Knowledge and Attitudes of General Population's Toward Rheumatoid Arthritis in Hail, Saudi Arabia

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KEYWORDS

Hail, population, knowledge, awareness, rheumatoid arthritis, rheumatic disorders, Rheumatoid arthritis (RA).

ABSTRACT

Background: A chronic inflammatory autoimmune illness, rheumatoid arthritis (RA) mainly affects small, symmetrical joints, especially those in the hand, wrist, and foot. However, it can also affect other joints and systems. Joint deformity, persistent pain, and a reduced quality of life are brought on by recurrent assaults.
Aim: The objective of the research is to evaluate the general public's awareness and insights regarding rheumatoid arthritis in Hail, Saudi Arabia.
Method: The cross-sectional research took place on people in Hail who were at least 18 years old and over. A self-administered questionnaire was distributed among Hail population using online platforms primarily social media. The questionnaire includes basic demographic characteristics, types of RA, the causes of RA, the symptoms, the risk factors, complications, treatment of RA and whether they know what RA is or not.
Results: 532 people in responded to the questionnaire; of them, 42.5% were female and 50.9% were male. 8.3% had received a diagnosis of RA, and 60.0% correctly associated it with joint pain and morning stiffness. 67.3% believed that RA is not a contagious disease. A significant majority (56.6%) correctly identified that women are more likely to develop RA. Regarding risk factors, 28.0% acknowledged smoking as a significant factor. A notable finding is that 63.7% were uncertain about RA's impact on pregnancy. Knowledge about specific joint involvement varied, with 60.0% correctly associating RA with inflammation in small joints.
Conclusion: The results indicate that while some participants demonstrated a correct comprehension of the disease, there were misconceptions, particularly regarding the joint pain characteristic, types of joint involvement and extra-articular manifestations. These results emphasize how crucial it is to set educational initiatives in place to clear up these misunderstandings and raise community understanding about rheumatoid arthritis.

1. Introduction

Rheumatoid arthritis (RA) is a long-term autoimmune condition that affects joints. Symmetric, progressive inflammation of the afflicted joints is its characteristic feature, leading to bone erosion, cartilage destruction, and disability [1]. While initially, only a small number of joints may be involved, eventually, numerous joints are affected, often accompanied by extraarticular symptoms [2].

Rheumatoid arthritis impacts 0.5–1% of individuals and causes 5–50 new cases per 100,000 individuals each year. The condition is more common in older adults and women [3].

From a clinical standpoint, there are notable differences between the symptoms of RA in its initial stages and those observed in its later, inadequately treated stages. In early-stage RA, widespread illness symptoms like fatigue, a sense of being unwell, painful, and swollen joints, and morning stiffness that lasts longer than 30 minutes. These symptoms are linked with increases in C-reactive protein (CRP) levels and an elevated erythrocyte sedimentation rate (ESR) [4]. On the other hand, insufficient management of rheumatoid arthritis shows an intricate clinical presentation that includes the emergence of severe systemic symptoms like vasculitis in small or medium-sized arteries, hematologic abnormalities (e.g., anemia, leukopenia, thrombocytopenia, or thrombocytosis), lymphomas, pleural

effusions, joint malalignment, reduced range of motion and rheumatic nodules [1,2,5].

Similar to other autoimmune disorders, RA most likely requires two different things to happen in order for it to develop: (1) The patient's genetic predisposition, contributing to the development of autoreactive T and B cells (2), coupled with an external trigger such as or tissue damage or bacterial or viral infections, this leads to the activation of antigen-presenting cells (APCs), which in turn stimulate the pre-existing autoreactive lymphocytes, leading to impaired tolerance and subsequent tissue/organ injury. As a result, among genetically susceptible individuals, the occurrence of RA is likely to result from the complex influences of genetic diversity, epigenetic modifications, and environmental factors provoked by a precipitating event (such as an accident or infection) [1].

