



## **Public Knowledge and Awareness about Gout: A Cross-sectional Study in Qatar**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Author IMMA designed and performed the study, performed the statistical analysis and wrote the protocol. Author MAM wrote all draft of the manuscript, managed the literature searches and analyses of the study. Both authors read and approved the final manuscript.*

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### **ABSTRACT**

**Background:** The prevalence of hyperuricemia and gout had shown an increasing trend all over the world including in developing countries. The patients may receive very little education on the dietary and lifestyle factors associated with gout.

**Objective of the Study:** Assess knowledge and awareness about gout disease and determine prevalence of gout in Qatar.

**Methodology:** A prospective cross-sectional study had been done on Qatari people in the period from December 2016 to March 2017. The Inclusion criteria were selected to be (i) Qatari (ii) older than sixteen years (iii) living in Qatar and (iv) agree to answer the questionnaire after mentioning the main objective of it. The data was collected from 447 Qatari by using a self-administered online questionnaire in Arabic language specially designed for the research purpose. All data were entered to the computer program MS EXCEL 2007 and frequency, percentage calculated for all the items in the questionnaire with representation for the answers by either pie chart or bar chart.

**Results:** Among the 447 subjects 52% were males, 62% aged between sixteen to thirty six years. 38% are university graduate. The average knowledge regarding etiology, predisposing factors, complications and diagnosis of gout were 30%, average knowledge regarding diet consumption

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related to gout is approximately 30%, average knowledge regarding signs and symptoms of gout was 31% and the overall mean for participants knowledge and awareness were 31%. Overall the participants who reported to have gout were only thirty-six (8%) among them 33% know the normal range of uric acid in blood, 61% informed by their physician or pharmacist about the medication to be taken during the acute attack and 64% informed by physician or pharmacist about the types of foods that should be avoided.

**Conclusion:** In conclusion, this study found low awareness and knowledge regarding gout among Qatari people. More attention is needed on patient education on gout and self-management training.

*Keywords: Gout; Qatari; hyperuricemia; patient education; inclusion criteria.*

## 1. INTRODUCTION

Gout is the most prevalent type of chronic inflammatory arthritis in adults [1]. Gout is associated with significant pain, disability and a negative impact on quality of life [2-4]. The prevalence of gout increases with advancing age and is associated with diuretic use, low dose aspirin, hypertension, cardiovascular disease, chronic renal insufficiency, and metabolic syndrome [5]. Both diet and alcohol intakes have been shown to be risk factors for incident gout as well as triggers for recurrent attacks in those with the condition [6-8]. Specifically, higher levels of meat (beef and pork) and seafood consumption as well as beer and spirits (but not moderate amounts of wine) in gout patients are associated with gout flares [9-10]. Acute gouty symptoms are usually treated with nonsteroidal anti-inflammatory drugs (NSAIDs), colchicine, or glucocorticosteroids, while chronic gout is managed using urate-lowering therapy (ULT) such as allopurinol, febuxostat, probenecid and sulfapyrazone [11].

The American College of Rheumatology (ACR) and the European League Against Rheumatism (EULAR) guidelines for the management of gout support the use of education and diet alongside pharmacologic interventions [12,13]. Thus, optimal gout management may require a combination of pharmacological interventions, diet modification and possibly the use of dietary supplements [14,15].

Many treatment and knowledge gaps exist in the area of gout management. Key treatment gaps include low rates of treatment with ULT and low adherence to ULT medications [16] and the failure to monitor and achieve a target serum urate < 6 mg/dl, an important therapeutic goal associated with better outcomes. A recent Internet study showed that only 55% of patients with gout were prescribed a ULT by their health

care provider [17], a finding similar to that noted in previous studies using large databases [18,19]. Medication adherence was the lowest for gout among seven chronic conditions studied, with 36% gout patients with 80% or higher adherence with medication in the first year of prescription compared to 68 and 65% of patients with hypothyroidism and diabetes (roughly twice as high as in gout), respectively [16]. Thus, treatment gaps are common in gout and medication adherence and outcomes are suboptimal.

