

## Quality-of-Life Assessment in Musculoskeletal Disorder Patients, Lahore, Pakistan

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### Abstract

The prevalence rate of Musculoskeletal Disorders (MSDs) in Pakistan is 70% more than that in developed countries. This study aims to assess health outcomes in musculoskeletal patients and the role of pharmacists in educating patients to improve Health-Related Quality of Life through extended pharmaceutical services in community pharmacy practice. Patients (n=281) with different musculoskeletal disorders including rheumatoid arthritis, osteoarthritis, gout, and body pain from 10 different community pharmacies responded to questionnaires containing demographics, disease-specific, and assessment of community pharmacy practice questions. Rheumatoid Arthritis (RA) was reported by 33.1% of the patients, 24.6% reported Osteoarthritis (OA), 6% reported gout, and 35.9% reported body pain. The studied population reported moderate to severe pain and other health parameters despite taking various analgesic medications. The patients' quality-of-life scores (poor, moderate, good) were significantly associated with the population demographics and community pharmacist knowledge. Community pharmacists improve the quality of life of musculoskeletal disorder patients by prescription checking, reducing medication errors, and counseling. There is a need for more access to community pharmacies to reduce the burden on healthcare centers. Training sessions should be conducted on comprehensive pharmaceutical services to prevent medication errors.

**Keywords:** Musculoskeletal disorders (MSDs), Health-related quality of life, Quality of life, Community pharmacists, Community pharmacy practice

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### Introduction

Musculoskeletal disorders comprise over 150 diseases that affect human muscles, joints, and bones. Many factors such as age, occupation, lifestyle, and family history can add to the risk of musculoskeletal disorders. Therefore, early diagnosis and therapy monitoring by healthcare professionals can improve long-term health outcomes. According to the World Health Organization (WHO), 1.71 billion people worldwide have musculoskeletal disorders. The prevalence differs with diagnosis and age; 369 million

people are affected in South Asia. The cases of Musculoskeletal Disorders (MSDs) in developing countries will increase by 2030 [1].

The prevalence of Musculoskeletal Disorders (MSDs) in poverty-stricken patients in Pakistan is 70% more than that of developed countries. Musculoskeletal disorders increase the incumbent on hospitals and affect the patients' Quality of life (QOL). Rheumatoid arthritis affects 0.142% of people in South Pakistan [2]. Osteoarthritis affects 80 % of old females and 20 % of old males in Pakistan [3]. Gout affects men four times more than those

women in the age group 35-70 years [4]. The work-related MSD also contributes 40% of Pakistan's direct and indirect costs [5].

It was observed that medication therapy patterns require improvement in community pharmacy practice. In 2003, the WHO presented guidelines for prescribing analgesic medications to musculoskeletal disorder patients. It is a three-step approach; firstly, prescribe paracetamol, if pain persists, prescribe Non-steroidal Anti-inflammatory Drugs (NSAIDs), and lastly, prescribe an opioid analgesic for severe pain management [6, 7].

Medication non-adherence is a determinant factor for therapy failure in arthritis. Medication refilling, dispensing, and counseling at community pharmacies can influence patient medication adherence [8].

Insufficient knowledge and poor practice of community pharmacists cause ineffective patient counseling. Community pharmacists should attend patient education training programs. They should consult with clinicians to discuss the patient cases to make better patient health outcomes. There is no study conducted in Pakistan to highlight this issue [9].

In the past, community pharmacy services expanded from providing a traditional dispensing service to patient-focused services. The previous literature supported that community pharmacists had done effective interventions to promote patient health outcomes [10]. In developed countries such as the UK, 89% of the public can access community pharmacies within 20 minutes. While in the emergency, 100% of the patients can influx the pharmacies for pharmaceutical services [11]. The extended pharmaceutical services (EPS) concept is well established in higher-income countries. In Pakistan, the Extended Pharmaceutical Services (EPS) concept is completely new and undefined. The public considers pharmacies as medical stores due to the provision of traditional pharmaceutical services. Counseling services are available in the community pharmacies of big cities [12].

