Knowledge, attitude and practice regarding osteoarthritis management among physicians of primary health care centers; Al-rusafa/ Baghdad/2017

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ABSTRACT

Background:-Osteoarthritis (OA) is the most common form of arthritis and the leading source of physical disability in elderly people. The Prevalence of OA is increasing and will continue to do so as the population gets older. The OA is predominantly managed in primary care centers by primary health care physicians and much can be done to alleviate symptoms from osteoarthritis by combinations of therapeutic options including pharmacological and non-pharmacological treatments.

Objectives of study :- To assess the knowledge, attitude and practice of Iraqi PHCC physicians in Baghdad, AL-Rusafa, regarding the management of osteoarthritis patient**,** and it's association with sociodemographic data**.**

Methods:- A descriptive cross sectional study with some analytic elements has been conducted from the 1st of January to 1st of June 2017, in primary health care centers of six sectors selected randomly from Al Rusafa health directorate; in Baghdad. The data was collected by self-administered questionnaire regarding demographic characteristics, knowledge, attitude, and practices of physicians regarding management of osteoarthritis. Data analysis was done by (frequency, percentage), Chi square test (Fisher exact test). P value less than 0.05 was considered significant .

Results: The total study sample was 204 enrolled physicians, their age ranged from (25-58) years, The correct answers regarding etiology, diagnosis, imaging findings etc. ranged from 64.2-83.3% which reflect good knowledge of physicians regarding OA disease as well as that highly qualified physician showed good knowledge, about half of enrolled physicians showed good attitude and their practices regarding osteoarthritis and its management are good in general.

Conclusion; -The knowledge, attitude and practice regarding osteoarthritis managent among primary health care physicians are good in general.

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Received at 20/11/2017
Accepted at 27/2/2018

INTRODUCTION

Osteoarthritis (OA) is the most prevalent form of arthritis worldwide.[1] Its prevalence in many countries exceeds the prevalence of other common medical conditions such as diabetes mellitus, hypertension, ischemic heart disease, and tuberculosis.[2] The disorder is one of the most common conditions encountered by both primary health-care (PHC) physicians and specialists.,[3] It is a degenerative disorder involving not just the articular cartilage but the entire joint organ, including the subchondral bone and synovium.[4], Despite many years of research, the condition still has an uncertain aetiology. However, wide range of systemic, genetic, biomechanical, and environmental factors contribute to the development of this condition.[5]

Osteoarthritis, at present, cannot be cured, and will likely get worse over time, but the symptoms can be controlled. Treatment choices fall into four main categories: non pharmacologic,pharmacologic, complementary and alternative, and surgical. [6].

PHC physicians are often the first and sometimes the only health-care providers for OA. Of all the cases treated by PHC physicians, only minority of OA may need referral.[7] Therefore, it is essential for them to be familiar with the various treatment options to optimize care. Many studies in different countries have evaluated OA either in the hospitals or in PHC-settings.[8, 9, 10]

Primary health care physicians (PHCPS') practicing in community settings often rely on informal and personal methods of education. Actual experiences in patient care are probably the strongest influence that brings about changes in professional practice.[11]

Inappropriate practices and lack of knowledge about the management of OA appear pervasive among the majority of PHC physicians in Al-Jouf province of Saudi Arabia.[7]

While in a French study had shown that there appears to be some discrepancy among primary health care physicians with regard to the osteoarthritis management [12]

Improving knowledge, attitude and practice of PHCC physicians in osteoarthritis diseases is essential issue for health care development[13]

Objectives of study

To assess the knowledge, attitude and practice of Iraqi PHCC physicians in Baghdad, AL-Rusafa, regarding the management of osteoarthritis patients**,** and it's association with sociodemographic data**.**

METHODS

Study Design and duration: A descriptive cross sectional study with some analytic elements in four months duration, from the 1st of January to 1st of June 2017

Setting: The study was conducted in Baghdad in primary health care centers of six sectors from AL-Rusafa health directorate; AL-Rusafa sector**,** AL-Baldiat sector**,** Baghdad AL-Gadeada sector**,** AL-Sadir sector**,** AL-Aadamia sector**,** and Al-Shaab sector, then five medical health care centers from each selected sectors were chosen randomly by using one in two systematic random selection.

