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Knowledge and Attitude of Osteoarthritis Management Among Primary Health Care Physicians at Primary Health Care Centers of Ministry of Health Inside Makkah Al-Mukarramah City, 2018.

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Abstract
Background: *The primary goal of Osteoarthritistreatment is educating the patient, minimizing pain, and improving joint function.* ***Objectives:*** *To estimate the level of knowledge and attitude of osteoarthritis management among primary health care PHC physiciansinside Makkah city, 2018, and identify factors affecting them.* ***Materials and methods:*** *Cross-sectional study, includes a sample of PHC physicians working at PHC centres of the ministry of health in Makkah city. A Self-administered questionnaire was utilized for data collection.* ***Results:*** *The study included 136 physicians. Overall, the knowledge score ranged between 2 and 10 (out of 10). There was no statistically significant difference in the knowledge between physicians according to age, gender, nationality, qualification, and experience. The majority of the physicians agreed that osteoarthritis is a common health problem in Saudi Arabia, more attention should be offered to osteoarthritis patients, recommended establishing Saudi guidelines, and perceived that PHC physicians can achieve a major role in control of osteoarthritis.* ***Conclusion:*** *Overall knowledge of PHC physicians in Makkah city regarding Osteoarthritis is acceptable. Their attitude towards the importance of the disease was promising. Conduct Saudi guidelines and further studies to assess the practice of PHC physicians regarding osteoarthritis, is recommended.*

Keywords:*Osteoarthritis, Knowledge, attitude, primary healthcare.*

I. INTRODUCTION

1.1BACKGROUND/LITERATURE REVIEW

Osteoarthritis(OA) is one of the most prevalent arthritis and among the leading causes of disability worldwide. [1,2] It affects the quality of life physically, emotionally, and socially. [3, 4]About 10% of the world's population aged 60 years or older have significant clinical problems attributed to OA according to the World Health Organization (WHO) Scientific Group on Rheumatic Diseases. [5]Al-Arfaj A et al. performed a cross-sectional study in Saudi Arabia and showed the prevalence of OA in 46 to 55 years old is 30.8% and 60.6% of patients aged 66-75 years. [6]In the United States, Osteoarthritis is affecting 22% of the population and expected to affect approximately 67 million adults. [7]Whereas about 8.5 million adults have osteoarthritis, and over 2

million patients consult their general practitioners in primary care regarding osteoarthritis-related symptoms each year in the United Kingdom. [8]

OA is a progressive degenerative disease characterized by joint pain, tenderness, and decreased range of motion, and the most commonly affected joints are hands, hips, knees, back, and neck. [9] The cause of OA is multifactorial, age, obesity, physical inactivity, trauma, and family history are risk factors for it. [10] Obesity is considered a strong risk factor for knee OA. [11]Regarding the diagnosis of OA, it is clinical diagnosis without investigation if a patient aged 45 years or older, has activity-related joint pain and has either no morning joint-related stiffness or morning stiffness that lasts 30 minutes or less. [12] The primary goal of the treatment of OA is educating the patient about the disease, minimizing pain, and improving joint function. [8] Non-pharmacological intervention such as weight loss and physical therapy considered the cornerstone of OA treatment. [13] However, the cornerstone of pharmacological therapy is Non-Steroidal Anti-Inflammatory Drugs(NSAIDs). [7]

In 2011, Al-Hazmi A carried out a cross-sectional study among 150 of primary health care physicians (PHCPs) in Al-Jouf province of Saudi Arabia, and it showed that 75.3% of physicians considered OA one of the common diseases in Saudi Arabia and 55% knew that OA diagnosed clinically. Regarding the most commonly prescribed medication for OA, it revealed 74% of physicians prescribed oral non-steroidal anti-inflammatory drugs, 18.2%prescribed acetaminophen, and topical NSAIDs in 6.5%. Furthermore, 71.4% of physicians educated their patients about OA, 79.2% discussed weight loss, and 36.4% of physicians considered continuity of care in their practice. However, most of them will refer OA patients to the rheumatologist immediately or later. [14]

On the other hand, Kingsbury SR et al. in 2012 conducted a study in the UK regarding current OA treatment, prescribing influences, and barriers to implementation in primary care. The survey carried out among UK general practitioners (GPs), and it revealed that 52% of GPs do not use educational materials for OA, most commonly due to lack of time 55%, material availability and material quality 54% and 67.28% respectively. Furthermore, 69% recommended exercise, 64% prescribed paracetamol, and topical non-steroidal anti-inflammatory drugs (NSAIDs), which were the most used management strategies. However, 35% who were prescribed NSAIDs and 31% who have referred their patients to a physiotherapist. [15]

Conversely to the previous study, Doubova S et al. in their cross-sectional study in 2015 regarding the quality of care for hip and knee osteoarthritis at family medicine clinics conducted that in-patients who are 20 years or older and had knee OA. It revealed that 26.1% of patients advised for exercise, physicians referred 19.6% of patients to the dietician and prescribed NSAIDs for 71.5 %of patients aged 65 years or more. However, Acetaminophen was used only in 5.2% of patients as the first line of treatment. [16]Sancheti P et al. conducted a multi-center cross-sectional study on the management of knee pain and early OA in India, published in 2017. The study included patients with knee pain and their orthopaedic surgeon. They completed the questionnaire which constructed to assess patient's knowledge about OA and their surgeon regarding OA severity and management. It showed 91.6% of patients had received medication, whereas 81.9% had non-pharmacological treatment, and 55.2% of patients had physical therapy. On the other hand, physicians prescribed oral medication, intra-articular steroid, and surgical management in 83.3%, 29.8%, and 13.2% of patients, respectively. [17]

