Original Article

Awareness about total knee replacement among Saudi population

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Abstract

Introduction: The purpose of this study is to identify the knowledge of the general population about knee osteoarthritis and its surgical interventions in the management of knee osteoarthritis. Knee osteoarthritis is a prevalent disease. A lack of knowledge about the nature of the disease may delay seeking medical advice until the advanced stage of the disease. **Methods:** This cross-sectional study was conducted among 486 participants (≥18 years) who were sampled randomly from an osteoarthritis awareness campaign located within a shopping facility located in Riyadh in 2020. Data were collected via a structured questionnaire, which included six domains; demographic information, causes, symptoms, treatment, complications, and general questions. Data for this study were analyzed by using the Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were expressed as mean ± standard deviation and categorical variables were expressed as percentages. The t-test and one-way Analysis of Variance (ANOVA) were used for continuous variables. Univariate and multivariate logistic regression were used to assess the associated factors with a low level of knowledge. A *P* value of <0.05 was considered statistically significant. **Results:** Most of the participants in our study were males (56.8%) and Saudi nationals (89.7%). (83.74%). Consider that surgical intervention is the best treatment when non-surgical options do not work. The mean questionnaire score for the 486 participants was found to be 20.85 ± 5.29 out of 35 points. In comparing the male to female total scores, we found the mean female total score to be statistically significant and higher than that of the males with a *P* value of 0.036. Furthermore, we found that the non-Saudis had a total score higher than the Saudis with a *P* value of 0.016. On the other hand, the difference in the total scores between the city and rural area residents and different educational levels were statistically insignificant. **Conclusions:** Our results demonstrate that the majority of the community has satisfactory awareness about the treatment options of knee osteoarthritis. It also demonstrates the domains that require more effort for increased public awareness of knee osteoarthritis.

Keywords: Awareness, knee pain, knowledge, osteoarthritis, TKR

Introduction

Osteoarthritis (OA) is a globally common age-related condition and is one of the most common conditions encountered by primary care physicians.[1] The symptoms of the disease include pain and joint dysfunction as a result of waxing and waning of the articular cartilage, which in turn, leads to the symptomatic friction of bones and an increase in intraosseous pressure.[2-4] OA is both the most common form of arthritis and one of the fastest growing causes of years lived with disability (YLD). It is also a major cause of decreased activities of daily living (ADLs), especially in the elderly-dependent population of the community.[5,6] The prevalence of OA is increasing namely due to the increased life expectancy of the population as well as other factors such as obesity. In addition, a significant amount of healthcare resources are invested in the management and care of those with OA.[7-10]

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OA is mainly diagnosed with a history and physical examination; a plain radiograph can help in confirming the diagnosis. The most reported symptom is usually pain, although it may initially present with no symptoms. OA tends to affect weight-bearing joints like knees, hips, and spine. The pain experienced is most commonly described as a deep achy pain that worsens with activity and is relieved with rest and analgesics. The most common findings in the physical examination are decreased range of motion, crepitus, and swelling of the affected joint. There are typical findings that are found in an X-ray of the affected joint. These include joint space narrowing, subchondral sclerosis, osteophyte formation, and cyst formation. Computed tomography (CT) and magnetic resonance imaging (MRI) are rarely used to aid in the diagnosis.[11]

