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ASSESSMENT OF PUBLIC AWARENESS ON RHEUMATOID ARTHRITIS AND IT IS RISK FACTOR, RIYADH, SAUDI ARABIA 2022

Abdulelah Alansari1, Ahmed Alkhurayyif[1], Ahmed Alzahrani[1], Ali Marie1, Faisal Aljarboua[1], Faisal Alrashidi[1], Fares Alammari[1], Muhannad Alzahim[1], Sultan Alluhaibi[1], Ammar Fathi Mohammed Khalifa[2], Amin Bawazer[3], Turki Mahdi Hamad Alzamanan[4], SULTAN MOHAMMED ALI ALYAMI[4]

1. Medical student, Al-Maarefa Colleges, Riyadh, Saudi Arabia
2. Professor. College of Medicine. AlMaarefa University, Saudi Arabia
3. Epidemiology, AlMaarefa University, Saudi Arabia
4. Ministry of Health, Saudi Arabia

Introduction

Rheumatoid arthritis (RA) is a chronic inflammatory autoimmune disease that primarily affects the joints but can also have systemic manifestations involving various organs of the body. RA is recognized as one of the most debilitating disorders due to its progressive nature, which leads to joint destruction, deformities, and significant impairment in quality of life. The disease is characterized by the infiltration of leukocytes into synovial tissues, joints, and synovial fluid, resulting in persistent inflammation and the eventual breakdown of joint cartilage (Smolen et al., 2016). This progressive joint damage leads to pain, functional disability, and a reduced ability to perform daily activities. Since RA was first identified by Sir Alfred Baring Garrod in 1859, it has been recognized as a chronic disease with no definitive cure. Long-term remission or complete resolution of symptoms is rare, underscoring the importance of early diagnosis, effective management, and increased public awareness of the disease (Alamanos et al., 2006).

The prevalence of RA varies across populations, with an estimated lifetime prevalence of up to 1% globally (Silman & Hochberg, 2001). While this may seem relatively low, the disease has a profound impact on those it affects. RA is ranked as the 42nd highest contributor to global disability, as measured by Disability-Adjusted Life Years (DALYs) (Cross et al., 2014). The disease's burden is more closely associated with its impact on morbidity rather than mortality. Common symptoms such as chronic pain, fatigue, depression, and functional impairment contribute significantly to the reduction in quality of life for RA patients. The World Health Organization (WHO) and the World Bank estimate that RA accounts for approximately 0.8% of all global DALYs and 0.1% of all deaths in Europe. These statistics highlight the critical importance of managing RA to reduce its disabling effects (Cross et al., 2014).

RA predominantly affects women, with a female-to-male ratio of approximately 3:1. This gender disparity is believed to result from a combination of genetic factors, particularly X-linked traits, and hormonal influences (McInnes & Schett, 2011). The disease typically begins between the ages of 40 and 60, but it can also occur in younger and older individuals. Family history is another significant risk factor for RA, although it remains unclear whether this is due to genetic predisposition or shared environmental exposures within families (Padyukov et al., 2004). Environmental factors such as smoking, obesity, and certain infections have also been implicated in the development of RA (Scott et al., 2010). Identifying and understanding these risk factors is

crucial for implementing preventive strategies and targeting early interventions.

Despite advancements in medical research and treatment options, the prognosis of RA often depends on how early the disease is diagnosed and managed. Early intervention with disease-modifying antirheumatic drugs (DMARDs) and biologics can slow disease progression, reduce inflammation, and prevent joint damage (Smolen et al., 2016). However, delayed diagnosis remains a significant challenge, particularly in regions where awareness of RA is limited. Studies have shown that low awareness of RA among the general population is associated with delayed diagnosis, poor treatment outcomes, and increased disease severity (Aletaha et al., 2010). This underscores the need for public health initiatives to raise awareness about RA, its symptoms, and its risk factors.

The consequences of RA extend beyond physical health. Patients with RA often experience social and economic challenges due to their reduced ability to work and participate in social activities. The disease can lead to significant financial burdens for individuals and healthcare systems due to the high costs of treatment, frequent medical visits, and loss of productivity (Scott et al., 2010). Furthermore, the psychological effects of living with a chronic disease, such as anxiety and depression, are common among RA patients, further diminishing their quality of life (Matcham et al., 2014).