Additionally, in 2012, Gronhaug.G et al. performed a cross-sectional survey of the quality of hip and knee osteoarthritis management in primary health care. It carried out among patients diagnosed with OA, and the result discussed where 55% of patients with knee OA visited their GPs and 65% with hip OA. Patients who informed regarding exercise and physiotherapy were 84% and 76% referred to a physiotherapist. However, only 8% of patients referred to the dietician for weight reduction. [18]

In 2016, a systematic review of OA in general practice performed by Alrashdi. An et al. found that lack of adequate knowledge in OA treatment, short consultation time, and lack of resources are major limitations among GPs in osteoarthritis treatment. [19]

1.2 RATIONALE

- Osteoarthritis is a common presents in primary care. [20]
- It is usually diagnosed and treated initially by primary health care physicians. [13]

- The primary health care physicians are the first contact with the patient, and they can provide comprehensive and continuing care for patients. [21]
- Up to the researcher's knowledge, only a few studies are carried out regarding OA in Primary care in Saudi Arabia.

1.3 AIM OF THE STUDY

To evaluate the knowledge and attitude of osteoarthritis management among primary health care physicians.

1.4 OBJECTIVES

1-To estimate the level of knowledge and attitude of osteoarthritis management among primary health care physicians inside Makkah city, 2018

2-To identify if there is an association of socio-demographic characteristics and knowledge, attitude, regarding osteoarthritis management among primary health care physicians inside Makkah city, 2018.

II. METHODOLOGY (MATERIALS AND METHODS)

2.1 STUDY DESIGN

Cross-Sectional study

2.2 STUDY AREA

Makkah city. It is the holiest place in the Islamic world. The population of Makkah city in 2012 was approximately 1.6 million.

According to the Ministry of Health (MOH) website, the government provides free of charge medical services to all citizens of Makkah through 7 hospitals and 85 primary health care centers (PHCCs) urban and rural.

The primary health care centers are arranged under seven supervisory sectors, in each sector; there are two reference centers. There are 37 PHCCs located inside Makkahorganized under three supervisory sectors, namely (Al-Adel Sector, Al-Zahir Sector, and Al-Ka'akiah Sector). The study was conducted at the 37 PHCCs located inside Makkah

2.3 STUDY POPULATION

The study was carried on primary health care physicians working at the 37 PHCCs of MOH located inside the Holy Makkah city. The total number of those physicians is 208 (sector administrators).

2.4 INCLUSION CRITERIA

All Primary health care physicians who are working at PHCCs of the MOH inside Makkah city, males and females were eligible for study inclusion.

2.5 EXCLUSION CRITERIA

- Primary health care physician on leave throughout the whole study period.
- Non-English-speaking physicians.
-

2.6 SAMPLE SIZE

The sample size is 136 physicians. It is calculated by using the Raosoft website for sample size calculation and based on the 95% confidence level, 5% margin of errors, and 50% response. However, it was increased by 10% for avoiding non-response error to become 150 physicians.

2.7 SAMPLING TECHNIQUE

- Simple sampling random technique was applied.

- First, the names of primary health care physicians working at the 37 PHCCs in the three sectors (Al-Adel, Al-Ka'akiah, and Al-Zahir) inside Makkah were listed, and each physician was given a code number.
- Then a random table generator website was used to select the sample from the prepared list.

2.8 DATA COLLECTION TOOL

A self-administered written, valid, and pretested questionnaire was utilized. The questionnaire was adopted from a previous similar study conducted in 2011 in Saudi Arabia. The permission of reused is obtained from the author (Al-Hazmi A). [14]

The questionnaire is composed of (34) closed-ended questions, and it is divided into two parts:

- The first part consists of socio-demographic characteristics, which include (age, gender, post-graduate qualification, years in practice, and nationality).
- The second part contains (29) questions regarding knowledge (10 questions) and attitude (19 questions) of osteoarthritis management.
- For knowledge questions, a score was created by giving a score of "1" for a correct answer and "0" for an incorrect or missed answers. Thus, a total score ranged between 0 and ten was computed for each physician. The total knowledge score was abnormally distributed as proved by significant Shapiro-Wilk test (p=0.001).
- The questionnaire was revised and revalidated by two consultants.

2.9 DATA COLLECTION TECHNIQUE

Data were collected from 14 January 2018 until 1 February 2018, for three weeks (15 days) and the week end was excluded. The researcher divided the total sample (150) on 15 days; therefore, ten samples were collected every day.

The researcher distributed the questionnaire. First, the researcher met each PHCC director and took permission for meeting each physician during the break time. Furthermore, the researcher took permission from each physician, gave them a brief idea about the research, explained that no more than 10 minutes will be taken from their time and asked them to fill the questionnaire.

The researcher collected the questionnaire at the same time if completed if not, she came at the last hour of work.

2.10 STUDY VARIABLES:

a) Dependent variable:

Knowledge and attitude regarding osteoarthritis management

b) Independent variables:

- Gender.
- Age.
- Post-graduate qualification.
- Years in practice at PHCCs.
- Nationality.

