

Relation between Knowledge, Medication Adherence, and Quality of Life, among gouty arthritis patients

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Abstract: Background: Gout is actually a form of arthritis. It is the body's reaction to irritating crystal deposits in the joints. Gouty arthritis is characterized by acute, intermittent, inflammatory arthritis that evolves over many years to chronic inflammatory polyarthritis. In severe cases, tophaceous urate deposits and inflammatory arthritis may lead to deformity, disability, and radiographic destruction. Aim: to find the relation between knowledge, medication adherence, and quality of life among gouty arthritis patients. Research design: A correlational research design was used. Subjects: A convenience sample consisting of 300 patients diagnosed with gouty arthritis. Setting: outpatient clinics of rheumatology, Mansoura and BeniSuiif University Hospitals, within 6 months. Three tools were used in data collection; 1. A structured interview questionnaire sheet consisting of three parts: socio-demographic data, medical history, and patients' knowledge, 2. Mourisky Adherence Scale, 3. Quality of life scale for pain. Results: there was a positive correlation between duration of gout and total adherence scores of the study subjects. However, there was a negative correlation with significant statistical differences between the duration of disease, total knowledge, and total quality of life scores. Conclusion: There was a positive correlation with significant statistical differences between total adherence scores of patients with gouty arthritis with their total knowledge and total quality of life scores. Recommendation: Develop and implement self-management program to improve knowledge, medication adherence, and quality of life for patients with gouty arthritis.

Keywords: Knowledge, Medication Adherence, Quality of Life for pain, gouty arthritis.

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I. Introduction

Gout is the most prevalent inflammatory arthropathy, Gouty arthritis is of the most primitive diseases recognized as a clinical entity, was first documented by the Egyptians in 2640 BC, when the Egyptians described it as an arthritis affecting the great toe ^[1]. Acute gouty arthritis is a form of inflammatory arthritis characterized by acute intermittent episodes of synovitis presenting with joint swelling and pain which is the most common form of inflammatory arthritis, that may progress to a chronic intermittent condition, further to the development of tophi (solid deposits of monosodium urate [MSU] crystals in joints, cartilage, and bones), a condition called chronic tophaceous gout ^[2&3].

Gouty arthritis is estimated to be one of the most common types of inflammatory joint disease; affecting 1-1.5 % of the world's population, affects at least 8 million people in the United States alone, and 1.4% of the adult population in the UK. In the western countries, gout affects more than 1% of adults. This number is on the rise around the world ^[4].

According to the National Health and Nutrition Examination Survey (NHANES), the prevalence of gout appears to be increasing. In addition of that, the rise in the prevalence of gout has paralleled the increase in prevalence of conditions associated with hyperuricemia, including obesity, hypertension, hypertriglyceridemia, hypercholesterolemia, type 2 diabetes and metabolic syndrome, chronic kidney disease, and renal insufficiency. The most commonly affected joints are the first metatarsophalangeal joint (1st MTPJ), mid foot and ankle ^[5].

The American College of Rheumatology [ACR] put preliminary criteria for the classification of the acute arthritis of primary gout. These preliminary criteria were intended for identifying the acute arthritis of gout and not necessarily for inter critical gout, the spectrum of comparator diseases was limited, and physician diagnosis was the gold standard ^[6]. Gout requires sustained treatment with urate-lowering drugs (ULDs) to reduce the frequency of

acute gouty attacks and prevent urate nephropathy, uric acid nephrolithiasis, and the deposition of tophi: a common cause of progressive joint damage, deformity and functional impairment; as this is associated with fewer gout flares, reduction of tophus area, and depletion of urate crystal stores in synovial tissues^[7].

Factors directly related to gout symptoms such as frequency and severity of acute attacks as well as those related to disease complications and adverse effects of gout treatment, all potentially contribute to impair health-related quality of life (HRQOL). Pain is likely to be the most troublesome symptom of osteoarthritis, it is therefore important to have more knowledge specifically about factors that affect people's life situation and QoL in cases of osteoarthritis^[4].

