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Evaluation of Community Pharmacist's Knowledge, Attitudes, and Practices Regarding the Pharmacotherapy Management of Gouty Arthritis in Lahore, Pakistan

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Gouty arthritis is a prevalent but frequently misdiagnosed condition particularly in developing countries. As a medical expert pharmacists are essential to patient medication management, patient education, and treatment protocol adherence but insufficient information is present on related to gouty arthritis in Pakistan.
Objective: The purpose of the study is to evaluate retail pharmacists (KAP) knowledge, attitude, practices regarding gouty arthritis in Lahore community pharmacies. It also examines the relationship between KAP scores and demographic characteristics finding gaps in pharmacist knowledge and treatment of arthritis.
Methods: A study with a cross-sectional design was carried out on retail pharmacists working in community pharmacies throughout Lahore. Data on their knowledge attitude and practice regarding gouty arthritis were gathered using a structured questionnaire. The data were summarized using descriptive statistics. The Kolmogorov-Smirnov test evaluated normality, in addition to measures of skewness and kurtosis. Statistical analysis involved Fishers exact test and the Chi-square test to ascertain relationships between KAP scores and demographic factors. Effect size was measured using Cramer's V and Phi-square.
Results: There is no significant association between demographics of pharmacists and knowledge. There is no association between our study variables and attitude. The post-hoc comparison of p values of different demographics shows no association with the practice regarding gouty arthritis.
Conclusion: Despite their generally positive attitudes toward patient care community pharmacists have a notable knowledge gap regarding gouty arthritis. Enhanced training and education are required to improve community pharmacies handling of gout. Limitation such as sample size and response bias should be addressed in future research.

Keywords: Gouty arthritis; pharmacist; community pharmacies; retail pharmacists; Pakistan; Lahore; chi square test; fisher's exact test; phi-square; pharmacy practice.

1. INTRODUCTION

Gout is the inflammatory arthritis with prevalence of 2-4 percent worldwide, mainly in men of age over 40 and in those people underlying with such comorbidities such as obesity, diabetes hypertension, coronary artery disease, or metabolic diseases etc. [1].

Gout also referred to as gouty arthritis is a severe type of arthritis brought on by the buildup of uric acid crystals in the joints which causes excruciating inflammation. The onset of gout is caused by excess or insufficient excretion of uric acid as a result of the body's metabolism. Alcohol seafood and red meat are among the foods that contain uric acid a byproduct of purine metabolism. Normal kidney excretion of uric acid occurs when it dissolves in blood. But uric acid builds up and forms sharp urate crystals that settle in the joints when the kidneys cannot excrete enough of it which causes inflammation and the excruciating flare-ups of gout [2]. Gout is caused by a combination of immune and non-immune pathways. When MSU crystals are deposited on mononuclear cells they activate the NLRP3 inflammasome which causes pro-inflammatory cytokines like interleukin-1 beta (IL-1β) to be produced. The excruciating acute gout flare-ups are caused by this inflammation [3]. In addition, non-inflammasome pathways also play a role involve the recruitment of neutrophils and the release of other inflammatory mediators [4].

Numerous genetic variations have been found to impact the metabolism of uric acid and its accumulation in the joints. One of the key genes involved is SLC2A9 which codes for a urate transporter involved in the reabsorption of uric acid in the kidney. Urate transporter ABCG2 encodes a gene that affects both the absorption and excretion of uric acid. Variants in this gene are linked to altered uric acid levels and an increased risk of gout. Variants in this gene have been connected to increased serum uric acid levels and gout susceptibility [5]. Genetic research has also revealed differences in purine metabolism-related genes like PRPS1 which impact uric acid production and raise the risk of gout [6].

Poor management of gout can result in severe complications. The development of urate kidney stones which can impair renal function, and chronic joint damage that can lead to deformities and tophi which are hard deposits of uric acid

crystals under the skin are a few causes [7]. If untreated the chronic nature of gout can have a major negative effect on a patient's quality of life [8].