The importance of studying RA and its risk factors cannot be overstated. Understanding the disease's etiology, progression, and impact can help guide the development of effective prevention and management strategies. Increased public awareness campaigns can play a pivotal role in promoting early diagnosis and encouraging individuals to seek medical attention when experiencing symptoms such as joint pain, stiffness, and swelling. Public health efforts should also focus on educating the population about modifiable risk factors, such as smoking cessation and maintaining a healthy weight, to reduce the risk of developing RA (Scott et al., 2010).

In conclusion, rheumatoid arthritis is a complex and multifaceted disease that demands attention from both the medical community and public health sectors. Its significant impact on quality of life, combined with its economic and social implications, highlights the need for increased awareness, early diagnosis, and effective management. By addressing these challenges, we can improve outcomes for individuals living with RA and reduce the overall burden of the disease on society. This study aims to assess public awareness of rheumatoid arthritis and its risk factors among the population of Riyadh, Saudi Arabia, with the goal of identifying knowledge gaps and informing future educational and preventive initiatives.

Methodology

Research approach.

Study design: The study is a cross-sectional study.

Study area and population: The study take place in Riyadh. The target of the study is adult male and female residing in Riyadh excluded mental ill, medical stuff and student. Cluster stratification random sample used to enroll the participant from different public places. The Riyadh region will be cluster to 5 geographical areas (North, South, East, West and Center). We assume that the five areas in Riyadh have a similar distribution of population. Therefore, the sample size distributed proportionally for the five areas, where from each area a sample of 108 collected. Attendances or visitors to theses public gathering areas such as Malls, coffee shops, big supermarkets, and

mosques asked to participate voluntary in the survey. The first come the first enrolled according to the including criteria till the required sample achieved from each area.

Sample size and technique: Based on a previous study in Jazan36, Saudi Arabia, about Rheumatic arthritis knowledge among public. They reported the level of public knowledge on the disease was 38.5%. Therefore, we used this prevalence to calculate the sample size with 95% CI = 95%, and margin of error of 5%. The calculated sample size was 358. However, due to clustering method of this study additional calculation was done to add a design effect of 1.5. Thus, a total number of the sample size will be 537.

Data needs.

Instrument: The study collected by a questionnaire designed specifically for this study, used to collect data for the investigation. It divided into three sections: The first section discusses if the participant knows some information that related to Rheumatoid Arthritis has 14 questions in a yes/no/I do not know format. The second section there is some sign and symptoms the participant asked if it is related to Rheumatoid Arthritis or no. The final portion is about participant lifestyle this will be asked in 5-point Likers scale (1=never,2=rare,3=sometimes,4=mostly and 5=always). The participant finally divided to adequate and inadequate knowledge.

Definition and procedure: To describe adult understanding of Rheumatoid Arthritis

Data collection method: The study was paper based questionnaire in Arabic language.

Data analysis and presentation: All data cleared, coded and entered using SPSS. The research presented in tables and graphs as frequencies and percentages.

Ethical consideration: This study will be reviewed by Institutional Review Boards committee at Al-Mareefa University. All participants permissions will be collected when they open the questionnaire link and will be informed about relevant information that will be collected. The data and information will be solely used for research purposes only and will be kept confidential.Result

Description of the study sample the total number of the participants that were included in the study was 537 men and women. The response rate was 100%. The age of the study participants varied from 14 to 87. (Table 1) shows, 84.5% of the participants were below 40 years of age and the mean age was 30.24 ± 12.62 (SD) years (median: 26.00). The majority of the study participants (73%) were university or postgraduate degree holders or students. About (47.9%) of the participants were employed, (26.1%) were students. The majority were Saudis (88.3%), non-Saudis were approximately (12%). The body mass index approximately half of participant were in normal weight (49.3%), (32.2%) have an overweight, only (5%) were underweight and (13.4%) were obese.

Table 1. Demographic characteristics of the participants

Variable	Category	No.	Percentage
Gender	Male	342	63.7
	Female	195	36.3
Education	Secondary and below	195	27.0
	Postgraduate	392	73.0
Age	≤20 years	79	14.7
	21-30 years	287	53.4
	31-40 years	88	16.4

	≥41 years	83	15.5
Occupation	Employed	257	47.9
	Self-employed	59	11.0
	Un-employed	81	15.1
	Student	140	26.1
Nationality	Saudi	474	88.3
	Non-Saudi	63	11.7
BMI	Underweight	27	5.0
	Normal weigh	265	49.3
	Overweigh	173	32.2
	Obese	72	13.4

Table 2- shows among all participant only (3.7%) diagnosed with Rheumatoid Arthritis, (11%) of participant have other joint problem and (36.9%) have a close family patient diagnosed with Rheumatoid Arthritis.