In recent years, the lifestyle of Arabian people has shifted towards a more Western type due to increasing affluence; this has led to increased incidences of obesity, hypertriglyceridemia, and diabetes. The prevalence of hyperuricemia and gout had shown an increasing trend all over the world including in developing countries. The patients may receive very little education on the dietary and lifestyle factors associated with gout. The primary aim of the current study was to assess knowledge and awareness about gout disease and determine prevalence of gout in Qatar.

## 2. MATERIALS AND METHODS

### 2.1 Study Design

A prospective cross-sectional study on Qatari people was conducted using a pre-tested and structured questionnaire in the period from December 2016 to March 2017.

### 2.2 Study Area and Population of the Study

The Inclusion criteria were included Qatari (older than 16 years), living in Qatar and agree to answer the questionnaires after mentioning the main objective of it. The data was collected from 447 Qatari by using a self-administered online

questionnaires in Arabic language specially designed for the research purpose. The questionnaire was uploaded via Google drive and sent to a random sample of the people living in Qatar; invite them to participate in the study after mentioning the aim of the study.

The questionnaire contained thirty five closed ended questions covering the following areas: demographics (gender, age , educational level, residence area, social status), gout-related knowledge regarding etiology, predisposing factors, complications and diagnosis, gout related knowledge regarding diet consumption, signs and symptoms among study subjects and final part to determine prevalence and attitudes of gout patient. An answer choice of “I don’t know” included to the questionnaire for best assessing to the actual knowledge.

### 3. RESULTS

#### 3.1 Study Population Demographic Characteristics

A total of 447 questionnaires were included in the study after exclusion of questionnaires answered by those who are younger than age of sixteen and participants with complete answers for all the questions included in the study. Among the 447 subjects 232 (52%) were males. However the majority of participants were between 16 to 36 years (62%) and only 5% over 55 years. Almost half of the participants (50%) were married, 37% are single and 13% divorced or widowed. The participants (37%) had general certificate of secondary education; about 38% of participants had graduated from universities (Table 1).

**Table 1. Demographic characteristic of participants (n=447)**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>		
Female	215	48%
Male	232	52%
<b>Place of residence (Qatar)</b>		
Doha	60	13%
Al Wakrah	66	15%
Al Rayyan	61	14%
Mesaieed	42	9%
Al shamal	36	8%
Al khor	65	15%
Dukhan	53	12%
Other	64	14%
<b>Age</b>		
16-25 years	134	30%
26-36 years	141	32%
36-45 years	101	22%
46-55 years	49	11%
56-65 years	17	4%
Older than 65 years	5	1%
<b>Marital status</b>		
Single	165	37%
Married	222	50%
Divorced	44	9%
Widow/ Widowed	16	4%
<b>Educational level</b>		
Doctorate or master degree	35	8%
University education	167	38%
Diploma	42	9%
General certificate of secondary education	166	37%
Intermediate education	37	8%

### 3.2 Gout-related Knowledge Regarding Etiology, Predisposing Factors, Complications and Diagnosis among Study Subjects

Among the study subjects there were 58% agree that gout occurs when urate crystals accumulate in the joint, 27% agree that older people are more likely to have gout than children, 23% agree that gout disease can be hereditary, 23% agree that men are more likely to develop gout at younger age than women, 32% disagree that people with low uric acid level are more susceptible to gout, 22% agree that hypertension increase the risk for gout occurrence, 25% agree that hyperlipidemia increase the risk for gout occurrence, 23% agree that diabetes mellitus increase the risk for gout occurrence, 27% agree that administration of certain drugs increase the risk for gout occurrence, 33% agree that sedentary life style increase the risk for gout occurrence, 37% agree that loss of body weight can help decreasing uric acid level, 26% agree that gout cause nephrolithiasis as a complication, 33% agree that gout can be diagnosed through blood tests (Table 2). The average knowledge regarding etiology, predisposing factors, complications and diagnosis of gout were 31% (Fig. 1).

### 3.3 Gout Related Knowledge Regarding Diet Consumption

Among the study group there were 33% disagree that increase in consumption of red meat and sea food help in decreasing gout attacks, 30% disagree that consumption of cream and full-fat milk have no relation with gout disease, 29%

agree that patient with gout can eat small amount of poultry and chicken meat, 28% agree about that gout patient can eat large amount of complex carbohydrates as whole grains, 32% agree that gout patient should increase amount of fluids and water consumed per day, 28% agree that there's a relation between drinking coffee or decaffeinated coffee and lower uric acid levels in blood ,28% agree that Vitamin C have a role in decreasing uric acid level (Table 3). Average knowledge regarding diet consumption related to gout is approximately 31% (Fig. 2).