When talking about the prevalence the gout has become much more common in recent years. Globally gout was estimated to affect 55.8 million people in 2020 this is a 22.5% increase since 1990. With a ratio of 3:26 the prevalence is noticeably higher in men than in women and rises with age. In 2020 the age-standardized prevalence worldwide was 659.3 cases per 100000 people. It is anticipated that this pattern will persist with estimates suggesting that by 2050 there may be 95.8million cases of gout worldwide [9,10]

Controlling acute flare-ups and preventing recurrences through long-term management are the two main goals of gouty arthritis treatment. Anti-inflammatory medications such as NSAIDs, corticosteroids, and, colchicine are frequently used in acute management to lessen pain and inflammation. To enhance its effectiveness during acute attacks colchicine is frequently combined with NSAIDs. Colchicine for example is useful in reducing inflammation brought on by urate crystals [11]. Corticosteroids are also frequently used particularly in situations where NSAIDs are intolerable or contraindicated [12].

The main objective of long-term management is to lower uric acid levels. ULTs like febuxostat and allopurinol are often prescribed to lower the risk of joint damage from chronic gout and to prevent flare-ups in the future. Inhibiting xanthine oxidase an enzyme involved in the synthesis of uric acid is how these drugs function [7].

Important roles are also played by dietary and lifestyle changes in the treatment of gout. Patients are recommended to restrict their intake of foods high in purines like red meat and seafood and to abstain from excessive alcohol use especially beer. In order to manage related comorbidities like obesity and hypertension and lower the risk of recurrent gout attacks weight loss and regular exercise are advised [12].

2. MATERIALS AND METHODS

The current research study is conducted to assess the (KAP) knowledge, attitude, and practice of retail pharmacists regarding gouty arthritis in community pharmacies in Lahore, Pakistan. Data is collected from different areas of Lahore. Lahore is the one of the largest and most important cities of Pakistan. In this cross-sectional observational studies data is collected from registered pharmacists practicing in community pharmacies in Lahore. Around 71 pharmacists participate in this research out of which males are 36 and females are 35. Participants of this research are freely agreed to take part in this research and given consent form attached prior to the data collection form. The data collection form consists of different sections, including Pharmacist demographics, knowledge section, Attitude section and Practice section, all of the sections contain series of questions. The pharmacist demographics include the name of pharmacist, age, gender, year of graduation, their specialization, nature of their job, years of experience, average working hours per week, location of workplace, their proficiency in using technology in daily work. The second section contains fifteen questions, all the questions are related to disease its screening, first line of treatment, treatment priority, drugs used in treatment of gout, their doses, maximum doses, treatment suggestions, management of gout, complications and contraindication, suggestion from pharmacist and non-pharmacological treatment of gout to check the knowledge of pharmacist on gouty arthritis. The third portion is attitude section, consist of thirteen questions, this section includes Likert-type attitude scale against the questions related to pharmacist suggestions and recommendations as well as the personal understanding of pharmacist in improving the treatment and counselling related to gouty arthritis. The last section is practice section which include thirteen questions, this includes Likert-type Practice Scale against the statements of personal practices in community pharmacy of a pharmacist. This section focuses on the personal habits of counselling, management and practices of a pharmacist in community pharmacy.

Inclusion criteria: This study includes licensed pharmacists working on community pharmacies, data collection forms are collected from different pharmacies across the city. The questionnaire is given to those pharmacists who were agreed to the consent form.

Exclusion criteria: Pharmacists working in other than community setting is excluded from the studies. Pharmacists who are not licensed, are excluded from the studies. Pharmacists who do not agreed to the consent form are excluded from the studies.