Neoteric research has shown that infection with Porphyromonas gingivalis, a prevalent periodontal bacterium, can provoke autoimmune reactions via citrullinated host peptides2,6. This process, induced by protein arginine deiminase (PAD), change the positively charged arginine residues of "self" proteins into neutral citrulline residues, therefore changing their surface charge and start formation of neoepitopes [2,6]. In addition, the development of RA is also influenced by genetic factors, as proof that concordance rates are higher for identical twins than for dizygotic twins and unrelated control collectives. Moreover, having a familial history of RA increases the risk of developing RA three– five times [1,7]. Diagnosing RA is typically based on multiple factors, including the patient's medical history, examination results, evaluation of risk factors, patient's family history, joint evaluation by imaging such as ultrasound sonography, and analysis of laboratory inflammatory markers such as elevated CRP and ESR serum concentrations, coupled with the presence of autoantibodies specific to RA [5,8].

There are two important autoantibodies in RA, RF and ACPA, which provide distinct clinical and pathophysiological insights. ACPAs have higher sensitivity and specificity for RA than RF; therefore, they generally provide superior diagnostic guidance. RF and ACPA are both unfavorable predictors of joint damage [9]. It has been suggested that MRI and ultrasound be used to diagnose and track the progression of RA patients' diseases[10]. Additionally, bone erosions can be detected by ultrasonography [11].

Throughout the years, several therapy approaches have been employed to raise patients' quality of life, lower their chance of experiencing extra-articular symptoms, and assess the safety and effectiveness of new active compounds [12]. "Treat to target" is the ACR's guiding principle, which suggests selecting a treatment that works well to achieve remission or, if that doesn't work, reducing disease activity. Since the erosions that are already there cannot be reversed, therapy intervention needs to be rapid and aggressive12. In order to achieve a speedy outcome, the general treatment method begins with a highly accurate diagnosis and incorporates nonpharmacological and pharmacological therapy, as well as prevention strategies [13]. Currently, RA management is based on the recommendations of the American College of Rheumatology (ACR) and the European Alliance of Associations for Rheumatology (EULAR), centering on two main approaches: symptomatic treatment (NSAIDs and GCs) and disease-modifying therapy (DMARDs) [13,14[. Previously, NSAIDs and GCs were used to treat the symptoms of RA; however, after a thorough evaluation of the benefit–risk balance, weak opioid derivative analgesics may also be considered for temporary relief of pain [15,16].

DMARDs are pharmacological medicines that decrease autoimmune activity and delay or prevent joint deterioration in order to induce remission. DMARDs are divided into three categories: biologic DMARDs (bDMARDs), targeted synthetic DMARDs (tsDMARDs), and conventional synthetic DMARDs (csDMARDs) [17].

2. Methodology

The Hail community participated in a cross-sectional study that used anonymous Arabic questionnaires. Targeting over 500 participants, the online survey was disseminated across the populace via social media.

Data analysis

The data was inputted and analyzed using Statistical Package for Social Science version 23.0 (SPSS 23.0). Descriptive analysis was performed to explore the clinical variables and demographics. Continuous variables were summarized using the mean and standard deviation, assuming a normal distribution of the data. A summary of the categorical variables was made using frequencies and percentages. To compare differences in the primary analysis, a Chi-square test was employed. A two-sided significance level of 0.05 was applied to assess the primary, secondary, and other outcomes. For the secondary analysis, Analysis of Variance (ANOVA) was performed to evaluate variations between continuous variables and demographic variables

3. Result and Discussion

Socio-demographic characteristics:

The socio-demographic characteristics of the sample was calculated through Frequencies (Percentages). Descriptive statistics of the current study showed that, majority of the participants were Male 271 (50.9%) and 226 (42.5%) participant's age range was 20-29 years and 302 (56.8%) participant's marital status was single. Most of the participants from this study 44.4% were students and 389 (73.1%) education was graduation, followed by 137 (25.8%) were having up to secondary education. Moreover, 254 (47.7%) participant's monthly income was less than 5000 Saudi Riyal (SR), followed by 83 (15.6%) had 10001-15000 SR, 80 (15.0%) had 5001-10000 SR, 75 (14.1%) had 15001-20000 SR and only 40 (7.5%) had more than 20000 SR as monthly income as shown in Table 1.

