

# A quantitative study of shoulder pain management by primary care physicians in Qatar

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Received: November 2022 Accepted: December 2022; Published: December 15, 2022.

Citation: Mirza Ather Majeed et al. 'A quantitative study of shoulder pain management by primary care physicians in Qatar  
World Family Medicine. December 2022 - January 2023; 21(1): 6-17 DOI: 10.5742/MEWFM.2023.95251496

## Abstract

**Background:** Patients with shoulder pain are mainly managed in primary care. There have been studies in other countries which suggested low confidence among general practitioners in diagnosing and managing shoulder pain, with frequent use of investigations. No comparable studies are available in Qatar. We conducted this study to understand the variations of practice amongst primary care physicians in patients with shoulder pain. We also aimed to assess the association between practice decisions and selected characteristics of physicians, such as their grade and musculoskeletal training or qualification. We hope our study will improve our knowledge of this subject and provide empirical evidence if a gap exists between practice and best evidence.

**Methods:** We conducted an online cross-sectional survey of all primary care physicians working within 27 health centers under the PHCC. Participation in this survey was voluntary and online survey responses were anonymous. The survey questionnaire included questions on participant characteristics and clinical scenarios describing the two most common shoulder pain presentations in primary care i.e., Rotator cuff tendinopathy and adhesive capsulitis. The response options for both scenarios were listed under categories of diagnosis, investigations, clinical management and referrals.

**Results:** 28% of physicians responded to email request with three quarters being male. Most of the responders were consultants and had more than 10 years of clinical experience. About one in five physicians reported to have musculoskeletal experience or qualifications. 73% of responders felt a CME session will be useful. In the first scenario, 49% felt confident

about the RCT diagnosing with 31% who didn't feel any investigation was required. From responders who chose to investigate, a nearly equal number selected plain shoulder radiography (71%) and Ultrasound scan (70%). For AdhC scenario, 64% of responders felt confident about the diagnosis. However, 78% chose investigation; the most common investigations were USS (65%), plain shoulder radiography (62%) and Blood test (58%). In both scenarios, USS was selected mainly to confirm diagnosis while shoulder radiography was considered to exclude other diagnosis. The most recommended treatment for both presentations was analgesia (RCT 86%, AdhC 82%) followed by physiotherapy (RCT 84%, AdhC 82%). 56% opted to refer RCT to secondary care compared to 62% for the AdhC. Association analysis revealed that junior grade responders were more likely to refer patient to specialist (RCT scenario,  $p=0.022$ ) and relied more frequently on shoulder radiography (AdhC Scenario,  $p=0.022$ ). Association analysis of previous MSK experience showed a statistically significant tendency to request blood tests and shoulder radiography by physicians with previous MSK experience ( $p=0.022$ ).

**Conclusion:** This survey in Qatar identifies a reliance on frequent use of investigations in the management of common shoulder pain presentations. A tendency to choose early referral to secondary care was also noted especially amongst junior grade physicians. We hope with more experience and CME training they may feel more confident in their decision making and less inclined to refer in future. However, the low response rate to the survey means that caution needs to be exercised in generalising the findings due to potential non-response bias.

**Key words.** Shoulder pain management, Primary care, Qatar.

## Introduction

Shoulder pain is one of the most frequent musculoskeletal complaints in the general population with an annual population prevalence of up to 46.7% and lifetime prevalence of up to 70% (1-3). Shoulder disorders cause pain, limit the ability to perform many routine activities and can significantly disrupt sleep. A recent community survey in Qatar demonstrated shoulder pain as the third commonest musculoskeletal complaint with a prevalence rate of 15.9%(4).

Patients with shoulder pain are mainly managed in primary care. Shoulder disorders are the third most common primary care musculoskeletal presentation, with up to 3% of adults likely to consult with new shoulder pain annually (1,5-7). Most patients present with minor symptoms lasting a relatively short duration i.e., less than 3 months, while others present with more severe symptoms lasting longer i.e., greater than 12 months, with chronicity and recurrence a common problem (2-4,8). The overall prognosis of shoulder pain is reported to be highly variable, with up to 50% of patients still reporting persistent pain 6–12 months after seeking an initial primary care consultation (3).

The most common cause of shoulder pain is rotator cuff tendinopathy (RCT), and its incidence increases with age.(9). Other major causes of shoulder pain include adhesive capsulitis (AdhC) which most commonly occurs in the 40–65 age group and glenohumeral osteoarthritis (OA) in the over 60 age group (10). Systemic diseases, such as rheumatoid arthritis and polymyalgia rheumatica, may also involve the shoulder (9).

The clinical management in primary care is based on the clinical history and physical examination to establish the likely clinical diagnosis, differentiate between the common causes mentioned above and exclude alternate diagnosis like referred neck pain and any serious pathology. Diagnosing and managing shoulder pain at the primary care level is challenging because many disorders exhibit similar clinical features and lack consensus on diagnostic criteria and concordance in clinical assessment (10). Physician's Knowledge and beliefs, patient expectation, access to investigations, availability of allied health and specialist services, receipt of special trainings and special interest may all influence uptake of evidence and impact clinical practice. There have been studies in other countries which suggested low confidence among general practitioners (GPs)/ primary care physicians in diagnosing and managing shoulder pain, with frequent use of investigations (11-14). Over-reliance on investigations could be explained by inherent uncertainties in patient symptomatology, natural reluctance to commit to a specific diagnosis based only on clinical information, access to investigations, or the availability of specialist services or simple lack of awareness of current evidence and guidelines.

