Original Article :

Knowledge and Awareness of Osteoarthritis Among Adult Saudi Population in Al-Baha Region, Saudi Arabia

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Abstract

Background and Aims:
Osteoarthritis is a chronic degenerative disease affecting joints, causing cartilage destruction, pain, stiffness, and reduced mobility. Common sites include hands, knees, hips, and spine due to weight-bearing stress or frequent use. Osteoarthritis is the most prevalent form of arthritis, and with age, the incidence rises. This study aimed to assess knowledge of causes, symptoms, and management of Osteoarthritis along with awareness levels among the Saudi adult population in the Al-Baha region, Saudi Arabia.

Methods:
A cross-sectional study surveyed 616 Saudi adults aged 18 years or older in Al-Baha by using an online structured questionnaire. Participants were recruited using convenience sampling methods. Data were analyzed using descriptive statistics, and non-parametric tests (Mann-Whitney U and Kruskal-Wallis, $p < 0.05$) were applied using SPSS version 27. A score of 60% indicated good awareness.

Result:
The majority of participants were in the 18-29 age group (42.4%) and were predominantly female (57.8%). Most participants had university degrees (57.5%). The results indicate that a majority of participants (60.9%) had inadequate knowledge about Osteoarthritis, while a smaller proportion (39.1%) had adequate knowledge. However, there was a significant association between education level and the level of knowledge ($p = 0.011$), with higher education levels being associated with a higher level of knowledge. Additionally, knowing someone with Osteoarthritis was significantly associated with a higher level of knowledge ($p = 0.033$). A significant number of participants knew someone with OA (66.7%).

Conclusion:
This study reveals a significant gap in osteoarthritis knowledge among the Al-Baha population. Higher education and personal experience with OA were associated with better awareness. These findings underscore the need for public health initiatives to improve osteoarthritis education and awareness.

Keywords:
Osteoarthritis, Knowledge, Saudi Population, Public Health, Community awareness, Health Education

Introduction:

Osteoarthritis (OA) is a chronic degenerative disease that primarily affects the articular cartilage of the joint. It is characterized by the progressive breakdown of cartilage due to mechanical stress and low-grade inflammatory processes, leading to joint destruction and resulting in pain, loss of mobility, stiffness, and swelling[1]. Commonly affected joints include the hands, knees, hips, and spine, it could affect a single joint (localized OA) or multiple joints (generalized OA)[1]. Furthermore, as the most prevalent form of arthritis in both industrialized and developing nations[2]. However, there is a poor association between radiographic alterations and joint pain severity[3]. As age advances, the incidence of OA tends to rise significantly.

Statistics reveal a progressive increase in OA prevalence with age. Notably, among individuals aged 46-55 years, the prevalence of OA stands at 30.8%. Furthermore, within the age bracket of 66-75 years, the prevalence skyrockets to a staggering 60.6%. These figures serve as a testament to the escalating impact of age on the development and manifestation of OA[4].

Looking at the literature review, several studies conducted in different regions of Saudi Arabia have revealed significant variations in public awareness and knowledge of OA. In Sudair, a 2021 study involving 387 participants found that only 14% of respondents had adequate knowledge of OA, while 34.6% demonstrated inadequate awareness5. Similarly, a 2020 study in Jeddah with 1,238 participants revealed that just 37% correctly identified the mechanism behind OA, indicating low levels of understanding, particularly among younger age groups[6] .

In contrast, a 2022 study in Tabuk involving 420 participants reported average knowledge levels, with a mean knowledge score of 8.03 (SD = 2.1), and highlighted the need for improved public education. The average knowledge, indicating a need for increased public education[7]. Also, a study in Aseer with 1,052 participants found significantly higher awareness levels, with 89% of the sampled population having good knowledge of the precautions to take against knee OA, and 82.6% reporting a high overall awareness of the disease[8].