Pain was identified as being the cardinal, defining symptom of gout, leading to functional limitation and/or cause people with arthritis to avoid various movements. Which impact physical functioning, sleep, and health-related quality of life^[8]. Pain is a highly personal experience. The degree to which pain interferes with the quality of a person's life is also highly personal. The American Chronic Pain Association Quality of Life Scale looks at ability to function, rather than at pain alone. It can help people with pain and their health care team to evaluate and communicate the impact of pain on the basic activities of daily life. This information can provide a basis for more effective treatment and help to measure progress over time^[9].

Medication adherence to allopurinol among patients with gout is widely reported to be low, with only 35% to 45% considered adherent. In a study of more than 13,000 patients with gout initiating allopurinol, representing more than 90% of prescribed ULTs, adherence was the single strongest predictor of SU goal achievement^[10]. One practical way to measure the effectiveness of these treatments is by examining processes of care using the evidence-based quality indicators i.e. the measures of quality of care received by patients of gout. Other ways include examining objective outcomes such as normalization of serum urate, delay and/or reversal of radiographic joint damage, or patient reported outcomes such as gout-specific health-related quality of life (HRQoL), pain and function^[11].

Patient's health related knowledge is the degree to which individuals have the capacity to understand basic health information and services needed to make appropriate health decisions, choose a healthy lifestyle, know how to seek medical care and take advantage of preventive measures in their life^[12]. We examined patients' knowledge concerning gout and its treatment, assess patients medication adherence, and their quality of life base on pain experience in order to determine patients' educational needs.

II. Significance of the study

Gout is the most common crystal arthritis, as the result of disturbed uric acid metabolism and precipitation of urate crystals in extra cellular space of joints, periarticular tissue, bones and other organs. The incidence of gout has been on rise globally; potentially attributable to recent shifts in diet, lifestyle, medical care, and increased longevity.

Gout requires sustained treatment with urate-lowering drugs to reduce the frequency of acute gouty attacks, adherence is critical for preventing the painful and damaging effects of the disease. Significant pain, activity limitation, and disability in patients with acute and chronic gouty arthritis lower quality of life. This research was needed to evaluate the relationship between knowledge, medication adherence, and quality of life for patients with gouty arthritis.

III. Operational Definitions

Gouty arthritis

Gouty arthritis is a form of inflammatory arthritis caused by deposition of monosodium urate crystals in joints, characterized by acute intermittent episodes of synovitis presenting with joint swelling and pain which is the most common form of inflammatory arthritis.

Quality Of Life Scale

A Measure of Function for People with Pain: The American Chronic Pain Association Quality of Life Scale looks at ability to function, rather than at pain alone. It can help people with pain and their health care team to evaluate and communicate the impact of pain on the basic activities of daily life. This information can provide a basis for more effective treatment and help to measure progress over time.

IV. Aim of the study

The aim of the current study was to find the relation between knowledge, medication adherence, and quality of life among gouty arthritis patients

Research Questions:

1. What is the level of knowledge among patients with gouty arthritis?
2. What is the level of medication adherence among patients with gouty arthritis?
3. What is the level of quality of life among patients with gouty arthritis?
4. Is there a relation between knowledge, medication adherence, and quality of life among patients with gouty arthritis?

V. Subjects and Methods

Technical design

Research design:

A correlational research design was used in this study.

Setting:

This study was carried out at rheumatology outpatient clinic, Mansoura and BeniSeuif University hospitals.

Subjects:

A convenience sample consisting of all available adult patients diagnosed with gouty arthritis throughout six months (from October 2016 to April 2017), equal to 300 patients.

