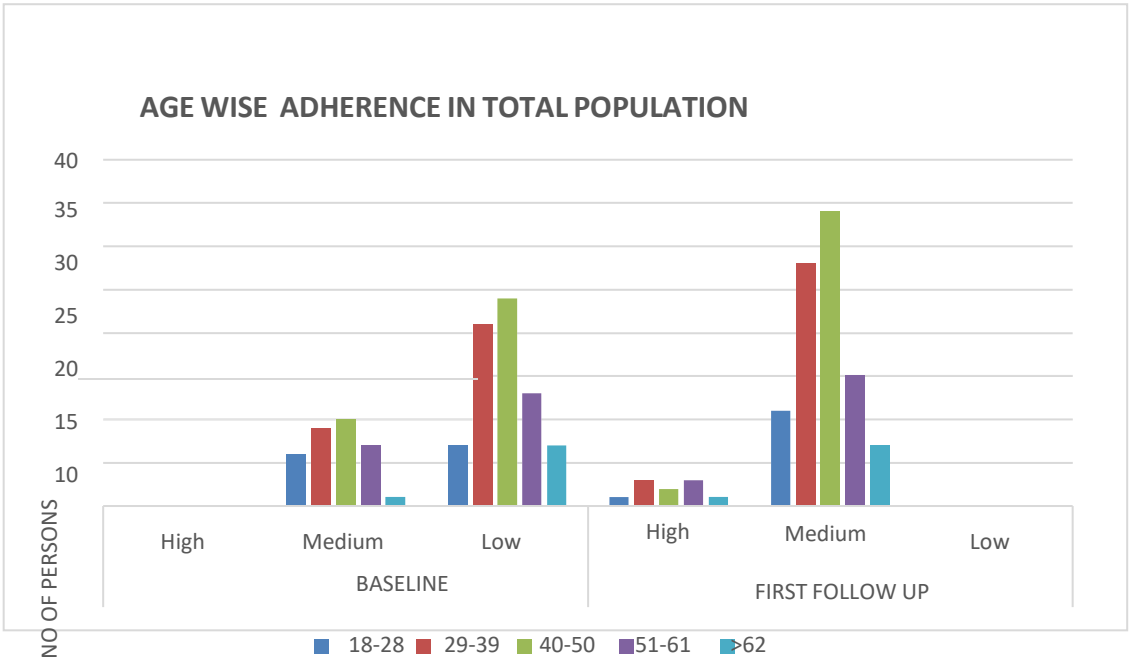

**TABLE 8 TREATMENT PROFILE IN PSORIASIS PATIENTS**

| DRUG | NO OF PATIENTS RECEIVED | PERCENTAGE % |
|---|---|---|
| Calcium | 94 | 17.24 |
| Cetirizine | 92 | 16.8 |
| Moyzen oil | 61 | 11.1 |
| Cefixime | 45 | 8.25 |
| Cap A & D | 41 | 7.52 |
| B complex | 36 | 6.6 |
| Betzee | 33 | 6.05 |
| Topisal lotion | 24 | 4.40 |
| Vitamin c | 23 | 4.22 |
| Pantoprazole | 19 | 3.48 |
| Methotrexate | 17 | 3.11 |
| HH omega | 12 | 2.20 |
| Clop s cream | 9 | 1.65 |
| Skinetics lotion | 9 | 1.65 |
| Diprobate cream | 8 | 1.46 |
| Vitamin D | 6 | 1.10 |
| Prophysalic NF3 ointment | 6 | 1.10 |
| Apremilast | 4 | 0.73 |
| Acrotac | 4 | 0.73 |
| Liquid paraffin | 2 | 0.36 |
| Total | 545 | 99.98 |

In this population(N=105), three patients were experienced adverse drug reactions. Among one patient experience oral ulcers due to methotrexate and two patient experiencenauseadue to methotrexate, the results were shown in the table.9.

**TABLE 9 ADVERSE DRUG REACTIONS OF TOTAL POPULATION**

| S.NO | NO OF PATIENTS REPORTED | ADVERSE DRUG REACTION | CAUSATIVE DRUG |
|---|---|---|---|

| | | | |
|---|---|---|---|
| **1** | 1 | Oral ulcers | Methotrexate |
| **2** | 1 | Nausea | Methotrexate |
| **3** | 1 | Nausea | Methotrexate |

In this study, the medication adherence of psoriatic patients at baseline and after one month offollow up was compared and the results was 1.35 at base line and after one month offollow up the P value of medication adherence was 0.00426, it is statistically significant. The resultswere shown in the table 10.