### 3.4 Gout-related Knowledge about Signs and Symptoms among Study Subjects

The study participants (28%) agree that the signs and symptoms of gout almost always occur suddenly and acutely (Table 4), 36% agree that gout cause acute pain in joints, 33% agree that gout cause redness and swelling of the joint, 29% agree that a gout attack can last for 5 to 10 days.

### 3.5 Prevalence and Attitudes of Gout Patient in Study Sample

Overall the participants who reported to have gout were only 36 (8%) among the 447 subjects. 33% of them know the normal range of uric acid in blood, 61% informed by their physician or pharmacist about the medication to be taken during the acute attack, 53% informed by their physician or pharmacist about the time to take the medications and 64% informed by physician or pharmacist about the types of foods that should be avoided (Table 5).

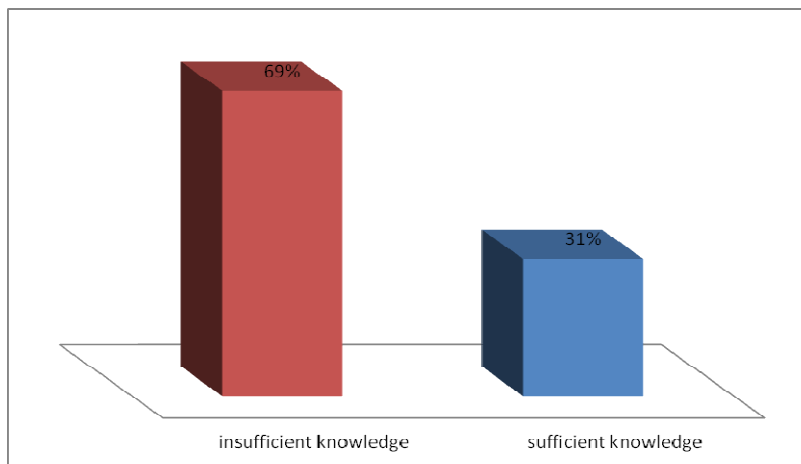


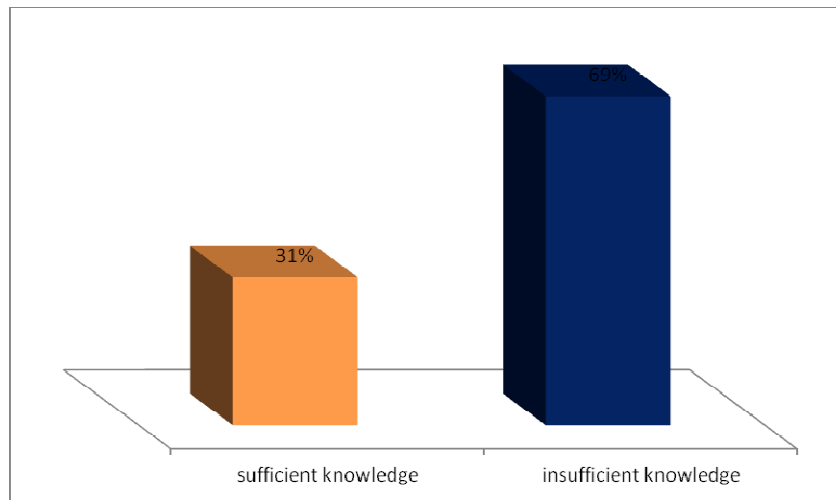
Fig. 1. Bar chart represent average knowledge regarding etiology, predisposing factors, complications and diagnosis of gout

