Assessing the level of awareness of osteoarthritis among Saudi citizens and residents in Riyadh

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ABSTRACT

Osteoarthritis (OA) is a degenerative joint disease characterized by cartilage deterioration, and it represents the most prevalent articular condition in developed countries. This study aimed to assess the prevalence of OA awareness and explore the association between awareness levels and sociodemographic characteristics (age, gender, and educational level) among Saudi citizens and residents of Riyadh. A quantitative observational cross-sectional study was conducted using an online questionnaire distributed through various social media platforms from June 2021 to December 2021. Data analysis was performed using SPSS statistical software, encompassing descriptive analysis and independent t-tests. The total number of participants was 921 Saudi citizens and residents of Riyadh, aged 18 years and older, excluding illiterate individuals and those unable to access the online survey. Among the respondents, 69.9% were female, 97.6% were Saudi nationals, 35.3% were aged 18-29 years, and 64.2% held a bachelor's degree. The overall mean knowledge score was 11±3 (57.9%). A statistically significant difference was observed in the mean scores between female and male subgroups (p=0.033). However, no significant differences were found with respect to age or educational level. Recognizing the level of awareness is crucial for developing strategies to mitigate the impact of OA. This study indicates that 68.5% of participants exhibited a good level of knowledge regarding OA, underscoring the importance of increasing public awareness and encouraging preventive measures among healthy individuals from an early age.

1. Introduction

Osteoarthritis (OA) is the most common articular disease in the developed country that causes a chronic painful stiff joint disability (Mukharrib et al., 2018), and it may lead to joint failure (Arden et al., 2015). It is a degenerative disease of the joints that is characterized by the deterioration of the cartilage lining them, causing the bones to rub against each other (Saeed et al., 2019). Its prevalence is increasing because of the aging of the population in developed countries (French et al., 2016). In the United States, it is estimated that 70-90% of patients over age 65 have radiologic evidence of the disease.

An increase in risk factors leading to OA can be divided into person-level factors (gender, obesity, genetics, and diet) and joint-level factors (injury, malalignment, and abnormal loading of the joints) that interact in a complex manner (Palazzo et al., 2016).

Clinically, OA is characterized mainly by a triad of symptoms that are joint pain during activity, stiffness, and locomotor restriction (Wieland et al., 2005). However, muscle weakness and balance issues may also appear (Wieland et al., 2005). In later stages, during the joint's passive or active movement, it is common to sense instability or buckling and an audible and palpable 'crunching' or 'cracking' over a joint (Chan and Wu, 2012). This can be a result of pain, effusion, muscle spasm or weakness, capsular contractures, intra-articular loose bodies, mechanical constraints, and joint deformity or misalignment (Altman, 2010). Surveys such as that conducted by Neogi (2013) have shown that OA is considered to be the leading cause of

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disability worldwide. Moradi-Lakeh et al. (2017) stated that a high prevalence of knee OA has been reported in KSA.

A previous study conducted clinically without radiographic investigations yielded a prevalence of 57.2% in a primary clinic setting (Al-Shammari et al., 2001). Another study was done by Al-Arfaj and Al-Boukai (2002), and the estimated prevalence of knee OA was found to be 53.3% in male and 60.9% in female patients. The epidemiological data of OA in KSA are considered outdated and limiting for the researchers' understanding of the prevalence, morbidity, and the population's knowledge (Alyami et al., 2020). Knowing the level of awareness of OA should draw attention to this disease to help healthy people adopt preventive measures at an earlier age. For patients with OA awareness, it is thought that a lack of knowledge of OA and its management options decreases adherence to treatment and consequently affects symptoms and function, and increases healthcare costs (Lorig et al., 1999; Mitchell and Hurley, 2008).

A few studies reported the level of knowledge of OA in Saudi Arabia. In 2020, a study conducted in Jeddah exhibited a low level of knowledge (Alyami et al., 2020); in contrast, there was a satisfactory level of awareness of OA in Aseer (Mukharrib et al., 2018). However, to our knowledge, there is no literature related to the knowledge of OA among Saudi citizens and residents in the Riyadh region. Our study question was about assessing the level of knowledge of OA, while the objectives were to measure the prevalence of awareness of OA and to assess the association between the level of awareness of OA and the sociodemographic characteristics (age, gender, and educational level) among Saudi citizens and residents of Riyadh region, Saudi Arabia.