Previous studies have reported the prevalence of OA in the Kingdom of Saudi Arabia, with varying levels of knowledge regarding OA among the population. However, no studies have been conducted to specifically assess the knowledge level regarding OA among the Saudi population in Al-Baha, Saudi Arabia. Our study aims to assess knowledge and awareness of OA and its related risk factors among the Sau-

di population in the Al-Baha region, Saudi Arabia.

Material and Methods:

Study design:

This cross-sectional study utilized a structured, validated questionnaire by Ali H. Alyami et al. to assess the knowledge and awareness of the general population in Jeddah, Saudi Arabia[6]. Permission was obtained for its use. The questionnaire has been previously utilized in a study by Alahmed et al. to assess knowledge about OA and its related risk factors in Hail[3].

Study setting and population:

The study was conducted in Al-Baha, Saudi Arabia, among Saudi adults aged 18 and above. Both males and females were invited to participate. Participants were recruited in October 2023 via an online questionnaire using a Google Form link, distributed through social media platforms (WhatsApp, Instagram, X, Snapchat), utilizing a convenience sampling method.

Inclusion and Exclusion Criteria:

Inclusion criteria: male and female Saudi population above 18 years of age living in the Al-Baha region.

Exclusion criteria: participants below the age of 18, non-Saudi population, and people who lived outside the Al-Baha region.

Sample size and sampling procedure:

A total of 616 individuals in the study completed the survey using convenience sampling. The standard sample size method was used to estimate the minimum sample size at a 95% confidence range. A minimum sample size of 384 was found to be sufficient for the study.

Data Collection Methods:

Three components of a self-administered questionnaire in Arabic were used. Demographic information, including age, gender, and educational attainment, was given in the first section. Group 1: 18–29, Group 2: 30-39, Group 3: 40–49, Group 4: 50–59, and Group 5: 60 and older participants were divided into 5 age groups. No education, less than secondary, secondary, bachelor's, or higher education were the other categories for education level. Participants were questioned about the concept of OA and their understanding of it in the second portion. Using a 20-item quiz, participants' knowledge was evaluated in the third portion, which concentrated on basic information, symptoms, risk factors, diagnosis, and OA treatment choices.

Data Analysis:

Data was gathered, cleaned, examined, and re-examined. The Statistical Package for Social Sciences, version 28, was used for all statistical studies, guaranteeing dependable and sturdy outcomes. Descriptive statistics were used in the study to summarize the data, which included participant biographical information, medical history

linked to OA, and knowledge of other individuals with OA. Counts, proportions (%), and mean values with standard deviations were presented as applicable. The amount of knowledge that participants displayed about chronic OA was tallied, while the general degree of awareness and the information source were graphed and shown in figures. The Mann-Whitney U test and the Kruskal-Wallis test were used in statistical studies to examine the link between participants' bio-demographic factors and their level of awareness and knowledge. Statistical significance was defined as $p < 0.05$, or a significance level less than 0.05.

Additionally, the Shapiro-Wilk and Kolmogorov-Smirnov tests were used to evaluate statistical collinearity. A score of one point was awarded for each right response. The discrete scores for each item on the questionnaire were tallied to measure the participants' level of knowledge regarding open access. A total score of sixty percent was interpreted as indicating a good degree of awareness, and any score below sixty percent was seen as unsatisfactory. For every research variable, frequency distributions and percentages were presented for descriptive analysis.

Ethical Considerations:

The study was approved by the IRB committee at the Faculty of Medicine, Al-Baha university, approval number (REC/SUR/BU-FM/2023/94). The questionnaire included an opening question to protect the privacy of collected data and guarantee each participant's informed consent. In addition, strict labeling and handling guidelines were put in place to protect the confidentiality of the data, and no individually identifiable participant data was gathered.

Results:

Bio-demographic data of study participants, Al-Baha Region, Saudi Arabia.

The bio-demographic data of study participants from Al-Baha Region, Saudi Arabia, shows that most participants were in the 18-29 age group (42.4%) and were predominantly female (57.8%). Most participants had university degrees (57.5%) and identified the wear and tear of cartilage as the main cause of OA (47.9%). A significant number of participants knew someone with OA (66.7%). Table 1.