Multiple modalities are available for the management of osteoarthritis and are best chosen to fit patients individually. These modalities are classified into non-pharmacological, pharmacological, and surgical methods. Non-pharmacological treatment includes lifestyle modification, physical exercises, weight reduction, and the use of walking aids.[12-16] Pharmacological modalities include acetaminophen, non-steroidal anti-inflammatory (NSAID) drugs, intra-articular injections of corticosteroids, or hyaluronic acid.[17-21] Those who do not benefit from pharmacological and non-pharmacological modalities in terms of functional improvement and pain control are considered for surgery. Multiple surgical interventions are described as treatment methods for knee OA including total joint arthroplasty (TJA) and high tibial osteotomy (HTO). TJA is efficient and provides significant relief from pain and improvement of the functional limitations associated with OA.[22-24] HTO goals are to unload diseased articular surfaces and to correct angular deformity at the tibiofemoral articulation although the clinical success of total knee arthroplasty has resulted in fewer high tibial osteotomies being done during the past decade.[25] All modalities of management of OA are directed toward the improvement of joint mobility, reduction of physical disability, and enhancement of health-related quality of life (HRQOL).[18] Patients may delay seeking medical care due to a lack of knowledge in several areas about OA such as treatment modalities, risk factors, and control of the disease. Identifying and decreasing knowledge gaps about OA may assist in early intervention that is beneficial for long-term outcomes.[26-28] Research on the level of knowledge in the Saudi population about knee OA is lacking. This study aims to evaluate the level of awareness about knee OA and its treatment modalities.

Subjects and Methods

Study design

In this quantitative cross-sectional study, a self-administered questionnaire was completed by all consenting participants applicable to the inclusion criteria during a 1-week time interval.

Population

The study includes all participants who are above the age of 18 and consented to participation in the study. The participants were sampled randomly from an osteoarthritis awareness campaign located in Riyadh, Saudi Arabia. All participants were chosen to be enrolled in the study before attending the awareness campaign. Those who have benefited from the campaign prior to partaking in the questionnaire were excluded from the study. We determined that 384 patients should be recruited to achieve a 5% margin of error and a 95% confidence interval by using the simple proportion equation.

Questionnaire

The questionnaire was designed by the researchers after reviewing the literature to assess the population's knowledge of OA disease and treatment. The questionnaire and the study were approved by the institutional review board (IRB) in the College of Medicine at King Saud University, Riyadh, Saudi Arabia.

The questionnaire consisted of six domains which the participants filled: (1) Demographic information: gender, educational level, nationality, residence, chronic illness, age, BMI. (2) Causes of knee OA: measurement of the participant awareness regarding the causes. (3) Symptoms of knee OA: measurement of the participant awareness regarding the symptoms.

(4) Treatment of knee OA: Participants were asked questions regarding the interventions for knee OA. (5) Complications of total knee replacement (TKR): measurement of the participant awareness regarding the complications of TKR. (6) Assessment of general population perception toward the disease, diagnosis, and treatment.

The questions answered correctly were provided one point, while those answered incorrectly or had no response were provided zero points. The Cronbach's alpha was used to assess the reliability and internal consistency of the items in the questionnaire. The Cronbach's alpha value for the questionnaires was 0.80 which reflects a good reliability of the questionnaires. The questionnaire was piloted on 32 subjects before being used for this study.

Ethical consideration

This study was conducted after the KSU-IRB approval and in accordance with the international research ethics standard. The participants' verbal consent was given. Participant confidentiality was maintained by the exclusion of any identifying data from the questionnaire. No rewards or obligations were given to all study participants.

Statistical analysis

Data for this study were analyzed by using Statistical Package for Social Studies (SPSS 22; IBM Corp., New York, NY, USA). Continuous variables were expressed as mean ± standard deviation and categorical variables were expressed as percentages. The t-test and one-way ANOVA were used for continuous variables. The Cronbach's alpha was used to assess the reliability and internal consistency of the items in the questionnaire.

Univariate and multivariate logistic regression were used to assess the associated factors with the low level of knowledge. A *P* value of < 0.05 was considered statistically significant.

Results

A total of 486 participants enrolled in this study based on the inclusion and exclusion criteria, of whom 276 (56.8%) were males and 210 (43.2%) were females. The mean age of the participant was 36.24 (± 10.89) [Table 1].

In the first section of the questionnaire, the participants were asked about the causes, symptoms, and treatment of knee OA. When asked if being overweight or obese is a cause of knee OA, 438 (90.12%) said yes, 433 (89.09%) considered aging as a cause of knee OA, 189 (38.9%) considered bowing of the legs as a cause of knee OA. While only 33 (6.79%) participants incorrectly considered that wrong posture is not a cause of knee OA [Table 2].