Sample size: A convenient sample of 204 physicians practicing medicine in selected PH centers was included in this study. Physicians who refused to participate in the study were excluded (11 physicians)

Data Collection: A Questionnaire was designed by the researcher which had been adapted from multiple questionnaires of international researches to collect data on physician's knowledge, attitude and practice regarding management of OA patients.

The questionnaire was delivered to participants who accept to participate in this study to be answered when they free at working hours.

The questionnaire consists of forty-five questions consist of five parts; -

1. Socio-demographic Part and medical background: A list of (6) items covered the physicians socio-demographic characteristics such as age and gender, in addition it contained items to cover the medical qualifications of the physicians, years of practice

2. Knowledge test part: A list of (11) items testing physician's knowledge regarding OA such as causes, diagnosis modality, imaging findings, clinical presentations, treatment.

3. Attitude test part: A list of (18) close ended questions with three options for answers (agree, neutral or undecided, disagree) that evaluated physician's attitude toward OA disease such as it is prevalence in Iraq, assessment of it is prevalence, burden of the disease in Iraq, sequel of the disease and role of family in management of OA.

4. practice test part: A list of (12) questions with three options for answers (most of the time, occasionally and not at all) that evaluate physician's practices toward management of OA patients.

For total Knowledge, attitude and practice assessment; the responses were categorized as >50% correct answers and <50% correct answers then associate them with their qualification and years of practice. For knowledge assessment; who answered correctly more than five questions was considered with >50% (good knowledge). For attitude assessment; who respond correctly to more than nine questions were considered with >50% (good attitude). For practice assessment; who respond correctly to more than six questions was considered with >50% (good practice).

Statistical Design

SPSS version 20 was used for data entry and analysis, frequency and percentage was used to represent the categorical data. Chi-square test (Fischer exact test when not applicable) was used to confirm significance. P-value<0.05 was considered significant.

RESULT

A total study sample was 204 physicians with a mean age of 35.7±5.2SD (ranged from 25-58) ,60.3% were among 30-40 years age group, the majority of physicians were females 73%, 14.2% with diploma degree and 28.4% with Board qualification. Physicians with 5-10 years of practice constituted less than half of the sample 47.5% followed by 11-15 years of practice, table 1.

Table.1 Sociodemographic characteristic of studied sample

		No.	%
Age category	<30	35	17.2
	30-40	123	60.3
	41-50	30	14.7
	>50	16	7.8
	Mean 35.7±5.2SD		
Gender	Female	149	73.0
	Male	55	27.0
Qualification	General physicians	117	57.4
	Diploma	29	14.2
	Board	58	28.4
Years in practice	<5	20	9.8
	5-10	97	47.5
	11-15	46	22.5
	>15	41	20.1

The study revealed that more than two third of physician correctly answered the questions that related to cause of OA (78.4%), diagnosis of OA (76.5%), commonly affected joints (73%),radiographic finding (64.2%), best options for the management of knee OA (78.4%), osteoarthritis variant affecting primarily the hands runs in families and is inflammatory (69.6%), Radiographs are generally the first line confirmation of the presence of OA (76.5%), base of treatment (81.4%), importance of differentiation of Primary and secondary osteoarthritis (83.3%), presentation of osteoarthritis (75%) and Pathological features of OA(72.5%) as shown in table.2.

Table.2. Response of Participants to Knowledge Questions

		No.	%
The cause of primary osteoarthritis is : (Genetic ,inflammatory, trauma, multifactorial in origin).	Genetic	7	3.4
	Inflammatory	29	14.2
	Trauma	8	3.9
	Multifactorial	160	78.4
Diagnosis of OA can almost always be made by history and physical examination	True	156	76.5
	False	48	23.5
All of the following joints are commonly affected in osteoarthritis except	Hip	14	6.9
	Knee	5	2.5
	Shoulder	149	73.0
	Hands	36	17.6
Radiographs; OA changes include all of the following changes except	Symmetric joint space narrowing	131	64.2
	osteophyte formation	10	4.9
	subchondral bone sclerosis	10	4.9
	subchondral cysts with sclerotic walls	53	26.0
Selected key recommendations for the management of knee osteoarthritis include all of the following except :	Weight loss	13	6.4
	Physiotherapy	15	7.4
	Mild aerobic exercise	16	7.8
	Pharmacologic therapy is the cornerstone of OA management	160	78.4
An osteoarthritis variant affecting primarily the hands runs in families and is inflammatory	True	142	69.6
	False	62	30.4
Radiographs are generally the	True	156	76.5

