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Original Article

Pharmacology Section

Evaluating DMARDs Adherence in Patients with Psoriasis, Psoriatic Arthritis and Rheumatoid Arthritis: A Quasi-experimental Study

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ABSTRACT

Introduction: Psoriasis (Ps), Psoriatic Arthritis (PsA), and Rheumatoid Arthritis (RA) are chronic autoimmune conditions requiring long-term pharmacological management. Medication adherence is crucial for effective disease control and improved patient outcomes. Drug-Related Problems (DRPs) and non-adherence significantly impact treatment efficacy. Disease-Modifying Antirheumatic Drugs (DMARDs) improve long-term outcomes and slow disease progression in Ps, PsA, and RA. Understanding adherence patterns helps healthcare providers address barriers to effective therapy.

Aim: This study aimed to assess medication adherence and identifies factors influencing adherence in patients suffering from Ps, PsA, and RA.

Materials and Methods: The present quasi-experimental study was conducted in KLE's Dr. Prabhakar Kore Hospital and MRC, Belagavi, Karnataka, India. The study was conducted for a period of seven months from September 2023 to April 2024) on 124 patients diagnosed with Ps, PsA, and RA. Medication adherence was measured using the Medication Adherence Rating Scale (MARS) across baseline, first follow-up (second week), and second follow-up (fourth week). Factors affecting adherence, such as demographic variables, forgetfulness, carelessness, Adverse Drug Reactions (ADRs), and polypharmacy, were analysed. Clinical pharmacists provided targeted interventions, including patient education and counselling via Patient Information Leaflet (PIL). Data were analysed using Statistical Package for Social Sciences (SPSS) v23 with Friedman and McNemar tests to assess adherence changes, using a 5% significance level (α=0.05).

Results: Of the 124 patients, 57.26% were females, and the most affected age group was 41-60 years. Methotrexate was the most commonly prescribed DMARD. Adherence improved from 54.03% at the baseline to 75.00% at second follow-up ($p<0.001^{**}$). Forgetfulness (32.25%) and carelessness (50.80%) were major barriers to adherence. Pharmacist-led interventions significantly enhanced adherence rates over time.

Conclusion: Clinical pharmacists play a crucial role in improving medication adherence through patient education and counselling. Enhancing adherence to conventional DMARDs leads to better disease management and reduced complications. Ongoing interventions, including regular follow-ups and personalised support, are essential for sustaining adherence in chronic autoimmune diseases. Improving adherence to DMARDs is vital for effective management of chronic autoimmune diseases. Clinical pharmacists play a key role through education, counselling, and ongoing patient support.

Keywords: Autoimmune diseases, Clinical pharmacist, Disease modifying antirheumatic drugs, Medication adherence, Patient counselling

INTRODUCTION

Psoriasis is a persistent (lasting) illness where skin cells proliferate excessively quickly due to an overactive immune system. Types include: Plaque, inverse, guttate, pustular, erythrodermic, scalp, nail [1]. A persistent inflammatory arthritis carried by the condition Ps is known as Psoriatic Arthritis (PsA) [2]. In adults, the prevalence of Ps is estimated to be 0.91 to 8.5%. The Ps prevalence rate is around 2-3% of the worldwide population [3]. An estimated 30% of persons with Ps develop PsA [4]. In India, 1.02% of all skin patients had Ps, with an overall incidence ranging from 0.44 to 2.2% [5]. RA is a chronic (persistent) autoimmune illness. It frequently affects both sides of the body's joints, such as both hands or both knees [6]. The worldwide prevalence rate was 208.8 instances per 100,000 population, a 14.1% increase from 1990 [7]. In India, the prevalence of RA is 0.9% of the adult population [8].