Statistical analysis: A validated questionnaire was used to collect the data in categories from the respondents. In our current study the significant p- value < 0.05. The Kolmogorov-Smirnov test, Kurtosis, and Skewness were used to analyze the novelty of data. The Chi Square test and Fisher's exact test were used to evaluate the data statistically. In addition, Phi square and Cramer's V rule were used to calculate the effect size.

3. RESULTS

Community pharmacists, hospital pharmacists, clinical pharmacists and pharmacy manager participated in this study. The community pharmacists have higher participation rate than others. About 49.3% of female's pharmacists and 50.7 % male pharmacists participated in this study. The greatest proportion of the pharmacists was in the age group of 20- 30 years (85.9%). Most of the pharmacists participated in this study have graduated after 2020 (63.4%) and most of them had an experience of <5 years (80.3%) Further demographic information of respondents is given in (Table 1).

The community pharmacists have 9.7% adequate knowledge about gouty arthritis. About 11.1% of male pharmacists have adequate knowledge towards gouty arthritis. More information regarding knowledge of pharmacists about gouty arthritis is given in (Table 2).

Table 1. Demographic information of respondents

Gender	
Male	36(50.7)
Female	35(49.3)
Age	
20-30 years	61(85.9)
31-40 years	9(12.7)
Above 40 years	1(1.4)
Year of graduation	
2000-2010	2(2.8)
2011-2020	24(33.8)
After 2020	45(63.4)
Specialization	
Yes	29(40.8)
No	42(59.2)
Years of experience	
<5 years	57(80.3)
5-10 years	11(15.5)
>10 years	3(4.2)
Nature of job	
Community pharmacist	62(87.3)
Hospital pharmacist	2(2.8)
Clinical pharmacist	2(2.8)
Pharmacy manager	5(7.0)
Numbers of working hours	
<8 hours	34(47.9)
8-10 hours	36(50.7)
> 10 hours	1(1.4)
Location of workplace	
Urban	71(100)
Rural	0(0.0)
Use of technology	
Proficient	43(60.6)
Very proficient	15(21.1)
Somewhat proficient	13(18.3)
Not proficient	0(0.0)

Table 2. knowledge of pharmacists about gouty arthritis

Variable	Adequate	Non adequate	p-value
Gender			
Male	4(11.1)	32(88.9)	0.966
Female	4(11.4)	31(88.6)	
Age			
20-30 years	7(11.5)	54(88.5)	0.937
31-40 years	1(11.1)	8(88.9)	
Above 40 years	1(100)	0(0.0)	
Year of graduation			
2000-2010	0(0.0)	2(100.0)	0.864
2011-2020	3(12.5)	21(87.5)	
After 2020	5(11.1)	40(88.9)	
Specialization			
Yes	2(6.9)	27(93.1)	0.447
No	6(14.3)	36(85.7)	
Years of experience			
<5 years	7(12.7)	50(87.7)	0.233
5-10 years	0(0.0)	11(100)	
>10 years	1(33.3)	2(66.7)	
Nature of job			
Community pharmacist	6(9.7)	56(90.3)	0.079
Hospital pharmacist	1(50)	1(50)	
Clinical pharmacist	1(50)	1(50)	
Pharmacy manager	5(100)	0(0.0)	
Numbers of working hours			
<8 hours	3(8.8)	31(91.2)	0.018
8-10 hours	4(11.1)	32(88.9)	
> 10 hours	1(100)	0(0.0)	
Location of workplace			
Urban	8(11.3)	63(88.7)	0.001
Rural	0(0.0)	0(0.0)	
Use of technology			
Proficient	3(7.0)	40(93.0)	0.105
Very proficient	4(26.7)	11(73.3)	
Somewhat proficient	1(7.7)	12(92.3)	
Not proficient	0(0.00	0(0.0)	