Studies showed the frequency of rheumatic symptoms was distributed evenly between rural and urban communities in northern Pakistan. The metropolitan cities have a 0.5% prevalence rate. The occurrence of Rheumatoid Arthritis (RA) is significantly observed in the representative population of Pakistan. Osteoarthritis (OA) was frequently seen in women, with a 4:1 female-to-male ratio [13]. It was reported that 7.9% of patients with family history, and 90.2% were chronic sufferers of rheumatoid arthritis patients [14]. The drugs most commonly used in these musculoskeletal disorders are Non-steroidal + Anti-inflammatory Drugs (NSAIDs).

This study focuses on rheumatoid arthritis, osteoarthritis, gouty arthritis, and musculoskeletal pain. The main reason to focus on these disorders is the high prevalence rate with

negligible pharmacotherapy. Our study targeted multiple community pharmacies in Lahore compared to other countries [15].

Our study aims: 1) To analyze the association of patient Quality of Life (QOL) with contributing factors of musculoskeletal disorders; 2) To assess the health outcomes improved by a community pharmacist's knowledge about Musculoskeletal Disorders (MSDs).

## Materials and Methods

### Study design

A cross-sectional, observational study was performed to evaluate community pharmacists' health outcomes and the medication use pattern in MSD patients from October 2021 to December 2021.

### Study setting

A total of 30 Community Pharmacies of Lahore were visited to conduct this study, of which 10 pharmacies participated in our research.

### Participant inclusion criteria

The study inclusion criteria were patients of different ages, visiting the community pharmacy could be new or chronic illness, having co-morbidities (Hypertension, Diabetes, Cardiovascular, and Mental Problems), and suffering from rheumatoid arthritis, osteoarthritis, gout, and overall body pain.

The population sample size for the study calculated was 227 given by the formula,

$$n = \frac{Z^2 P(1 - P)}{d^2} \quad (1)$$

Whereas  $Z=Z$  statistic for a level of confidence = expected prevalence and  $d$  = precision with a 10% margin of error, 90% confidence interval, and 70% prevalence rate of musculoskeletal disorders [16].

### Data collection

The questionnaire survey forms were distributed among pharmacies. On each visit, the patients were asked to fill out the survey form entirely and accurately without any assistance from the pharmacist. The data form comprised of four parts: I) Patient's demographics, II) Disease information related to MSD, medicines, and any other treatment, III) Patient health-related quality of life, and IV) Community pharmacy practice from the patient's point of view. The study comprised open and close-ended questions. In the disease information section, Q1, Q2, and Q6 were nominal and close-ended questions. The Q3, Q4, and Q5 were nominal and open-ended questions. In the quality-of-life section, Q1 to Q5 were ordinal and close-ended questions. In the Assessment of community

pharmacy practice, Q1 and Q5 were open-ended questions while Q2, Q3, and Q4 were nominal and open-ended questions.

**Data analysis**

Statistical analysis was executed using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics and a chi-square test of independence were used. The study presumed a 90% confidence interval, and a p-value of less than 0.1 was considered significant in statistical analyses.

**Results and Discussion**

Four hundred patients were communicated, and 281 patients responded with a 70.25% response rate. Patient demographics are presented in **Table 1**. **Table 2** highlights the medication used for rheumatoid arthritis, osteoarthritis, gouty arthritis, and body pain. Patients with various musculoskeletal conditions tended to use more Non-steroidal Anti-inflammatory Drugs (NSAIDs) 15.7% and fewer anti-gout drugs (0.4%) compared to any other medicines used. Significant differences were observed for single medicine use. **Table 3** presents the data on the patient's quality of life assessed using a questionnaire survey, and various outcomes experienced by patients were analyzed.

During The Assessment of Community Pharmacy Practice in 281 patients, 189 (67.3%) patients got the same brand of medicine as prescribed. On the other hand, 92 (32.7%) patients received the medication with alternate brands of lower costs. Only 54 (19.2%) reported the side effects or ADR from the dispensed medicine. Identification of drug therapy problems and treatment changes in musculoskeletal disorders by the community pharmacist is presented in **Figure 1**. 39 (13.9%) patients responded that pharmacists identified the drug therapy problems in their prescriptions. Out of 281 patients, 67 patients (23.8%) answered that community pharmacists had changed the treatment plan in consultation with their physicians. The 56 patients (19.9%) specified the treatment changes done by the pharmacists. In comparison, no treatment changes were done in the plan of 214 (76.2%) patients. A total of 165 patients (58.7%) have been consulted. At the same time, no counseling was done to 116 patients (41.3%).