Table 1: Baseline characteristics of the sample

		Frequencies *(f)*	Percentages *(%)*
Gender			
	Male	271	50.9
	Female	261	49.1
Age			
	Below 20 years	81	15.2
	20-29 years	226	42.5
	30-39 years	52	9.8
	Above 40 years	173	32.5
Education			
	No formal education	06	1.1
	Primary	02	0.4
	Middle	11	2.1
	Secondary	124	23.3
	Graduation	389	73.1
Marital status			
	Single	302	56.8
	Married	209	39.3
	Divorce/widow	21	3.9
Employment status			
	Student	236	44.4
	Unemployed	51	9.6
	Employed	168	31.6
	Retired	77	14.5
Monthly income			
	Less than 5000 SR	254	47.7
	5001-10000 SR	80	15.0
	10001-15000 SR	83	15.6

	15001-20000 SR	75	14.1
	More than 20000 SR	40	7.5

Kurtosis and Skewness test

The shape of the data distribution and univariate outliers were examined using skewness and kurtosis in SPSS. Outliers were identified and treated by transforming them into standardized scores based on a threshold of ±2 standard deviations from the mean. Additionally, a skewness test was conducted to assess the symmetry of the data distribution in relation to its dispersion from the mean value. Data is treated by adding or subtracting the positive or negative value of 2 to settle the diagnosed asymmetrical values, as shown in Table 2.

Table 2. Skewness and Kurtosis of Tinnitus Handicap Inventory (THI)

Descriptive Statistics	Mean	Std. Deviation	Skewness	Kurtosis
Is rheumatoid arthritis a contagious disease	.77	.523	-.209	-.201
Rheumatoid arthritis is immune disease	1.02	.894	-.041	-1.752
Women more likely to get rheumatoid arthritis?	1.21	.939	-.427	-1.732
Rheumatoid arthritis only affects the elderly?	.95	.622	.037	-.416
Is smoking one of the most important risk factors for rheumatoid arthritis?	.79	.854	.421	-1.500
Rheumatoid arthritis cause fatigue?!	1.63	.749	-1.639	.808
Rheumatoid arthritis is characterized by pain in the joints of the hands and stiffness in the morning for more than half an hour?	1.24	.951	-.493	-1.717
Rheumatoid arthritis is characterized by abdominal pain	.67	.677	.513	-.774
Rheumatoid arthritis affecting pregnancy?	.60	.850	.858	-1.067
Rheumatoid arthritis is characterized by inflammation of the small joints such as the joints of ?the fingers and toes	1.29	.913	-.596	-1.537
Rheumatoid arthritis affects only the joints of the knees?	.91	.676	.113	-.812
Rheumatoid arthritis affects all joints in the body with no exceptions	1.22	.916	-.453	-1.659
Rheumatoid arthritis is characterized by an increase in pain with movement?	1.27	.900	-.555	-1.539
If not treated, rheumatoid arthritis may cause deformities in the affected joints, leading to loss of function in the absence of treatment?"	1.33	.923	-.712	-1.449
Rheumatoid arthritis patients often end up in a wheelchair	.79	.865	.428	-1.532
Does rheumatoid arthritis affect body organs such as the heart and lungs?	.79	.901	.431	-1.632
Is it better to have rheumatoid arthritis diagnosed and treated by an orthopedic specialist? (Correct, Wrong, I don't know)	1.30	.881	-.630	-1.418
There are medicines that relieve pain and prevent joint deformities, but do not treat the disease permanently?	1.32	.928	-.671	-1.504

Reliability Analysis

Reliability in data collecting requires the use of a trustworthy instrument. An instrument is considered trustworthy if it consistently yields consistent data values when the data collection process is repeated. The Cronbach's Alpha values of each item in the instrument that has been used to measure various variables have been determined by the researcher for this purpose. If the Alpha (α) is more than 0.70, the construct is regarded as reliable.

The reliability of with the help of these eighteen items of Knowledge and attitude of Rheumatoid arthritis were also estimated. The reliability was estimated by measuring the Cronbach alpha's value. After getting satisfactory finding of these scales this variable was further considered for analysis purposes and the constructs also consists of about eighteen items each. The internal consistency value of the knowledge and attitude was .896, as shown in Table 3.