first – line confirmation of the presence of OA	False	48	23.5
Treatment should not be based solely on radiographic abnormalities	True	166	81.4
	False	38	18.6
Primary and secondary osteoarthritis must be differentiated	True	170	83.3
	False	34	16.7
Patients with osteoarthritis usually presents all ,except	joint pain	6	2.9
	joint moderate hotness	153	75.0
	swelling	26	12.7
	stiffness	19	9.3
Pathological features of OA include all of the following except	Increase the viscosity of Synovial fluid	148	72.5
	articular cartilage loses its glistening appearance	6	2.9
	cartilage become thin	1	0.5
	Collagen fiber structure is altered	49	24.0

Table 3 showed that 65.8% of general practitioner answered >50%correct answers, 79.3% of Diploma answered >50%correct answers, and 86.2% of Board answered >50%correct answers, this association was statistically significant (p=0.01).

Table.3 Relationships between Knowledge Category and Qualification

Knowledge Answers	Qualification						P value
	General practitioner		Diploma		Board		
	No.	%	No.	%	No.	%	
>50% correct	77	65.8	23	79.3	50	86.2	
<50% correct	40	34.2	6	20.7	8	13.8	
Total	117	100	29	100	58	100	0.01

Table 4 showed that 80% of those who had <5 Years in practice answered >50%correct answers, and 82.9% of those who had >15 Years in practice answered >50%correct answers, but the association did not reach the significant level (p=0.2).

Table.4 relationships between knowledge category and years in practice

Knowledge Answers	Years in practice								P value
	<5		5-10		11-15		>15		
	No.	%	No.	%	No.	%	No.	%	
>50% correct	16	80	66	68	34	73.9	34	82.9	0.2
<50% correct	4	20	31	32	12	26.1	7	17.1	
Total	20	100	97	100	46	100	41	100	

Physicians' responses on different aspects of attitudes toward OA are shown in Table 5. Most of PHCC physicians 91.7% suggested that OA is common health problem in Iraq,71.6% agree that OA is an underestimated disease in Iraq, 70.6% agree that OA disease reached a level of public health problem in Iraq,79.9% agree that OA is a part of growing old,84.3% suggested that more attention should be offered to OA patients ,62.7% believed that osteoarthritis causes patients excessive anxiety ,72.5% disagree to prescribe medication depending on x-ray finding 76.5% of PHCC physicians interested in involvement the family in the management the patient ,66.7% believed that their training not prepare them adequately to manage patients with osteoarthritis .89.7% suggested that a physician is a useful person to support osteoarthritis patients,61.3% agree with the statement that " an osteoarthritis is not amenable to change,59.3% of physicians disagree with the statement that education of weight loss should be offered only to adults who are obese [BMI >30 kg/m^2]. 81.9% believed that collaboration with other health professional is important tool for care of patients with osteoarthritis,72.1% of physicians think that screening program for OA is favorable to improve care of OA patients,61.8% believed that Oral non opioid analgesics(e.g., acetaminophen)usually

produce satisfactory results in the treatment of osteoarthritis patients in general practice,72.5% suggested that the physicians in primary care centers are capable of achieving a major role in control of osteoarthritis,86.8% of physicians agree to recommend Iraq guidelines to care and manage osteoarthritis and 70.6% believed that non-drug therapy more beneficial than drug therapy for most osteoarthritis patients.