Qatar is a small country with an estimated population of 2.6 million. The Primary Health Care Corporation (PHCC) is the state-run primary health care provider in Qatar, which operates through 27 health centers. Health centers are staffed with primary care physicians of different levels of expertise and grades (GP, Family Medicine Specialist, Consultants and Senior Consultants) with direct access to X-ray and physiotherapy services and referral to governmental secondary care providers. It is not clear to what extent findings from the surveys in other countries translate to Qatar's primary health care system as no comparable studies have been conducted locally (11-14).

Our study is the first of its kind in Qatar primary care. The primary aim of this study was to understand the variations of practice amongst primary care physicians in patients with shoulder pain. Furthermore, physician's management decisions can all be influenced by physician's knowledge and experience. Therefore, a secondary aim of our study was to assess the association between practice decisions and selected characteristics of physicians like their grade and specialized training or qualification. We used a physician survey including clinical scenarios which has previously been shown to be a suitable method to measure aspects of clinical practice and management decisions. We hope our study will describe current clinical practice and may help to identify any gaps between practice and best evidence. This in turn will guide future research in this area and help PHCC formulate its policies, thereby benefiting the service providers and ultimately receivers.

## Methods

We conducted a cross-sectional survey of all primary care physicians working within 27 health centers under the PHCC. An email with an invitation to participate along with a survey link using Google forms was sent to all eligible participants during February 2022 via PHCC official email to complete an online Survey. Relevant information about the purpose of the study and instructions about the survey were included in the email containing the link to the survey. Participation in this survey was voluntary and online survey responses were anonymous. A reminder email was sent out after two weeks to increase the response rate of the study.

A survey questionnaire is a quantitative method (predefined questions formatted in standardized questionnaires) that provides access to quantitative and qualitative information. Clinical scenarios have previously been shown to be a suitable method to measure aspects of clinical practice related to management decisions (15-18). However they are limited by the fact that they are brief and can be interpreted differently by different clinicians. To minimize this limitation, we adopted these scenarios from previous surveys in other countries (12-14). This has also facilitated a comparative analysis with those studies. Survey questions were written in English as it is the common language across all the physicians in PHCC. The online questionnaire was designed in a way that included mandatory fields for all relevant areas and

did not allow erroneous data entry (e.g., numbers where text is required), comments or free text other than in the specified fields. We conducted a small informal pilot study of the questionnaire to collect feedback about clarity, acceptability, clinical relevance, representation of real patients and time required for completion, which was estimated to be around 5–10 minutes.

#### The survey questionnaires used had two sections.

**A)** Participant characteristics section was used to record age, gender, job designation, years of clinical experience and additional musculoskeletal/surgical experience/diploma/qualification.

PHCC primary care work force has physicians with a varied training and qualification background. Some physicians have been employed for a long time and were recruited as General Practitioner with no formal post graduate training while others possess formal post graduate training in family medicine. They have different designations as family medicine specialist, family medicine consultant and senior consultants. Some physicians have extra surgical or orthopedics training and qualifications. Data was collected about these variables. Participants were asked about how many patients with shoulder pain they see each month and how confident they feel in managing these patients in primary care. Lastly they were asked if they feel the need for a CME/training workshop relevant to shoulder pain disorder.

**B)** Scenario based questions describing the two most common shoulder pain presentations in primary care. The first scenario described a 77-year-old female with a six-week history of shoulder pain consistent with rotator cuff tendinopathy (RCT), while the second scenario described a 50-year-old female with a three-week history of shoulder pain compatible with early adhesive capsulitis (AdhC).

The response options for both scenarios were listed under categories of diagnosis, investigations, management including advice and medications and referrals.

**1. Diagnosis:** Physicians were asked to select a clinical diagnosis from a list of options. For each diagnosis selected they were asked to rate their confidence in the diagnosis on a 7-point Likert-type scale ('definitely yes', 'most likely', 'likely', 'notsure', 'unlikely', 'mostunlikely' and 'definitelynot').

**2. Investigations:** Physicians were asked to state whether they would request investigations for each patient. If yes, they were asked to select from a list of options including blood tests, USS of the shoulder, plain radiograph of the shoulder, MRI of the shoulder, MRI of the cervical spine and a free-text option. They were also asked to select a reason for any investigation they selected, choosing from the following options: 'to confirm the diagnosis', 'to exclude other diagnoses', 'to guide treatment options', 'to decide on a specialist referral' and a free-text option. They were free to select any combination of investigations but restricted to one reason only for each investigation.

**3. Treatment:** Physicians were asked to indicate whether they would recommend treatment. If yes, they were asked to select from a list of options. They were free to select any combination of options.

**4. Referral to a specialist:** Physicians were asked to indicate whether they would refer the patient for a specialist opinion. If yes, they were asked to select from a list of referral destinations and they were free to select any combinations of options.

**5. Prognosis:** We also asked doctors to indicate the likely prognosis and the likelihood that surgery would be required as either very likely, likely, not sure, unlikely, or very unlikely.

#### Sample size

All primary care family medicine physicians working in the 27 health centers under the PHCC, spread across the state of Qatar were included. A total of 516 physicians were invited to participate in the study to complete the online survey.

#### Statistical Methods

The Statistical analysis was performed by STATA 11.2 (College Station TX USA). Demographic details like age, gender, Staff grade, years of clinical experience, MSK Sports medicine experience qualifications diploma, How Many patients with shoulder pain do you see per month (On average), How Confident Do you feel in managing patients with shoulder pain and Do you feel the need for CME activities, were expressed as frequency and percentage. To summarise the confidence in the diagnoses, responses to the seven-item Likert scale were converted into five items, by combining the responses 'definitely yes' and 'most likely' into one group "confident yes", and 'definitely not' and 'most unlikely' into another group "confident no". The remaining responses of 'likely', 'not sure' and 'unlikely' were left ungrouped. Chi square test for goodness of fit was used to measure the association between the Staff grade and MSK experience with structured questionnaire of Blood tests, X-ray of the shoulder, CT scan of the shoulder, MRI Scan of the shoulder, Treatment and referral and it was expressed as frequency and percentage.  $P < 0.05$  was considered as Statistically Significant.