**Table 2. Responses to questions regarding etiology, predisposing factors, complications and diagnosis of gout**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gout occurs when urate crystals accumulate in the joint</b>		
Agree	258	58%
Disagree	78	17%
Don't know	111	25%
<b>Older people are more likely to have gout than Children</b>		
Agree	122	27%
Disagree	168	38%
Don't know	157	35%
<b>Gout disease can be hereditary</b>		
Agree	101	23%
Disagree	143	32%
Don't know	203	45%
<b>Men, are more likely to develop gout at younger age than women</b>		
Agree	102	23%
Disagree	148	33%
Don't know	197	44%
<b>People with low uric acid level are more susceptible to gout</b>		
Agree	121	27%
Disagree	143	32%
Don't know	183	41%
<b>Hypertension increase the risk for gout occurrence</b>		
Agree	97	22%
Disagree	133	30%
Don't know	217	48%
<b>Hyperlipidemia increase the risk for gout occurrence</b>		
Agree	112	25%
Disagree	118	26%
Don't know	217	49%
<b>Diabetes mellitus increase the risk for gout occurrence</b>		
Agree	104	23%
Disagree	131	29%
Don't know	212	48%
<b>Administration of certain drugs increase the risk for gout occurrence</b>		
Agree	121	27%
Disagree	132	30%
Don't know	194	43%
<b>Sedentary life style increase the risk for gout occurrence</b>		
Agree	147	33%
Disagree	119	27%
Don't know	181	40%
<b>Loss of body weight can help decreasing uric acid level</b>		
Agree	164	37%
Disagree	99	22%
Don't know	184	41%
<b>Gout cause nephrolithiasis as a complication</b>		
Agree	115	26%
Disagree	130	29%
Don't know	202	45%
<b>Gout can be diagnosed through blood tests</b>		
Agree	149	33%
Disagree	109	24%
Don't know	189	43%

**Table 3. Responses to questions regarding diet consumption**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Increase in consumption of red meat and sea food help in decreasing gout attacks</b>		
Agree	111	25%
Disagree	150	33%
Don't know	186	42%
<b>Consumption of cream and full-fat milk have no relation with gout disease</b>		
Agree	98	22%
Disagree	135	30%
Don't know	214	48%
<b>Patient with gout can eat small amount of poultry and chicken meat</b>		
Agree	130	29%
Disagree	122	27%
Don't know	195	44%
<b>Gout patient can eat large amount of complex carbohydrates as whole grains.</b>		
Agree	124	28%
Disagree	135	30%
Don't know	188	42%
<b>Gout patient should increase amount of fluids and water consumed per day</b>		
Agree	145	32%
Disagree	119	27%
Don't know	183	41%
<b>There's a relation between drinking coffee or Decaffeinated coffee and lower uric acid levels in blood</b>		
Agree	125	28%
Disagree	121	27%
Don't know	201	45%
<b>Vitamin C have a role in decreasing uric acid level</b>		
Agree	125	28%
Disagree	128	29%
Don't know	194	43%



**Fig. 2. Bar chart represent average knowledge regarding diet consumption related to gout among study group**

**Table 4. Responses to questions about signs and symptoms of gout**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>The signs and symptoms of gout almost always occur suddenly and acutely</b>		
Agree	132	28%
Disagree	117	26%
Don't know	198	46%
<b>Gout cause acute pain in joints</b>		
Agree	163	36%
Disagree	108	24%
Don't know	176	40%
<b>Gout cause redness and swelling of the joint</b>		
Agree	146	33%
Disagree	123	28%
Don't know	178	39%
<b>A gout attack can last for five to ten days</b>		
Agree	131	29%
Disagree	120	27%
Don't know	196	44%

**Table 5. Prevalence and attitudes of gout patient in participants**

<b>Variable</b>	<b>No.</b>	<b>Percentage (%)</b>
<b>Are you a patient with gout</b>		
Yes	36	8%
No	392	88%
Don't know	19	4%
<b>If you are a patient with gout, do you know the normal range of uric acid in blood (n=36)</b>		
Yes	12	33%
No	24	67%
<b>If you are a patient with gout , did the physician or pharmacist inform you about the medication to be taken during the acute attack (n=36)</b>		
Yes	22	61%
No	14	39%
<b>If you are a patient with gout , did the physician or pharmacist inform you about the time to take the medications (n=36)</b>		
Yes	19	53%
No	17	47%
<b>If you are a patient with gout , did the physician or pharmacist inform you about the types of foods should be avoided (n=36)</b>		
Yes	23	64%
No	13	33%