Tools for data collection: The following tools were used in the current study:

- ❖ **Tool I:** A structured Interview Questionnaire sheet developed by the researcher based on literature review Consisting of 3 parts:
 - **Part 1: Socio-demographic data sheet:** includes; age, gender, residence, marital status, educational level, occupation, and monthly income.
 - **Part 2: Medical history sheet:** This part was concerned with patients' history such as; duration of the diseases, ways of discovering disease, manifestations, comorbidities, joints affected, and family history of the disease.
 - **Part 3: Knowledge about gout:** 5 closed ended questions concerned with patients' knowledge about gout including; definition; causes, manifestations, and treatment, and complications of gout which was. 18 total correct points, the total score was calculated (18); Satisfactory for a total grade $\geq 60\%$ (≥ 11) of the maximum score, and unsatisfactory $< 60\%$ (< 11) from the total grade.
- ❖ **Tool II: Morisky Medication Adherence Scale:** the structured self-reported 8-item Morisky Medication Adherence Scale (MMAS-8) consists of eight items of which summation yields a maximum of 8 points. Adopted from Morisky et al., 2008 and translated to Arabic. Each response is scored as (zero) for "no", (1) for "sometimes", and (2) for "yes"; total score was calculated and the result is categorized into 3 groups; low, medium and high to reflect as 8 (high adherence), 6-8 (medium adherence), and < 6 (low adherence).
- ❖ **Tool III: Quality of Life Scale for Pain:** It measures of function for people with pain; developed by Cowan P & Kelly N, 2003 (American Chronic Pain Association) and translated to Arabic. The scale was scored from zero (non-functioning) to 10 (normal quality of life). For example, a 0 might indicate (staying in bed all day and feel hopeless about life), where a 7 might mean (can work or volunteer a few hours each day), and a 10 indicates (can work every day and carry on a social life).

Operational design: Operational design included the preparatory phase, content validity, pilot study, fieldwork and limitations of the study.

- **Preparatory phase:** Developing structure questionnaire and the review of related literature which carried out from August 2016 to October 2016. A period of 2 months to develop.
- **Content validity** of the three tools was checked by a panel of five experts from the Medical-Surgical Nursing specialty and modifications were done based on their opinions.
- **Test reliability** of the proposed tools was done by cronbach's alpha test, showed a strong significant positive correlation between test (A) and retest (B) in knowledge, adherence and quality of life items.
- **Pilot study:** A pilot study was carried out on 30 patients (10%) in order to test clarity and applicability of the tool. The pilot study was also used to estimate the time needed for each subject to fill in the questions. Modifications were done based on the results of the pilot study. Those who shared in the pilot study were excluded from the main study sample.
- **Field work:** The actual field work started from October 2016 to April 2017. A formal letter was issued from the Faculty of Nursing, at Mansoura University to the directors of Mansoura and BeniSeuif University hospitals to approve for conducting this study. An oral consent was taken from the patients who agreed to participate in the study after explaining the purpose and nature of the study. The researchers emphasized strongly that the information collected would be used for scientific research only, confidentiality will be assured. The researcher gave the questionnaire sheet to the participants and asked them to write their responses, for those who can't read

and write; the researcher read the sheet to them and wrote their exact response. The time consumed to fill the demographic, history, and knowledge sheet was from 110-15 minutes, for medication adherence and quality of life; it was about 15-20 minutes.

Administrative design

An official permission was obtained from director of Mansoura and BeniSeuif University Hospitals before conducting the study explaining the aim of the study to obtain the permission for data collection.

Ethical considerations:

An oral consent was taken from the patient who participated in the study after explanation of purposes and nature of the study, and the right to withdraw at any time, or refuse to answer specific question without giving any reason.

Statistical design:

After data collection, they were coded and transferred into special design formats to be suitable for computer feeding. The Statistical Package for Social Science (SPSS) version 20 was utilized for statically analysis and tabulation as well as some graphic presentations of the results. Statistical significance and associations were assessed using the arithmetic mean, standard deviation (SD), chi square (X^2), and coefficient correlation (r) to detect the relations between the variables with significant level $p \leq 0.05$.

VI. Results

The results of the current study showed that, 68.7% of patients aged more 40 years with men age 43.9 ± 11.1 . As regards gender, it was showed that 58% of study subjects were the females, 55.7% of them were married, 67% of study subjects were from them were from urban areas. As regard to education, 33.3% of the study sample was secondary education and 29.7% of them were just read and write. As regard to occupational status, 73.3% of the study subjects were not working, and 92.3.0% of them had not enough monthly income.