## Results

Of the 516 questionnaires emailed to physicians, 147 were returned, making a response rate of 28.4%. Due to the design features, the online responses were complete and did not include any erroneous or missing data.

#### Demographic and Participants' characteristics

Over three quarters of the respondents were males (Table 1). Most of the responders were consultant grade (67%), with the second biggest group being GP's. 86% of physicians had more than 10 years of clinical experience. About one in five physicians reported to have musculoskeletal (MSK), sports medicine experience or qualification. Regarding number of patients with shoulder pain seen per month, 44% selected 10-15. Regarding question about confidence in managing shoulder pain patients, 32% selected 'somewhat confident' while 31% felt 'fairly confident'. 'Completely confident' and 'not confident' at all was equally chosen by 7%. Nearly three quarters of physicians felt the need for CME session about this subject; 10% didn't feel it was necessary while 17% selected 'maybe'.

<b>Table 1: Demographic and Participant's characteristics</b>		
	<b>Number of Cases</b>	<b>Percentage</b>
<b>Age</b>		
25-34	2	1%
35-44	77	52%
45-54	57	39%
55-64	8	5%
65+	3	2%
<b>Gender</b>		
Male	114	78%
Female	31	21%
Prefer Not to Say	2	1%
<b>Grade</b>		
Consultant	99	67%
GP	21	14%
Senior Consultant	12	8%
Specialist	15	10%
<b>Years of Clinical Experience</b>		
<5 Years	3	2%
5-10 Years	18	12%
>10 Years	126	86%
<b>MSK Sports medicine experience qualifications diploma</b>		
Yes	28	19%
No	119	81%
<b>How Many patients with shoulder pain, do you see per month (on average)</b>		
0-5	50	34%
5-10	64	44%
10-15	19	13%
15+	14	10%
<b>How confident do you feel in managing patients with shoulder pain</b>		
1. Completely	11	7%
2. Fairly	45	31%
3. Somewhat	47	32%
4. Slightly	34	23%
5. Not at all	10	7%
<b>Do you feel the need for CME activities</b>		
Yes	108	73%
No	14	10%
Maybe	25	17%

## Clinical Scenario 1: Rotator Cuff Tendinopathy

### Diagnosis

About half of the responders who selected the correct diagnosis of RCT felt that they were confident of this diagnosis (72, 49%) while about one third (46, 31%) stated the diagnosis was likely (Table 2). Five responders (3%) did not think it was a case of RCT. Acute rotator cuff was the second most probable diagnosis indicated by 15% while adhesive capsulitis was selected 'confident yes' by 13%.

**Table 2: Physicians' confidence in diagnosis for the RCT clinical scenario**

	Acute RC tear (n%)	Glenohumeral OA (n%)	ACJ disorder (n%)	RCT (n%)	Referred neck pain (n%)	AdhC (n%)
Confident Yes	22 (15%)	31 (21%)	10 (7%)	72 (49%)	3 (2%)	19 (13%)
Likely	23 (16%)	54 (37%)	39 (27%)	46 (31%)	19 (13%)	39 (27%)
Not Surely	8 (5%)	15 (10%)	19 (13%)	11 (7%)	13 (9%)	13 (9%)
Unlikely	56 (38%)	39 (27%)	69 (47%)	13 (9%)	78 (53%)	48 (33%)
Confidently No	38 (26%)	8 (5%)	10 (7%)	5 (3%)	34 (23%)	28 (19%)

### Investigations

Of the 147 physicians who provided responses, 45 (31%) did not select any investigation (Table 3). A nearly equal number of responders selected plain shoulder radiography (104, 71%) and Ultrasound scan (103, 70%). Blood tests were the third most frequently selected, by 90 GPs (61%), followed by MRI of the shoulder, selected by 75 responders (51%). The majority selected these investigations in combination with others. The most common reason for selecting USS and MRI of the shoulder for this scenario was to confirm the diagnosis, while plain radiograph of the shoulder and blood tests were selected to exclude other diagnoses.

**Table 3: Selected investigations for the RCT clinical scenario (Total n=102 (69%))**

Reason for Investigation	Blood test (n%)	Plain radiograph shoulder (n%)	US shoulder (n%)	CT scan shoulder (n%)	MRI shoulder (n%)	MRI neck (n%)	Other
To confirm diagnosis	6 (7)	31 (30)	68 (66)	28 (42)	38 (51)	5 (8)	0
To exclude other diagnoses	58 (64)	61 (59)	18 (17)	15 (22)	10 (13)	39 (59)	
To guide treatment option	22 (24)	11 (11)	13 (13)	10 (15)	13 (17)	6 (9)	
To decide on a specialist referral	4 (4)	1 (1)	4 (4)	14 (21)	14 (19)	16 (24)	
Other							
Total number	90, 61%	104, 71%	103, 70%	67, 46%	75, 51%	66, 45%	0%

### Treatment, referral & prognosis

Oral analgesia was the most selected treatment (126, 86%), followed by physiotherapy (123, 84%) and corticosteroid shoulder injection (58, 39%) (Table 4). A small number of physicians (3, 2%), did not select any treatment. Most of the time, treatments were selected in combinations instead of a single option. The most common combination was analgesia and physiotherapy (62, 42%) followed by corticosteroid shoulder injection and physiotherapy (45, 31%).