2.11 DATA ENTRY AND ANALYSIS

Statistical Program for the Social Science (SPSS), version 25 used for data entering and analysis.

Description: Frequency and percentage applied to describe categorical data, whereas knowledge score described by median, inter-quartile range (IQR), and mean rank.

Statistical tests: Since the knowledge score abnormally distributed as shown by significant Shapiro-Wilk test (p=0.001), non-parametric statistical tests adopted. Mann-Whitney test used to compare continuous variables between two groups and a Kruskal-Wallis test to compare it between more than two groups. Spearman correlation coefficient applied to correlate between two continuous variables (age and knowledge score). Chi-square test used to investigate the association between two categorical variables.

Significance: *P-value* ***less or equal to 0.05***was used to indicate statistical significance.

2.12 PILOT STUDY/PRETESTING

The researcher performed a pilot study on 10% of the sample size, which is approximately 14 primary health care physicians to test the clarity of the questionnaire and the feasibility of the methods. No changes needed as feedback.

2.13 ETHICAL CONSIDERATIONS:

- Approval from the concerned authority in the ministry of health and primary health care administration was obtained, number 439/D/S/402/47M and date 29/03/1439H.
- The researcher took written, informed consent from all participants.
- Acknowledgments provided to the supervisor, the advisor, the facilitators, and the participants.

2.14 RELEVANCE & EXPECTATIONS:

This study provided information regarding osteoarthritis management among PHCPs that might help in evaluating physician's knowledge and attitude toward OA management in primary health care centres.

2.15 BUDGET, FUND OR GRANT:

self-funded research.

III. RESULTS

- **Socio-demographic data**

The study included 136 physicians. Their ages ranged between 26 and 59 years with an arithmetic mean of 34.40 and a standard deviation of (±) 6.94 years. Table 1 summarizes the remaining socio-demographic characteristics of the physicians. Females represent 59.6% of them, and Saudis represent 72.8% of the physicians. More than half of them (52.2%) had MBBS whereas 34.6% had Board or equivalent degrees. Most of the participants (43.4%) had 5 years or less of experience in primary health care, while 8.8% had an experience over 20 years.

Table 1: Socio-demographic characteristics of physicians

Variables	Categories	Number	Percentage
Gender	Male	55	40.4
	Female	81	59.6
Nationality	Saudi	99	72.8
	Non-Saudi	37	27.2
Qualification	MBBS	71	52.2
	Diploma	12	8.8
	Master	6	4.4
	Board/equivalent	47	34.6
Years in experience	≤5	59	43.4
	>5-10	38	27.9
	>10-20	27	19.9
	>20	12	8.8

- **Knowledge of osteoarthritis**

From table 2, it is seen that most of the physicians correctly knew that the cause of osteoarthritis is multifactorial, and primary and secondary osteoarthritis must be differentiated (82.4%). Most of them could recognize that radiographs are generally the first line confirmation of the presence of osteoarthritis (75%), treatment should not be based solely on radiographic abnormalities (75%), and diagnosis of osteoarthritis can almost be made by history and physical examination (73.5%). On the other hand, less than half of the physicians

(43.4%) knew that pharmacologic therapy is not the cornerstone of osteoarthritis management, proximal interphalangeal [pip] joints are often not spared in osteoarthritis (39%) and only 26.5% could recognize that shoulders are not commonly affected in osteoarthritis.

Table 2: Responses of the physicians to the knowledge questions regarding osteoarthritis

	Correct answer	Frequency	Percentage
The cause of primary osteoarthritis is:	Multifactorial in origin	112	82.4
Diagnosis of osteoarthritis can almost be made by history and physical examination.	True	100	73.5
The following joints are commonly affected in osteoarthritis except:	Shoulders	36	26.5
All the following joints are often spared in osteoarthritis except:	Proximal interphalangeal [pip] joints	53	39.0
Radiographs changes of osteoarthritis include all the following except:	Symmetrical joint space narrowing	78	57.4
Selected key recommendations for the management of knee osteoarthritis include all the following except:	Pharmacologic therapy is the cornerstone of osteoarthritis management	59	43.4
Radiographs are generally the first line confirmation of the presence of osteoarthritis:	True	102	75.0
Treatment should not be based solely on radiographic abnormalities:	True	102	75.0
Primary and secondary osteoarthritis must be differentiated:	True	112	82.4
Patients with osteoarthritis usually present with all, except:	Moderate joint hotness	80	58.8

- Socio-demographic factors associated with osteoarthritis knowledge

-Gender

It is realized from table 3 that female physicians were more knowledgeable regarding osteoarthritis than males (mean ranks was71.75 versus 63.72). However, this difference was not statistically significant.

Table 3: Comparison between male and female physicians regarding knowledge about osteoarthritis

	Osteoarthritis knowledge score		
	Median	IQR	Mean rank
Males (n=55)	6	5-7	63.72
Females (n=81)	6	5-8	71.75

P-value of Mann-Whitney test=0.236

-Nationality

Table 4 shows that Saudi physicians were more knowledgeable regarding osteoarthritis than non-Saudis (mean ranks was71.47 versus 60.55). However, this difference was not statistically significant.