Figure 1 reveals that 73.0, 26.3, 15.0, and 7.0, 5.0 % of the study subjects had comorbidities of hypertension, diabetes mellitus, kidney, and liver diseases respectively.

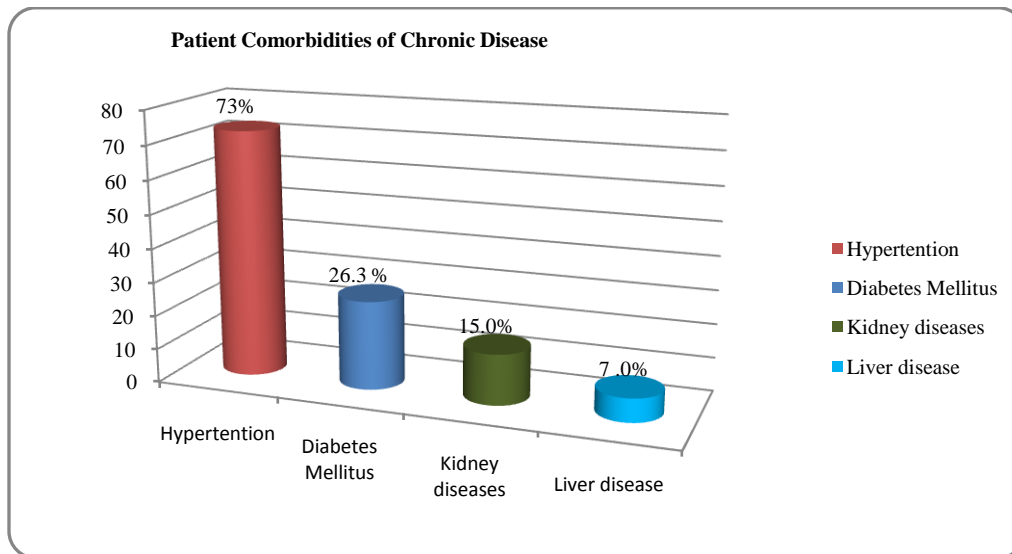


Figure (1): Percentage Distribution of the Study Subjects according to Associated Comorbidities of Chronic Diseases (N.300)

Figure 2 shows that the 75.7%, 54.0%, and 66.0% of study subjects had unsatisfactory knowledge, low medication adherence, and limited functioning quality of life scores respectively.

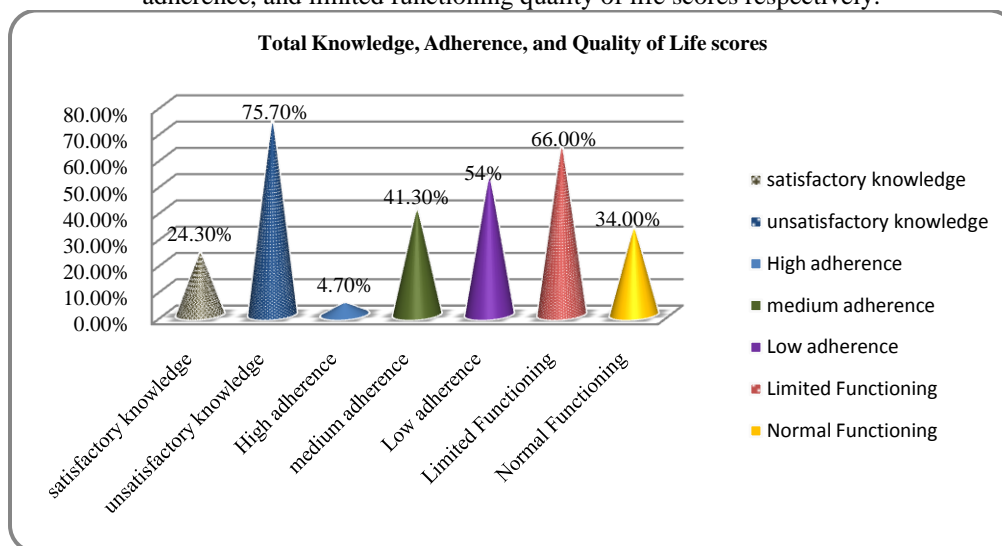


Figure (2): Percentage Distribution of the Study Subjects according to Total Knowledge, Adherence, and Quality of Life scores (N.300)