Table 2. Source of knowledge of RA among the study participants.

Source of Knowledge	Categories	No.	%
Diagnosed with RA	Yes	20	3.7
	No	517	96.3
Diagnosed with any other joint problem	Yes	59	11
	No	478	89
Close family anyone diagnosed RA	Yes	198	36.9
	No	339	63.1

Table 3A- Shows general knowledge of RA among the study participants is formed in several questions related to RA and their answers to measure their knowledge such as if they think it is a serious condition answer was yes and almost half of them got the correct answer (46.7%). Be able to control RA by yourself, most of them got the correct answer and answered with no (52.1%). Treatable and available medicine, the majority got the correct answer and answered with yes (58.5). Patient need routinely visit psychiatric sections (42.3%) of the participants got the correct answer and answered with no. Is easily diagnosed the answer was no and nearly third of them got the right answer (30.7%). Can be treated by surgery (32.4%) of the participants got the correct answer and answered with no. Can negatively affect, the majority got it correctly and answered with yes (60.9%). Just need pain killer, the answer was no and (38%) of them got it correct. Usually, early signs, answers of no were (27.2%) and it was the correct answer. An autoimmune disease who answered it correctly with yes was about (32%). Exercise has a good effect, no was the correct answer (17.7%). Gender has the rule, answers formed in yes (32.4%) and it is the correct answer. Patients have the ability to walk long distance, the majority got the right answer and answered with no (60.7%).

Table 3A. Correct answers on general knowledge regarding Rheumatoid arthritis.

Variables	No.	%
A serious condition	251	46.7
Be able to control RA yourself	280	52.1
Patients need routinely visit psychiatric sections	227	42.3
Is easily diagnosed	165	30.7
Can be treated by surgery	174	32.4
Just need pain killer	204	38.0
Usually, early signs	146	27.2
Exercise has a good effect	95	17.7
Patients have the ability to	326	60.7
Treatable and available medication	314	58.5
Can negatively affect	327	60.9
An autoimmune disease	172	32.0
Gender has the rule	174	32.4

Table 3B- Shows General knowledge of RA among the study participants (67.6%) have inadequate knowledge, while (32.4%) have adequate knowledge from total of 537 participants.

Table 3B. Correct answers on general knowledge regarding Rheumatoid arthritis

		Frequency	%	Cumulative Percent
Valid	Inadequate knowledge	363	67.6	67.6
	Adequate knowledge	174	32.4	100.0

Table 4A- Shows knowledge of sign and symptoms of RA among the study participants. Nearly 2/3 of the participants (67.6%) got the correct answer, pain in more than one joint is one of the symptoms of RA. Many of the participants (68.9%) have got the correct answer that Aching is one of the symptoms of RA. Almost half of the participants (47.1%) agreed that morning stiffness is one of the symptoms. 2/3 of the participants (60.1%) also agreed that fatigue is one of the symptoms. Most of the participants (65.4%) agreed for weakness as one of the symptoms. More than half of the participants (54.9%) agreed that numbness is one of the symptoms. Tenderness is one of the symptoms of RA and half of the participants (50.1%) said yes. (42.4%) of the participant got the correct answer that swelling is symptom for RA. Nearly 1/3 of the participants (23.8%) got the correct answer for fever as symptom of RA. (25.7%) of the participants thought headache is symptom of RA. Almost half of the participants (48%) agreed that warn joint is one of the symptoms of RA. Sweating is symptom for RA, (28.3%) said it is. (27.7%) of the participants thought weight loss is a symptom for RA. Insomnia is one of the symptoms of RA, (41%) of the participants agreed.

Table 4A. Correct answer on knowledge of sign and symptoms of RA among the study participants.