Table 4: Comparison between Saudi and non-Saudi physicians regarding knowledge about osteoarthritis

	Osteoarthritis knowledge score		
	Median	IQR	Mean rank
Non-Saudi (n=37)	5	5-7	60.55
Saudi (n=99)	6	5-8	71.47

P-value of Mann-Whitney test=0.144

-Qualification

It is shown in table 5, that the highest level of osteoarthritis knowledge was observed among physicians who hold Board/equivalent degree (mean rank was 76.03) whereas the lowest level of knowledge was observed among those who hold Diploma/ master's degree (mean rank was 50.86). However, this difference did not reach a statistically significant level, p=0.064.

Table 5: Comparison between physicians regarding knowledge about osteoarthritis according to their qualification

	Osteoarthritis knowledge score		
	Median	IQR	Mean rank
MBBS (n=71)	6	5-7	67.99
Diploma/Master (n=18)	5	4-7	50.86
Board/equivalent (n=47)	6	5-8	76.03

P-value of Kruskal-Wallis test=0.064

-Experience

It is illustrated in table 6 that the highest level of osteoarthritis knowledge was observed among physicians with experience of more than 20 years in PHC (mean rank was 78.13) whereas the lowest level of knowledge was observed among those with experience of 5 years or less (mean ranks was 63.65). However, this difference was not statistically significant.

Table 6: Comparison between physicians regarding knowledge about osteoarthritis according to their experience in primary health care

Experience in years	Osteoarthritis knowledge score		
	Median	IQR	Mean rank
≤5 (n=59)	6	5-7	63.65
>5-10 (n=38)	6	5-8	74.22
10-20 (n=27)	6	5-8	66.76
>20 (n=12)	6	5.25-7.75	78.13

P-value of Kruskal-Wallis test=0.467

- **Attitude towards osteoarthritis and its management**

  From table 7, the following are concluded:

  -The majority of the PHC physicians agreed that osteoarthritis is a common health problem in Saudi Arabia (97.8%), more attention should be offered to osteoarthritis patients (95.6%), collaborations with other health professionals, specially trained nurses, dietitians, and physiotherapists are essential tools for care of patients with osteoarthritis (94.9%), and the primary health care physician could be a useful person to support osteoarthritis patients (90.4%).

-Most of the PHC physicians had an interest to involve the family in management of patients with osteoarthritis (88.2%), thought that osteoarthritis causes patients excessive anxiety and concern (86.8%), recommended establishing "Saudi guidelines to care and manage osteoarthritis (86.8%) and perceived that the physicians in the primary care centers can achieve a major role in control of osteoarthritis (84.6%).

-On the other hand, less than half of the PHC physicians felt that an oral non-opioid analgesic (e.g., acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice (42.6%), agreed that during counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m2) (33.1%), prescribed medications for asymptomatic patients but x-ray positive osteoarthritis findings (29.4%), and agreed with the statement that (an osteoarthritis is not amenable to change) (25%).

-Most of PHC physicians agreed that non-pharmacological treatment is more beneficial than pharmacological treatment (64.7).

Table 7: Attitude of the physicians towards osteoarthritis and its management

	Agree (%)*	Disagree (%)*	Notsure (%)*
Do you think osteoarthritis is a common health problem in Saudi Arabia?	133 (97.8)	2 (1.5)	1 (0.7)
Do you perceive osteoarthritis is an underestimated health problem in Saudi Arabia?	105 (77.2)	11 (8.1)	20 (14.7)
Do you perceive osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions?	107 (78.7)	13 (9.6)	16 (11.8)
Do you think osteoarthritis is a part of growing old?	92 (67.6)	26 (19.1)	18 (13.2)
More attention should be offered to osteoarthritis patients.	130 (95.6)	2 (1.5)	4 (2.9)
Do you think osteoarthritis causes patient excessive anxiety and concern?	118 (86.8)	8 (5.9)	10 (7.4)
Would you prescribe medications for asymptomatic patients, but x-ray positive osteoarthritis findings?	40 (29.4)	67 (49.3)	29 (21.3)
Do you have the interest to involve the family in the management of patients with osteoarthritis?	120 (88.2)	4 (3.0)	12 (8.8)
Did you perceive your training prepare you adequately to manage patients with osteoarthritis?	79 (58.1)	28 (20.6)	29 (21.3)
Do you perceive the primary health care physician could be a useful person to support osteoarthritis patients?	123 (90.4)	5 (3.7)	8 (5.9)
Dealing with osteoarthritis patients is heavy going.	71(52.2)	35 (25.7)	30(22.1)
Do you perceive the statement that (osteoarthritis is not amenable to change)?	34 (25.0)	62 (45.6)	40 (29.4)
During counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m^2):	45 (33.1)	81 (59.6)	10 (7.4)
Collaborations with other health professionals, specially trained nurses, dietitians, and physiotherapists are very important tools for the care of patients with osteoarthritis:	129 (94.9)	1 (0.7)	6 (4.4)
Do you perceive of screening programs for osteoarthritis is favorable to improve the care of osteoarthritis patients?	90 (66.2)	24 (17.6)	22 (16.2)
Do you feel that an oral non-opioid analgesic (e.g., acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice?	58 (42.6)	60 (44.1)	18 (13.2)
Do you perceive the physicians in the primary care centers can	115 (84.6)	15	6

achieve a major role in the control of osteoarthritis?		(11.0)	(4.4)
Do you perceive that non-drug therapy would be more beneficial than drug therapy for osteoarthritis patients?	88 (64.7)	21 (15.4)	27 (19.9)
Do you recommend establishing "Saudi guidelines to care and manage osteoarthritis?	118 (86.8)	5 (3.7)	13 (9.6)

*Percentage of agreement.