Table 1: Showing Bio-demographic data of study participants, Al-Baha Region, Saudi Arabia.

Bio-demographic data of study participants, Al-Baha Region, Saudi Arabia		Count	%
Age Grouping	18 - 29 Years old	261	42.4%
	30 - 39 Years old	84	13.6%
	40 - 49 Years old	165	26.8%
	50 - 59 Years old	90	14.6%
	60 years old and more	16	2.6%

Gender	Male	260	42.2%
	Female	356	57.8%
Education	Uneducated	3	0.5%
	Less than a high school degree	32	5.2%
	High school degree	197	32.0%
	University	354	57.5%
	Postgraduate degrees	30	4.9%
Do you know how osteoarthritis develops?	The amount of blood that reaches the joint decreases with age	71	11.5%
	The nerve that passes near the joint is pressed	67	10.9%
	Accumulation of acids inside the joint	51	8.3%
	The cartilage at the ends of the bones wears away over time	295	47.9%
	I do not know	132	21.4%
Do you know anyone who has osteoarthritis?	No	122	19.8%
	Yes	411	66.7%
	I am not sure	83	13.5%

Source of information about chronic osteoarthritis (OA) in Al-Baha Region, Saudi Arabia.

The figure 1 depicts the source of information among the participants about the

Figure 1:

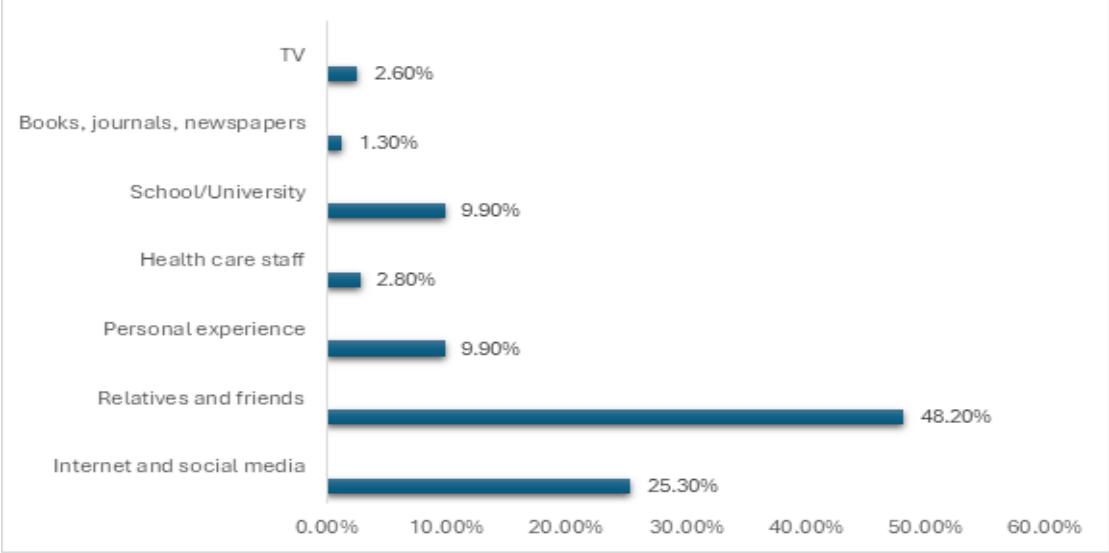


Figure 1. Source of information about chronic OA in Al-Bahah Region, represented by the percentage of participants. The most cited source was «relatives and friends» (48.20%), while healthcare staff were not commonly cited (2.80%) among our participants.

Chronic OA in Al Baha region, KSA.

Knowledge And Awareness of Osteoarthritis Among the Saudi Population in Al-Baha Region.