Table 1 reveals that, 66.0% of patients with gouty arthritis had limited functioning and low quality of life scores related to pain in different levels. However 34.0% of them go to work volunteer each day, had normal daily activities each day, had social life outside of work, take an active part in family life.

Table (1): Percentage Distribution of Study Subjects according to their Quality of Life Scores (N.300)

Quality of Life for People with Pain	No	%
0. Stay in bed all day Feel hopeless and helpless about life	0	0.0
1. Stay in bed at least half the day Have no contact with outside world	14	4.7
2. Get out of bed but don't get dressed Stay at home all day	1	0.3
3. Get dressed in the morning Minimal activities at home Contact with friends via phone, email	10	3.3
4. Struggle but fulfill daily home responsibilities. No outside activity Not able to work/volunteer	8	2.7
5. Do simple chores around the house Minimal activities outside of home two days a week	7	2.3
6. Work/volunteer limited hours Take part in limited social activities on weekends	10	3.3
7. Work/volunteer for a few hours daily. Can be active at least five hours a day. Can make plans to do simple activities on weekends	22	7.3
8. Work/volunteer for at least six hours daily Have energy to make plans for one evening social activity during the week.	63	21
9. Work/volunteer/be active eight hours daily Take part in family life Outside social activities limited.	63	21
10. Go to work/volunteer each day. Normal daily activities each day. Have a social life outside of work. Take an active part in family life.	102	34
Total	300	100

Table 2 shows that there was a statistical significant relation between patient's knowledge and their personal characteristics related to age, sex, marital status and education, occupation with P value ≤ 0.001) except for the residence and income, non-significant correlations were found. There was also a statistical significant relation between all personal characteristics of the study subjects and their medication adherence scores except for occupation. While there were no statistical significant relation between all personal characteristics of the study subjects and their quality of life scores related to pain.

Table (2): Relation between Sociodemographic characteristics of the Study Subjects & their total knowledge, medication adherence, and total quality of life scores(N.300)

Item	Total Knowledge			Total adherence				Total Quality of life		
	Satisfied N. 73	Unsatisfied N. 227	X ² P- value	High N. 14	Medium N. 124	Low N.162	X ² P- value	Limited Function N. 237	Normal Function N. 63	X ² P- value
Age	23.7	76.3								
20-	43.8	56.3	26.0 0.000**	13.6	35.6	50.8	24.6 0.000**	48	11	5.75 0.13
30-	11.2	88.8		1.3	56.3	42.5		69	11	
45-				4.1	39.8	56.1		72	26	
>=55	20.6	79.4		1.6	30.2	68.3		48	15	
Sex										
Male	14.9	85.1	19.8	8.0	27.6	64.4	37.3	135	39	0.002
Female	37.3	62.7	0.000**	0.0	60.3	39.7	0.000**	102	24	0.96
Marital status										
Single	23.9	76.1	8.77	20.9	26.9	52.2	55.5 0.000**	48	19	1.11
Married	28.7	71.3	0.0	46.1	53.9	135		32	0.77	
Divorced	19.6	80.4	0.033*	0.0	50.0	50.0		37	9	
Widowed	0	100	4.7	30.0	70.0	17		3		
Residence										
Urban	19.9	80.1	6.50	7.0	23.9	69.2	77.7	156	45	0.36
Rural	33.3	66.7	0.11	0.0	76.8	23.2	0.000**	81	18	0.54
Education										
Illiterate	14.3	85.7	26.7 0.000**	0.0	52.4	47.6	117.7 0.000**	49	14	2.6 0.44
Read & write	42.7	57.3		0.0	42.7	57.3		71	18	
Secondary	22.0	78.0		0.0	23.0	77.0		76	24	
University	8.3	91.7		29.2	62.5	8.3		41	7	
Occupation										
Working	27.3	72.7	3.87	5.9	41.4	52.7	2.97	176	44	0.36
Not working	16.3	83.8	0.04*	1.3	41.3	57.5	0.226	61	19	0.54
Income										
Enough	21.0	79.0	1.18	9.2	31.1	59.7	15.03	91	28	0.013
Not enough	26.5	73.5	0.27	1.7	48.1	50.3	0.001*	146	35	0.9

