# Knowledge and Awareness of Ankylosing Spondylitis among Saudi General Population in KSA

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## ABSTRACT

**Objective:** The aim of the research is to determine the general population's knowledge and awareness of ankylosing spondylitis in Saudi Arabia and to determine the sociodemographic characteristics linked to higher or lower awareness levels. The study will also investigate common misunderstandings or knowledge gaps about the symptoms, causes, and therapies of AS.

**Methods:** Ankylosing Spondylitis (AS) knowledge and awareness among Saudi Arabia's general public will be evaluated through the use of a cross-sectional descriptive research design. Cost-effective and useful for large population-based surveys, this design is appropriate for capturing a moment in time of popular knowledge.

**Results:** The study included 350 participants. The most frequent age among them was 30-39 years old (n=106, 30.3%), followed by 18-29 years old (n=98, 28%), then 40-49 years old (n=74, 21.1%), and 50-59 years old (n=53, 15.1%). The most frequent gender among study participants was male (n=189, 54%) and female (n=161, 46%). The most frequent nationality among study participants was Saudi (n= 325, 92.9%), followed by non-Saudi (n= 25, 7.1%). Educational Qualification among study participants, with most of them were Bachelors (n=242, 69.1%), followed by High School (n=76, 21.7%), then Master's (n=32, 9.1%). Occupation among study participants, with most were employed (non-healthcare) (n=173, 49.4%), followed by Unemployed (n=56, 16%), then Employed (Healthcare) (n=49, 14%), and Student (n=40, 11.4%). Participants were asked Do you suffer from any chronic back or joint pain? Most of them answered No (n=223, 63.7%) and Yes (n=127, 36.3%). The participants were asked heard of Ankylosing Spondylitis; most of them answered No (n=291, 83.1%), and Yes (n=59, 16.9%). The diagnosis of cancer is presented in Figure 4. Participants were asked where Ankylosing Spondylitis was more common. Most of them answered I don't know (n=187, 53.4%), followed by Women (n=71, 20.3%), then equally common (n=58, 16.6%), at least Men (n=34, 9.7%). Participants were asked Do you personally know anyone diagnosed with AS The most frequent answer No (n=315, 90%), followed by Yes - relative or colleague (n=22, 6.3%), then Me (n=13, 3.7%). Participants were asked in their opinion, how serious Ankylosing Spondylitis is as a health condition; Most of them were I don't know (n=185, 52.9%), followed by Somewhat Serious (n=102, 29.1%), then Very Serious (n=49, 14%), and at least Not Serious (n=14, 4%).

**Conclusion:** The results showed statistically significant associations between knowledge about Ankylosing Spondylitis and each of age, nationality, educational qualification, occupation, and prior awareness of the disease, while no significant association was found with gender.

## INTRODUCTION

The axial skeleton, especially the spine and sacroiliac joints, is the primary site of ankylosing spondylitis (AS), a chronic, progressive, inflammatory rheumatic illness. If left untreated, it usually starts in young adulthood and can result in spinal fusion and severe disability. The estimated prevalence of AS varies greatly by geography and ethnicity, ranging from 0.1% to 1.4% worldwide. Due to a lack of public awareness, poor access to rheumatological treatments, and the overlap of early symptoms with more prevalent causes of back pain, AS is thought to be underdiagnosed and underreported in Arab nations, especially in the Middle East. Due to a dearth of extensive epidemiological investigations, the precise frequency of AS in Saudi Arabia is still mostly unknown. [1], [2]

Nonetheless, regional reports and certain hospital-based data indicate that AS might be more common than thought, particularly among young Saudi men. The frequency of HLA-B27, one of the main genetic markers linked to AS, differs among ethnic groups. [3] Although HLA-B27 is less prevalent in Saudi Arabians than in Caucasian groups, AS cases with notable clinical implications are still observed. This emphasizes how crucial clinical suspicion is in addition to genetic susceptibility. [4]