#### 4. DISCUSSION

This current study provides information on patient knowledge and credence regarding gout disease. Several deficits in knowledge were

identified in the total population including dietary triggers, etiology, predisposing factors, complications and method of diagnosis. A previous epidemiologic study has examined the relationship between dietary factors and uric acid

levels with gout flares [20-22]. Specifically, there is an increased risk of gout with higher levels of red meat and seafood consumption [21]. In this current study 67% of the participants haven't sufficient knowledge about relation of red meat and sea food in predisposing gout attacks. In a previous study, increasing coffee intake, but not tea intake, was associated with significantly lower risk of incident gout in men [23]. Only 28% of the study participants agree that there's a relation between drinking coffee or decaffeinated coffee with lower uric acid in blood. Two previous studies indicated that higher intake of total Vitamin C was associated with lower risk of incident gout [24,25]. Only 28% of study subjects agree that Vitamin C have a role in decreasing uric acid level.

Uric acid renal transport is explained by a four-component system: Glomerular filtration, proximal tubular reabsorption, tubular secretion, and post-secretory reabsorption. This system allows understanding the action of drugs that decrease urinary uric acid excretion (which increase serum uric acid levels) and those that augment urinary uric acid excretion (and decrease serum uric acid levels) [26]. Some drugs used for the treatment of arterial hypertension and other diseases like neoplasms increase the serum uric level levels. This effect is due to the fact that they decrease urinary uric acid excretion, which leads to renal tubular reabsorption of uric acid, resulting in most cases from stimulation of the URAT-1 transporter which promotes a reduction in the urinary excretion of this substance [27]. Previous studies [28,29] focused on the use of diuretics, including thiazide and loop diuretics and reported increased risk of both incident gout and gout flares in patients with prevalent gout receiving loop or thiazide diuretics but only 27% of this study participant aware that certain drugs increase the risk for gout occurrence.

Previous studies findings [30,31] have indicated that diabetes, hypertension, hyperuricemia, obesity, elevated triglyceride and cholesterol levels were all associated with the risk of gout. In this study only 22% participants aware that hypertension increase the risk for gout occurrence, 25% participants aware that hyperlipidemia increase the risk for gout occurrence, 23% participants aware that diabetes mellitus increase the risk for gout occurrence, 37% participants aware that loss of body weight can help in decreasing uric acid

level, 26% participants agree that gout cause nephrolithiasis as a complication.

Nevertheless, the literature has not totally elucidated the mechanism by which excess body fat leads to increased serum uric acid. In addition to the increase in endogenous production of urate, evidence shows that accumulated visceral fat leads to an increase in free fatty acids and tumor necrosis factor alpha (TNF- $\alpha$ ), together with a decrease in adiponectin concentration, which leads in turn to reduced renal excretion of uric acid [32,33].

Overall the participants who reported to have gout were only 8% of the study population but it doesn't reflect prevalence of hyperuricemia in both sexes. The absence of cases of gout despite presence of hyperuricemia is not unusual because they do not have to mirror each other, as reported by Chang et al. [34]. These authors reported no cases of gout among 199 hyperuricemic nonaborigines in a Taiwanese population despite the high incidence of gout among the aborigines (33 cases in 267 hyperuricemic patients).

Despite the availability of multiple treatment guidelines [35,36] gout in the majority of patients remains poorly controlled. Only 61% reported that they informed by their physician or pharmacist about the medication to be taken during the acute attack and 64% reported that they informed by physician or pharmacist about the types of foods that should be avoided.

## **5. CONCLUSION**

The study has several strengths. Firstly, this is the first study giving quantitative data on awareness of Qatari people about gout. Secondly, it was based on a random sample from all areas of Qatar. In conclusion, this study found low awareness and knowledge regarding gout among Qatari people. There is a need to introduce gout education on risk factors, signs and symptoms and predisposing factors for secondary schools as well as universities students and also promote public awareness about gout through campaign, social media and seminars. Both, physicians and pharmacists must be encouraged to provide more information about gout for their patients. Educational program on gout targeting general population in Qatar is also recommended.



## CONSENT

It is not applicable.

## ETHICAL APPROVAL

It is not applicable.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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