(*) Significant statistical difference, P<0.05

(**)Highly significant statistical difference, P<0.005

Table 3 reveals that, there was a positive correlation with significant statistical differences between duration of gout & numbers of gouty flares in last six months, and number of joints affected, total knowledge, and total medication adherence scores of the study subjects. However, there was a negative correlation with significant statistical differences between the duration of disease and total quality of life scores (P-value ≤ 0.01).

Table (3): Correlation coefficient between Duration of gout and some variables of the study Subjects (N.300):

Variables	Duration of gout	
	r-test	P. value
Number of gouty flares in last six months	0.670	0.000**
Number of joints affected	0.115	0.046*
Total Knowledge scores	0.222	0.000**
Total Adherence scores	0.246	0.000**
Total Quality of life	-0.162	0.005**

r = Pearson correlation

** Highly Significance ≤ 0.001

Table 4 shows that, there was a positive correlation with significant statistical differences between total adherence scores of patients with gouty arthritis with their total knowledge and total quality of life scores.

Table (4): Correlation between Total Adherence score, Total Quality of Life score of the study Subjects and their total knowledge scores:

Variable	Total Medication Adherence score	
	r	P
Total Knowledge score	0.229	0.000**
Total Quality of Life score	0.151	0.009**

r = Pearson correlation

VII. Discussion

Gout management is currently suboptimal despite excellent available therapy. Gout patient education has been shown to enhance medication adherence but needs improvement. The need for effective gout patient education is powerfully supported by the literature and medication adherence is acknowledged as a key goal in improving gouty arthritis health outcomes. This study was established to find the relation between knowledge, medication adherence, and quality of life for patients with gouty arthritis.

Regarding sociodemographic characteristics of the study subjects, the findings of the present study revealed that, more than two thirds of the Study Subjects were females aged 45 years and more, this finding is incongruent with **(Alshammari I. & Mujtaba M., 2017)**^[13] who reported that the approximately half of the patients with gout were males. This difference may be related to the age groups of the study subjects in both studies as **(Alshammari I. & Mujtaba M., 2017)**^[13] revealed that more than half of the patients participated in his study were aged between 16 to 36 years. Both results are supported by **(Zhu Y., et al., 2011)**^[14] who stated that the prevalence of gout is high in males and increased in both sexes with increasing age.

Concerning associated chronic diseases of the study subjects, the present study showed that slightly less than three quarters of patients with gouty arthritis had comorbidities of hypertension, more than one quarter had diabetes mellitus, and about one fifth of them had kidney diseases (**Fig. 1**), this findings go in the same line with **(Joo., K, et al., 2014)**^[15] who found that patients with gout frequently had multiple comorbidities including hypertension (HTN), type II diabetes mellitus (DM), and chronic kidney disease. And with **(Rehim, 2014)**^[16], a study established in Egypt, which mentioned that the prevalence of gout has increased related to factors that promote hyperuricemia, including hypertension, type 2 diabetes mellitus, metabolic syndrome, and chronic kidney disease. As regards to patients knowledge and adherence scores; the results of this study showed that more than three quarters of patients with gouty arthritis had unsatisfactory total knowledge scores (**Fig. 2**); this result is in agreement with **(Harrold L., 2012)**^[17] who found that there was knowledge deficit regarding management of gout. From the researchers' point of view, these results could be related to inappropriate source of knowledge and lack of awareness regarding the need for chronic therapy with urate-lowering medications. More than half of study subjects had low medication adherence scores. This result goes in the same line with results with **(Harrold L., 2009)**^[7] who said that poor adherence to newly-initiated urate-lowering drugs (ULDs) was common in patients with gout who shared in his study. These findings reflect poor adherence of patients with gout as it is a chronic disease which needs long term treatment.