Table 3. Attitude of pharmacists on gouty arthritis

Outcome variables	Mean (SD)	95% confidence interval C.I		t-statistical (df)	p-value
		Lower bounds	Upper bounds		
Gender					
Male	0.72±0.45	0.566	0.85	0.97	0.756
Female	0.68±0.52	0.50	0.86		
Age					
20-30 years	0.67±0.50	0.54	0.79	0.59	0.391
31-40 years	0.88±0.33	0.63	1.00		
Above 40 years	1.0±0.0	1.00	1.00		
Year of graduation					
2000-2010	1.00±0.00	1.00	1.00	0.38	0.685
2011-2020	0.70±0.46	0.52	0.88		
After 2020	0.68±0.51	0.53	0.83		
Specialization					
Yes	0.55±0.50	0.36	0.74	5.02	0.028
No	0.80±0.45	0.67	0.94		
Years of experience					
<5 years	0.73±0.48	0.61	0.85	2.17	0.122
5-10 years	0.45±0.52	0.12	0.77		
>10 years	1.00±0.00	1.00	1.00		
Nature of job					
Community pharmacist	0.70±0.49	0.58	0.82	1.13	0.340
Hospital pharmacist	1.00±0.00	0.00	1.00		
Clinical pharmacist	1.00±0.00	0.00	1.00		
Pharmacy manager	0.40±0.54	0.00	1.00		
Numbers of working hours					
<8 hours	0.73±0.44	0.58	0.87	0.35	0.706
8-10 hours	0.66±0.53	0.50	0.83		
> 10 hours	1.00±0.00	1.00	1.00		
Location of workplace					
Urban	0.70±0.48	0.57	0.81		
Rural	-	-	-		
Use of technology					
Proficient	0.67±0.47	0.53	0.80	0.66	0.518
Very proficient	0.66±0.61	0.35	0.94		
Somewhat proficient	0.84±0.37	0.61	1.00		
Not proficient	**-**				

Table 4. Practice of pharmacists on gouty arthritis

Outcome	Mean (SD)	95% confidence interval C.I		t-statistical (df)	p-value
variables		**Lower limit**	**Upper limit**		
Gender					
Male	0.22±0.54	0.06	0.43	2.28	0.135
Female	0.42±0.60	0.23	0.63		
Age					
20-30 years	0.36±0.60	0.21	0.51	0.88	0.419
31-40 years	0.11±0.33	0.00	0.35		
Above 40 years	0.00±0.00	0.00	0.00		
Year of graduation					
2000-2010	0.00±0.00	0.00	0.00	0.69	0.503
2011-2020	0.41±0.65	0.16	0.70		
After 2020	0.28±0.54	0.13	0.46		
Specialization					
Yes	0.20±0.41	0.07	0.35	2.02	0.159
No	0.40±0.66	0.20	0.63		
Years of experience					
<5 years	0.33±0.57	0.18	0.48	0.49	0.162
5-10 years	0.36±0.67	0.00	0.81		
>10 years	0.00±0.00	0.00	0.00		
Nature of job					
Community pharmacist	0.30±0.58	0.17	0.46	1.17	0.328
Hospital pharmacist	0.00±0.00	0.00	0.00		
Clinical pharmacist	1.00±0.00	1.00	1.00		
Pharmacy manager	0.40±0.54	0.00	1.00		
Numbers of working hours					
<8 hours	0.25±0.64	0.16	0.59	0.82	0.44
8-10 hours	0.27±0.51	0.11	0.45		
> 10 hours	1.00±0.00	1.00	1.00		
Location of workplace					
Urban	0.32±0.58	0.19	0.46	-	-
Rural	-	-	-		
Use of technology					
Proficient	0.32±0.64	0.14	0.53	0.14	0.86
Very proficient	0.26±0.45	0.07	0.50		
Somewhat proficient	0.38±0.50	0.26	0.52		
Not proficient	0.32±0.58	0.19	0.47		

Table 3 shows that gender, age, year of graduation, specialization, years of experience, nature of job, number of working hours and use of technology has no significant difference. ($p > 0.05$) on the attitude of community pharmacists, hospital pharmacists, clinical pharmacists and pharmacy manager.