Table 3: Internal consistency of Knowledge and attitude of Rheumatoid arthritis

Name	No. of Items	α
Knowledge and attitude of Rheumatoid arthritis	18	.896

Prevalence of knowledge and attitude regarding Rheumatoid arthritis

The below table provides insights into individuals' knowledge and attitudes of rheumatoid arthritis (RA). Among the respondents, 91.7% reported no previous diagnosis of RA, while 8.3% had received such a diagnosis. Notably, 67.3% believed that RA is not a contagious disease, and 41.0% were aware that it is an immune disease. A significant majority (56.6%) correctly identified that women are more likely to develop RA. There is a good level of awareness among the participants when asked if rheumatoid arthritis only affects the elderly, were 61.1% answered wrong. Regarding risk factors, 28.0% acknowledged smoking as a significant factor. Respondents demonstrated good awareness (79.7%) that RA causes fatigue, and 60.0% correctly associated it with joint pain and morning stiffness. However, 43.4% believed that rheumatoid arthritis is not associated with abdominal pain. A notable finding is that 63.7% were uncertain about RA's impact on pregnancy. Knowledge about specific joint involvement varied, with 60.0% correctly associating RA with inflammation in small joints. According to the statistical report, when questioned if rheumatoid arthritis exclusively affects the knee joints, 18.6% of respondents answered correctly, 53.6% answered wrongly, and 27.8% didn't know. Similarly, regarding the question of whether rheumatoid arthritis affects every joint in the body without exception, 55.5% of respondents answered correctly, 11.3% answered wrongly, and 33.3% didn't know. Moreover, concerning whether increased pain with movement is a hallmark of rheumatoid arthritis, 57.5% of respondents answered correctly, 11.8% answered wrongly, and 30.6% didn't know. Understanding about joint deformities and loss of function due to untreated RA was evident in 64.8% of respondents. Misconceptions persisted, as 20.7% wrongly thought RA patients often end up in wheelchairs. Knowledge about the systemic effects on organs such as the heart and lungs was varied, with 32.1% correctly recognizing this aspect. In terms of treatment, 58.5% believed that RA is better diagnosed and treated by an orthopedic specialist. Additionally, 63.0% acknowledged the existence of pain-relieving medications that do not provide a permanent cure, as shown in Table 4.

Table 4. Frequencies and percentages of knowledge and attitude

		Frequencies *(f)*	Percentages *(%)*
Have you ever been diagnosed with rheumatoid arthritis			
	No	488	91.7
	Yes	44	8.3
Is rheumatoid arthritis a contagious disease			
	I don't know	149	28.0
	Wrong	358	67.3
	Correct	25	4.7
Rheumatoid arthritis is immune disease			
	I don't know	207	38.9

	Wrong	107	20.1
	Correct	218	41.0
Women more likely to get rheumatoid arthritis?			
	I don’t know	190	35.7
	Wrong	41	7.7
	Correct	301	56.6
Rheumatoid arthritis only affects the elderly?			
	I don’t know	118	22.2
	Wrong	325	61.1
	Correct	89	16.7
Is smoking one of the most important risk factors for rheumatoid arthritis?			
	I don’t know	262	49.3
	Wrong	121	22.7
	Correct	149	28.0
Rheumatoid arthritis cause fatigue?			
	I don’t know	87	16.4
	Wrong	21	3.9
	Correct	424	79.7
Rheumatoid arthritis is characterized by pain in the joints of the hands and stiffness in the morning for more than half an hour?			
	I don’t know	192	36.1
	Wrong	21	3.9
	Correct	319	60.0
Rheumatoid arthritis is characterized by abdominal pain			
	I don’t know	238	44.7
	Wrong	231	43.4
	Correct	63	11.9
Rheumatoid arthritis affecting pregnancy?			
	I don’t know	339	63.7
	Wrong	65	12.2
	Correct	128	24.1
Rheumatoid arthritis is characterized by inflammation of the small joints such as the joints of ?the fingers and toes			
	I don’t know	167	31.4
	Wrong	46	8.6
	Correct	319	60.0
Rheumatoid arthritis affects only the joints of the knees?			
	I don’t know	148	27.8
	Wrong	285	53.6
	Correct	99	18.6
Rheumatoid arthritis affects all joints in the body with no exceptions			
	I don’t know	177	33.3
	Wrong	60	11.3
	Correct	295	55.5
Rheumatoid arthritis is characterized by an increase in pain with movement?			
	I don’t know	163	30.6
	Wrong	63	11.8
	Correct	306	57.5