Ps treatment includes Methotrexate (MTX), Cyclosporine, Hydroxychloroquine (HCQ), adalimumab, and infliximab without Ultravoilet (UV) therapy, and Localised Ultravoilet B (LUVB), Psoralen+Ultravoilet A (PUVA), or Ultravoilet B (UVB)+MTX with UV therapy. Second-line treatment is acitretin, MTX, or UVB+biologics, while topicals include corticosteroids and calcipotriol. PsA is managed with Non Steroidal Anti-inflammatory Drugs (NSAIDs), analgesics, steroids, or DMARDs like MTX, cyclosporin, HCQ, adalimumab, infliximab, etanercept, and apremilast [9]. RA treatment involves HCQ and NSAIDs for mild cases, while moderate to severe cases may require MTX, HCQ, sulfasalazine, adalimumab, or rituximab [10].

The complex treatment of Ps, PsA, and RA increases the potential for DRPs. DRPs are events or circumstances involving drug therapy that actually or potentially interfere with desired health outcomes [11]. Types include indication without drug, drug without indication, improper drug selection, inappropriate dosage, Adverse Drug Reactions (ADR), drug interactions, failure to receive drug, non-adherence to medication [12].

Non-adherence to medications is a key DRP affecting health outcomes; adherence is essential to achieve clinical goals. World Health Organisation (WHO) defines Medication Adherence as "the degree to which the person's behaviour corresponds with

the agreed recommendations from a health care provider" [13]. Medication non-adherence occurs when a patient fails to take a prescribed medication. Challenges that hinder patients from taking their prescribed medications can occur at the patient, provider, or health system levels [14]. Factors affecting medication adherence: Lack of knowledge, complicated regimen, side effects, cost and access, forgetfulness, lack of symptom improvement, language and cultural barrier [13].

A medication adherence questionnaire helps assess how well patients follow prescribed treatments. These tools evaluate medication-taking behaviours, adherence barriers, and beliefs-individually or in combination. They offer insight into reasons behind non-adherence and guide interventions. Commonly used questionnaires include the Brief Medication Questionnaire (BMQ), Hill-Bone Compliance Scale, and Self-Efficacy for Appropriate Medication Use Scale (SEAMS). Others include the Medication Adherence Questionnaire (MAQ), Morisky Medication Adherence Scales (MMAS-4 and MMAS-8), and MARS [15].

Clinical pharmacists help bridge the gap between physicians and patients by following up and improving patient understanding of Ps and PsA. They use innovative approaches and counseling to educate patients on DMARDs' adverse effects, proper use, lifestyle changes, and treatment importance. This support enhances adherence to pharmacotherapy and overall disease management [16]. Pharmacists may greatly enhance patient medication adherence by doing medication reconciliation, which involves examining all of the patient's medications and providing feasible answers to their adherence concerns [17]. Pharmacists can save healthcare expenses by monitoring drug adherence using surveys, questionnaires and finding missed refills [18].

Previous literature has identified that poor adherence is a major challenge in managing chronic conditions like Ps. Non- adherence was more common among methotrexate. Research on medication adherence in RA, Ps, and PsA has largely focused on broader drug classes, with limited attention given to Conventional DMARD (cDMARDs) [19].

The present study specifically evaluated adherence to methotrexate, cyclosporine, and hydroxychloroquine, which have delayed therapeutic effects causing early non-compliance. Therefore, the study aimed to evaluate medication adherence and identify the factors influencing adherence in patients with Ps, PsA and RA.

MATERIALS AND METHODS

The present quasi-experimental study was conducted in the Department of Dermatology, Orthopaedics (Rheumatology) and General Medicine at KLEs Dr. Prabhakar Kore Charitable Hospital and Medical Research Centre for, Belagavi, Karnataka, India. the duration of 7 months (September 2023-March 2024). Institutional ethical clearance was obtained from the Human Ethics Committee of KLE College of Pharmacy, Belagavi (Ref No; KLECOPBGMEC/D004-2023).

Inclusion and Exclusion criteria: The study included patients diagnosed with RA, Ps, and PsA who are undergoing DMARDs therapy. Both Inpatient (IPD) and Outpatient (OPD) populations were considered. Patients above 18 years with co-morbidities were included, while pregnant or lactating women, those unwilling to participate and individuals with psychiatric conditions were excluded [Table/Fig-1].