**Table 4** displays the association between quality-of-life scoring with different parameters such as population demographics and counseling given by community

pharmacists. The males have a relatively poor quality of life (51.2%), moderate quality of life (27.1%), and good quality of life (21.7%) whereas the females have a good quality of life (34.2%), moderate quality of life (39.5%) and poor quality of life (26.3%). The counseling given at community pharmacy (complete counseling about medicine, lifestyle changes, diet changes, refer to other healthcare professionals, no counseling) presents a significant association with quality of life ( $p < 0.05$ ) while age has no significant association with quality of life.

**Table 1.** Study Population Demographics (n=281)

Variables	n (%)
<b>Gender</b>	
Female	152 (54.1)
Male	129 (49.1)
<b>Age (years)</b>	
0-21	145 (51.2)
21-40	112 (39.6)
41-60	24 (8.5)
<b>Marital status</b>	
Single	48 (17.1)
Married	228 (81.1)
Divorced	3 (1.1)
Widowed	2 (0.7)
<b>Educational status</b>	
Illiterate	83 (29.5)
Primary education	72 (25.6)
Secondary education	72 (25.6)
Higher education	54 (19.2)
<b>Employment status</b>	
Employed	114 (40.6)
Unemployed	167 (59.4)
<b>Prevalence of MSD in the population</b>	
<b>Male</b>	
Rheumatoid Arthritis	36 (27.9)
Osteoarthritis	26 (20.2)
Gouty Arthritis	13 (10.1)
Body Pain	54 (41.9)
<b>Female</b>	
Rheumatoid Arthritis	57 (37.5)
Osteoarthritis	44 (28.9)
Gouty Arthritis	4 (2.6)
Body Pain	47 (30.9)

**Table 1** shows the Population demographics and Prevalence of the four Musculoskeletal Disorders in males and females.

**Table 2.** Medication Pattern in the Studied Musculoskeletal Disorders (N = number, and % = Percentage)

Medication	Rheumatoid Arthritis	Osteoarthritis	Gout	Body Pain
	n (%)	n (%)	n (%)	n (%)
NSAIDs	8 (2.9)	11 (3.9)	3 (1.1)	22 (7.9)

Muscle Relaxants	2 (0.7)	1 (0.4)	1 (0.4)	3 (1.1)
Calcium, Vitamin D Supplement	5 (1.8)	3 (1.1)	0 (0.0)	4 (1.4)
Multivitamin	2 (0.7)	2 (0.7)	0 (0.0)	6 (2.1)
Opioid Analgesic	1 (0.4)	1 (0.4)	0 (0.0)	2 (0.7)
Antigout	0 (0.0)	0 (0.0)	1 (0.4)	0 (0.0)
Misc. Analgesics	3 (5.7)	4 (1.4)	1 (0.4)	3 (1.1)
NSAIDs, DMARDs, Corticosteroids	30 (17.1)	12 (4.3)	0 (0.0)	2 (0.7)
NSAIDs, Muscle Relaxant	9 (8.6)	6 (2.1)	1 (0.4)	5 (1.8)
Misc. Analgesics, Antigout	2 (5.7)	4 (1.4)	7 (2.5)	7 (2.5)
NSAIDs, PPI	15 (7.1)	5 (1.8)	0 (0.0)	5 (1.8)
NSAIDs, Multivitamin	17 (14.3)	10 (3.6)	2 (0.7)	14 (5)
Muscle Relaxant, Calcium, Vitamin D Supplement	0 (0.0)	0 (0.0)	0 (0.0)	4 (1.4)
Misc. Analgesic, Multivitamin	6 (14.3)	10 (3.6)	1 (0.4)	16 (5.7)
Opioid Analgesic, Multivitamin	2 (1.4)	1 (0.4)	0 (0.0)	7 (2.5)
<b>Total</b>	<b>93 (33.2)</b>	<b>70 (25)</b>	<b>17 (6.1)</b>	<b>100 (35.7)</b>

Table 2 shows the frequency of medication usage patterns in the four musculoskeletal disorders prescribed by the physician. N= Number of patients, %= Percentage.