Table 4 summarizes that gender, age, year of graduation, specialization, years of experience, nature of job, number of working hours and use of technology has no significant difference. ($p > 0.05$) on the practice of community pharmacists, hospital pharmacists, clinical pharmacists and pharmacy manager.

4. DISCUSSION

Modern research assesses knowledge, attitude and exercise of retail pharmacists regarding gouty arthritis in community pharmacies and the findings found out that pharmacists normally lacked adequate understanding about gouty arthritis, with only 9.7% of community pharmacists demonstrating enough understanding furthermore, there were no significant findings in attitudes based on gender, age, years of training, or process nature, indicating a substantial gap in awareness throughout the profession. A similar study was conducted among 323 participants in Dar es Salaam, Tanzania revealed that the knowledge regarding gouty arthritis among those populations is poor and low [13].

In the present research the greatest proportion of the pharmacist are between the age 20 to 30 years and the study from the Chinese population shows that the population over 30 usually had poor knowledge, practice and attitude regarding the gout which makes it difficult for the treatment and prevention of such disease [14].

The present research emphasizes the need for more desirable education and training for pharmacists, in managing continual situations like gouty arthritis. Addressing the information gaps could enhance affected person outcomes and the general best of care furnished through community pharmacies in Lahore. Future studies ought to address obstacles together with response bias and small sample sizes to provide an extra comprehensive expertise of pharmacists' skills in managing gout.

In this research, it is found that only 9.7% of pharmacists proven expertise of gouty arthritis and its control, a drastically lower percent than expected. This aligns with broader findings in studies where pharmacists, especially the ones in community settings, regularly lack the important expertise of gout remedy protocols. as an instance, a observe found out that 63% of pharmacists had been unaware that first-line therapy for gout entails both a xanthine oxidase inhibitor and a prophylactic agent [15]. Moreover 22.5% of pharmacists knew that colchicine ought to be used continuously for 6 months after beginning urate-lowering therapy [15] despite these low levels of awareness the educational interventions have proven effective. One study showed that video tutorial significantly improved pharmacists understanding of gout management, especially regarding the role of colchicine during the start of urate lowering therapies. After the intervention 84% of pharmacists correctly identified the need of continued colchicine use, compared to only 36% in the control group [16].

This shows the importance of targeted education which fills the gap and empower the pharmacists to manage and assist patients of gouty arthritis.

5. LIMITATIONS

Studies on the knowledge, attitude and practice of retail pharmacists related to gouty arthritis in Lahore may as well encounter several limitations. Sample size and representativeness can affect the validity of the findings if the surveyed pharmacists do no longer reflect the broader population. Response bias is a concern as pharmacists might offer socially acceptable. Variability in training and experience among pharmacists can cause inconsistent responses. Access to updated statistics on gouty arthritis might vary among pharmacists affecting their knowledge and practices. Cultural and regional differences may want to influence findings making them less applicable to other regions. In addition to other factors such as workload and useful resource availability can affect pharmacists' capability to update themselves of the latest trends.

6. CONCLUSION

In conclusion, this study highlights the significant knowledge gaps among community pharmacists in Lahore regarding the treatment of gouty arthritis, despite their active involvement in patient care. With only 9% of pharmacists demonstrating sufficient understanding of the condition, and a workforce largely composed of individuals with less than five years of

experience, it is clear that more comprehensive education and training are needed. Although there were no significant differences in attitudes or practices based on demographic factors, pharmacists with greater expertise and longer working hours exhibited slightly better knowledge and attitudes. By addressing these gaps through targeted education, community pharmacies could enhance their ability to manage gouty arthritis effectively, ultimately benefiting patients with this chronic condition. Future studies should consider factors such as response bias and sample size to provide a more complete understanding of pharmacists' capacity to treat gout.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of this manuscript.

CONSENT

As per international standards or university standards, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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