If not treated, rheumatoid arthritis may cause deformities in the affected joints, leading to loss of function in the absence of treatment?"			
	I don't know	167	31.4
	Wrong	20	3.8
	Correct	345	64.8
Rheumatoid arthritis patients often end up in a wheelchair			
	I don't know	268	50.4
	Wrong	110	20.7
	Correct	154	28.9
Does rheumatoid arthritis affect body organs such as the heart and lungs?			
	I don't know	284	53.4
	Wrong	77	14.5
	Correct	171	32.1
Is it better to have rheumatoid arthritis diagnosed and treated by an orthopedic specialist? (Correct, Wrong, I don't know)			
	I don't know	150	28.2
	Wrong	71	13.3
	Correct	311	58.5
There are medicines that relieve pain and prevent joint deformities, but do not treat the disease permanently?			
	I don't know	171	32.1
	Wrong	21	3.9
	Correct	340	63.0

significantly influenced by educational levels among the surveyed participants.

Comparative analysis between age groups and gender to compare the knowledge and attitude.

The differences in knowledge and attitude on rheumatoid arthritis concerning gender, age group, and education were compared using a one-way between-groups analysis of covariance in Table 5. The Independent variable was gender, age group, and education and the dependent variable was Knowledge and attitude towards rheumatoid arthritis. To make sure there was no breach of the assumptions of normality, linearity, homogeneity of variance, and accurate measurement of covariate, preliminary analyses were carried out.

Initially, a statistically significant distinction was observed in the replies provided by the male and female participants. ($t = -3.66$, $p < .001$), indicating that there was more knowledge and attitude scores among females. Secondly, the age groups exhibited a significant difference ($F = 3.51$, $p = .015$), with post-hoc analyses revealing varying mean scores among individuals aged less than 20 years, those who are between the ages of 20 and 29; 30-39; and over 40 years old and more knowledge found between 30-39 years of age group. Finally, there was no significant difference between education levels in knowledge and attitude scores. ($F = 0.436$, $p = .782$). In summary, the study suggests notable variations in knowledge and attitude towards rheumatoid arthritis based on gender and age, but not significantly influenced by educational levels among the surveyed participants, as shown in Table 5 and Figures 1-3 approve it.

Table 5. *Comparative analysis between clinical variables, age groups and gender*

	Male	Female	t	p-value
Knowledge and attitude towards rheumatoid arthritis	7.01 (4.12)	8.26 (3.72)	-3.66	<.001

	<20 yrs	20-29 yrs	30-39 yrs	>40 yrs	F	
Knowledge and attitude towards rheumatoid arthritis	6.54 (3.98)	7.87 (3.97)	8.63 (3.99)	7.50 (3.90)	3.51	.015
	No education	Primary	Middle	Secondary	Graduation	F	
Knowledge and attitude towards rheumatoid arthritis	7.83 (5.88)	9.00 (1.41)	7.45 (5.18)	7.24 (3.88)	7.74 (3.96)	.436	.782