The results showed that the majority of participants recognized OA as a chronic problem (64.9%) and acknowledged that different joints can be affected (39.9%). However, there were misconceptions, as a minority believed that OA is rare (9.3%) and caused by cold, damp weather (25%). Some of the participants were aware of common symptoms such as pain (as a symptom of OA) (52.8%) and stiffness (56.0%), but fewer recognized swelling (41.9%) as a sign. Knowledge regarding diagnostic methods varied, with a majority aware of physical examination and X-ray (61.0%) but fewer aware of the uselessness of blood tests (42%). Treatment options such as NSAIDs (33.6%), exercise like swimming (61.0%), and physiotherapy (75.2%) were known, but there were misperceptions about the effectiveness of acid-free diets (35.4%) and intra-articular injections (23.2%). Joint replacement surgery was considered a viable option by 45.1% of participants. Table 2

Table 2: Knowledge And Awareness of OA Among the Saudi Population in Al-Baha Region.

Knowledge and Awareness of Osteoarthritis Among the Saudi Population in Al-Baha Region	No		Yes		I am not sure	
	Count	**%**	**Count**	**%**	**Count**	**%**
Osteoarthritis is a chronic problem.	128	20.8%	400*	64.9%	88	14.3%
Osteoarthritis is rare.	495*	80.4%	57	9.3%	64	10.4%
Different joints can be affected by osteoarthritis.	219	35.6%	246*	39.9%	151	24.5%
Osteoarthritis is caused by cold, damp weather.	309*	50.2%	154	25.0%	153	24.8%
Osteoarthritis is caused by a microorganism.	251*	40.7%	173	28.1%	192	31.2%
Pain is the only symptom of osteoarthritis.	325*	52.8%	204	33.1%	87	14.1%
Stiffness is a symptom of osteoarthritis.	96	15.6%	345*	56.0%	175	28.4%
Swelling is a sign of osteoarthritis.	180	29.2%	258*	41.9%	178	28.9%
Osteoarthritis can lead to loss of joint movement.	102	16.6%	388*	63.0%	126	20.5%
There are genetic factors that can predispose people to osteoarthritis.	243	39.4%	190*	30.8%	183	29.7%
Aging is a risk factor for osteoarthritis.	60	9.7%	495*	80.4%	61	9.9%
Men and women are equally affected by osteoarthritis.	305*	49.5%	174	28.2%	137	22.2%
Physical examination and X-ray are used to diagnose osteoarthritis.	72	11.7%	376*	61.0%	168	27.3%
Blood tests are used to diagnose osteoarthritis.	259*	42.0%	164	26.6%	193	31.3%

NSAIDs can improve osteoarthritis symptoms.	280	45.5%	207*	33.6%	129	20.9%
Some forms of exercise, like swimming, are suitable for people with osteoarthritis.	89	14.4%	376*	61.0%	151	24.5%
Acid-free diets are a proven treatment for osteoarthritis	109*	17.7%	218	35.4%	289	46.9%
Physiotherapy can cause a great improvement in the symptoms of osteoarthritis.	55	8.9%	463*	75.2%	98	15.9%
Intra-articular injection by stem cells or hyaluronic acid is an effective modality for curing osteoarthritis.	234*	38.0%	143	23.2%	239	38.8%
Joint replacement surgery will be the ultimate option to relieve the symptoms of osteoarthritis.	152	24.7%	278*	45.1%	186	30.2%
* Right Answer						

Level of Knowledge Regarding OA Among Saudi Population in Al-Baha Region.

The results indicate that a majority of participants (60.9%) had inadequate knowledge about OA, while a smaller proportion (39.1%) had adequate knowledge. The Mean score of 0 to 20 was 10.2, with a median score of 11. The standard deviation was 3.53.