Sample size calculation: The sample size was determined using the standard formula for estimating a single proportion with absolute precision. The calculation has been performed using SPSS Software V23.

Formula used: $n = \frac{Z^2 pq}{d^2}$ Prevalence value (p)=0.5, d=9% [19]

Expected Sample size=114

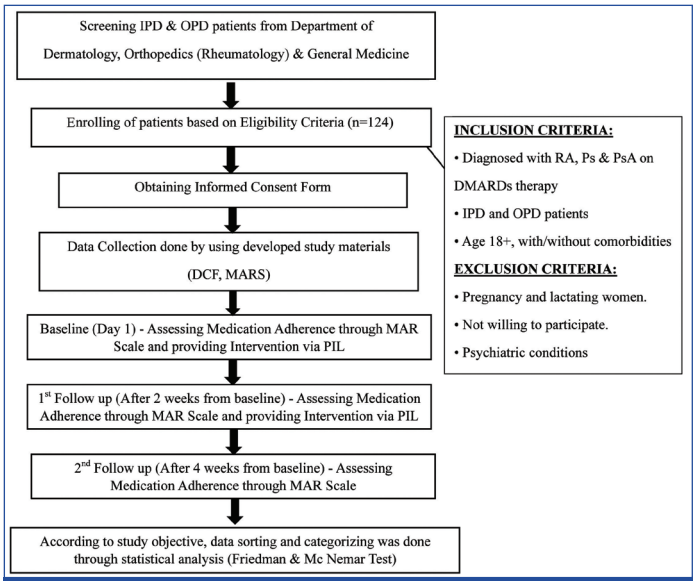
Collected Sample size=124

Study Procedure

MARS is a pre validated 10-item questionnaire used to measure compliance of Medication taking behaviour. Two pre-existing self-report compliance criteria served as the basis for this scale. The first is the Medication Adherence Questionnaire (MAQ) (Morisky, Green, and Levine, 1986); the second is the Drug Attitude Inventory (DAI) (Hogan, Awad, and Eastwood, 1983). A compliance scale has been created by combining these compliance metrics. There are ten questions in the Modified MARS, and the answers are yes or no. This questionnaire's fundamental assessment feature is how easily it may be used to evaluate results in a clinical or research settings [20].

The MARS consists of 10 items which require yes/no responses. The first 4 items (Q1, Q2, Q3, Q4) are based on the MAQ, and are scored, no=1 and yes=0. The remaining items are from the DAI and are coded as follows: Q5, Q6, Q9, Q10, no=1 and yes=0; Q7, Q8, no=0 and yes=1. A total score will then reflect a greater degree of compliance if it is high, and non-compliance if it is low.

The MARS requires permission to be used and the same has been obtained by the authors. The study assessed demographic variables (age, gender, occupation), clinical characteristics (diagnosis, co-morbidities), treatment-related data (type of DMARD therapy), and medication adherence using the MARS. Adherence was classified as adherent or non adherent, and factors influencing adherence were analysed across demographic and clinical variables. The MARS was used to measure medication adherence for all patients at three different times in time: baseline, first follow-up (second week), and second follow-up (fourth week). The Study methodology is shown in [Table/Fig-1] in the form of a flow diagram.



[Table/Fig-1]: Study methodology Data Collection Form (DCF)

The parameters evaluated included demographic variables (age group, gender, occupation), clinical characteristics (diagnosis, co-morbidities), and treatment-related data (type of DMARD therapy-monotherapy or combination). Additionally, medication adherence was assessed using the MARS questionnaire, and both adherence scores and adherence classification (e.g., adherent vs. non adherent) were analysed. Key barriers to Medication adherence were identified by comparing adherence levels across various demographic, clinical-related variables.

All collected data were systematically sorted and categorised based on the study objectives to enable effective comparison of medication adherence over time in both known and newly

diagnosed patient groups. MARS scores were analysed to evaluate the impact of interventions delivered through the Patient Information Leaflet (PIL), which included active patient education and counselling.