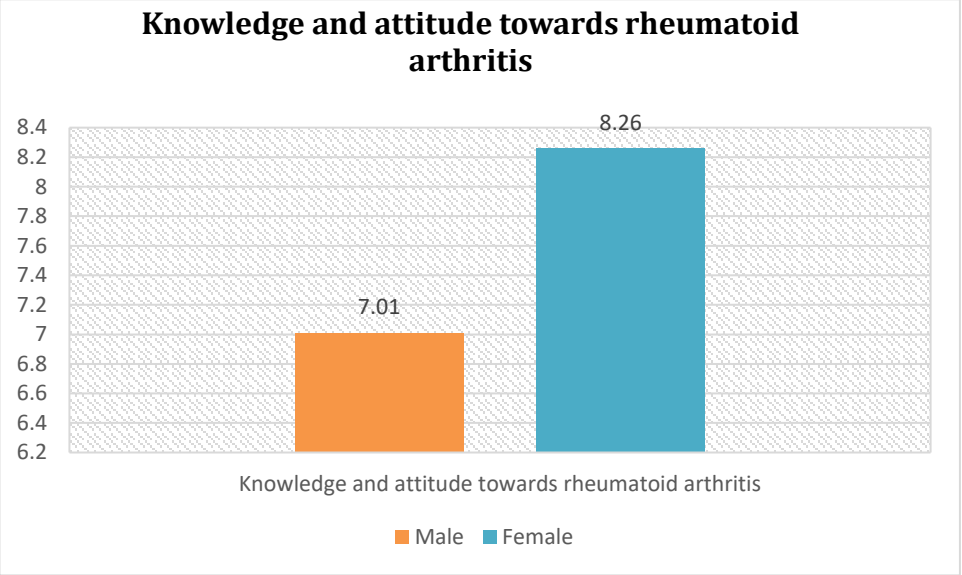

Figure1. Gender wise Knowledge and attitude towards rheumatoid arthritis

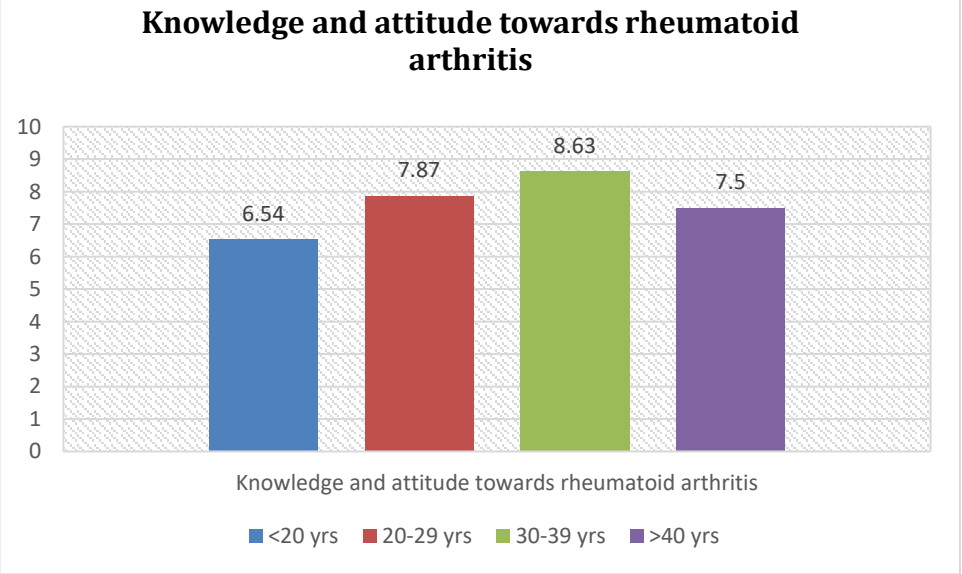

Figure2. Between age groups Knowledge and attitude towards rheumatoid arthritis

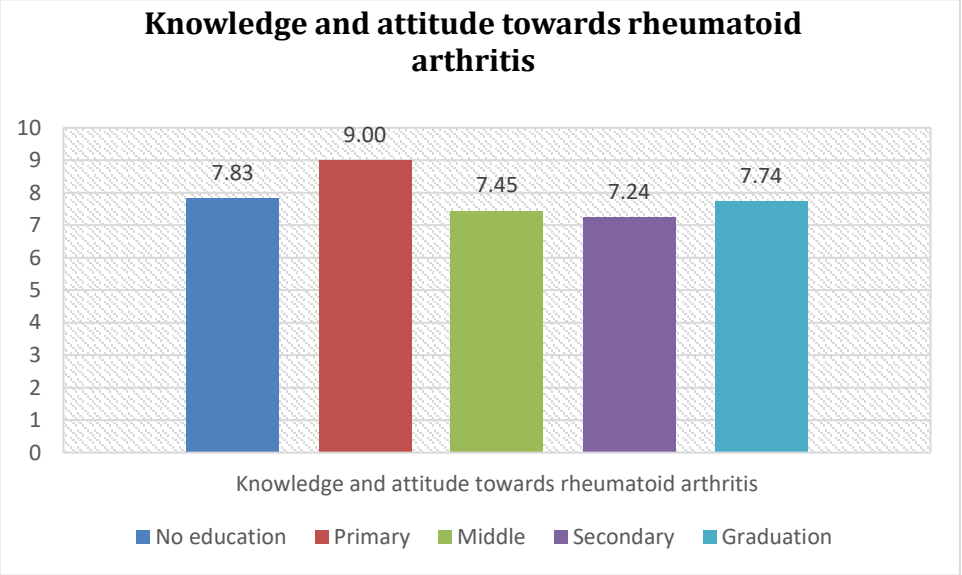

Figure3. Between education groups Knowledge and attitude towards rheumatoid arthritis

Discussion

One of the biggest barriers to obtaining early medical attention was the lack of knowledge and awareness among patients about the early signs and symptoms of rheumatoid arthritis and their restricted access to rheumatologists. Patients so seek medical attention as soon as the illness affects their ability to function [19]. Therefore, it is crucial that the general public is informed of the signs and symptoms of rheumatoid arthritis.