Table.5. Primary care physicians' attitudes toward osteoarthritis

		No.	%
Do you think osteoarthritis is common health problem in Iraq ?	**Disagree**	12	5.8
	Neutral	5	2.5
	Agree	187	91.7
Do you perceive osteoarthritis is an underestimated health problem in Iraq ?	**Disagree**	40	19.6
	Neutral	18	8.8
	Agree	146	71.6
Do you perceive an osteoarthritis in Iraq has reached a level of public health significance and requires actions?	**Disagree**	35	17.2
	Neutral	25	12.3
	Agree	144	70.6
Do you think an osteoarthritis is a part of growing old?	**Disagree**	23	11.3
	Neutral	18	8.8
	Agree	163	79.9
More attention should be offered to osteoarthritis patients	**Disagree**	13	6.4
	Neutral	19	9.3
	Agree	172	84.3
Do you think an osteoarthritis causes patients excessive anxiety and concern?	**Disagree**	33	16.2
	Neutral	43	21.1
	Agree	128	62.7
Would you prescribe medications for asymptomatic patients , but x-ray positive osteoarthritis findings?	**disagree**	148	72.5
	Neutral	12	5.9
	Agree	44	21.6
Do you have an interest to involve the family in management of patients with osteoarthritis ?	**Disagree**	30	14.7
	Neutral	18	8.8
	Agree	156	76.5
Did you perceive your training prepare you adequately to manage patients with osteoarthritis ?	**Disagree**	136	66.7
	Neutral	28	13.7
	Agree	40	16.9
The primary health care physician could be a useful person to support osteoarthritis patients.	**Disagree**	11	5.4
	Neutral	10	4.9
	Agree	183	89.7
Do you perceive the statement that " an osteoarthritis is not amenable to change?	**Disagree**	59	28.9
	Neutral	20	9.8
	Agree	125	61.3
During counseling of patients with osteoarthritis ; education of weight loss should be offered only to adults who are obese [BMI >30 kg/m 2].	**Disagree**	121	59.3
	Neutral	18	8.8
	Agree	65	31.9
Collaborations with other health professionals, especially trained nurses ,dietitians ,and physiotherapist is very important tools for care of patients with osteoarthritis	**Disagree**	27	13.2
	Neutral	10	4.9
	Agree	167	81.9
Do you perceive of screening program for osteoarthritis is favorable to improve care of osteoarthritis patients?	**Disagree**	22	10.8
	Neutral	35	17.2
	Agree	147	72.1
Do you feel that Oral non-opioid analgesics(e.g., acetaminophen)usually produce satisfactory results in the treatment of osteoarthritis patients in general practice?	**Disagree**	57	27.9
	Neutral	21	10.3
	Agree	126	61.8
Do you perceive the physicians in primary care centers are capable of achieving a major role in control of osteoarthritis?	**Disagree**	41	20.1
	Neutral	15	7.4
	Agree	148	72.5
Do you recommend to establish "Iraq guidelines to care and manage osteoarthritis?	**Disagree**	17	8.3
	Neutral	10	4.9
	Agree	177	86.8
Do you perceive that nondrug therapy would be more beneficial than drug therapy for most osteoarthritis patients?	**Disagree**	43	21.1
	Neutral	17	8.3
	Agree	144	70.6

Table 6 showed that 59.8% of general practitioner answered >50%correct answers, 79.3% of Diploma answered >50%correct answers, and 91.4% of Board answered >50%correct answers, this association was statistically significant (p=0.01).

Table.6 relationships between attitude category and qualification

Attitude Answers	Qualification						P value
	General practitioner		Diploma		Board		
	No.	%	No.	%	No.	%	
>50% correct	70	59.8	23	79.3	53	91.4	0.01
<50% correct	47	40.2	6	20.7	5	8.6	
Total	117	100	29	100	58	100	

Table 7 showed that 85% of those who had <5 Years in practice answered >50%correct answers, and 82.6% of those who had 11-15 Years in practice answered >50%correct answers, but the association statistically not-significant (p=0.07).

Table.7 relationships between attitude category and years in practice

Attitude answers	Years in practice								P value
	<5		5-10		11-15		>15		
	No.	%	No.	%	No.	%	No.	%	
>50% correct	17	85	65	67	38	82.6	26	63.4	0.07
<50% correct	3	15	32	33	8	17.4	15	36.6	
Total	20	100	97	100	46	100	41	100	

More than two third of the physicians (n=144; 70.6%) educate the patients about their condition and just 13.7% used telephone contact for social support. In addition, it was' found that 65.7% of physicians encourage patients for Physical and occupational therapy,76.5% advice patients to do Range of motion and strengthening exercises,55.4% of them advice for Aerobic conditioning, Weight loss 85.8%, 46.1% encourage them to use Assistive devices for ambulation and activities for daily living, 67.2% of physicians prescribed Oral non-opioid analgesics ,only 28.4% prescribed supplements ,most of them 74.5% prescribed Non steroidal anti –inflammatory drugs, 33.8% of physicians advice for Intra –articular steroid injections and only 20.1% prescribed Opioid analgesics for the management of OA as shown in table.8.