Figure 2:

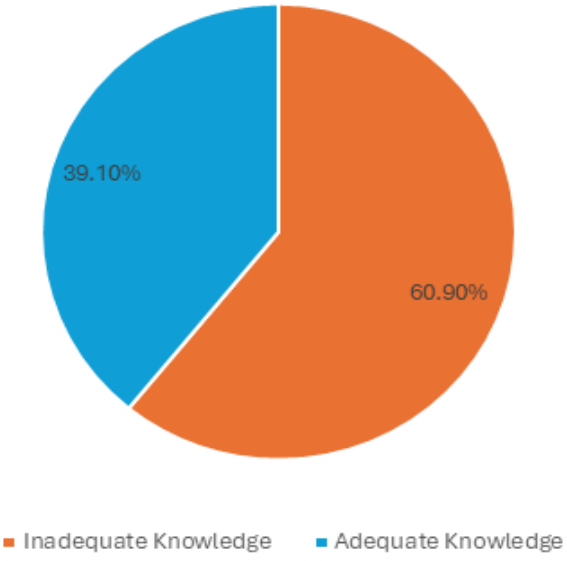


Figure 2. Level of Knowledge Regarding OA Among the Saudi Population in Al-Baha Region. 39.10% (241 individuals) demonstrated inadequate knowledge, while 60.90% (375 individuals) had adequate knowledge (Total N = 616).

The association between bio-demographic factors and the levels of knowledge and awareness of OA among the Saudi Population in Al-Baha Region.

The results showed no significant association between age groups (p = 0.492) or gender (p = 0.378) and the level of knowl-

edge about OA. However, there was a significant association between education level and the level of knowledge (p = 0.011), with higher education levels being associated with a higher level of knowledge. Additionally, knowing someone with OA was significantly associated with a higher level of knowledge (p = 0.033), as shown in Table 3

Table 3: The association between bio-demographic factors and the levels of knowledge and awareness of osteoarthritis.

The association between bio-demographic factors and the levels of knowledge and awareness of osteoarthritis among the Saudi Population in Al-Baha Region.		Level of Knowledge				P-Value
		Inadequate		**Adequate**		
		Count	**%**	**Count**	**%**	
Age Grouping	18 - 29 Years old	153	58.6%	108	41.4%	.492
	30 - 39 Years old	58	69.0%	26	31.0%	
	40 - 49 Years old	96	58.2%	69	41.8%	
	50 - 59 Years old	57	63.3%	33	36.7%	
	60 years old and more	11	68.8%	5	31.3%	
Gender	Male	153	58.8%	107	41.2%	.378
	Female	222	62.4%	134	37.6%	
Education	Uneducated	3	100.0%	0	0.0%	.011
	Less than a high school degree	26	81.3%	6	18.8%	
	High school degree	127	64.5%	70	35.5%	
	University	200	56.5%	154	43.5%	
	Postgraduate degrees	19	63.3%	11	36.7%	
Do you know anyone with OA?	No	77	63.1%	45	36.9%	.033
	Yes	229	55.7%	182	44.3%	
	I am not sure	69	83.1%	14	16.9%	

Discussion:

The most prevalent illness and cause of impairment among the elderly is osteoarthritis (OA)[9]. Therefore, it is crucial to raise awareness of OA in the Kingdom of Saudi Arabia to help people adopt healthy habits and accept newly suggested prevention measures [1]. This study aimed to assess the knowledge of OA among the general population in the Al-Baha region. The findings revealed that out of the 616 participants, more than half exhibited insufficient knowledge about OA, which aligns

with the results of similar studies conducted in other regions of Saudi Arabia, such as Makkah, Tabuk, and Jeddah. [6,7,10] . It is interesting to note that two studies from Qunfudah, Sudair, and Aseer revealed a higher degree of knowledge[1,2,5].