- Factors associated with an attitude of the physicians towards osteoarthritis and its management

- **Physicians' gender**

As shown in table 8, there was a statistically significant difference between male and female physicians in three statements concerning their attitude towards osteoarthritis and its management:

-Female physicians more agreed than male physicians that osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions (80.2% versus 76.4%), p=0.047.

-Male physicians had more interest to involve the family in the management of patients with osteoarthritis than female physicians (96.4% versus 82.7%), p=0.045.

-Female physicians more agreed than male physicians that osteoarthritis is not amenable to change (29.6% versus 18.2%), p=0.050.

Table 8: Attitude of physicians towards osteoarthritis and its management according to gender

	Male N=55 (%)*	Female N=81 (%)*	p-value
Do you think osteoarthritis is a common health problem in Saudi Arabia?	52 (94.5)	81 (100)	0.104
Do you perceive osteoarthritis is an underestimated health problem in Saudi Arabia?	44 (80.0)	61 (75.3)	0.573
Do you perceive osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions?	42 (76.4)	65 (80.2)	0.047
Do you think osteoarthritis is a part of growing old?	39(70.9)	53 (65.4)	0.754
More attention should be offered to osteoarthritis patients.	53(96.4)	77 (95.1)	0.788
Do you think osteoarthritis causes patients excessive anxiety and concern?	44 (80.0)	74 (91.4)	0.158
Would you prescribe medications for asymptomatic patients, but x-ray positive osteoarthritis findings?	15 (27.3)	25 (30.9)	0.163
Do you have the interest to involve the family in management of patients with osteoarthritis?	53 (96.4)	67 (82.7)	0.045
Did you perceive your training prepare you adequately to manage patients with osteoarthritis?	34 (61.8)	45 (55.6)	0.106
Do you perceive the primary health care physician could be a useful person to support osteoarthritis patients?	51 (92.7)	72 (88.9)	0.655
Dealing with osteoarthritis patients is heavy going.	33(60.0)	38 (46.9)	0.274
Do you perceive the statement that (osteoarthritis is not amenable to change)?	10 (18.2)	24 (29.6)	0.050
During counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m^2):	20 (36.4)	25 (30.9)	0.677
Collaborations with other health professionals, specially trained	51 (92.7)	78	0.418

nurses, dietitians, and physiotherapists are very important tools for the care of patients with osteoarthritis:		(96.3)	
Do you perceive of screening programs for osteoarthritis is favorable to improve the care of osteoarthritis patients?	40 (72.7)	50 (61.7)	0.410
Do you feel that an oral non-opioid analgesic (e.g., acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice?	25 (45.5)	33 (40.7)	0.451
Do you perceive the physicians in the primary care centers can achieve a major role in the control of osteoarthritis?	50 (90.9)	65 (80.2)	0.220
Do you perceive that non-drug therapy would be more beneficial than drug therapy for most osteoarthritis patients?	32 (58.2)	56 (69.1)	0.093
Do you recommend establishing Saudi guidelines to care of and manage osteoarthritis?	48 (87.3)	70 (86.4)	0.522

*Percentage of agreement.

- **Physicians' nationality**

Table 9 shows that there was a statistically significant difference between Saudi and non-Saudi physicians in three statements concerning their attitude towards osteoarthritis and its management:

-All non-Saudi physicians compared to 81.8% of Saudi physicians agreed that osteoarthritis causes patients excessive anxiety and concern, p=0.021.

-Non-Saudi physicians had prescribed medications for asymptomatic patients but x-ray positive osteoarthritis findings more than Saudi physicians (45.9% versus 23.2%), p=0.035.

-Mostof non-Saudi physicians (97.3%) compared to 79.8% of Saudi physicians agreed that the primary care centers could achieve a major role in the control of osteoarthritis, p=0.040.

-Furthermore, 62.2% of non-Saudi physicians compared to 48.5% of Saudi physicians agreed that dealing with osteoarthritis patients is heavy going. However, the difference was borderline, not significant, p=0.056.

Table 9: Attitude of physicians towards osteoarthritis and its management according to nationality

	Non-Saudi N=37 (%)*	Saudi N=99 (%)*	p-value
Do you think osteoarthritis is a common health problem in Saudi Arabia?	36 (97.3)	97 (98.0)	0.638
Do you perceive osteoarthritis is an underestimated health problem in Saudi Arabia?	31 (83.8)	74 (74.7)	0.409
Do you perceive osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions?	33 (89.2)	74 (74.7)	0.060
Do you think osteoarthritis is a part of growing old?	28 (75.7)	64(64.6)	0.424
More attention should be offered to osteoarthritis patients.	37 (100)	93(93.9)	0.309
Do you think osteoarthritis causes patients excessive anxiety and concern?	37 (100)	81 (81.8)	0.021
Would you prescribe medications for asymptomatic patients, but x-ray positive osteoarthritis findings?	17 (45.9)	23 (23.2)	0.035
Do you have the interest to involve the family in the management of patients with osteoarthritis?	35 (94.6)	85 (85.9)	0.301
Did you perceive your training prepare you adequately to manage patients with osteoarthritis?	24 (64.9)	55 (55.6)	0.603
Do you perceive the primary health care physician could be a useful	37	86 (86.9)	0.063