Table.8. Practices of PHC physicians toward osteoarthritis

		No.	%
Patient education and self –management programs	Not at all	8	3.9
	Occasionally	52	25.5
	Most of the time	144	70.6
Social support through telephone contact	Not at all	90	44.1
	Occasionally	86	42.2
	Most of the time	28	13.7
Physical and occupational therapy	Not at all	10	4.9
	Occasionally	60	29.4
	Most of the time	134	65.7
Range of motion and strengthening exercises	Not at all	3	1.5
	Occasionally	45	22.1
	Most of the time	156	76.5
Aerobic conditioning	Not at all	25	12.3

	Occasionally	66	32.4
	Most of the time	113	55.4
Weight loss	Not at all	7	3.4
	Occasionally	22	10.8
	Most of the time	175	85.8
Assistive devices for ambulation and activities for daily living	Not at all	26	12.7
	Occasionally	84	41.2
	Most of the time	94	46.1
Oral non-opioid analgesics (e.g. Acetaminophen)	Not at all	14	6.9
	Occasionally	53	26.0
	Most of the time	137	67.2
Supplements,(Glucosamine, chondroitin,Capsaicin cream)	Not at all	13	6.4
	Occasionally	133	65.2
	Most of the time	58	28.4
Nonsteroidal anti –inflammatory drugs	Not at all	3	1.5
	Occasionally	49	24.0
	Most of the time	152	74.5
Intra –articular steroid injections	Not at all	60	29.4
	Occasionally	75	36.8
	Most of the time	69	33.8
Opioid analgesics	Not at all	77	37.7
	Occasionally	86	42.2
	Most of the time	41	20.1

Table 9 showed that 72.6% of general practitioner answered >50%correct answers, 79.3% of Diploma answered >50%correct answers, and 87.9% of Board answered >50%correct answers, but the association did not reach the significant level (p=0.07)

Table.9. relationships between practice category and qualification

practice answers	qualification						P value
	General practitioner		Diploma		Board		
	No.	%	No.	%	No.	%	
>50% correct	85	72.6	23	79.3	51	87.9	0.07
<50% correct	32	27.4	6	20.7	7	12.1	
Total	117	100	29	100	58	100	

Table 10 showed that 85% of those who had <5 Years in practice answered >50%correct answers, and 80.5% of those who had >15 Years in practice answered >50%correct answers, but the association statistically not-significant (p=0.8).

Table.10. relationships between practice category and years in practice

Practice Answers	Years in practice								P value
	<5		5-10		11-15		>15		
	No.	%	No.	%	No.	%	No.	%	
>50% correct	17	85	74	76.3	35	76.1	33	80.5	0.8
<50% correct	3	15	23	23.7	11	23.9	8	19.5	
Total	20	100	97	100	46	100	41	100	

DISCUSSION

Physicians in primary health care centers (PHCC) are the first confrontation line in providing health services for the community, who are responsible for prevention, screening, management of diseases and referral of patients to hospitals.[14]

The knowledge of PHCC physicians in this study was good regarding diagnosis of OA can almost always made by history and physical examination , radiographs may be required to confirm the diagnosis and correctly answered the question regarding primary and secondary osteoarthritis types differentiation, which goes in line with a study done in Saudi Arabia by Homoud AA .,2012 ,but, in response to other questions like (the most affected joints , pharmacologic therapy importance , clinical presentation of osteoarthritis and pathological features) ,the results were higher than the referred study[7].

This study revealed that the knowledge of PHCC physicians regarding osteoarthritis was generally increased for specialist physicians (Board), which is consistent with results of Al-Rashdi et al [15] study in Oman which documented that PHC physicians with specialty degree had higher knowledge in osteoarthritis and its management than PHC physicians with diploma and/or general practitioners. Paskins study showed that the general practitioners need competent knowledge to deal with OA cases in primary health care centers [16].

This study showed that physicians who had longer years in practice had more knowledge, which was similar to the result of Denoeud et al[17] study in France who detected that longer career duration since graduation for doctors is significantly related to their knowledge in osteoarthritis effective management. The physician who had <5 years in practices had a high knowledge score in this study; this can be explained on the basis of fresh medical data with newly graduated physicians.

Generally, PHCC physicians' knowledge regarding OA and its management was good, this finding is better than results of Homoud study in Saudi Arabia [7], in their qualitative study in France, Alami et al [18] reported that the knowledge regarding osteoarthritis and its management of practitioners working in PHCC was good, the result goes with this study.