**TABLE 10 P-VALUE AT BASELINE AND FOLLOW UP**

| **P VALUE** | |
|---|---|
| **BASELINE** | **FOLLOW UP** |
| 1.35 | 0.00426 |

**DISCUSSION**

Total 105 patients were enrolled in this study successfully. In which, the dominant age group was 40-50years(33.33%) followed by 29-39 years(29.52%), it was in accordance with the study[6] "Treatment Adherene and Persistance of Five Commonly Prescribed Medication for Moderate to Severe Psoriasis ina U.S. Commercially Insured Population" performed by Bingcao Wu, Erik Muser et al that the dominantage group was 45-55 years and also accordance with the study [7] " Impact of Clinical Pharmcist on Medication Adherence among Psoriasis patients: A randomized controlled study" performed by Aisharya C. Hiremath, Ramesh Bhandari et al that the dominant age group was 50-59 years.According to our data, the mean age group of the patients in the study was found to be 42 years. It was found to be in accordance with the study [8] "Assesssment of Medication Adherence and Treatment Satisfaction in Japanese patients with psoriasis of various severities" performed by Susumu Ichiyama, Michiko Ito, Yoko Funasaka et al that the mean age was found to be 57.9±14.2, it was also in accordancewith the study [9] "Adherence to systemic therapy in patients with psoriasis during the COVID-19 pandemic: A multicenter study performed by IlterisOguzTopal MD, Asude Kara Polat MD et al that the 45.9±14.2.We found that the most commonly seen comorbid condition in our study is Hypertension(7), it wasin accordance with the study[6], "Treatment Adherene and Persistance of Five Commonly Prescribed Medication for Moderate to Severe Psoriasis in a U.S. Commercially Insured Population" performed by Bingcao Wu, Erik Muser et al that the commonly seen comorbid condition was Hypertension. It was alsoin accordance with the study [10], "Psoriasis patient's experiences concerning medical adherence to treat with topical corticosteriods" performed by Mathias Tiedemann, Svendsen et all that the Hypertension is commonly seen comorbid condition in their study population, the study [11], Impact of Treatment-Related Beliefs on Medication Adherence in Immune-Mediated Inflammatory Diseases: Results of the Global ALIGN Study performed by Pierre Michetti, John Weinman et al that the Hypertension is most commoncomorbid condition.According to our study data, Psoriasis Vulgaris(26) is the most common type of the psoriasis was observed.It was in accordance with the studies, ""Assesssment of Medication Adherence and TreatmentSatisfaction in Japanese patients with psoriasis of various severities" performed by Susumu Ichiyama, Michiko Ito, Yoko Funasaka et al [8] and "Improvement of health-related quality of life and adherence totreatment with calcipotriol-betamethasone dipropionte gel in patients with psoriasis vulgaris" performed by George Kontochristopoulos, Athanasios Chantzaras, et al [12] that the Psoriasis Vulgaris is the most common type observed.In our study, the P value of baseline was 1.35 and of the first follow up was 0.00426, it was in accordancewith the study [7], "Impact of Clinical Pharmcist on Medication Adherence among Psoriasis patients: A randomized controlled study" performed by Aisharya C. Hiremath, Ramesh Bhandari et al that the p valueof interventional group was 0.0001 and control group was 0.3464.In our study we got positive result as the medication adherence from baseline to first follow up is increased and it was mainly observed in the age groups of 40-50 years.

**CONCLUSION**

This study helps to understand the need of a pharmacist for better medication adherence. This study had shown the positive impact among the participants which improves the outcomes and influencesgreater health benefits in management of chronic diseases like psoriasis. In our study we approved a positive result of adherence, as it is increased from baseline (low adherence) to first follow up (medium adherence). Hence there is a need of clinical pharmacist in improving the medication adherence for betterhealth of psoriasis patient.

**LIMITATIONS:**

- ✓ Our study has certain limitations within which our findings needs to be interpreted carefully.
- ✓ This study was conducted in outpatient dermatology department for six months of time period, so itdoesn't define the exact population of psoriatic patients.
- ✓ More follow ups would have helped to understand more regarding adherence.

**RECOMMENDATIONS:**

Medication adherence plays a vital role in improving disease condition, for this the governments also should take the responsibility in appointing clinical pharmacists in various government sectors because clinical pharmacists educate the patients regarding their disease conditions, administration of medications, life style modifications and consequences of non adherence of medications.

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**ABBREVIATIONS:**

**URTI**- Upper respiratory tract infections, **PSORS-1**-Psoriasis susceptibility 1, **HLA** -Human Leukocyte Antigen, **DNA**-Deoxyribonucleic Acid, **TNF-*α***- Tumor Necrosis Factor -α, **TGF-*β***- Tissue Growth Factor-β, **IL-6**-Interleukin-6, **Th-17**-T helper 17, **KOH**- Potassium Hydroxide, **PASI**-Psoriasis Area andSeverity Index, **BSA**- Body Surface Area, **DLQI**- Dermatology life quality of index, **UV**-Ultraviolet, **TL01**-Light Treatment 01,**US**-Ultrasound, **TGA**-Therapeutic Goods Administration, **JAK**- Janus Kinase, **PDE-4**-Phosphodiesterase -4, **MMAS-8**-Morisky Medication Adherence Scale-8, **TSQM-9**-Treatment satisfaction Questionnaire for medication -9, **PDI**- Power Distance Index

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