STATISTICAL ANALYSIS

Data was analysed using SPSS Version 23.0. Statistical tests, including the Friedman test for repeated measures and the McNemar test for paired categorical data, were used to assess changes in adherence. The level of significance was set at 5% (α=0.05) for statistical analyses. These analyses helped determine the effectiveness of the intervention and highlighted trends and factors influencing medication adherence among patients on DMARD therapy.

RESULTS

The study included 124 patients, with a higher proportion of females (57.26%) than males (42.74%). The mean age was 46.84 years, with the majority in the 41-60 years age group (42.74%). The age range of the patients was from 18 to 80 years, with the minimum age being 18 years. The most common occupations were housewives (41.94%), followed by farmers (22.58%) and others (35.48%). [Table/Fig-2].

Characteristics	Category	No. of patients (n=124)	% of patients
Gender	Male	53	42.74
	Female	71	57.26
Age groups (in years) Mean±SD: 46.84±15.07	<=20	7	5.65
	21-40	38	30.65
	41-60	53	42.74
	61-80	26	20.97
Occupation	Farmer	28	22.58
	Housewife	52	41.94
	Others (Types)	44	35.48
	Maids	12	27.27
	Autorickshaw drivers	8	18.18
	Clerks	9	20.45
	Daily wage workers	15	34.09

[Table/Fig 2]: Demographic details of patients

Among diagnoses, the majority had RA (53.23%), followed by Ps (45.16%), and Ps with PsA (4.84%). Co-morbidities were present in 34.68% of patients, with the most common being Type 2 Diabetes Mellitus (30.23%), hypertension (20.93%), and osteoarthritis (13.95%), while other conditions like polyarthritis, Chronic Liver Disease (CLD), Chronic Kidney Disease (CKD), and Hypothyroidism were present in smaller percentages. According to the DMARDs prescribed, the most commonly used Conventional Disease-Modifying Anti-Rheumatic Drugs (DMARDs) was methotrexate (57.26%), followed by HCQ (38.71%) and Cyclosporine (13.71%). Monotherapy was more common, with methotrexate (47.58%), HCQ (30.65%), and Cyclosporine (12.10%), while combination therapy was less frequent, with MTX + HCQ (8.06%) and MTX + Cyclosporine (1.61%) [Table/Fig-3].

The study highlights both adherence challenges and improvements across follow-up periods. At baseline, 70.1% of participants reported taking medication only when symptomatic, indicating inconsistent adherence. However, carelessness remained relatively stable across follow-ups (50%). At the second follow-up, 83% acknowledged the benefits of continuous medication use, and 66.1% consistently carried their medication while travelling. Only 12.3% reported feeling disoriented and 16.4% felt sluggish by the

Characteristics	Category		No. of patients (n=124)	% of patients
Diagnosis	Ps		56	45.16
	Psoriasis (Ps) and Psoriatic Arthritis (PsA)		6	4.84
	Rheumatoid arthritis (RA)		66	53.23
Co-morbidities	No		81	65.32
	Yes		43	34.68
	Types (N=43)	T2 Diabetes Mellitus	13	30.23
		Hypertension	9	20.93
		Osteoarthritis	6	13.95
		Polyarthritis	5	11.62
		CLD[1]	4	9.30
		CKD[2]	3	6.97
		Hypothyroidism	3	6.97
Monotherapy[3]	MTX		59	47.58
	HCQ		38	30.65
	Cyclosporine		15	12.10
Combination therapy	MTX+HCQ		10	8.064
	MTX+Cyclosporine		2	1.61

[Table/Fig-3]: Clinical/Treatment Characteristics details of patients.
1. Chronic Liver Disease (CLD)
2. Chronic Kidney Disease (CKD)
3. DMARDs wise distribution: Cyclosporine=17(13.41%), Hydroxychloroquine=48(38.71%) & Methorexate=71(57.26%)

second follow-up. These findings emphasise the ongoing need for patient education, counselling, and adherence support programs [Table/Fig-4].