person to support osteoarthritis patients?	(100)		
Dealing with osteoarthritis patients is heavy going.	23 (62.2)	48(48.5)	0.056
Do you perceive the statement that (osteoarthritis is not amenable to change)?	10 (27.0)	24 (24.2)	0.728
During counseling of patients with osteoarthritis education for weight loss should be offered only to adults who are obese (BMI>30 kg/m^2)	12 (32.4)	33 (33.3)	0.117
Collaborations with other health professionals, specially trained nurses, dietitians, and physiotherapists are very important tools for the care of patients with osteoarthritis:	35 (94.6)	94 (94.9)	0.222
Do you perceive of screening programs for osteoarthritis is favorable to improve the care of osteoarthritis patients?	30 (81.1)	60 (60.6)	0.073
Do you feel that an oral non-opioid analgesic (e.g., acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice?	15 (40.5)	43 (43.4)	0.773
Do you perceive the physicians in the primary care centers can achieve a major role in the control of osteoarthritis?	36 (97.3)	79 (79.8)	0.040
Do you perceive that non-drug therapy would be more beneficial than drug therapy for most osteoarthritis patients?	27 (73.0)	61 (61.6)	0.430
Do you recommend establishing "Saudi guidelines to care and manage osteoarthritis?	35 (94.6)	83 (83.8)	0.224

* Percentage of agreement

- **Physicians' qualification**
- Table 10 demonstrates that there was a statistically significant difference between physicians, according to their highest qualification, in three statements concerning their attitude towards osteoarthritis and its management:

-The majority of physicians with a Diploma/master's degree (94.4%) compared to 71.8% of those with MBBS agreed that osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions, p=0.032.

-Physicians with Board or equivalents tended to prescribe medications for asymptomatic patients but x-ray positive osteoarthritis findings more than those with Diploma/master's degree (29.8% versus 27.8%), p=0.030.

-Physicians with MBBS agreed more than those with Board/equivalents that during counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m2) (40.8% versus 23.4%), p=0.014.

Table 10: Attitude of physicians towards osteoarthritis and its management according to highest qualification

	MBBS N=71 (%) *	Diploma/ master N=18 (%) *	Board/ equivalent N=47 (%) *	p-value
Do you think osteoarthritis is a common health problem in Saudi Arabia?	70 (98.6)	18 (100)	45 (95.7)	0.315
Do you perceive osteoarthritis is an underestimated health problem in Saudi Arabia?	55 (77.5)	16 (88.9)	34 (72.3)	0.395
Do you perceive osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions?	51 (71.8)	17 (94.4)	39 (83.0)	0.032

Do you think osteoarthritis is a part of growing old?	51 (71.8)	9 (50.0)	32 (68.1)	0.219
More attention should be offered to osteoarthritis patients.	66 (93.0)	17 (94.4)	47 (100)	0.162
Do you think osteoarthritis causes patients excessive anxiety and concern?	59 (83.1)	17 (94.4)	42 (89.4)	0.628
Would you prescribe medications for asymptomatic patients, but x-ray positive osteoarthritis findings?	21 (29.6)	5 (27.8)	14 (29.8)	0.030
Do you have the interest to involve the family in the management of patients with osteoarthritis?	63 (88.7)	15 (83.3)	42 (89.4)	0.593
Did you perceive your training prepare you adequately to manage patients with osteoarthritis?	37 (52.1)	10 (55.6)	32 (68.1)	0.467
Do you perceive the primary health care physician could be a useful person to support osteoarthritis patients?	62 (87.3)	17 (94.4)	44 (93.6)	0.691
Dealing with osteoarthritis patients is heavy going.	35 (49.3)	10 (55.6)	26 (55.3)	0.446
Do you perceive the statement that (an osteoarthritis is not amenable to change)?	16 (22.5)	4 (22.2)	14 (29.8)	0.727
During counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m^2):	29 (40.8)	5 (27.8)	11 (23.4)	0.014
Collaborations with other health professionals, specially trained nurses, dietitians, and physiotherapists are very important tools for the care of patients with osteoarthritis:	65 (91.5)	17 (94.4)	47 (100)	0.358
Do you perceive of screening programs for osteoarthritis is favorable to improve the care of osteoarthritis patients?	51 (71.8)	13 (72.2)	26 (55.3)	0.160
Do you feel that an oral non-opioid analgesic (e.g., acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice?	28 (39.4)	9 (50.0)	21 (44.7)	0.151
Do you perceive the physicians in the primary care centers can achieve a major role in control of osteoarthritis?	57 (80.3)	15 (83.3)	43 (91.5)	0.205
Do you perceive that non-drug therapy would be more beneficial than drug therapy for most osteoarthritis patients?	46 (64.8)	10 (55.6)	32 (68.1)	0.538
Do you recommend establishing "Saudi guidelines to care and manage osteoarthritis?	59 (83.1)	17 (94.4)	42 (89.4)	0.636

* Percentage of agreement

- **Physicians' experience**

Table 11 shows that there was a statistically significant difference between physicians, according to their experience, in four statements concerning their attitude towards osteoarthritis and its management:

-Less experienced physicians (≤5 years) were more agreed than higher experienced physicians (>20years) that during counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m^2) (39% versus 16.7%), p=0.019.