Populations in Egypt, Iraq, the Netherlands, and Portugal had greater awareness of rheumatoid arthritis; over 50% of research participants were aware of the disease [21,28-29]. However, the findings of the research showed that the participants' knowledge of rheumatoid arthritis was inadequate. In many of the knowledge-based topics, participants admitted in their responses that they were unfamiliar with the statements that were provided A majority of the participants demonstrated a lack of awareness regarding the substantial risk associated with smoking and the development of rheumatoid arthritis. Similar findings to ours have been found in a Saudi Arabia study, were participants showed an inadequate understanding of rheumatoid arthritis. whereas good knowledge of rheumatoid arthritis was shown in another study [22-23].

Within our surveyed population, 41% acknowledged rheumatoid arthritis as an autoimmune condition. Conversely, a study carried out in Taif, Saudi Arabia, showed that fewer people (26.6%) were aware of this fact [22]. 4.7% of participants in our study incorrectly perceived rheumatoid arthritis as a contagious disease; likewise, one study carried out in Qassim, Saudi Arabia, found that 2.1% held this misconception [18].

Compared to a survey done in Qassim, Saudi Arabia, where the equivalent percentage was 28.6%, we observed that a greater number of people (56.6%) thought women were at greater risk than men of getting rheumatoid arthritis [18]. Furthermore, our study showed that 28% of participants accurately recognized smoking as a risk factor, as compared to 22.18% of those with a relation to rheumatoid arthritis correctly identified smoking as a contributing factor for rheumatoid arthritis in a study conducted in Jazan, Saudi Arabia [23].61.1% were aware that rheumatoid arthritis doesn't exclusively affect the elderly, Conversely, a study in Qassim indicated that only 35.8% were aware of this fact [18].

Regarding the level of education, we found no discernible variations in the knowledge and attitudes about rheumatoid arthritis among the participants in our study. Nevertheless, it is notable that people with a primary education have the highest level of knowledge about rheumatoid arthritis. The knowledge of rheumatoid arthritis concerning educational levels varies among different populations in

Saudi Arabia. In contrast to our study. A study conducted in Jazan demonstrated a positive relationship between education level and knowledge ($p = 0.001$). Individuals with university education or higher exhibit a greater level of knowledge than those with lower forms of education [23]. In Al-Qassim, the study found no connection between rheumatoid arthritis and level of education that was statistically significant [18].

The total knowledge score and demographic knowledge differences between the age groups were significant ($F = 3.51$, $p = .015$). We found that participants aged 30-39 years had higher knowledge than the other groups. The lowest score was for people aged less than 20 years. We have to target this population by creating engaging materials such as videos and infographics, utilizing social media apps and online platforms, collaborating with schools, empowering peer educators, and promoting healthy lifestyles.

79.7% of our study population acknowledged that rheumatoid arthritis (RA) is associated with fatigue. Additionally, 60% knew that it is characterized by stiffness in the morning for longer than thirty minutes and pain in the hand joints. Whereas a study conducted in Qassim had different findings, where only 5.7% were aware of that fact [18].

Although the typical feature of rheumatoid arthritis is a reduction in pain during movement, 57% of our population, when asked, mistakenly believed it to be characterized by an elevated pain with movement, emphasizing the importance of raising awareness about the nature of pain associated with rheumatoid arthritis. In Qassim, 41.3% held this misconception18.

It is crucial to recognize that rheumatoid arthritis can affect various organs throughout the body, beyond the joints. When asked if rheumatoid arthritis affects body organs such as the heart and lungs, 32.1% of our study population were aware of this fact. A study in Jazan had comparable findings: 37.7% of rheumatoid arthritis patients or those who have family or friends with rheumatoid arthritis knew this fact, and 30.6% of people who had no relation with rheumatoid arthritis knew this fact [23].