The participants were asked if they thought that knee osteoarthritis could affect younger people, 378 (77.60%) correctly answered yes. When asked if surgical intervention is the best treatment when non-surgical options do not work, 407 (83.74%) correctly answered yes.

When asked about how knee osteoarthritis is diagnosed, only 94 (19.3%) correctly answered X-ray, while the majority 148 (30.4%) answered MRI [Table 3].

The response of 486 participants to multiple response questions about the complications specific for total joint replacement (TJR): Overall, 282 (58.02%) considered infection on the site of surgery as a complication, 281 (57.82%) considered joint instability as a consequence of TJR, 166 (34.16%) considered thrombosis as a complication of TJR, and 151 (31.07%) considered bleeding as a complication of TJR [Table 4].

The mean questionnaire score for the 486 participants was found to be 20.85 ± 5.29 out of 35 points. The participants scored a mean of 6.67 ± 1.48 out of 10 points in the causes section of the questionnaire, 3.09 ± 1.29 out of 5 in the symptoms section, 5.73 ± 1.74 out of 9 in the treatment section, 3.42 ± 2.62 out of 8 in the complications section, and 3.3 ± 1.12 out of 5 in the general section of the questionnaire. Gender did not seem to influence the mean total score results of the questionnaire. The mean total score for the 486 participants in the questionnaire was similar for both genders with males scoring a mean of 20.41 ± 5.33 and their female counterparts scoring 21.42 ± 5.20 (*P* = 0.036). Both the female and male groups scored similarly when comparing each domain separately. The participants residing in the city also scored similarly to those residing in rural areas, 20.86 ± 5.33 and 20.80 ± 5.12 (*P* = 0.930), respectively. The study considered the comparison of the total score mean between different educational statuses. However, all different categories scored similarly to each other [Table 5].

Table 1: Baseline characteristics of the study participants

Variable	Values	Number	%
Gender	Male	276	56.8
	Female	210	43.2
Educational level	Uneducated	8	1.6
	Elementary or intermediate school	65	13.4
	High school	19	3.9
	University	330	67.9
	Higher education	64	13.2
Nationality	Saudi	436	89.7
	Non-Saudi	50	10.3
Residence	City	406	83.5
	Rural	80	16.5
Chronic illness	Yes	89	18.3
	No	397	81.7

Table 2: Correct response rate of participants about the causes, symptoms, and treatment of knee OA

Questions	Correct answers	
	Number	%
Causes		
Overweight or obesity	438.00	90.12
Repetitive stress on the knee joint	382.00	78.60
Bowing of the legs	189.00	38.89
Gender	356.00	73.25
Trauma to the knee joint	373.00	76.75
Inactivity	391.00	80.45
Genetic factors	308.00	63.37
Rheumatoid arthritis	339.00	69.75
Aging	433.00	89.09
Wrong posture	33.00	6.79
Symptoms		
Pain	394.00	81.07
Swelling	269.00	55.35
Bowing of the legs	134.00	27.57
Spasticity	347.00	71.40
Clicking sounds during movement	357.00	73.46
Treatment		
There is treatment	355.00	73.05
Exercises	385.00	79.22
Warm compressors	121.00	24.90
Cold compressors	143.00	29.42
Local injection of corticosteroids	232.00	47.74
Medications	311.00	63.99
Physiotherapy	421.00	86.63
Surgical intervention	369.00	75.93
Weight reduction	449.00	92.39

Discussion

Knee OA is a chronic progressive waning of the articular cartilage which manifests by a group of symptoms that may affect a patient's quality of life.[2] TKR is an elective procedure that helps in relieving pain and improving a patient's quality of life.[22,23,29] Primary healthcare physicians play a vital role in the evaluation and monitoring of knee osteoarthritis as it is one of the most common conditions seen in primary care.[1] They can