-Highest experienced physicians (>20 years) showed the highest rate of agreement regarding perceiving of screening programs for osteoarthritis as favorable to improve the care of osteoarthritis patients whereas those who had experience between >5-10 years showed the lowest rate (83.3% versus 57.9%), p=0.009.

-All physicians with experience exceeded 10 years compared to 74.6% of those with experience of 5 years or less agreed that the physicians in the primary care centers could achieve a major role in the control of osteoarthritis, p=0.016.

-All physicians with experience exceeded 10 years compared to 78% of those with experience of 5 years or less recommend establishing "Saudi guidelines to care and manage osteoarthritis, p=0.042.

Table 11: Attitude of physicians towards osteoarthritis and its management according to experience

	≤5 N=59 (%)*	>5-10 N=38 (%)*	>10-20 N=27 (%)*	>20 N=12 (%)*	p-value
Do you think osteoarthritis is a common health problem in Saudi Arabia?	56 (94.9)	38 (100)	27 (100)	12 (100)	0.677
Do you perceive osteoarthritis is an underestimated health problem in Saudi Arabia?	44 (74.6)	27 (71.1)	23 (85.2)	11 (91.7)	0.223
Do you perceive osteoarthritis in Saudi Arabia has reached a level of health significance and requires actions?	42 (71.2)	34 (89.5)	20 (74.1)	11 (91.7)	0.073
Do you think osteoarthritis is a part of growing old?	37 (62.7)	29 (76.3)	15 (55.6)	11 (91.7)	0.183
More attention should be offered to osteoarthritis patient.	54 (91.5)	37 (97.4)	27 (100)	12 (100)	0.384
Do you think osteoarthritis causes patients excessive anxiety and concern?	47 (79.7)	34 (89.5)	25 (92.6)	12 (100)	0.285
Would you prescribe medications for asymptomatic patients, but x-ray positive osteoarthritis findings?	17 (28.8)	8 (21.1)	11 (40.7)	4 (33.3)	0.194
Do you have the interest to involve the family in management of patients with osteoarthritis?	50 (84.7)	34 (89.5)	24 (88.9)	12 (100)	0.712
Did you perceive your training prepare you adequately to manage patients with osteoarthritis?	33 (55.9)	25 (65.8)	16 (59.3)	5 (41.7)	0.545
Do you perceive the primary health care physician could be a useful person to support osteoarthritis patients?	48 (81.4)	37 (97.4)	27 (100)	11 (91.7)	0.057
Dealing with osteoarthritis patients is heavy going.	27 (45.8)	19 (50.0)	15 (55.6)	10 (83.3)	0.084
Do you perceive the statement that (an osteoarthritis is not amenable to change)?	14 (23.7)	11 (28.9)	7 (25.9)	2 (16.7)	0.463
During counseling of patients with osteoarthritis, education for weight loss should be offered only to adults who are obese (BMI>30 kg/m^2):	23 (39.0)	10 (26.3)	10 (37.0)	2 (16.7)	0.019
Collaborations with other health professionals, specially trained nurses, dietitians, and physiotherapists are very important tools for the care of patients with osteoarthritis:	56 (94.9)	36 (94.7)	25 (92.6)	12 (100)	0.574
Do you perceive of screening programs for osteoarthritis is favorable to improve the care of osteoarthritis patients?	40 (67.8)	22 (57.9)	18 (66.7)	10 (83.3)	0.009
Do you feel that an oral non-opioid analgesic (e.g. acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice?	24 (40.7)	15 (39.5)	13 (48.1)	6 (50.0)	0.838
Do you perceive the physicians in the primary care centers can achieve a major role in the control of osteoarthritis?	44 (74.6)	32 (84.2)	27 (100)	12 (100)	0.016
Do you perceive that non-drug therapy would be	34 (57.6)	25 (65.8)	20	9	0.442

more beneficial than drug therapy for most osteoarthritis patients?			(74.1)	(75.0)	
Do you recommend establishing "Saudi guidelines to care and manage osteoarthritis?	46 (78.0)	33 (86.8)	27 (100)	12 (100)	0.042

* Percentage of agreement

IV. DISCUSSION

Osteoarthritis (OA) is one of the most prevalent disorders encountered among patients aged over 50 years by primary healthcare (PHC) physicians worldwide [22] and in the Kingdom of Saudi Arabia.[23]Furthermore, PHC physicians are often the first and in many cases the only healthcare providers for patients with OA.[21, 24, 25]the present study was conducted to evaluate knowledge and attitude of osteoarthritis management among primary health care physicians in Makkah Al-Mukarramah city.

In the current study, almost three-quarters of physicians knew that the diagnosis of osteoarthritis can almost be made by history and physical examination and exactly 75% of them could recognize that radiographs are generally the first line confirmation of the presence of OA. It has been documented that for the diagnosis of OA, a careful history, physical examination, and radiographs may be needed to confirm the diagnosis. [26-28] In a study carried out in AlJouf, [14] more than two-thirds of physicians knew that the diagnosis of OA could almost be achieved by history and physical examination.