<b>Table 4: Treatment options, referral, and prognosis</b>				
	<b>SCENARIO 1: RCT</b>		<b>SCENARIO 2: AdhC</b>	
	number	%	number	%
<b>TREATMENT OPTIONS</b>				
No treatment	3	2%	3	2%
Analgesia Total	126	86%	120	82%
Injection Total	58	39%	75	51%
Physiotherapy Total	123	84%	121	82%
<b>Breakdown</b>				
Analgesia alone	15	10%	14	10%
Injection alone	5	3%	2	1%
Physiotherapy alone	12	8%	10	7%
Analgesic & Injection	4	3%	5	4%
Analgesic & Physio	62	42%	43	30%
Injection & Physiotherapy	4	3%	10	7%
Analgesic, Injection & Physiotherapy	45	31%	58	41%
<b>REFERRAL</b>				
Yes	82	56%	90	62%
No	65	44%	56	38%
<b>Destination</b>				
Orthopedic Surgeon	62	42%	86	59
Rheumatologist	11	8%	24	16
Rheumatologist & Orthopedic Surgeon	6	4%		
Other	3	2%	4	3
<b>PROGNOSIS</b>				
Recover within 2 weeks	8	5%	7	5%
Recover within 6 weeks	92	63%	62	42%
Recover within 1-2 Years	25	17%	62	42%
Have recurrence within 2 years	10	7%	7	5%
Have permanent difficulties with activities of daily life	11	7%	4	3%
Require surgery	1	1%	5	3%

More than half of the physicians (82, 56%) opted to refer the patient to a specialist in secondary care. The most common destination was orthopedics (62, 42%) while 11 physicians (8%) chose a referral to a rheumatologist. Six physicians (4%) selected both orthopedics and rheumatologist referral.

Most of the physician believed that the patient in this scenario will recover within 6 weeks (92, 63%). Seven percent of physicians felt that the patient will have permanent difficulties with activities of daily life and the same number of physician's expected recurrence of symptoms within 2 years. Need for surgery was mentioned by a small number of physicians i.e. 1% and 3% for RCT and AdhC scenarios respectively.

## Clinical Scenario 2: Adhesive Capsulitis

### Diagnosis

The majority of physicians indicated that they were confident of the correct diagnosis of the patient described in this scenario (94, 64%) (Table 5) with 19% (28) stating that the diagnosis was likely. 7% (10) of responders were not sure of this diagnosis. 18% (26) physicians felt this scenario was consistent with diagnosis of rotator cuff tendinopathy while 17% (25) chose Acute rotator cuff tear.

	Acute RC tear (n%)	Glenohumeral OA (n%)	ACJ Disorder (n%)	RCT (n%)	Referred Neck pain	AdhC (n%)
Confident Yes	25 (17%)	7 (5%)	8 (5%)	26 (18%)	4 (3%)	94 (64%)
Likely	23 (16%)	31 (21%)	21 (14%)	50 (34%)	17 (12%)	28 (19%)
Not Surely	8 (5%)	12 (8%)	27 (18%)	19 (13%)	16 (11%)	10 (7%)
Unlikely	59 (40%)	79 (54%)	66 (45%)	33 (22%)	72 (49%)	13 (9%)
Confidently No	32 (22%)	18 (12%)	25 (17%)	19 (13%)	38 (26%)	2 (1%)

### Investigations

Of the 147 physicians who provided responses, 115 (78%) chose an investigation while 32 (22%) did not select any investigation (Table 6). The most common investigation selected was USS of the shoulder, selected by 95 (65%). Plain radiography of the shoulder was the second most frequently selected, by 91 physicians (62%), followed by blood tests, selected by 85 physicians (58%). The majority selected these in combination with other investigations. The only other investigation suggested by 1 responder was joint aspiration. The most common reasons for selecting investigations are similar to those related to the first scenario: for USS and MRI of the shoulder to confirm the diagnosis, and for blood tests and plain radiographs of the shoulder to exclude other diagnoses.

Reason for Investigation	Blood test n (%)	Plain radiograph shoulder n (%)	USS shoulder n (%)	CT scan shoulder n (%)	MRI shoulder n (%)	MRI neck n (%)	Other
To confirm diagnosis	15 (18)	21 (23)	63 (66)	24 (40)	52 (68)	18 (29)	
To exclude other diagnoses	52 (61)	63 (69)	20 (21)	15 (25)	5 (7)	29 (46)	1*
To guide treatment option	11 (13)	5 (6)	10 (11)	5 (8)	5 (7)	4 (6)	
To decide on a specialist referral	7 (8)	2 (2)	2 (2)	16 (27)	14 (18)	12 (19)	
Total number	85 (58%)	91 (62%)	95 (65%)	60 (41%)	76 (52%)	63 (43%)	

### Treatment, referral & prognosis

Physiotherapist and oral analgesia were selected by a nearly equal number of physicians (82%), (Table 4). Corticosteroid injection was indicated by about half of the responders (57, 51%). Most responders selected more than one treatment. The most common combination was analgesics, injection and physiotherapy (58, 41%) followed by analgesics and physiotherapy (43, 30%).

More than half of the physicians (90, 62%) opted to refer the patient to a specialist in secondary care. The most common destination was orthopedics (86, 59%) while 24 physicians (16%) chose a referral to rheumatologist.

Sixty-two physicians (42%) felt that the patient will recover within 6 weeks while the same number indicated that recovery would take 1-2 years. Three percent of physicians felt that the patient will have permanent difficulties with activities of daily life. Need for surgery was mentioned by a similar number of physicians (3%).