2. Methods

This study used a quantitative observational cross-sectional study design that was conducted in Riyadh, Saudi Arabia. It was carried out in the period of June 2021 to December 2021 by King Saud University, College of Medicine in Riyadh region. Data were collected using an online questionnaire that was taken from a study that was conducted in Jeddah, Saudi Arabia (Moradi-Lakeh et al., 2017), after getting the authors' consent. The participants were selected using simple random sampling. The sample size is 921 that is calculated with P=0.826 where P is the prevalence of awareness of OA, d=3% where d is the precision, zα for 95%=1.96, and assuming a non-response is 50% the sample size will equal to ∼ 921. Since the survey was online, the non-response will be very high, so we distributed more than 1900 online questionnaires to help us select random samples from the responses. The target population was Saudi citizens and residents aged 18 years and above in the Riyadh region. The study included Saudi citizens, residents, males and females of different ages who have access to an online survey, and excluded illiterates, ages younger than

18 years old, and participants who cannot access the online survey because of lack of the internet. The questionnaire was distributed via several social media applications including (Twitter, Snapchat, and WhatsApp) since these applications are the most popular in Saudi Arabia. Data were stored in a protected electronic format using an anonymous self-administered Google online questionnaire format. Our study variables were age, gender, nationality (resident/citizen), and educational level, while the outcome variable was the prevalence of awareness of OA. Possible confounding factors are health and social status, and there might be respondent bias. After collecting the data using Google Docs, the data was exported to Microsoft Excel where it was revised and coded. The analysis then was carried out by using IBM SPSS v26. As for the descriptive data, mean and standard deviation measures were used for quantitative data, while percentage and frequency were used for categorical data. As for the inferential tests, one-way Anova (a single factor analysis of variance) and independent t-test have been used. A p-value of ≤ 0.05 was used to report the statistical significance of the results. Regarding the Ethical Considerations, institutional review board (IRB) approval was obtained (Date: 18 Aug. 2021, Ref. No. 21/0698/IRB), and a consent form is attached to the questionnaires, which indicated the purpose of the study and the right of the participant to withdraw at any time without any obligation towards the study team.

3. Results and discussion

The total number of responses was 921. Most participants (69.9%) were females, and 97.6% of the respondents were Saudi. Most participants (35.3%) were aged between 18-29 years old. The study has taken into consideration the level of education for each participant. Most participants (64.2%) who were included in the study hold a bachelor's degree. When comparing the mean score based on gender, the female subgroup scored 11.06±3.38 and the male subgroup scored 10.54±3.52, which was statistically significant (p=0.033). There was also a difference according to the age of participants, yet it was not significant as the p-value was (p=0.079). Moreover, the study could not identify any correlation between the level of awareness and the educational level of each participant (p=0.74) (Table 1).

From the study sample, 84.6% were not diagnosed with OA, and 64% know a relative who is diagnosed with it. The study questionnaire included questions related to facts about the disease. 50.3% of all participants have chosen the correct mechanism by which the disease can occur. 37% of the participants chose relatives and friends as their source of information regarding OA. Also, most of the study respondents (71.2%) were aware of the chronicity of OA, and only 39.9% knew that all kinds of joints can be affected by OA. Regarding the disease prevalence, 53.6% agreed that OA does not affect

men and women equally, and 82.8% believed that OA is not a rare disease (Table 2).

On the other hand, 49% do not think that OA is caused by cold, damp weather, and 52.2% agreed that OA is not caused by a micro-organism. Regarding disease symptoms, 50.4% knew that pain is not the only symptom of OA, 47.4% think that "stiffness" is one of the symptoms, and 42.1% agreed that "swelling" is also seen in OA. 65.6% of respondents believed that OA leads to loss of joint movement (Table 3). Regarding the risk factors of the disease, the majority (80%) were aware that aging is a risk factor, but only 33% knew that genetics is a risk factor too. Most participants (79.3%) agreed that X-rays and physical exams are used to diagnose OA, while 50.6% believed that blood tests are not necessary for the diagnosis. When