Early AS symptoms are frequently mild and can be mistaken for musculoskeletal strains or mechanical back pain, which delays diagnosis. Chronic lower back discomfort that gets better with movement, morning stiffness, exhaustion, and occasionally peripheral joint involvement and uveitis are among the symptoms. [5] Between five and ten years may pass between diagnosis and irreparable spinal injury. Therefore, public awareness is essential for early detection and intervention, particularly among those between the ages of 18 and 40. [6] Individuals with ankylosing spondylitis experience decreased mobility, discomfort, exhaustion, and related comorbidities like depression and cardiovascular risks, which negatively impact their quality of life in addition to their physical health. When the illness is detected early and treated with pharmacologic medications (NSAIDs, biologics) and lifestyle changes (exercise, physical therapy), these effects can be greatly minimized. [7], [8]

Even with its severe long-term effects, AS is still one of the least well-known autoimmune diseases in the general public, particularly in non-specialist and community contexts. Public awareness of autoimmune illnesses, particularly AS, is low in Saudi Arabia. [9] Current awareness initiatives tend to overlook rheumatologic disorders in favor of more well-known conditions like diabetes and hypertension. [10]

Proactive measures are needed to increase awareness, enhance health-seeking behavior, and shorten diagnostic delays since noncommunicable and chronic diseases are placing a growing load on Saudi healthcare systems. Increasing people's knowledge of AS, including its warning signals, risk factors, and available treatments, can motivate them to consult a doctor sooner. Additionally, it might enhance patient outcomes and lower medical expenses related to problems and late-stage management. [11], [12]

Furthermore, if the baseline level of knowledge is established, it is possible to educate the public as digital media and public health campaigns have grown in Saudi Arabia through platforms including social media and the Ministry of Health's mobile applications. There is a dearth of baseline information, though, regarding the general public's awareness of AS and their opinions regarding its severity and management. [14], [15]

As a result, the purpose of this study is to evaluate the general Saudi population's knowledge and awareness of ankylosing spondylitis while investigating the ways in which demographic factors like age, gender, education, and occupation affect perceptions and thoughts about the condition. [13] Policymakers and health educators can use the research's findings to create culturally appropriate educational materials and focused awareness campaigns that support early diagnosis and improved illness outcomes.

## METHODS

**Study design**

Ankylosing Spondylitis (AS) knowledge and awareness among Saudi Arabia's general public will be evaluated through the use of a cross-sectional descriptive research design. Cost-effective and useful for large population-based surveys, this design is appropriate for capturing a moment in time of popular knowledge.

**Study approach**

The study will be carried out in a number of locations throughout the Kingdom of Saudi Arabia, including both urban and rural areas from important provinces like Riyadh, Jeddah, Dammam, Abha, and Al-Madinah.

Saudi nationals and residents who are at least eighteen years old and come from a variety of educational and professional backgrounds make up the target population.

**Study population**

The study will be carried out in a number of locations throughout the Kingdom of Saudi Arabia, including both urban and rural areas from important provinces like Riyadh, Jeddah, Dammam, Abha, and Al-Madinah.

Saudi nationals and residents who are at least eighteen years old and come from a variety of educational and professional backgrounds make up the target population.

**Study sample**

In order to include all the above said types of respondents the researcher has chosen stratified random sampling procedure based on the age, location, medical history and other related components. Based on patient volume and accessibility, location will be selected for right kind of respondents.

**Study tool**

For the current study, a questionnaire was used for data collection and was also considered a study tool.

**Data collection**

The main instrument for gathering data will be a standardized and tested questionnaire.
Among them will be—
- Information about demographics (e.g., age, gender, location, occupation, education, etc.)
- Knowledge items (definition, causes, symptoms, diagnosis, and therapy)
- Things that raise awareness (media coverage, health initiatives, sense of gravity, etc.)

In order to ensure validity, reliability, and clarity, the questionnaire will be pretested on thirty volunteers in both Arabic and English.

**Data analysis**

- Using SPSS software version 26, data will be entered and examined.
- Frequency, percentage, mean, and standard deviation are descriptive statistics that will be used to describe answers and demographic data.
- ANOVA, t-tests, or chi-square tests will be performed to investigate correlations between awareness levels and demographic factors.
- The aggregate of the right answers will determine the participants' knowledge score, which will then be used to classify them as low, moderate, or high awareness.