Variables	No.	%
Pain in more than one joint	363	67.6
Aching	370	68.9
Morning	253	47.1
Fatigue	323	60.1
Weakness	351	65.4
Numbness	295	54.9
Tenderness	269	50.1
Swelling	228	42.4
Fever	128	23.8
Headache	138	25.7
Warn	258	48.0
Sweating	152	28.3
Weight loss	149	27.7
Insomnia	220	41.0

Table 4B- Shows that Knowledge of sign and symptom of RA among the study participants, (58.8%) have inadequate knowledge. While (41.2%) have adequate knowledge of sign and symptoms of RA

Table 4B. Knowledge of sign and symptoms of RA among the study participants

		Frequency	%	Cumulative Percent
Valid	Inadequate knowledge	316	58.8	58.8
	Adequate knowledge	221	41.2	100.0
	Total	537	100.0	

Table 5- shows among all participant only (4.3%) diagnosed with heart disease, (7.6%) of participant have Diabetes mellitus, (1.7%) have a renal problem, (2%) was diagnosed with liver disease and (6.3%) of participant have osteoporosis.

Table 5. Co-existing diseases

Diagnosed with	Categories	No.	%
Heart disease	No	514	95.7
	Yes	23	4.3
DM	No	496	92.4
	Yes	41	7.6
Renal	No	528	98.3

	Yes	9	1.7
Liver	No	525	97.8
	Yes	11	2.0
Osteoporosis	No	503	93.7

Table 6A- There is insignificant statistical relation between age and general knowledge (p Value = 0.092). Participant under 20 years which are (14.7% of all participants) (16.0%) of the participants who have inadequate knowledge of general knowledge represented by them and (12.1%) of the participants who have adequate knowledge of general knowledge represented by them. Participant between 21 and 30 years which are (53.4% of all participants) (53.7%) of the participants who have inadequate knowledge of general knowledge represented by them and (52.9%) of the participants who have adequate knowledge of general knowledge represented by them. Participant between 31 and 40 years which are (16.4% of all participants) (17.4%) of the participants who have inadequate knowledge of general knowledge represented by them and (14.4%) of the participants who have adequate knowledge of general knowledge represented by them. Participant above 40 years which are (15.5% of all participants) (12.9%) of the participants who have inadequate knowledge of general knowledge represented by them and (20.7%) of the participants who have adequate knowledge of general knowledge represented by them.

Table 6B- There is insignificant statistical relation between gender and knowledge of general knowledge (p Value = 0.134). According to the gender, participants who has inadequate knowledge of general knowledge (65.8%) of them were male and (34.2%) were female. On the other hand, participants with adequate knowledge of general knowledge of (59.2%) of them were male and (40.8%) were female.

Table 6C- There is insignificant statistical relation between education and knowledge of general knowledge (p Value = 0.833). According to the education, participants who has inadequate knowledge of general knowledge (26.7%) of them were secondary and below and (73.3%) were postgraduate. On the other hand, participant who has adequate knowledge of general knowledge of (27.6%) of them were secondary and below and (72.4%) of them were postgraduate.

Table 6. Association of adequate general knowledge with demographic characteristics

Variables	Categories	inadequate knowledge		adequate knowledge		
		No.	%	No.	%	P value
Age	≤20 Years	58	16.0	21	12.1	0.092
	21-30 Years	195	53.7	92	52.9	
	31-40 Years	63	17.4	25	14.4	
	≥41 Years	47	12.9	36	20.7	
Gender	Male	239	65.8	103	59.2	0.134
	Female	124	34.2	71	40.8	

Education	secondary and below	97	26.7	48	27.6	0.833
	Postgraduate	266	73.3	126	72.4	
Occupation	Employed	169	46.6	88	50.6	0.494
	Self-employed	39	10.7	20	11.5	
	Un-employed	53	14.6	28	16.1	
	Student	102	28.1	38	21.8	
Nationality	Saudi	322	88.7	152	87.4	0.649
	Non-Saudi	41	11.3	22	12.6	
BMI	Underweight	19	5.2	8	4.6	0.624
	normal weight	172	47.4	93	53.4	
	Overweight	122	33.6	51	29.3	
	Obese	50	13.8	22	12.6	

Table 7A- There is significant statistical relation between age and knowledge of sign and symptoms (p Value = 0.025). Participant under 20 years which are (14.7% of all participants) (16.5%) of the participants who have inadequate knowledge of sign and symptoms represented by them and (12.2%) of the participants who have adequate knowledge of sign and symptoms represented by them. Participant between 21 and 30 years which are (53.4% of all participants) (55.7%) of the participants who have inadequate knowledge of sign and symptoms represented by them and (50.2%) of the participants who have adequate knowledge of sign and symptoms represented by them. Participant between 31 and 40 years which are (16.4% of all participants) (16.1%) of the participants who have inadequate knowledge of sign and symptoms represented by them and (16.7%) of the participants who have adequate knowledge of sign and symptoms represented by them. Participant above 40 years which are (15.5% of all participants) (11.7%) of the participants who have inadequate knowledge of sign and symptoms represented by them and (20.8%) of the participants who have adequate knowledge of sign and symptoms represented by them.