asked about the treatment, only 31.5% knew that aspirin is used to improve the symptoms, 66.1% agreed that some forms of exercise are suitable for people with OA, 76.3% believed that physiotherapy can improve the symptoms, and only 11.6% knew that acid-free diet is a proven treatment for OA. When asked about the use of intra-articular injections with stem cells as a cure for OA, only 16.2% of the studied sample knew about its efficacy. However, 46.8% agreed that joint replacement surgery will be the ultimate option to relieve the symptoms of the disease. It can be concluded, therefore, that the overall knowledge mean score was 11±3 (57.9%), the maximum score was 19 and the minimum score was 0.

Table 1: Distribution of sociodemographic characteristics and comparison of mean knowledge score in relation to the Socio-demographic characteristics of study subjects

Item		No.	%	Mean	Standard deviation	P-value
Gender	Female	644	69.90	11.068	3.388	0.033
	Male	277	30.10	10.542	3.525	
Age	18-29	325	35.30	11.225	3.573	0.079
	30-39	148	16.10	11.007	3.302	
	40-49	213	23.10	10.77	3.35	
	50-59	184	20.00	10.543	3.487	
	More than 60	51	5.50	10.529	2.989	
Educational level	Less than secondary	43	4.67	10.348	3.380	0.748
	Secondary	187	20.30	10.508	3.471	
	Bachelor	591	64.17	11.083	3.341	
	Higher education	100	10.86	10.88	3.885	

Table 2: Distribution of study subjects' responses toward the OA knowledge-related items (n=921)

Items		No.	%
Have/had you been diagnosed with OA?	No	779	84.60
	Yes	142	15.40
Do you know someone in your family who has been diagnosed with OA?	No	249	27.00
	Yes	589	64.00
	Not sure	83	9.00
Which of the following do you think is the underlying mechanism of OA?	It occurs when blood that reaches the joint decreases with aging	52	5.60
	It occurs because the nerve passing near the join gets compressed	72	7.80
	It occurs when the protective cartilage on the ends of the bones wears down over time	463	50.30
	It occurs because too much acid accumulates inside the joint	89	9.70
	I don't know	245	26.60
Do you think OA is a chronic problem?	No	109	11.80
	Yes	656	71.20
	Not sure	156	16.90
Do you think OA is rare?	No	763	82.80
	Yes	58	6.30
	Not sure	100	10.90
Do you think that all kinds of joints can be affected by OA?	No	360	39.10
	Yes	321	34.90
	Not sure	240	26.10

Table 3: Participants' awareness level of OA based on the questionnaires' responses

Items on the quiz	No	Yes	Not sure
1. Do you think OA is caused by cold, damp weather?	451	201	269
2. Do you think it is developed by a microorganism (bacteria/virus)?	481	102	338
3. Do you think pain is the only symptom of OA?	464	286	171
4. Do you think stiffness is a symptom of OA?	154	437	330
5. Do you think the swelling is a sign of OA?	244	388	289
6. Do you think OA can lead to loss of joint movement?	129	604	188
7. Do you think genetics is a risk factor for OA?	359	304	258
8. Do you think aging is a risk factor for OA?	98	737	86
9. Do you think men and women are equally affected by OA?	494	199	228
10. Do you think physical examination and X-ray are used to diagnose OA?	59	730	132
11. Do you think blood tests are used to diagnose OA?	466	148	307
12. Do you think Aspirin can improve OA symptoms?	407	290	224
13. Do you think some forms of exercise like swimming are suitable for people with OA?	107	609	205
14. Do you think acid-free diets are a proven treatment for OA?	107	206	608
15. Do you think physiotherapy can cause a great improvement in the symptoms of OA?	75	703	143
16. Do you think intraarticular injection by stem cells is an effective modality for curing OA?	362	149	410
17. Do you think a joint replacement surgery will be the ultimate option to relieve the symptoms of OA?	200	431	290

According to the findings of the study, the participants showed a good level of awareness regarding OA. Sociodemographic factors were taken into consideration in the study, however, only gender has shown a significant correlation with the level of awareness. Age and educational level did not have any influence over the level of knowledge. Symptoms of OA, including swelling, stiffness, and joint pain, were familiar to most participants as well as the morbidity of the disease. Epidemiology and mechanism of the disease were also two aspects of the disease that were well known to many of the study population. On the other hand, participants showed the opposite in terms of treatment of OA. In a previous study which was conducted in Karachi and included 316 elderly females having OA, 63% attributed their joint pain to their age while others linked it to physical routine and diet (Saeed et al., 2019).