**Table 3.** Quality of Life Parameters in the Musculoskeletal Disorder Patients

QOL	Walking n (%)	Pain/Stiffness n(%)	Sleep n (%)	Social Activities n (%)	Daily Routine n (%)
Not at all	22 (7.8)	12 (4.3)	50 (17.8)	24 (8.5)	22 (7.8)
Slightly	64 (22.8)	48 (17.1)	37 (13.2)	62 (22.1)	73 (26.0)
Moderately	125 (44.5)	65 (23.1)	66 (23.5)	71 (25.3)	73 (26.0)
Fairly	0 (0.0)	56 (19.9)	51 (18.1)	80 (28.5)	69 (24.6)
Severely	70 (24.9)	100 (35.6)	77 (27.4)	44 (15.7)	44 (15.7)

Table 3 explains the frequency of five quality-of-life parameters including Walking ability, Joint/ Muscle

Pain, Sleep Pattern, Social Activities, and Daily Routine of the studied population.

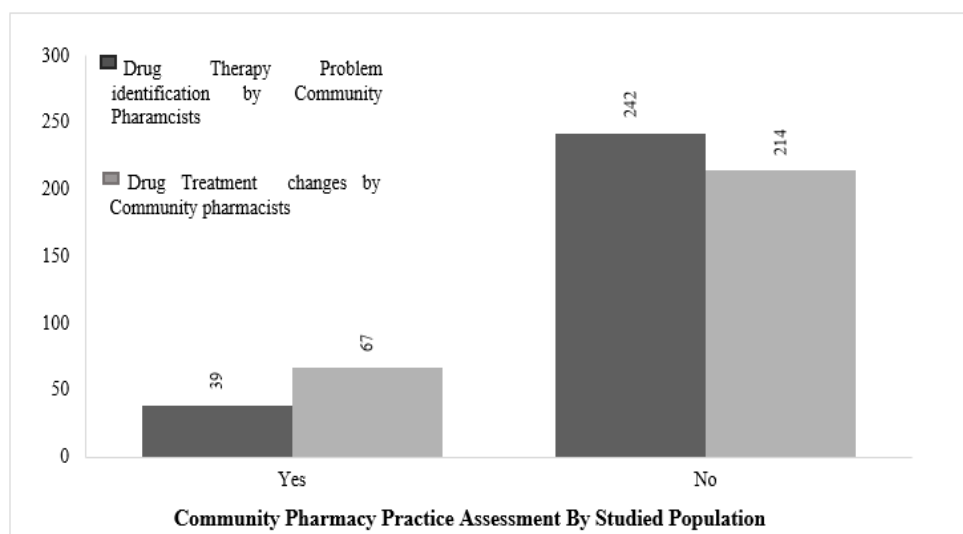


Figure 1. Identification of Drug therapy problems and Treatment changes in Musculoskeletal Disorder patients by Community Pharmacist

Figure 1 shows the community pharmacy assessment practice by the Musculoskeletal Disorder patients comprising the identification of drug therapy problems

(Yes = 242, No = 39) and treatment changes done by the community pharmacists (Yes = 214, No = 67) in their prescriptions.