The objectives of treatment encompass reducing discomfort and swelling in the joints, preventing deformities like ulnar deviation and radiographic damage (such as erosions), preserving the patient's quality of life, and managing extra-articular symptoms [24].

Treatment options that are effective include oral conventional synthetic disease-modifying antirheumatic medications (DMARDs) like methotrexate, injectable biologic DMARDs, and oral targeted synthetic DMARDs. The main advice is to begin taking DMARDs as soon as possible to reduce impairment [26]. Tumor necrosis factor inhibitors are examples of biological drugs that are frequently used as second-line treatments or that can be added for dual therapy [24]. Early rheumatoid arthritis treatment improves the chance of establishing disease remission and lowers joint damage and disability; ideally, treatment should begin no later than three to six months after symptoms appear [27].

Research has demonstrated that patients treated by rheumatologists had better clinical and radiological outcomes, received DMARD medication more frequently, and had an earlier diagnosis23. Individuals with rheumatoid arthritis who see a rheumatologist later in the course of the illness are more likely to eventually need orthopedic surgery [25]. Within our surveyed population, 58.5% believe rheumatoid arthritis is diagnosed by an orthopedic, a study conducted in Jazan, Saudi Arabia revealed that 90% held this misconception23.

64.8% of participants in our study acknowledged rheumatoid arthritis causes deformities if not treated. In contrast, a study carried out in Qassem, Suadi Arabia showed that less people 38.7% were aware of this fact [18]. Furthermore, according to 28.9% of our survey participants, people with rheumatoid arthritis frequently end up in wheelchairs, conversely, a study in Qassim, Suadi Arabia where the corresponding percentage was indicated as 19.6% [18].

In the UK, two-thirds of people are interested in learning more about rheumatoid arthritis [20]. The people in the Netherlands were only moderately interested in learning more about rheumatoid arthritis21. These results suggest that people's knowledge about rheumatoid arthritis will increase as

they get more connected to information sources, and this, along with their desire to learn more, offers promise for the effectiveness of various educational treatments. Our research validates the need for several legislative and educational programs to improve the health of people with rheumatoid arthritis and increase public awareness.

It's important to address some of the research's limitations. First, there's a chance that some of the answers were invalid because we employed online, self-reported survey techniques. Due to the response-gathering mechanism previously mentioned, biases such as social likability and response are likely. Another problem with self-reported questionnaires is their unclear language, which makes it more likely that different people may interpret the same question differently.

4. Conclusion and future scope

Generally, our population has some knowledge about rheumatoid arthritis that is more than we expected, yet it needs to be improved. The two variables age and gender had a statistically significant relationship with knowledge and attitudes of rheumatoid arthritis, unlike educational level where there is no significant difference which raises the importance of education. Our research indicates that more information regarding the disease has to be provided to the general public. Consequently, in order to raise people's awareness, certain precautions should be taken by physicians and community education campaigns.

Ethical Approval

We are delighted to report that the College of Medicine's Committee of Scientific Research and Conferences at the University of Ha'il (H-2023-434) has thoroughly evaluated the research protocol and granted ethical approval for the study titled "Knowledge and Attitudes of General Population's Toward Rheumatoid Arthritis in Hail, Saudi Arabia ". The participants have been provided with a clear understanding of the research objectives and are voluntarily consenting to participate in the study.

Author Contribution

Conceptualization,K.A,. and M.Z.A.; methodology, K.A; software, B.J.A.; validation, M.Z.A.; formal analysis, A.T. A., and , S.A.A. ;investigation, H.A.Y., and , A. E.A.; resources, A.T. A.; data curation, , A. E.A., and Kh. H.A.; writing—original draft preparation, K.A.; writ-ing—review and editing, M.Z.A,.; visualization, B.J.A., and , S.A.A.; supervision, K.A. and M.Z.A.; project administration, H.A.Y, A. E.A., and Kh. H.A.; . All authors have read and agreed to the published version of the manuscript.

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Data Availability Statement

The data used to support the findings of this study are included in the article.

Conflicts of Interest

The authors declare no conflict of interest

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