Concerning to quality of life scores, the results of the current study showed that more than two thirds of patients with gouty arthritis had limited functioning quality of life scores (**Fig. 2**). These results in agreement with the results of **(Scirè C. et al., 2013)**^[18] who stated that functional and HRQoL impairment observed in patients with gout. These results reflect the bad effect of pain related to pathophysiology of gout on quality of life of the patients affected which need special care and treatment.

Regarding, quality of life assessment, the results of this study revealed that, more than two thirds of patients with gouty arthritis had limited functioning and low quality of life scores related to pain in different levels (table 1). This finding in agreement with **(Tatlock S., 2017)**^[8] who mentioned that, Pain leads to functional limitation and causes people with arthritis to avoid various movements, which impact physical functioning, sleep, and health-related quality of life.

The results of this study showed that, there was a relation between patient's knowledge, adherence, and their sociodemographic characteristics related to age, sex, marital status and education (table 2). This result goes in the same line with **(Singh J. 2014)**^[19] who stated that, there are differences in the impact of gout by race and gender. From the researchers out of view, this result is supported by different studies in different topics which revealed that the patient with a higher education is more knowledgeable than low educated patients; which in inward affects patients' adherence. Fortunately, there is evidence that patients with gout can improve adherence with appropriate education **(Theodore R. & Batterman A., 2018)**^[20]. While there was no statistical significant relation between sociodemographic characteristics of the study subjects and their quality of life scores related to pain. This may be related to the pathophysiology of the disease which leads to joints swelling and pain.

The present study found a positive correlation with significant statistical differences between duration, numbers of gouty flares in last six months, and number of joints affected (**Table 3**). This result goes in the same line with **(Flurey C, 2017)**^[21] who reported that asymptomatic hyperuricaemia, may continue for many years without detection until the first gouty attack occurs & and with **(Repko J et al., 2015)**^[2] who found that long standing hyperuricemia may lead to the asymptomatic deposition of uric acid crystals in synovial fluid. Gouty flares happen more often and last longer over time.

This study found a positive correlation with significant statistical differences between duration of gout and patients' knowledge, adherence scores. However, there was a negative correlation with significant statistical differences between the duration of disease and total quality of life scores (Table 3). From the researchers' point of view; patients' knowledge and adherence score increased with increasing duration from long experience with the disease and follow up in the outpatient clinic, while quality of life affected related to complications, pain, and gouty flares which supported by (Roddy W&Zhang M., 2007)^[22] who said that gout associates with poor overall QOL mainly resulting from associated co-morbidity.

Our study results reflects that, there was a positive correlation with significant statistical differences between total adherence scores of patients with gouty arthritis with their total knowledge and total quality of life scores, this result goes in the same line with the results of (Alshammari I. & Mujtaba M. , 2017)^[13] who found same result in his study and with (Jasvinder A , 2009)^[11] who stated that, significant pain, activity limitation, and disability in patients with acute and chronic gouty arthritis lower health-related quality of life.

VIII. Conclusion

From the results of the present study, it could be concluded that; patients with gouty arthritis had unsatisfactory knowledge scores; more than half of them had low medication adherence scores, and limited functioning with low quality of life scores related to pain in different levels.

There was a statistical significant difference between patient's knowledge, medication adherence scores, and their personal characteristics as age, sex, marital status and education, occupation. While there were no statistical significant difference between all personal characteristics of the study subjects and their quality of life scores.

Recommendation:

The study recommends; self-management program to improve knowledge, medication adherence, and quality of life for patients with gouty arthritis, Replication of the study using a large probability sample from different geographical areas to allow greater generalizability of the results.

Limitation of the study:

- Recruitment affected by time constraints.
- Homogenous characteristics of the sample.
- Self-report questionnaire response bias possible.

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