The Friedman test showed a statistically significant difference between the follow-ups (p=0.0002), indicating that medication adherence scores changed over time [Table/Fig-5].

On comparison, the difference between Baseline and 1st follow-up was not statistically significant (p=0.2753). However, a statistically significant difference was observed between Baseline and 2nd follow-up (p=0.0001), as well as between 1st and 2nd follow-up (p=0.0002) [Table/Fig-6].

Adherence at baseline, 1st follow-up, and 2nd follow-up was 54.03%, 56.45%, and 75%, respectively. The difference between baseline and 1st follow-up was not statistically significant (p>0.05), while comparisons between baseline and 2nd follow-up, and between 1st and 2nd follow-up, showed statistically significant improvement in adherence [p<0.05] [Table/Fig-7].

The results indicate a consistent improvement in medication adherence across all DMARD categories from baseline to the second follow-up. Among them, Cyclosporine showed the highest adherence improvement (from 52.94% to 70.58%), followed by hydroxychloroquine and methotrexate. This suggests that the educational and counselling interventions provided by clinical pharmacists had a positive impact on adherence behaviour over time, regardless of the DMARD used [Table/Fig-8].

Middle-aged patients (41-60 years, 44.2%) and females (62.8%) had higher non-adherence due to responsibilities and multitasking. Polypharmacy {n=41, (33.06%)} and forgetfulness {n=40, (32.25%)} were key barriers, making adherence difficult. Carelessness (n=63,(50.80%)) was the most significant factor, highlighting the need for better medication adherence. Education, reminders, and structured medication management can improve adherence rates. Polypharmacy, assessed based on the presence of co-morbidities, was identified as a contributing factor to medication nonadherence. Individuals with multiple comorbid conditions and higher medication burden showed increased rates of non-adherence, highlighting the need for simplified treatment regimens and better medication management strategies.

Questions	Baseline N (%)		1st Follow-up N (%)		2nd Follow-up N (%)		Average N (%)	
	Yes	No	Yes	No	Yes	No	Yes	No
1. Do you ever forget to take your medication?	53 (42.7)	71 (57.2)	46 (37.1)	88 (62.9)	40 (32.2)	84 (67.7)	46.33 (37.3)	81 (62.6)
2. Are you careless at times about taking your medication?	66 (53.2)	58 (46.7)	55 (44.3)	69 (55.6)	63 (50.8)	61 (49.1)	61.33 (49.4)	62.66 (50.5)
3. When you feel better, do you sometimes stop taking your medication?	95 (76.6)	29 (23.3)	85 (68.5)	39 (31.4)	74 (59.6)	50 (40.3)	84.66 (76.6)	39.33 (31.7)
4. Sometimes if you feel worse when you take the medication, do you stop taking it?	71 (57.2)	53 (42.7)	73 (58.8)	51 (41.1)	62 (50)	62 (50)	68.66 (55.3)	58.66 (44.6)
5. I take my medication only when I am sick	91 (73.3)	33 (26.6)	91 (73.3)	33 (26.6)	79 (63.7)	45 (36.2)	87 (70.1)	37 (28.8)
6. Do you face difficulty in maintaining adherence to prescribed medications?	46 (37.1)	78 (62.9)	45 (36.2)	79 (63.7)	59 (47.5)	65 (52.4)	50 (40.3)	74 (59.6)
7. Do you always remember to carry the medications whenever you travel?	83 (66.9)	41 (33.0)	85 (68.5)	39 (31.4)	78 (62.9)	46 (37.1)	82 (66.1)	42 (33.8)
8. By staying on medication, I can prevent getting sick	100 (80.6)	24 (19.3)	104 (83.8)	20 (16.1)	105 (84.6)	19 (15.3)	103 (83.0)	21 (16.9)
9. I feel weird, like a 'strange and disoriented' on medication?	15 (12.1)	109 (87.9)	17 (13.7)	107 (86.2)	14 (11.2)	110 (88.7)	15.33 (12.3)	108.6 (87.6)
10. Medication makes me feel tired and sluggish	20 (16.1)	104 (83.8)	21 (16.9)	103 (83.0)	20 (16.1)	104 (83.8)	20.33 (16.4)	103.6 (83.6)

[Table/Fig-4]: MARS question wise response of yes and no in baseline, 1st and 2nd follow-ups.