Table 3: Assessment of general population perception toward the disease, diagnosis, and treatment

Questions	*n*	%
What do you think is the purpose of performing a knee replacement surgery?		
Pain relief	329.00	67.69
Increase the quality of walking	399.00	82.00
To be able to go back to sports	180.00	37.00
To be able do prayers	209.00	43.00
What are the reasons that might prevent you from knee replacement surgery in case you needed it?		
Pain after the surgery	164.00	33.70
General anesthesia and its complications	123.00	26.02
The surgery is not beneficial	288.00	61.03
There are no available surgeons	116.00	24.07
Do you think that knee osteoarthritis can affect young people?		
Yes	377.00	77.60
No	47.00	9.70
I don't know	62.00	12.70
How do you think knee osteoarthritis is diagnosed?		
Self-diagnosis	21.00	4.30
Clinical examination	128.00	26.30
X-ray	96.00	19.70
CT-scan	94.00	19.30
MRI	148.00	30.40
Do you think that surgical intervention is the best treatment if non-surgical options didn't work?		
Yes	407.00	83.74
No	79.00	16.26

Table 4: Assessment of general population perception toward the complications of TKR

Questions	Correct answers	
	Number	%
Bleeding	151.00	31.07
Superficial surgical site infection	282.00	58.02
Thrombosis (clots)	166.00	34.16
Blood vessels injury	166.00	34.16
Nerve injury	216.00	44.44
Ligamentous injury	211.00	43.42
Infection of prosthetic knee joint	191.00	39.30
Instability of knee	281.00	57.82

improve a patient's knowledge about seen disease process and management leading to better coping with disease activity and pain.[30] This study aims to identify the level of knowledge of the general population about knee osteoarthritis and TJR.

This will provide primary healthcare workers with a better understanding of community perception toward the disease and surgical options, and also provide the ability to correct a patient's misconception with the goal of better healthcare to patients.

It was previously reported that most of the general population is not familiar with seen knee osteoarthritis causes. Around 32% believes that gender plays a role in the development of

knee OA, 35.7 and 59.1% believe that obesity or overweight is a cause of knee OA, 38.1 and 46 believe that the aging process has a role in the pathogenesis of the disease, whereas 36.8 and 41.7% believe that repetitive stress or overuse can lead to knee OA.[31,32] Our study population demonstrated a higher level of knowledge about the causes of OA compared with the literature. Most of the study population admits that the following factors have a role in the pathogenesis of knee OA: gender, obesity or overweight, age, and repetitive stress or overuse (73.25, 90.12, 89.1, and 78.6%, respectively). The knowledge of the population about the bowing of legs as a cause or as a symptom of knee OA was not reported in the literature. A few acknowledge that bowing of the leg has a role in the development of knee OA (38.89%) and 27.56% believe that it is a part of knee OA symptomatology.

Regarding knee osteoarthritis symptoms, Ganasegeran *et al.*[31] reported 72.1% of the population presumes that the knee OA patients will complain of knee pain, 54.8% will complain from knee swelling, and 49.9% will report knee clicking sounds.[33] Our population demonstrated more familiarity with knee OA symptoms, in which they recognized pain, swelling, and clicking sounds as knee OA symptoms (81.1, 55.35, and 73.5%, respectively). The knowledge level about diagnostic modalities has not been previously evaluated in the literature review. In our study, the participants believed that it is self-diagnosed (4.3%), diagnosed by clinical examination (26.3%), requires imaging for diagnoses such as an X-ray (19.7%), Computed Tomography (CT) scan (19.3%), or Magnetic Resonance Imaging (MRI) (30.4%).

Ganasegeran *et al.*[31] showed that a few (18.5%) are oriented about non-surgical measures such as cold compresses in relieving knee pain. Furthermore, 41.3% are aware that intra-articular steroid injection might aid in the temporary relief of knee pain.[29] In our study, the majority are oriented about the role of physiotherapy programs, weight reduction, and analgesics in improving knee pain intensity (86.6, 92.4, and 64%, respectively). On the other hand, the minority were aware of the role of cold compresses and intra-articular steroid injection in relieving knee pain (29.4 and 47.7%, respectively).