More than half of physicians believed that OA symptoms causes patients excessive anxiety and concern, which goes with Paskins study in UK [19]; most of patients with OA disease living with constant pain, their treatment either not very or not effective, which made them anxious.

More than half of physicians agree with the statement that (an OA is not amenable to change), this was in line with study in Australia [20], which revealed that there was no cure for OA, but an extensive body. of research has provided evidence to support. use of a range of modestly effective treatments for symptom and function management.

Higher percentage of physicians suggested that collaboration with other health professionals especially trained nurses, dietitians and physiotherapist are very important tools to care for OA ,but ,in fact, such a collection in trained staff is rarely available at any PHC center in Iraq. These results similar to a study in Saudi Arabia by Homoud AA., 2012[7]

Most of physicians disagree to prescribe medications for symptomatic patients, despite that x-ray shows positive OA finding. This finding coincides with results of de SA et al [21] study in Canada which reported an obvious discordance in osteoarthritis conservative management and variability perceptions of

PHCC physicians regarding osteoarthritis diagnosis especially radiography. Bedsons et al [22] had stated that doctors should avoid use the term *osteoarthritis* because of the difficulty of correlating the diagnostic test (radiography) with symptoms, diagnosis, and outcome and because of concern about the potential for harm from the label.

Similar to knowledge, the attitude of PHCC physicians toward osteoarthritis was significantly better among those physicians with higher specialty (Board). These findings were similar to results of Schonberg et al [23] study in USA which stated that physicians in PHCC with higher scientific qualifications perceived better attitudes toward osteoarthritis than physicians of lower qualifications.

Regarding practices of PHCC physicians towards OA, in this study showed that most of PHCC physicians educate the patient about the disease, in a study done by Paskins et al [24] found that a formal language is needed for holistic components of OA care such as patient education and self-management support.

Majority of PHCC physicians advice patients about the importance of weight loss that plays a major role in decrease joint pain. In study of karbala by Abdul Qahar [25], 2011 found that most of patients with knee OA were obese. The explanation of this finding may be that stress and amount of force on the weight bearing joints are increased in overweight subjects and this additional physical load could cause cartilage breakdown leading to osteoarthritis. Similar results founded in a study in USA by Felson DT [26] found that overweight persons had a higher bone density, which could be a risk factor for OA.

Most of PHCC physicians did not use telephone contact for social support for patients, this may be due to work overload, this is coincides with study of Saudi Arabia done by Homoud, 2012. [7]

In response to other practices related to the medications,it was founded that more than half of physicians prescribe acetaminophen, which is used to relieve pain but does not affect swelling. A study in Canada [27] showed that people who took acetaminophen had less pain (when resting, moving, sleeping and overall) and felt better overall than people who took a placebo.

Regarding opioid analgesics prescriptions, only one forth of PHCC physicians prescribed opioid ,which could be attributed to drug unavailability or most of physicians fear from misuse these drugs by patients ,this goes with Rosemann et al[28] study, who described a reluctance among PHCC physicians to prescribe opiates for OA, considering that patients. would automatically reject these 'heavy' drugs, in addition to physicians perceiving opiates. were 'over-treatment' for OA.[29]

This study showed poor practices of PHCC physicians regarding assistive devices , and intra articular steroids injection, most of PHCC physicians did not prescribe intra articular steroid injections to OA patients due to lack of training ,which was in line with study of Saudi Arabia by Homoud., 2012[7]

Low percentage of physicians prescribed supplements (Glucosamine and chondroitin) to the patients, this may be due to that physicians didn't notice any improvement of symptoms in their OA patients, this result was not coincide with study of United States done by Clegg[30], 2006., that revealed the combination of glucosamine and chondroitin may have some efficacy in patients with moderate-to-severe symptoms of OA.

CONCLUSION

- The knowledge, attitude and practice of primary health care centers physicians regarding osteoarthritis management were good in general.
- The physicians with high degree of qualification (Board) had a better knowledge, attitude and practice than physicians with Diploma and GP.
- Better knowledge attitude and practice was seen for physicians who had less than 5 years in practice.

Recommendations:

- ❖ Adherence to national Iraqi guideline of osteoarthritis management with annual revision of these guidelines.
- ❖ Further national multi-centers studies on knowledge, attitude and practices of physician in primary health care centers must be supported.
- ❖ Continuous medical education should be maintained and monitored.

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