In accordance with Homoud AH,[14] nearly only a quarter of physicians in the present study knew that shoulder is less frequently affected by OA. Furthermore, about 58.8% of the participated physicians knew that patients with OA usually not present with moderate joint hotness. This percentage was higher than that reported in a similar study carried out in AlJouf (39%). [14] A markedly hot joint suggests septic or inflammatory arthritis rather than OA. [28-30] So, this misconception among a considerable proportion of physicians could impact the quality of delivered care. More than half of the physicians in this study (57.4%) compared to 39% in a study carried out in AlJouf[14] knew the characteristic radiographic changes in OA. [29-32] This finding is not satisfactory as radiography is generally helpful to confirm the diagnosis of OA. [28, 29, 32] The majority of the physicians (82.4%) in our study compared to only 59.7% in AlJouf`s study [14] could recognize that the etiology of primary OA is multifactorial. [29, 33]

Regarding OA management, proper management aims to relieve symptoms and improve the function of joints.[28,34, 35] In the present study, less than half of the physicians knew that pharmacologic therapy is not the cornerstone of osteoarthritis management and, the majority of them (particularly males) agreed with the involvement of the family during education and management of OA patients. The insufficient knowledge observed in this study regarding some issues could be explained by the fact that only 58.1% of the studied physicians claimed that their received training prepares them adequately to manage patients with osteoarthritis as well as the lack of Saudi guidelines to manage OA. Therefore, having adequate training and the existence of Saudi guidelines are essential in improving physician`s knowledge regarding OA in Makkah Al-Mukarramah city. In 2016, a systematic review of OA in general practice performed by Al-Rashdi A et al. found that the lack of adequate knowledge in OA treatment was one of the major limitations among GPs in osteoarthritis treatment. [19]

The overall knowledge score regarding OA was moderate as the median knowledge score was 6 out of 10. In AlJouf, Homoud AH described the knowledge of the PHC physicians regarding OA as inadequate. [14]

Fortunately, in the present study, the majority of PHC physicians were aware that OA is a common health problem in Saudi Arabia, and 77.2% believed that it is an underestimated health problem. In a similar study carried out in AlJouf, [14] more than 75% of the PHC physicians considered OA as a common health problem in KSA. Lim AY et al. (2011) [36] and Rosemann T et al. (2007) [37] reported that OA is an underestimated public health problem worldwide.

Regarding most commonly prescribed medication for OA, less than half of the surveyed physicians agreed that an oral non-opioid analgesic (e.g., acetaminophen) usually produce a satisfactory result in the treatment of osteoarthritis patients in general practice, and almost two-thirds of them perceived that non-drug therapy would be more beneficial than drug therapy for most osteoarthritis patients. In a study carried out in AlJouf, 74% of physicians prescribed oral non-steroidal anti-inflammatory drugs, 18.2% acetaminophen, and

6.5% topical NSAIDs.[14] Kingsbury SR et al. in the UK (2012) reported that for OA treatment, 64% of physicians prescribed paracetamol and topical non-steroidal anti-inflammatory drugs (NSAIDs), 35% prescribed NSAIDs and 31% referred their patients to a physiotherapist. [15]Doubova S et al. (2015) revealed that physicians prescribed NSAIDs for 71.5 % of patients aged 65 years or more. However, acetaminophen was used only in 5.2% of patients as the first line of treatment. [16] In India, Sancheti P et al. (2017) showed that 91.6% of patients had received medication, whereas 81.9% had non-pharmacological treatment, and 55.2% of patients had physical therapy. On the other hand, physicians prescribed oral medication, intra-articular steroid, and surgical management in 83.3%, 29.8%, and 13.2% of patients, respectively. [17]

As a positive attitude towards OA management at PHC centers, majority of physicians in the present study agreed with the establishment of Saudi guidelines about care and management of OA and believed that collaborations with other health professionals, specially trained nurses, dietitians, and physiotherapists are essential tools for the care of patients with osteoarthritis. The same has been found in another Saudi study carried out in AlJobail. However, having a team of trained personnel for management of OA is rarely available at any one center in the developing world,[38] including KSA.

Up to our knowledge, this is the first study conducted to explore the knowledge and attitude of primary care physicians regarding OA in Makkah Al-Mukarramah city. However, the study has some important limitations. First, the practice of the physicians regarding OA was not investigated, and their source of information about OA was not included. Second, the cross-sectional design with its inherited limitation for just proofing association and not causality.

CONCLUSION

Overall knowledge of primary healthcare physicians in Makkah Al-Mukarramah city regarding OA is acceptable, despite being deficient in some important issues particularly the presentation and management of the disease, with no difference between the physicians according to age, gender, nationality, qualification, and experience. However, their attitude towards the importance of the disease, its magnitude in Saudi Arabia, and the need to establish Saudi guideline for its management was promising.

RECOMMENDATIONS

1. Adequate training of primary health care physicians is essential through continuous medical education activities implanted by rheumatologists to improve knowledge and consequently, the practice of physicians regarding OA management.
2. Establishment of a Saudi guideline for the management of osteoarthritis at primary care settings is mandatory
3. Further studies are recommended to assess the practice of primary health care physicians concerning OA management and identify the defects.
4. Organizing screening programs for osteoarthritis at primary health care centers to improve the care of osteoarthritis patients.
5. Inclusion the source of information about OA management in further studies, and investigate the knowledge, attitude, and the practice of primary health care physicians according to that.

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