## Association analysis

## Impact of physician's grade on diagnosis and management of shoulder pain

Based on the grades, physicians were divided into two, Junior Grade (GP & Specialist, n=36) and Senior Grade (Consultant & Senior Consultants, n=111). Analysis of RCT clinical scenario revealed that Junior grade physicians were more likely to refer the patient to secondary care and the difference was clinically significant (p=0.022) (Table 7). Furthermore, during analysis of AdhC scenario, Junior grade physicians were found to more frequently rely on x-ray of the shoulder with a statistically significant difference (p=0.022). There were no other statistically significant differences between these groups

Table 7: Impact of physician's grade on diagnosis and management of shoulder pain									
	Junior Grade (n=36)	Senior Grade (n=111)	Total	P-Value	Junior Grade (n=36)	Senior Grade (n=111)	Total	P-Value	
				<b>SCENARIO 1: RCT</b>			<b>SCENARIO 2: AdhC</b>		
<b>Blood tests</b>									
To Confirm the Diagnosis	2 (8%)	4 (6%)	6	0.301	6 (22%)	9 (16%)	15	0.569	
To decide on a specialist referral	2 (8%)	2 (3%)	4		2 (7%)	5 (9%)	7		
To Exclude Other Diagnoses	13 (50%)	45 (70%)	58		14 (52%)	38 (66%)	52		
To Guide treatment options	9 (36%)	13 (20%)	22		5 (19%)	6 (10%)	11		
<b>X-ray of the Shoulder</b>									
To Confirm the Diagnosis	11 (38%)	20 (27%)	31	0.065	12 (42%)	9 (14%)	21	0.022	
To decide on a specialist referral	1 (3%)	0	1		1 (4%)	1 (2%)	2		
To Exclude Other Diagnoses	12 (41%)	49 (65%)	61		14 (50%)	49 (78%)	63		
To Guide treatment options	5 (17%)	6 (8%)	11		1 (4%)	4 (6%)	5		
<b>Ultrasound of the Shoulder</b>									
To Confirm the Diagnosis	17 (68%)	51 (65%)	68	0.829	18 (62%)	45 (68%)	63	0.606	
To decide on a specialist referral	1 (4%)	3 (4%)	4		0	2 (3%)	2		
To Exclude Other Diagnoses	3 (12%)	15 (19%)	18		8 (28%)	12 (18%)	20		
To Guide treatment options	4 (16%)	9 (12%)	13		3 (10%)	7 (11%)	10		
<b>CT Scan of the Shoulder</b>									
To Confirm the Diagnosis	8 (38%)	20 (43%)	28	0.967	6 (26%)	18 (49%)	24	0.329	
To decide on a specialist referral	5 (24%)	9 (20%)	14		7 (30%)	9 (24%)	16		
To Exclude Other Diagnoses	5 (24%)	10 (22%)	15		7 (30%)	8 (22%)	15		
To Guide treatment options	3 (14%)	7 (15%)	10		3 (13%)	2 (5%)	5		
<b>MRI Scan Shoulder</b>									
To Confirm the Diagnosis	7 (30%)	31 (61%)	38	0.085	17 (61%)	35 (73%)	52	0.689	
To decide on a specialist referral	7 (30%)	7 (13%)	14		7 (25%)	7 (15%)	14		
To Exclude Other Diagnoses	3 (13%)	7 (13%)	10		2 (7%)	3 (6%)	5		
To Guide treatment options	6 (26%)	7 (13%)	13		2 (7%)	3 (6%)	5		
<b>MRI Cervical spine</b>									
To Confirm the Diagnosis	3 (14%)	2 (5%)	5	0.459	8 (2%)	10 (26%)	18	0.707	
To decide on a specialist referral	6 (27%)	10 (23%)	16		6 (24%)	6 (16%)	12		
To Exclude Other Diagnoses	12 (55%)	27 (61%)	39		10 (40%)	19 (50%)	29		
To Guide treatment options	1 (5%)	5 (11%)	6		1 (4%)	3 (8%)	4		
<b>TREATMENT</b>									
Analgesic & Injection	0	4 (4%)	4	0.442	0	5 (5%)	5	0.226	
Analgesic & Physio	19 (53%)	43 (39%)	62		10 (30%)	33 (30%)	43		
Analgesic, Injection & Physio	7 (19%)	38 (34%)	45		13 (39%)	45 (41%)	58		
Analgesia	3 (8%)	12 (11%)	15		5 (15%)	9 (8%)	14		
Injection & Physiotherapy	1 (3%)	3 (3%)	4		0	10 (9%)	10		
Injection	2 (6%)	3 (3%)	5		1 (3%)	1 (1%)	2		
Physiotherapy	4 (11%)	8 (7%)	12		4 (12%)	6 (6%)	10		
<b>REFERRAL</b>									
Yes	26 (72%)	56 (50%)	82	0.022	26 (72%)	64 (58%)	90	0.133	
No	10 (28%)	55 (40%)	65		10 (28%)	46 (42%)	56		



### Impact of physician's MSK experience on diagnosis and management of shoulder pain

Based on the previous experience and qualifications provided by responders, they were divided into two groups; Group one with no musculoskeletal (MSK) experience or qualification (n=28) and group 2 with previous MSK experience or qualification (n=119). Analysis of RCT clinical scenario did not show any statistically significant difference in their diagnosis and management decisions (Table 8). However, during analysis of AdhC scenario, Physicians with MSK experience were more likely to select plain radiographs of the shoulder and blood tests with the difference being clinically significant (p=0.022). There were no other statistically significant differences between the two groups.

### Discussion

This is the first national study to report on primary care management of patients with shoulder pain by primary care physicians in Qatar, using clinical scenarios. Our survey revealed the current pattern of care for shoulder pain as variable. Nearly one third of participants felt "fairly confident" while a nearly similar number felt "somewhat confident" in managing shoulder pain patients. In general, there was a high reliance on imaging, particularly plain radiographs, ultrasound, and MRI to either confirm the diagnosis or exclude alternate diagnoses.