When comparing this to the current study, many participants recognized pain as a symptom of OA among other symptoms. The level of awareness was low in the study sample which could be explained by the lower socioeconomic status of participants in Karachi compared to the population. Moreover, a similar study was conducted in Jeddah, Saudi Arabia, and involved 1238 subjects. The overall level of awareness was found to be low among most participants. The results of their study did not show any significant correlation with gender or age; however, educational level was found to be associated with the level of knowledge, in resemblance to the findings of our study (Alyami et al., 2020).

Mukharrib et al. (2018) assessed the awareness of OA in the Aseer region of Saudi Arabia. Their findings have stated that 82.6% of the study population has shown a good level of awareness regarding OA. Age and level of education were found to be significant factors affecting the level of knowledge, while gender was irrelevant to awareness of the disease. In addition, a recent study that was conducted in the Sudair district in Saudi Arabia showed a significant association between gender and the knowledge of participants about OA; men had less knowledge about OA than women (Alanazi et al., 2021), which is consistent with our findings.

Another study that took place in Peninsular Malaysia was aiming to assess the knowledge of OA among railway workers (Ganasegeran et al., 2014). In contrast to our findings, the results of that study have shown that age is significantly correlated with the level of awareness as older participants have higher awareness than younger workers. Additionally, the result showed that the level of education is positively correlated with the awareness level. However, in contrast to our current study, they did not show any association with gender. Although, the fewer proportion of female participants that were included in their study sample (25%) would make a valid reason for that. There was poor knowledge regarding the medications of OA in the current study. A contrasting result to our finding was discovered in Ali's study, as respondents were aware of several forms of medication available for the alleviation of knee pain (Ali et al., 2012). Additionally, exercise as a part of the treatment process for OA was known by the majority (66%) of respondents.

Recognizing the level of awareness in the population can help draw the map for strategies to limit the disease. Increased awareness can help in early detection of the disease which can lead to better management, limit worsening of the disease and eventually result in a better quality of life for patients with OA. It can be a key factor in decreasing incidents of the disease and its complications by improving protective measures against the disease. Raising awareness can also decrease the disease burden on hospitals by decreasing the need for surgery as patients get treated early and slow disease progression with non-operative treatment.

Limitations of our study include several items. First, the study did not measure the level of satisfaction with treatment among participants who were having OA. Second, it did not assess the knowledge about complications of the disease. Third, modifiable risk factors such as being overweight, metabolic syndrome, unhealthy diet, and physical inactivity which can lead to OA were not included (Berenbaum et al., 2018). Evaluation of knowledge about the risk factor of OA would make a good reference to help authorities make strategies for raising awareness about them and limiting the development of the disease. Future studies should overcome these limitations by improving the study questionnaire to include the missing parts which were mentioned.

4. Conclusions

Overall, the current study which was conducted among Saudi citizens and residents of the Riyadh region suggests that the majority (68.5%) of the participants had a good level of knowledge regarding OA. There was a difference between female and male subgroups' mean scores which was statistically significant. There were no significant differences according to the age of participants neither between the educational level subgroups. The findings of our study revealed that participants had a higher level of knowledge regarding the underlying mechanism, symptoms, and diagnostic tests of OA compared to other aspects of the study such as risk factors, etiology, and management of the disease. This study demonstrates the need to raise public awareness regarding OA to eliminate the factors that lead to this disease and enhance the quality of life to ensure the healthy life of the community, especially the elderly and females.

Acknowledgments

Compliance with ethical standards

Ethical considerations

Institutional review board (IRB) approval was obtained (Date: 18 Aug. 2021, Ref. No. 21/0698/IRB), and a consent form is attached to the questionnaires, which indicated the purpose of the study and the right of the participant to withdraw at any time without any obligation towards the study team.

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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