Table 7B- There is insignificant statistical relation between gender and knowledge of sign and symptoms (p Value = 0.158). According to the gender, participants who has inadequate knowledge of sign and symptoms (66.1%) of them were male and (33.9%) were female. On the other hand, participant who has adequate knowledge of sign and symptoms of (60.2%) of them were male and (39.8) of them were female.

Table 7C- There is insignificant statistical relation between education and knowledge of sign and symptoms (p Value = 0.212). According to the education, participants who has inadequate knowledge of sign and symptoms (25%) of them were secondary and below and (75%) were postgraduate. On the other hand, participant who has adequate knowledge of sign and symptoms of (29.9%) of them were secondary and below and (70.1%) of them were postgraduate.

Table 7. Association of adequate knowledge of signs and symptoms with some demographic characteristics

Variables	Categories	inadequate knowledge		adequate knowledge		
		No.	%	No.	%	P value
Age	≤20 Years	52	16.5	27	12.2	0.025
	21-30 Years	176	55.7	111	50.2	
	31-40 Years	51	16.1	37	16.7	
	≥41 Years	37	11.7	46	20.8	
Gender	Male	209	66.1	133	60.2	0.158
	Female	107	33.9	88	39.8	
Education	secondary and below	79	25.0	66	29.9	0.212
	Postgraduate	237	75.0	155	70.1	
Occupation	Employed	156	49.4	101	45.7	0.132
	Self-employed	31	9.8	28	12.7	
	Un-employed	40	12.7	41	18.6	
	Student	89	28.2	51	23.1	
Nationality	Saudi	278	88.0	196	88.7	0.800
	Non-Saudi	38	12.0	25	11.3	
BMI	Underweight	15	4.7	12	5.4	0.546
	normal weight	164	51.9	101	45.7	
	Overweight	98	31.0	75	33.9	
	Obese	39	12.3	33	14.9	

The general practices implemented by the participants were found highly inadequate (436/81.2%) versus (101/18.8%) of adequate physical exercise practice. This calculation was made by using a cut-off of 60% to show adequate and inadequate practice.

Variables	Categories	inadequate practice		adequate practice		
		No.	%	No.	%	P value

Age	≤20 Years	64	14.7	15	14.9	0.024
	21-30 Years	221	50.7	66	65.3	
	31-40 Years	76	17.4	12	11.9	
	≥41 Years	75	17.2	8	7.9	
Gender	Male	263	60.3	79	78.2	0.001
	Female	173	39.7	22	21.8	
Education	secondary and below	116	26.6	29	28.7	0.667
	Postgraduate	320	73.4	72	71.3	
Occupation	Employed	202	46.3	55	54.5	0.362
	Self-employed	52	11.9	7	6.9	
	Un-employed	67	15.4	14	13.9	
	Student	115	26.4	25	24.8	
Nationality	Saudi	387	88.8	87	86.1	0.460
	Non-Saudi	49	11.2	14	13.9	
BMI	Underweight	20	4.6	7	6.9	0.088
	normal weight	212	48.6	53	52.5	
	Overweight	138	31.7	35	34.7	
	Obese	66	15.1	6	5.9	

Discussion

The results of our research revealed that most participants had inadequate general knowledge and less than half of them had adequate general knowledge. This goes in line with a study conducted by Hazzazi in 2020, Saudi Arabia[36]. We recommend ministry of health develop more programs to expand the general knowledge of the public awareness about RA.

The outcome of our research showed that the majority of participants had inadequate knowledge of signs and symptoms and the minority had adequate knowledge of signs and symptoms. This goes in line with a study done by Naima Assaad in 2022, in Syria[37]. On this basis, ministry of health should develop more programs to expand the knowledge of the public about RA sign and symptoms.