There have been studies in Canada, USA, Australia and the UK which suggested low confidence among primary care physicians in diagnosing and managing shoulder pain, with frequent use of investigations (11-14). Over-reliance on investigations could be explained by inherent uncertainties in patient symptomatology, natural reluctance to commit to a specific diagnosis based only on clinical information, access to investigations, or the availability of specialist and allied health services, or simple lack of awareness of current evidence and guidelines. In our study, only a modest number of respondents confidently committed to correct diagnosis in the scenario. This could be a consequence of limited clinical information available in the scenario rather than a genuine lack of confidence in committing to a diagnosis. However, the fact that a high number of responders selected investigation, a possibility of genuine reluctance to make a clinical diagnosis cannot be completely ruled out. This is further supported by the fact that even when physicians responded that they were confident of a diagnosis, they still requested investigation to confirm it. This pattern is like the findings in previous such studies mentioned earlier.

Rationale in choice of investigations is mixed. In the RCT scenario, 70% of responders selected plain radiography of shoulder. Out of these, 60% selected this to exclude other diagnosis which could be explained by the fact that the patient in the scenario is elderly and had 6 weeks history of shoulder pain not responding to conservative treatment. However, in the AdhC scenario, plain radiography was selected again by most responders (two thirds). This practice is not evidence based as in the absence of any

red flag symptoms, in a middle-aged woman with three weeks history of shoulder pain, alternate diagnosis like glenohumeral joint OA is unlikely as this usually affects older people. Similarly, in both scenarios, nearly two thirds of responders selected USS mainly to confirm the diagnosis, a rationale that is not supported by published evidence and literature. Imaging of the rotator cuff with USS is rarely indicated in primary care. A normal rotator cuff US does not exclude serious shoulder pathologies such as tumor and glenohumeral osteoarthritis. The procedure is highly operator-dependent. Asymptomatic changes on ultrasonography are common and increase with age and many observed abnormalities might not require specific treatment (19,20). This has led to concerns that ultrasound findings might be misleading, may cause unnecessary anxiety for the patient and may result in inappropriate and/or delay correct diagnosis and potentially unnecessary intervention. This type of imaging is therefore more usefully performed after secondary care referral when it can help direct secondary care treatment when conservative care has failed. Any positive US findings need to be interpreted by shoulder surgeons in the context of patient symptoms, disability, and response to treatment. Referrals to secondary care should therefore be based on patient symptoms, disability, and response to conservative treatment rather than US reports.

Blood tests are usually not indicated in primary care assessment in the absence of any red flags or findings suggestive of malignancy, PMR, generalized rheumatological condition or undiagnosed diabetes. Blood tests were also selected by three out of five physicians in both scenarios. Unilateral shoulder pain without any other symptoms in RCT scenario makes PMR and rheumatoid arthritis unlikely. A blood test in the AdhC scenario could be justified to exclude undiagnosed diabetes mellitus due to its strong association with adhesive capsulitis.

Regarding choice of treatment, analgesia and physiotherapy were recommended by the majority of responders for both scenarios. Half of the responders selected to offer intra-articular steroid in the AdhC scenario while two fifths chose to do so in the RCT case. Most responders selected more than one treatment; the most common combination being analgesics, injection & physiotherapy, and analgesics & physiotherapy. These treatment choices are similar to what has been described in previous primary care studies in other countries (13-14).

In our study, more than half of the physicians opted to refer the patient to a specialist in secondary care in both scenarios with orthopedics clinic being the most common destination. Patients in our scenarios had 6 weeks (RCT) and 3 weeks (AdhC) duration of symptoms and had not had a trial of physiotherapy or steroid injection. The latest British Orthopedics Association guidelines suggest that Physiotherapy rehabilitation should usually be used for a minimum of 6 weeks unless patients are unable to tolerate, or physiotherapists identify a reason for earlier referral to secondary care (21). In patients who show improvement