**Table 4.** Represents data of participants having poor, good, or moderate QOL and significant association with MSDs

Variable	Quality of Life Scoring			p-value*
	Poor (n%)	Moderate (n%)	Good (n%)	
<b>Gender</b>				
Male	66 (51.2)	35 (27.1)	28 (21.7)	<b>0.000</b>
Female	60 (26.3)	40 (39.5)	52 (34.2)	
<b>Age</b>				
0-20	66 (45.5)	42 (29.0)	37 (25.5)	<b>0.054</b>
21-40	34 (30.4)	45 (40.2)	33 (29.5)	
41-60	6 (25.0)	8 (33.3)	10 (41.7)	
<b>Education</b>				
Illiterate	8 (9.6)	33 (39.8)	42 (50.6)	<b>0.000</b>
Primary	17 (23.6)	32 (44.4)	23 (31.9)	
Secondary	45 (62.5)	17 (23.6)	10 (13.9)	
Higher	36 (66.7)	13 (24.1)	5 (9.3)	
<b>Employment</b>				
Employed	68 (59.6)	31 (27.2)	15 (13.2)	<b>0.000</b>
Unemployed	38 (22.8)	64 (38.3)	65 (38.9)	
<b>Marital Status</b>				
Single	32 (66.7)	15 (31.2)	1 (2.1)	<b>0.000</b>
Married	74 (32.5)	77 (33.8)	77 (33.8)	
<b>Co-morbid Conditions</b>				
Diabetes	6 (26.1)	9 (39.1)	8 (34.8)	<b>0.000</b>
Hypertension	9 (18.8)	22 (45.8)	17 (35.4)	
Diabetes, Hypertension	1 (5.9)	4 (23.5)	12 (0.6)	
Cardiovascular Diseases	3 (27.3)	2 (18.2)	6 (54.5)	
Hypotension	0 (0.0)	3 (75.0)	0 (25.0)	
Nil	87 (48.9)	55 (30.9)	36 (20.2)	
<b>Counselling Given at Community Pharmacy</b>				
Complete counseling about medicine	30 (40)	26 (34.7)	19 (25.3)	<b>0.003</b>
Lifestyle changes	22 (61.1)	11 (30.6)	3 (8.3)	
Diet changes	5 (33.3)	4 (26.7)	6 (40)	
Refer to other healthcare professionals	11 (57.9)	5 (26.3)	3 (15.8)	
No counseling	26 (22.4)	43 (37.1)	47 (40.5)	
Lifestyle changes, Diet Changes	6 (75)	1 (12.5)	1 (12.5)	
Lifestyle changes, Refer to other healthcare professionals	6 (50)	5 (41.7)	1 (8.3)	

Table 4 describes the musculoskeletal disorder population data with three Quality of life Scores (Poor, Moderate, Good). \*p-value based on Chi-square test of independence with gender, education status, employment, marital status, co-morbid conditions, and counseling given at community pharmacies as significant association with quality of life. In the present study, the majority of the pharmacists provided traditional pharmaceutical services, especially dispensing and counseling community-dwelling patients with chronic musculoskeletal disorders. The pharmacists' counseling points have significantly impacted the patient's quality of life assessed through the mobility parameters, pain, and sleep patterns. The cohort of enrolled ambulatory

MSD patients has given information about prescribed and over-the-counter musculoskeletal disorder treatment medications in the community setting. It has been observed that the drug therapy problems identified by the community pharmacists were associated with the low health status of patients. This study indicated an association between community pharmacists' knowledge and patient quality of life.

The studies done previously in Pakistan identified the practice gap of community pharmacists in primary health care services. Despite their status, the difference in community pharmacy practice in developed countries can relate to the healthcare system infrastructure, resources,

and excellent quality of community pharmacy services [12]. In studies conducted in the USA, the pharmacist can contribute to improving patient health outcomes in the community pharmacy practice through various community-based patient care services such as medication optimization, wellness and prevention, acute and chronic care management, and counseling [17]. Additionally, musculoskeletal disorder patients require many complementary therapies such as lifestyle and dietary changes for long-term treatment [18].

The previous clinical trials demonstrated that patient education, interventions, and disease management programs can minimize arthritis-related problems. The earlier wellness programs can improve 20-50% of arthritis symptoms by reducing the 40% of physician visits in rheumatoid arthritis patients [19]. Similar to the findings, [20] reported that 83.6% of community pharmacists could not review the prescriptions in China, and their little knowledge led to the worst patient counseling. In India and Pakistan, the profession of community pharmacists is striving. Due to insufficient legislation control, modern pharmacy services are still undergoing to meet the challenging needs of current medicine procurement, dispensing, and use [21].