There is insignificant relation between age and general knowledge, where the majority with adequate general knowledge are between the age of 21 to 30 years. Meanwhile, the minority are 20 years old or less. However, the majority with inadequate general knowledge are between the age 21 to 30. Whereas the minority were between 41 years or above. Our study revealed that most participants have inadequate general knowledge toward awareness to rheumatoid arthritis, this parallel a study was conducted by Hazzazi in 2020 in Saudi Arabia[36]. In addition, we recommend

other researchers to establish their research to a larger study population according to the demographic characteristics between age and general knowledge.

There is insignificant relation between gender and general knowledge, where the majority with adequate general knowledge are male, Meanwhile, the minority are females. However, the majority with inadequate general knowledge are male. Whereas the minority are females. Our study revealed that most participants have adequate general knowledge toward awareness to rheumatoid arthritis, which in contrary to a study done by Hazzazi in 2020 in Saudi Arabia[36]. However, this might be influenced by different study population. Therefore, we encourage other researchers to put their effort in equalizing gender participants.

There is insignificant relation between education and general knowledge, where the participant who had adequate knowledge 2/3 of them were postgraduate and 3/4 of participant who had inadequate knowledge were the same. This goes in line with a study done by Naima Assaad in 2022, in Syria[37]. We recommend the ministry of health for further improvements in the education of general knowledge of RA in society and schools.

There is insignificant relation between occupation and general knowledge. Most participants who have adequate knowledge were employed then followed by students. Meanwhile, participants who have inadequate knowledge were also employed then followed by student. This goes in contrary with a study by Hazzazi in 2020, Saudi Arabia[36], because the majority of their participant were un-employed. We recommend that other researcher to do more research with more participants.

There is insignificant relation between nationality and general knowledge. Saudi participants represent the majority of participant who have inadequate and adequate knowledge. While Non-Saudi participants represent the minority of participants who have adequate and inadequate knowledge. This goes in line with a study done by Elhussein in 2018 Saudi Arabia[38]. We recommend ministry of health to do more events about rheumatoid arthritis.

There is significant relation between age and knowledge of sign and symptoms, where the majority with adequate knowledge of sign and symptoms were between 21 years old and 30 years old. Moreover, the minority with adequate knowledge were 20 years old or less. However, the majority with inadequate knowledge of sing and symptoms were between the age of 21 and 30, also the minority with inadequate knowledge were 41 years old and above. There is unsignificant relation between gender and knowledge of sign and symptoms, where the majority with adequate knowledge of sing and symptoms were male, also the minority were females. However, the majority with inadequate knowledge of sign and symptoms were male and the minority were female. Our study revealed that most participants have in adequate knowledge about sign and symptoms of Rheumatoid arthritis, this parallel a study was conducted by Hazzai 2020 in Saudi Arabia[36]. Meanwhile, we recommend other researchers establish their research to a larger study population according to the association of adequate knowledge of signs and symptoms with demographics characteristics.

There is insignificant relation between education and knowledge of sign and symptoms. Where the majority with adequate knowledge were postgraduate. Meanwhile, the minority were secondary and below. Also, it was the same for participant with inadequate knowledge. Our study shows that most participants had inadequate knowledge of sign and symptoms, this goes in contrary to a study done by Elhussein in 2018 Saudi Arabia[38]. We encourage ministry of health to intensify public education to increase their awareness.

There is insignificant relation between occupation and knowledge of signs and symptoms, the majority of adequate knowledge were employed participants. Meanwhile most of the participant with inadequate knowledge were employed. This goes in contrary with a study by Hazzazi in 2020,

Saudi Arabia[36], because the majority of their participant were un-employed. We recommend that other researcher to explore attitude and lifestyle.

Conclusion: In our study, the level of awareness was inadequate in general knowledge as well as clinical manifestation of Rheumatoid Arthritis. Especially in participant who are more than 40 years which have the risk of getting the disease. Awareness about RA must be increased via dissemination of information, organize educational events or share the effect of RA in quality of life of patient.

Recommendation:

1- Ministry of health develop more programs to expand the general knowledge of the public awareness about RA.
2- Ministry of health should develop more programs to expand the knowledge of the public about RA sign and symptoms.
3- Researchers must establish their research to a larger study population according to the demographic characteristics between age and general knowledge.
4- Researchers should put their effort in equalizing gender participants.
5- Ministry of health for further improvements in the education of general knowledge of RA in society and schools.
6- Other researchers to explore attitude and lifestyle.
7- Ministry of health should do more events about rheumatoid arthritis.
8- Iintensify public education to increase their awareness.

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