The bio-demographic data of the participants in our study aligns with several other studies conducted in different regions of Saudi Arabia. Like our study, the studies in Tabuk, Jeddah, and Makkah all found that the majority of participants were in the younger 18-29 age group and were predominantly female[6,7,10]. This suggests that the population seeking health information or participating in these types of studies on OA tends to skew towards younger adult women in Saudi Arabia. The difference in results between older and younger populations may suggest that younger individuals use technology more frequently than the elderly. However, this also raises concerns about potential sampling bias, as the findings may not be generalizable to the entire population, particularly older adults and men. However, the study in the Aseer region had contrasting findings, with the sample being predominantly middle-aged (30-49 years old) and having more male participants than female. This disparity highlights the potential regional differences[2]. An interesting commonality across the studies is the association between higher education levels and greater knowledge about OA. Our study, as well as the ones in Tabuk and Jeddah, found a significant positive relationship between educational attainment and OA awareness. This suggests that targeted educational interventions, particularly for those with lower levels of formal education, could be an effective strategy to improve overall understanding of this condition within the Saudi population[6,7]. A significant number of participants knew someone with OA (66.7%), This was expected given that earlier research indicated that 15.3% of Saudi Arabians had OA overall [12]. Additionally, our study finding that knowing someone with OA was linked to higher levels of knowledge aligns with the Makkah study[10], which also reported this association ($p = 0.001$). This implies that personal experiences or exposure to disease can play an important role in shaping individuals' awareness and understanding of OA.

In our study, the majority of participants (48.2%) reported relying on relatives and friends as their main source of information about OA. This was followed by the internet and social media (25.3%) as another common source. These results suggest that in the Al-Bahah region, informal and personal connections are the predom-

inant channels through which people seek and obtain information about this chronic condition. In comparison, the Makkah study found markedly different results [10]. Their findings indicated that participants who sourced their OA information from more formal and educational sources, such as their own studies (49% had good awareness) and medical specialists (41% had good awareness), tended to have higher levels of awareness about OA. Conversely, those who relied on other, potentially less reliable sources only had a 21.6% rate of good awareness. This discrepancy raises questions about the credibility and accuracy of information disseminated through informal channels and social media. It is possible that misinformation or lack of access to reliable medical information might have contributed to the knowledge deficit observed in our study.

Also, the study's results showed that 64.9% of participants correctly identified OA as a chronic problem, while 80.4% correctly identified it as not being a rare condition. These results are far better than those of earlier Malaysian research[13], where only 51.9% of participants were aware that OA is a common disease. Additionally, other studies have reported that about 82.4% of respondents have correctly identified the basic mechanism for OA, and 49.6% have said it is a chronic condition[10]. In the current study, 52.8% of participants correctly answered that pain is not the only symptom of OA, 56.0% correctly identified that stiffness is a symptom, 41.9% correctly identified that swelling is a sign, and 63.0% correctly identified that OA can lead to loss of joint movement. These results are in line with earlier studies. According to research by Hunter DJ et al., stiffness and discomfort are the main symptoms of OA[14–17]. Additionally, a study by Saeed F et al. reported that 62% of OA patients experience joint swelling, and 71% suffer from restricted mobilization[18]. Similar findings were reported in a prior study conducted in Jeddah by Ali H. Alyami et al., where almost half of the participants correctly identified pain and stiffness as the primary symptoms of OA[6].

Furthermore, our study found that only a small proportion of respondents (39.9%) believe that OA can affect different joints. While Yucesoy B et al reported medical understanding that OA can impact various joints, including the knees, hips, hands, and spine[19]. Regarding genetic factors, our study only found that 30.8 % of participants recognized that genetic predisposition could increase the risk of OA. This aligns with the evidence from the systematic review by Tschon et al[20]. which noted

the high heritability of OA, ranging from 40-70% depending on the joint. However, our study also found that a sizeable proportion (29.7%) were unsure about the genetic link, indicating that more education may be needed in this area. On the risk factor of aging, our study revealed a moderate level of awareness, with 80.4% of respondents correctly identifying it as a key risk factor. This finding is supported by the study from Areej Amanat et al.[21], which also reported a good understanding of age as a risk factor for OA among the general public. The gender-related aspects of OA showed more mixed results in our study. While 49.5% of respondents believed that men and women are not equally affected, the previous systematic review by Tschon et al. has consistently revealed that women had a higher risk of developing OA and having symptoms that are more severe[20]. This discrepancy suggests that there may be room for improved public awareness and understanding of the gender-specific patterns of OA. Hormonal, genetic, and social factors may contribute to this disparity. Targeted educational programs, such as awareness campaigns, should focus on educating menopausal women, along with other groups who are at risk of osteoarthritis. This could decrease morbidity, improve outcomes and quality of life for the affected, and decrease the incidence of osteoarthritis. A significant correlation was observed between education level and knowledge level ($p = 0.011$), suggesting that individuals with higher education tend to possess greater knowledge. This trend may be attributed to increased access to technology, reading materials, and research resources, which facilitate information acquisition and comprehension.