Many pieces of research indicated that pharmacy culture in several countries is reluctant to change pharmacy practice due to time, funding, and limited support. Pharmacists lack the confidence to take responsibility and to adapt to changes in the community pharmacy careers to accept new challenges [22]. The literature disclosed various recommendations; including the presence of a graduate pharmacist at each community pharmacy, strengthening national medicine regularity authority for the training of pharmacists, and compulsory professional development programs for community pharmacies [23]. The higher prevalence of Musculoskeletal disorders among married household women showed that household work could be an alarming sign leading to the progression of Musculoskeletal Disorders (MSDs) among women. Working females were also inclined towards Musculoskeletal Disorders (MSD) because of stationary posture for a significant duration with many workable hours, pressure, and sleep disturbances [24].

This study exhibited the poor quality of life in patients having generalized body pain and better quality of life in rheumatoid arthritis patients. In the Thai population, patients with Rheumatoid Arthritis (RA) had a higher Health-related Quality of life (HrQOL) as compared to the patients with less severe mobility problems [25]. The delay in getting treatment for Musculoskeletal Disorder (MSD) led to significant immobility and functional deprivation in the later years of life [26]. The prognosis of Rheumatoid Arthritis (RA) has improved dramatically due to the introduction of new therapies, including Disease

Modifying Anti-rheumatic Drugs (DMARDs), early treatment, and the treat-to-target strategy [27].

Moreover, the results showed that males had a lower level of Quality of life (QOL) index than females. Research showed that Quality of Life (QOL) was associated with work-related musculoskeletal disorders in male workers. It included physical and psychological factors, extreme body postures, insufficient recovery time, cold temperatures, monotonous work, time pressure, and increased workload [28].

The limited mobility due to Musculoskeletal disorders in older patients was also aggravated by other co-morbid conditions. These patients had limited mobility, and this restriction led to other ill-health conditions such as obesity, diabetes, or cardiovascular disorders. In war veterans, arthritis was related to diabetes, obesity, and cardiovascular co-morbidities [29].

The higher socioeconomic status led to higher chances of getting work-related musculoskeletal disorders. Similar to the study conducted, higher education and higher income levels were also associated with poor quality of life [30]. The musculoskeletal disorder patients included in this study had a relatively lower health-related quality of life than healthy individuals [30].

The majority of patients had moderately affected walking ability. Their social activities, hobbies, daily routine, and sleep were also concerned indirectly. This study revealed that medications taken were not thoroughly treating the disease, or these patients needed more time to recover. Modifications in Musculoskeletal disorder (MSD) treatment should be recommended for such patients. Despite the availability of treatment-effective medicines, the MSD burden on health care is increased. Consistently, most patients might not take their medications properly due to improper counseling, poor adherence, and adverse effects. The patient's health-related quality of life can be improved through pharmacist counseling and patient compliance with therapy monitoring.

### *Strengths and limitations*

The survey provides key information about the relationship between community pharmacists' knowledge of musculoskeletal disorders and patient health-related quality of life in community pharmacy practice. The advantage of this quantitative-based research enables comprehensive data collection that provides valuable insights and an in-depth understanding of the pharmacist's role in determining the health assessment outcomes of these patients. This study is also the first survey to perform studies on the health status of Musculoskeletal Disorder (MSD) patients at community pharmacies in Lahore, Pakistan.

One of the limitations observed in the study is the education status and limited time for giving valuable data

to pharmacists' patients. The limitation was rectified by the supplementary staff present in the pharmacy.

## Conclusion

The study concluded that effective community pharmacy practice enhances the quality of life in musculoskeletal disorder patients. Community pharmacists have potential career growth and ample opportunities to proactively participate in primary health care by polishing their pharmaceutical care skills for long-term diseases like Musculoskeletal Disorders (MSDs). In Pakistan, public awareness is necessary for improved access to community pharmacies to optimize patient health outcomes. Community pharmacists must be entertained for the training programs organized by national health authorities to provide extended pharmaceutical services and traditional dispensing services in Pakistan.

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**Conflict of interest:** None.

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**Ethics statement:** This is an observational study. The review board of the institution of the University of Veterinary and Animal Sciences analyzed the study protocol and confirmed that no ethical approval is required.

Informed consent was obtained from all individual participants included in the study.

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