The awareness level of the population about the role of TJR in chronic non-responding knee pain varied between 18.9 and 46.5%.[31,34] Our population demonstrated a higher level of awareness about the role of TJR in patients with non-responding knee pain (83.74%).

Al-Mohrej *et al.*[34] reported reasonable expectation of population after undergoing TJR. The minority thought the pain will resolve completely within a short duration after the surgery (8.8%) and around 22% thought they could pray normally after the surgery. Most of our population (67.1%) anticipated pain relief and improvement in the quality of life (81%) after undergoing the surgery. With regard to the ability to pray after surgery, 42.1% of the responders expected the patient to be able to pray normally.

Table 5: The statistical difference in the total scores across the respondent's demographic categorical variables

	Total Score Mean (out of 35)	SD	*P*
Gender			
Male	20.41	5.33	0.036
Female	21.42	5.20	
Residence			
City	20.86	5.33	0.930
Rural area	20.80	5.12	
Nationality			
Saudi	20.65	5.36	0.016
Non-Saudi	22.56	4.31	
Educational status			
Uneducated	21.25	5.06	0.460
Elementary or intermediate school	21.52	4.42	
High school	19.16	7.15	
University	20.72	5.34	
Higher education	21.27	5.27	

Multiple factors were studied previously that might affect a patient's decision to undergo TKR including knowledge about procedure, religiosity, and trust in the provider.[35] In our study, multiple factors and fears were studied that prevent the patient from undergoing TJR including persistent pain (34.1%), general anesthesia complications (26%), believing that surgery is not beneficial (61%), and no surgeon availability (24.1%).

Some limitations to this study exist. The participants in this study were chosen randomly within a single city of Riyadh. This geographic and possible socioeconomic limitation may have influenced the results of the level of knowledge evaluated in this study. The participants completed a questionnaire with a Cronbach's alpha value of 0.80, however, geographic-specific questions were included such as the effect of osteoarthritis on Islamic prayer which may hinder the ability to generalize this knowledge throughout the regional population. The average age of the participants was 36.24. This might not reflect the majority of those who are at risk to be affected by osteoarthritis. However, it does emphasize the importance of early awareness on the future impact of the disease.

The general Saudi population's level of awareness about TJR complications was not previously studied. Our study population demonstrated a higher level of knowledge about the causes of OA compared with literature, however, almost half of the responders were not aware of the TJR complications. The level of awareness about the complications was as follows: bleeding (31.1%), surgical site infection (58%), vascular injury (34.2%), nerve injury (44.4%), ligamentous injury (43.4%), prosthetic infection (39.3%), and knee instability (57.8%). The improvement in the population level of knowledge about knee osteoarthritis, and specifically, about TJR may be attributed to the increased utilization of TJR and the high level of education of the participants which will lead to better patient compliance and satisfaction.[34]

Conclusion

Knowledge about the OA disease process appears to have a role in the early diagnosis and better coping with disease progression. Most of the community seems to have satisfactory knowledge about the OA disease process. The patient's fear might affect the delivery of the appropriate intervention at the appropriate time. More effort is required in increasing the level of awareness regarding the indications and complications of surgical intervention. Appropriate primary care level disease orientation as well large-scale awareness campaigns may be beneficial in reducing patient fears in seeking appropriate management.

Key points

- OA is a common disease among the older population and can negatively impact daily activities significantly.
- OA is one of the most commonly seen conditions in primary care.
- OA is mainly diagnosed with a history and physical examination and can be confirmed with X-rays.
- The awareness level among the Saudi population about the OA disease process is satisfactory.
- The awareness level among the Saudi population about OA management needs to be increased.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflicts of interest

There are no conflicts of interest.

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