A substantial portion of participants (48.20%) reported obtaining their knowledge from relatives and friends, while only 2.80% relied solely on healthcare staff. This may be linked to the longer duration of familiarity with friends and family. physicians may not build a trustworthy relationship and rapport with their patients, which is a necessity for patients to trust and follow management plans, thus potentially causing further complications to patients and increasing the load on healthcare providers and medical facilities.

OA can be diagnosed using a straightforward film X-ray, history, and physical examination, according to the study by Ariani A, et al. It is uncommon to diagnose OA utilizing biochemical markers in the blood [22]. Comparatively, our study revealed that just 42.0% of respondents properly identified that blood tests are not usually used to diagnose OA, whereas 61.0% of respondents correctly identified that physical

examination and x-ray are used to do so. According to the study by Safa H. Alkalash, just 45% of the respondents knew that an X-ray and physical examination may be used to diagnose OA. This is less than 61.0% of participants in our research who were able to identify these diagnostic techniques accurately [1]. Guidelines from research such as Ariani A et al., Bannuru RR et al., and Kolasinski SL et al. concerning the treatment of OA. suggest NSAIDs (non-steroidal anti-inflammatory medicines) as a first line of treatment[22–23]. According to our survey, 33.6% of participants knew that NSAIDs help lessen the symptoms of OA. This is less than the 46% discovered in the study by Ali H. Alyami[6]. but higher than the 28% revealed in the study by Safa H. Alkalash[1]. It is advised to launch awareness efforts to provide the public with clear, fact-based information on this debilitating illness. The low awareness of treatment options, particularly NSAIDs, may be due to a lack of targeted education on osteoarthritis management. This could have significant implications for patient outcomes, as those unaware of effective treatments may delay seeking medical help or rely on less effective remedies.

Limitations and strengths:

There are various restrictions on this study. First off, the self-administered online questionnaire might only be useful for people who can read, are accustomed to using computer tools, have access to the internet, and are prone to memory bias. Second, there appears to have been a biased selection since 42.4% of the participants were between the ages of 18 and 29. Even with the size of the study sample, it only included one Saudi Arabian city, which might have an impact on how generalizable the results are to other parts of the kingdom. Nonetheless, despite these drawbacks, the study represents a significant effort to raise awareness of this widespread illness in the general public. The questionnaire tool was designed in a manner that neither defined misconceptions about osteoarthritis (OA) for the participants nor provided them with an opportunity to express their misconceptions.

Recommendations:

Future research should investigate the quality of information accessible through informal channels and examine its influence on public awareness more thoroughly. This deeper understanding could help shape targeted awareness campaigns aimed at educating the public about available treatments and their benefits. In addition, future studies should aim for a more balanced sample in terms of age and gender to ensure broader applicability of the results.

Conclusion:

The study indicates that most participants had inadequate knowledge about OA, possibly due to reliance on relatives, friends, and social media for information. Higher education and familiarity with someone having OA were associated with better knowledge. The minimal role of medical professionals in spreading awareness reflects a missed opportunity for public education. Awareness of diagnosis and treatment was limited, with some overestimating the role of surgery and underestimating conservative management. These findings support the introduction of public awareness campaigns using concise, evidence-based content through social media, collaboration with the Ministry of Health, and visits to the primary healthcare centers.

Conflict of interest: The authors declare no conflict of interest.

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