**Table 8: Impact of physician's MSK experience on diagnosis and management of shoulder pain**

	Have MSK experience (n=28)	No MSK experience (n=119)	Total	p-Value	Have MSK experience (n=28)	No MSK experience (n=119)	Total	p-Value
	<b>SCENARIO 1</b>				<b>SCENARIO 2</b>			
<b>Blood tests</b>								
To Confirm the Diagnosis	3 (17%)	3 (4%)	6	0.234	6 (38%)	9 (13%)	15	0.022
To decide on a specialist referral	1 (6%)	3 (4%)	4		1 (6%)	6 (9%)	7	
To Exclude Other Diagnoses	9 (50%)	49 (68%)	58		5 (31%)	47 (68%)	52	
To Guide treatment options	5 (28%)	17 (24%)	22		4 (25%)	7 (10%)	11	
<b>X-ray of the Shoulder</b>								
To Confirm the Diagnosis	5 (26%)	26 (31%)	31	0.940	2 (15%)	19 (24%)	21	0.025
To decide on a specialist referral	0	1 (1%)	1		0	2 (3%)	2	
To Exclude Other Diagnoses	12 (63%)	49 (58%)	61		8 (62%)	55 (71%)	63	
To Guide treatment options	2 (11%)	9 (11%)	11		3 (23%)	2 (3%)	5	
<b>Ultrasound of the Shoulder</b>								
To Confirm the Diagnosis	11 (2%)	57 (70%)	68	0.213	12 (67%)	51 (66%)	63	0.222
To decide on a specialist referral	0	4 (5%)	4		0	2 (3%)	2	
To Exclude Other Diagnoses	6 (29%)	12 (15%)	18		2 (11%)	18 (23%)	20	
To Guide treatment options	4 (19%)	9 (11%)	13		4 (22%)	6 (8%)	10	
<b>CT Scan of the Shoulder</b>								
To Confirm the Diagnosis	4 (33%)	24 (44%)	28	0.702	5 (46%)	19 (39%)	24	0.516
To decide on a specialist referral	2 (17%)	12 (22%)	14		2 (18%)	14 (29%)	16	
To Exclude Other Diagnoses	3 (25%)	12 (22%)	15		2 (18%)	13 (27%)	15	
To Guide treatment options	3 (25%)	7 (13%)	10		2 (18%)	3 (6%)	5	
<b>MRI Scan Shoulder</b>								
To Confirm the Diagnosis	8 (67%)	30 (48%)	38	0.613	12 (92%)	40 (63%)	52	0.226
To decide on a specialist referral	1 (8%)	13 (21%)	14		1 (8%)	13 (21%)	14	
To Exclude Other Diagnoses	1 (8%)	9 (14%)	10		0	5 (8%)	5	
To Guide treatment options	2 (17%)	11 (17%)	13		0	5 (8%)	5	
<b>MRI Cervical spine</b>								
To Confirm the Diagnosis	3 (2%)	2 (4%)	5	0.048	6 (55%)	12 (23%)	18	0.088
To decide on a specialist referral	2 (17%)	14 (26%)	16		0	12 (23%)	12	
To Exclude Other Diagnoses	5 (42%)	34 (63%)	39		5 (45%)	24 (46%)	29	
To Guide treatment options	2 (17%)	4 (7%)	6		0	4 (8%)	4	
<b>TREATMENT</b>								
Analgesic & Injection	1 (4%)	3 (3%)	4	0.812	0	5 (5%)	5	0.226
Analgesic & Physio	13 (46%)	49 (41%)	62		10 (30%)	33 (30%)	43	
Analgesic, Injection & Physio	6 (21%)	39 (33%)	45		13 (39%)	45 (41%)	58	
Analgesia	4 (14%)	11 (9%)	15		5 (15%)	9 (8%)	14	
Injection & Physiotherapy	0	4 (3%)	4		0	10 (9%)	10	
Injection	1 (4%)	4 (3%)	5		1 (3%)	1 (1%)	2	
Physiotherapy	3 (11%)	9 (8%)	12		4 (12%)	6 (6%)	10	
<b>REFERRAL</b>								
Yes	16 (57%)	66 (55%)	82	0.872	16 (57%)	74 (63%)	90	0.586
No	12 (43%)	53 (45%)	65		12 (43%)	44 (37%)	56	

of therapy is justified. If a patient fails to respond to 3 months of conservative treatment measures, they should be referred to secondary care. However, patients should be referred earlier if severe symptoms necessitate it as it is inappropriate to persist with ineffective treatments. Physicians in Qatar primary care have direct access to a physiotherapy clinic. We are not sure if an early referral to secondary care is due to lack of GP confidence to diagnose and manage shoulder complaints or lack of awareness of current management and referral guidelines. Our finding of a high reliance upon specialist referral is in keeping with some but not all previous studies (12-14,22 5,23).

We examined whether physicians with senior grade and with MSK experience were more confident in making a diagnosis and whether they differed in their approach to requesting investigations or offering treatment. One would expect them to have a higher level of knowledge and skills in managing patients with shoulder pain. Our study found that junior grade physicians more frequently relied on radiography of the shoulder and more frequently referred the patients to secondary care. On the other hand, physicians with MSK experience were keener to select plain radiography of shoulder and blood tests in the AdhC scenario. Interestingly this finding is consistent with a finding in a primary care study in the UK.

### Strengths and limitations

Scenario-based surveys are limited by the fact that they are brief and can be interpreted differently by different individuals. To minimize this limitation, we adopted surveys which have been used successfully in similar studies in other countries. Participation in this study was completely voluntary and the physician's choice to participate or not, was not held against them. Data was collected anonymously, and no personally identifiable data was collected from the participants.

We measured stated rather than actual practice, which means patient preference, or perceived patient pressure, are less likely to influence stated management responses.

All participants work for the same national primary care organization and hence have the same set up of services and access to investigations and specialists. Thus, our findings of general overreliance on imaging and referral would indicate that access or lack of it was not really a factor in the physician's stated responses

A potential limitation of our study is the low response rate which limits generalizability of its result. The low response rate means that the findings are likely to be influenced by non-response bias. Within our study population, we can only compare responders to non-responders based on gender and designation which limits our ability to assess the likely influence of such bias. We used direct email containing survey link as the method of electronic distribution. We are not clear whether newer electronic distribution methods like social media would give a different response.

### Implications for future research and interventions

Our survey describes clinical practice of a large sample of primary care physicians in Qatar and provides insight into their reasoning about imaging and treatment decision. We believe that despite the availability of evidence to inform clinical practice, our study indicates an 'evidence -practice' gap among primary care physicians. The objection could be that clinical scenarios are brief and can be interpreted differently by different clinicians. Moreover, the diagnosis of shoulder pain presentations is known to be challenging with symptoms and signs potentially reflecting various underlying conditions. However, in our support, the clinical scenarios used in this survey were adapted from previous studies conducted in other countries (11-14).

We believe a more in-depth understanding of their clinical reasoning, perhaps using qualitative research, would particularly help better understand the rationale for their decision regarding investigations and other management choices. In the meanwhile, interventions are needed to improve diagnosis and treatment of common shoulder problems in primary care and to reduce inappropriate imaging and specialist referral. This can include academic detailing like education seminar, a hands-on workshop focused on shoulder clinical examination including shoulder injection technique or a joint clinic with primary care physicians and orthopedic surgeon. Finally, we suggest the development and dissemination of local clinical guidelines aimed at primary care management of patients with shoulder pain.

### Conclusion

The results of our survey among primary care physicians in PHCC, Qatar, using brief clinical scenarios show an apparent frequent use of investigations, including blood tests, plain radiographs and USS in the management of common shoulder pain presentations. This reliance on investigations was more prevalent in junior grade physicians. The most common treatment approach was analgesia and physiotherapy.