Source	Friedman test	p-value
Follow-ups	16.5471	0.0002*

[Table/Fig-5]: Comparison of Medication Adherence Score at baseline, 1st and 2nd follow-ups.
*p<0.05

Follow-ups	Mean±SD	Mean Diff.±SD Diff.	Z-value	p-value
Baseline	5.42±1.28	0.16±1.30	1.0909	0.2753
1st follow-up	5.58±1.29			
Baseline	5.42±1.28	0.68±1.62	4.2048	0.0001*
2nd follow-up	6.10±1.25			
1st follow-up	5.58±1.29	0.52±1.45	3.7207	0.0002*
2nd follow-up	6.10±1.25			

[Table/Fig-6]: Post-hoc pair wise comparison of Medication Adherence Score in Baseline, 1st and 2nd follow-ups.
*p<0.05

DISCUSSION

In this current study 124 patients were enrolled, out of which 71 were female and 53 were male. Highest number of subjects was from age group 41-60, conventional DMARDs such as methotrexate, HCQ and Cyclosporine, were prescribed in 71, 48 and 17 patients respectively and 75% of patients showed higher adherence after intervention in 2nd follow-up. Cherukupalli H et al., conducted a study, where 100 patients were enrolled, out of which 51 were female and 49 were male. Highest number of patients were from age group 31-40, methotrexate was prescribed in 47 patients and 53% of patients showed higher adherence [19].

On comparison of medication adherence showed no significant difference between baseline and 1st follow-up (p=0.7660), while significant improvements were observed between baseline and 2nd follow-up (p=0.0001), and between 1st and 2nd follow-ups (p=0.0010).

After intervention the present study showed increased adherence to MTX from 50.70% to 63.38% and it focuses more on use of

Levels of adherence	Baseline	1st Follow-up	2nd Follow-up	Mc Nemar test between		
	N (%)	N (%)	N (%)	Baseline to 1st follow-up	Baseline to 2nd follow-up	1st follow-up to 2nd follow-up
Adherent	67 (54.03)	70 (56.45)	93 (75.00)	p=0.7660	0.0001*	0.0010*
Non adherent	57 (45.97)	54 (43.55)	31 (25.00)			

[Table/Fig-7]: Shows comparison of medication adherence among the study population at baseline, 1st and 2nd follow ups.
*p<0.05

Drugs	Adherent			Non adherent		
	Baseline	1st FU	2nd FU	Baseline	1st FU	2nd FU
Methotrexate	36 (50.70%)	41 (57.74%)	45 (63.38%)	35 (49.29%)	30 (42.25%)	26 (36.61%)
Hydroxychloroquine	28 (58.33%)	26 (54.16%)	34 (70.83%)	20 (41.66%)	22 (45.83%)	14 (29.16%)
Cyclosporine	09 (52.94%)	11 (64.70%)	12 (70.58%)	08 (47.05%)	06 (35.29%)	05 (29.41%)

[Table/Fig-8]: shows Medication Adherence with respect to DMARDs in Baseline, 1st and 2nd follow-ups.
* Patients receiving combination DMARD therapy (e.g., MTX + HCQ or MTX + Cyclosporine) were assessed collectively without separating adherence for each individual drug

In our study, forgetfulness and carelessness emerged as important patient-related factors contributing to medication nonadherence. In addition, ADRs were identified as a factor affecting medication adherence in n=6, 04.83%. Patients who reported experiencing ADRs during the course of treatment were classified under this category, indicating that the presence of side effects negatively influenced their adherence behaviour.

Age significantly affected medication adherence (p<0.05). Gender did not significantly affect medication adherence (p>0.05). Occupation had no significant affect on medication adherence (p>0.05) [Table/Fig-9].

Conventional DMARDs. Dommasch ED et al., conducted a study that found adherence to ustekinumab, etanercept, and adalimumab was more than methotrexate. The study also found that acitretin was lower compared to methotrexate. The study suggests that to fully explain the general low adherence to systemic treatments for Ps [21].

The current study mainly focuses on conventional DMARDs and adherence rate was found to be 75% after intervention was implemented for two follow-ups. Balsa A et al., carried out a study and the study's findings revealed that, the adherence was 59.1%; and Biologics were associated with higher adherence [22].

Factors affecting	No. of patients	% of patients	Chi square test	p-value
Age (years)				
<=20	1	2.32	16.44186	0.00092*
21-40	14	32.5		
41-60	19	44.2		
61-80	09	20.93		
Gender				
Male	16	37.20	2.813953	0.093448
Female	27	62.8		
Occupation				
Farmer	11	39.28	3.125	0.209611
Housewife	21	40.38		
Others	16	93.18		
Polypharmacy	41	33.06	-	
Forgetfulness	40	32.25	-	
Carelessness	63	50.80	-	
ADRs	06	04.83	-	

[Table/Fig-9]: Factors affecting medication adherence among patients.
*p<0.05

The present study consisted of factors such as carelessness (50.80%), forgetfulness (32.25%), polypharmacy (33.06%), ADRs (4.83%), hinderance due to occupation. Bharth P et al., conducted a study and evaluated the factors influencing drug adherence in RA patients. The factors were forgetfulness (88%), self-decision to stop medication disease improvement and stoppage (77%), lack of faith in the benefits of treatment (44%), poor caretaker-patient relationship (44%), cost of medication (16%) [23].

Out of 124 patients, the most affected group was individuals aged 41-60 (n=19), likely due to the onset or progression of chronic illnesses. Female patients 27are more impacted than males (n=16), possibly due to differences in healthcare-seeking behaviours, biological factors, or societal roles. Housewives are the most affected occupational group (n=21), which may result from caregiving responsibilities and limited self-care time. The common barriers are forgetfulness, affecting 40 individuals (32.25%), emphasising the need for interventions like reminders or simplified regimens. Carelessness impacts 63 patients (50.80%), likely due to low health awareness or prioritisation. ADRs affect six patients (4.83%), highlighting the importance of regular monitoring. Personalised treatment plans are crucial to minimising these risks. Polypharmacy affects 41 patients (33.06%), complicating medication adherence and outcomes. Polypharmacy due to co-morbidities further complicates chronic illness management.

Limitation(s)

This study has certain limitations that should be considered adherence was primarily assessed through self-reported measures, which are subject to recall and social desirability bias, potentially leading to overestimation. The inclusion of patients with varying disease severities and different DMARD regimens (biologics vs. conventional) may have introduced heterogeneity, affecting the uniformity of outcomes. Additionally, the absence of a control group limits the ability to attribute improvements in adherence solely to the intervention. The potential Hawthorne effect may have also influenced patient behaviour, as being observed could temporarily enhance adherence. Furthermore, the study did not evaluate the impact of improved adherence on clinical outcomes such as disease activity, symptom control, or patient-reported quality of life. Nevertheless, the findings highlight the importance and feasibility of adherence-focused interventions in routine clinical practice and provide a foundation for future studies to build upon.

CONCLUSION(S)

Through targeted interventions, including patient education, counselling, and the provision of PILs, adherence to DMARDs increased significantly over two follow-ups. The study highlights the significant role of clinical pharmacists in improving medication adherence among patients with Ps, PsA, and RA. This improved adherence not only ensures better disease management but also minimises the risk of complications and enhances patient quality of life. The study reinforces the need for collaborative healthcare approaches by integrating clinical pharmacists into multidisciplinary teams to optimise patient care. Continued efforts in patient education and regular follow-ups are essential for sustaining adherence in these chronic conditions.

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