A tendency to choose early referral to secondary care was also identified which was more frequently noted amongst junior grade physicians. We hope with more experience and CME training they may feel more confident in their decision making and less inclined to refer in future. However, the low response rate to the survey and potential non-response bias means that caution needs to be exercised in generalizing the findings.

### Funding

This study was funded by PHCC. The funders had no role in the study design, analysis, interpretation, or writing.

## References

1. Urwin M, Symmons D, Allison T, et al. Estimating the burden of musculoskeletal disorders in the community: the comparative prevalence of symptoms at different anatomical sites, and the relation to social deprivation. *Ann Rheum Dis* 1998;57:649–55. doi:10.1136/ard.57.11.649
2. Luime JJ, Koes BW, Hendriksen IJ, et al. Prevalence and incidence of shoulder pain in the general population; a systematic review. *Scand J Rheumatol* 2004;33:73–81. doi:10.1080/03009740310004667
3. Cadogan A, Laslett M, Hing WA, McNair PJ, Coates MH. A prospective study of shoulder pain in primary care: prevalence of imaged pathology and response to guided diagnostic blocks. *BMC Musculoskelet Disord* 2011;12:119. doi:10.1186/1471-2474-12-119
4. Aldeen Sarakbi H, Alsaed O, Hammoudeh M, et al. Epidemiology of musculoskeletal complaints and diseases in Qatar: A cross-sectional study. *Qatar Med J* 2020(2):29. doi:10.5339/qmj.2020.
5. Linsell L, Dawson J, Zondervan K, et al. Prevalence and incidence of adults consulting for shoulder conditions in UK primary care; patterns of diagnosis and referral. *Rheumatology* 2006;45:215–21. doi:10.1093/rheumatology/kei139
6. Greving K, Dorrestijn O, Winters JC, et al. Incidence, prevalence, and consultation rates of shoulder complaints in general practice. *Scand J Rheumatol* 2012;41:150–5.
7. Jordan KP, Kadam UT, Hayward R, et al. Annual consultation prevalence of regional musculoskeletal problems in primary care: an observational study. *BMC Musculoskelet Disord* 2010;11:144. doi:10.1186/1471-2474-11-144
8. Winters JC, Sobel JS, Groenier KH, Arendzen JH, Meyboom-de Jong B. The long-term course of shoulder complaints: a prospective study in general practice. *Rheumatology (Oxford)*. 1999;38(2):160-163. doi:10.1093/rheumatology/38.2.160
9. Whittle S, Buchbinder R. In the clinic. Rotator cuff disease. *Ann Intern Med* 2015;162:ITC1
10. Mitchell C, Adebajo A, Hay E, Carr A. Shoulder pain: diagnosis and management in primary care. *Br Med J*. 2005;331:1124–1128. doi: 10.1136/bmj.331.7525.1124.
11. Glazier RH, Dalby DM, Badley EM, et al. Management of common musculoskeletal problems: a survey of Ontario primary care physicians. *CMAJ* 1998;158:1037–40.
12. Loebenberg MI, Rosen JE, Ishak C, Jazrawi LM, Zuckerman JD. A survey of decision making processes in the treatment of common shoulder ailments among primary care physicians. *Bull Hosp Jt Dis* 2006;63:137–44.
13. Buchbinder R, Staples MP, Shanahan EM, Roos JF. General practitioner management of shoulder pain in comparison with rheumatologist expectation of care and best evidence: an Australian national survey. *PLoS One* 2013;8:e61243. doi:10.1371/journal.pone.0061243
14. Artus M, van der Windt DA, Afolabi EK, et al. Management of shoulder pain by UK general practitioners (GPs): a national survey *BMJ Open* 2017;7:e015711. doi: 10.1136/bmjopen-2016-015711
15. Braithwaite D, Emery J, De Lusignan S, Sutton S. Using the internet to conduct surveys of health professionals: a valid alternative? *Fam Pract* 2003;20:545-51. doi:10.1093/fampra/cm9509
16. Luck J, Peabody JW, Dresselhaus TR, Lee M, Glassman P. How well does chart abstraction measure quality? A prospective comparison of standardized patients with the medical record. *Am J Med* 2000;108:642–9. doi:10.1016/s0002-9343(00)00363-6
17. Peabody JW, Luck J, Glassman P, Dresselhaus TR, Lee M. Comparison of scenarios, standardized patients, and chart abstraction: a prospective validation study of 3 methods for measuring quality. *JAMA* 2000;283:1715–22. doi:10.1001/jama.283.13.1715
18. Veloski J, Tai S, Evans AS, Nash DB. Clinical vignette-based surveys: a tool for assessing physician practice variation. *Am J Med Qual* 2005;20:151–7. doi:10.1177/1062860605274520
19. Milgrom C, Schaffler M, Gilbert S, van Holsbeeck M. Rotator-cuff changes in asymptomatic adults. The effect of age, hand dominance and gender. *J Bone Joint Surg Br*. 1995;77:296-298.
20. Awerbuch MS. The clinical utility of ultrasonography for rotator cuff disease, shoulder impingement syndrome and subacromial bursitis. *Med J Aust* 188: 50–53. doi:10.5694/j.1326-5377.2008.tb01507.x).
21. <https://bess.ac.uk/bess-boa-primary-intermediate-care-shoulder-pain-guidelines/>
22. Speed CA, Crisp AJ. Referrals to hospital-based rheumatology and orthopaedic services: seeking direction. *Rheumatology (Oxford)*. 2005;44:469-471. doi:10.1093/rheumatology/keh504
23. van der Windt DA, Koes BW, Boeke AJ, Devillé W, De Jong BA, Bouter LM. Shoulder disorders in general practice: prognostic indicators of outcome. *Br J Gen Pract*. 1996;46:519-523.