### Ethical considerations

It will be carried out on 10% of the total respondents (may be 30-40), and the results will be checked thereof. Further, any type of discrepancy will be removed, and the questionnaire or data sheet will be revised. A pilot study may also be conducted to state the precision level of the statistical tools and even the selection criteria of the respondents. The above-stated process will be followed throughout the pilot study, and the outcomes will be analyzed. The duration, manner, and viability will also be evaluated.

## RESULTS

The study included 350 participants. The most frequent age among them was 30-39 years old (n=106, 30.3%), followed by 18-29 years old (n=98, 28%), then 40-49 years old (n=74, 21.1%), and 50-59 years old (n=53, 15.1%). Figure 1 shows the age distribution among study participants. The most frequent gender among study participants was male (n=189, 54%) and female (n=161, 46%). Figure 2 shows the gender distribution among study participants. The most frequent nationality among study participants was Saudi (n= 325, 92.9%), followed by non-Saudi (n= 25, 7.1%). Figure 3 shows the distribution of Gender among study participants.

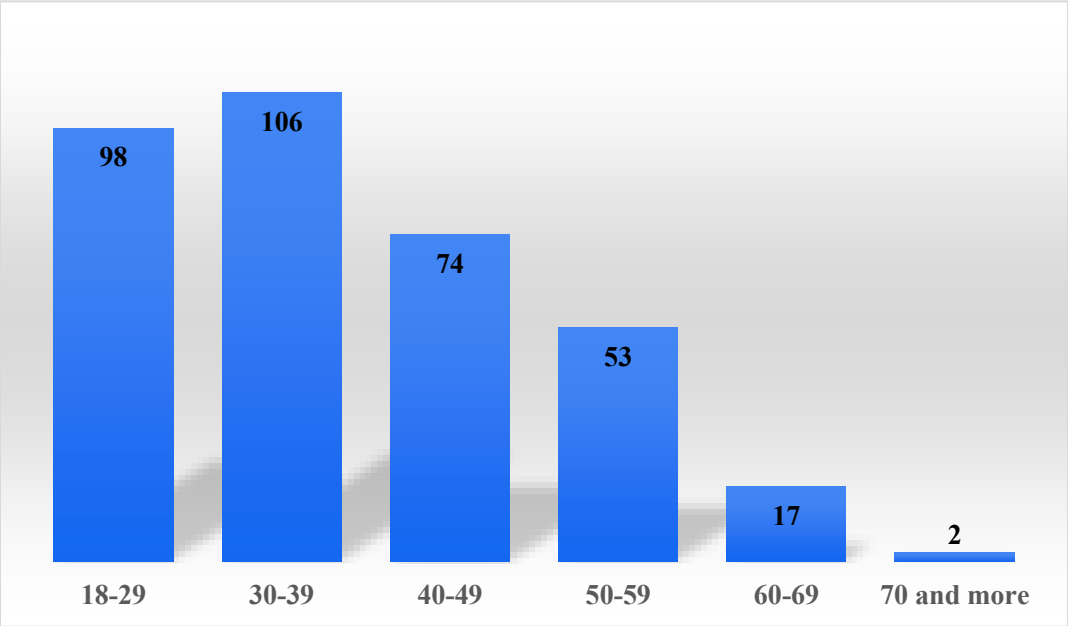


**Figure 1: Age distribution among study participants**

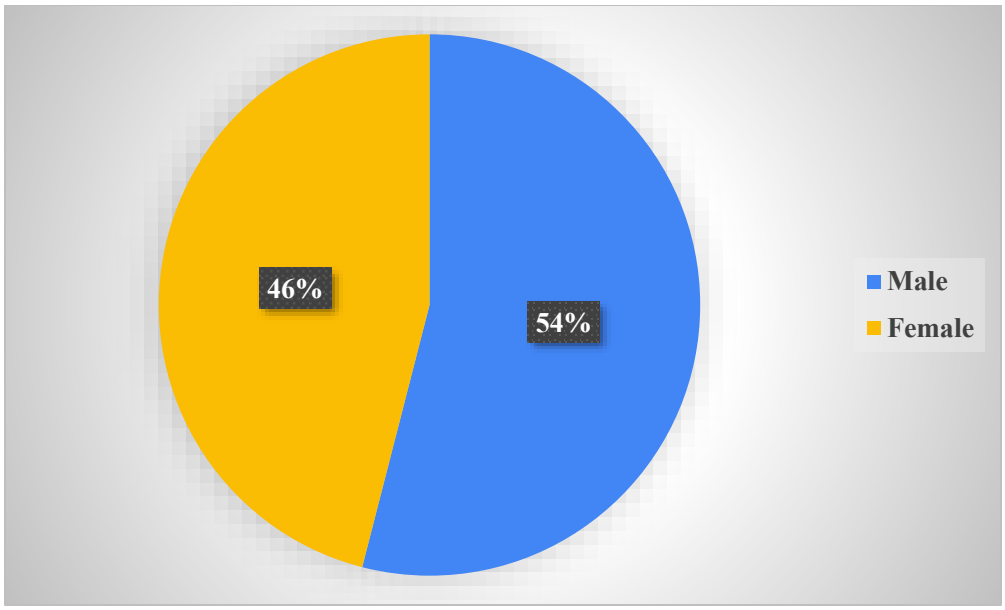


**Figure 2: Gender distribution among study participants**

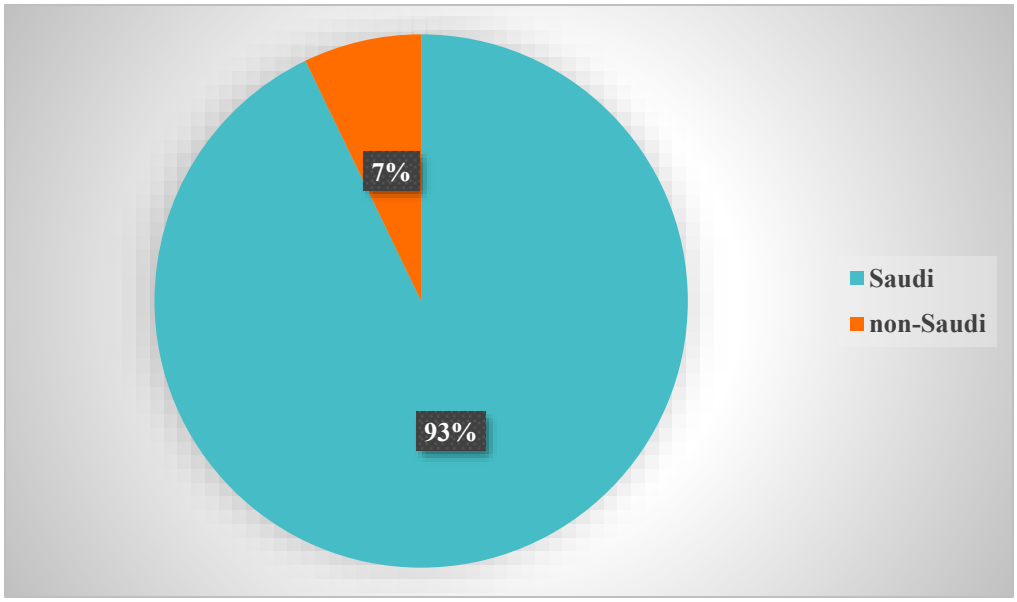


**Figure 3: Nationality distribution among study participants**

Educational Qualification among study participants, with most of them were Bachelors (n=242, 69.1%), followed by High School (n=76, 21.7%), then Master's (n=32, 9.1%). Occupation among study participants, with most were employed (non-healthcare) (n=173, 49.4%), followed by Unemployed (n=56, 16%), then Employed (Healthcare) (n=49, 14%), and Student (n=40, 11.4%).

Participants were asked Do you suffer from any chronic back or joint pain? Most of them answered No (n=223, 63.7%) and Yes (n=127, 36.3%).

The participants were asked heard of Ankylosing Spondylitis; most of them answered No (n=291, 83.1%), and Yes (n=59, 16.9%). The diagnosis of cancer is presented in Figure 4.

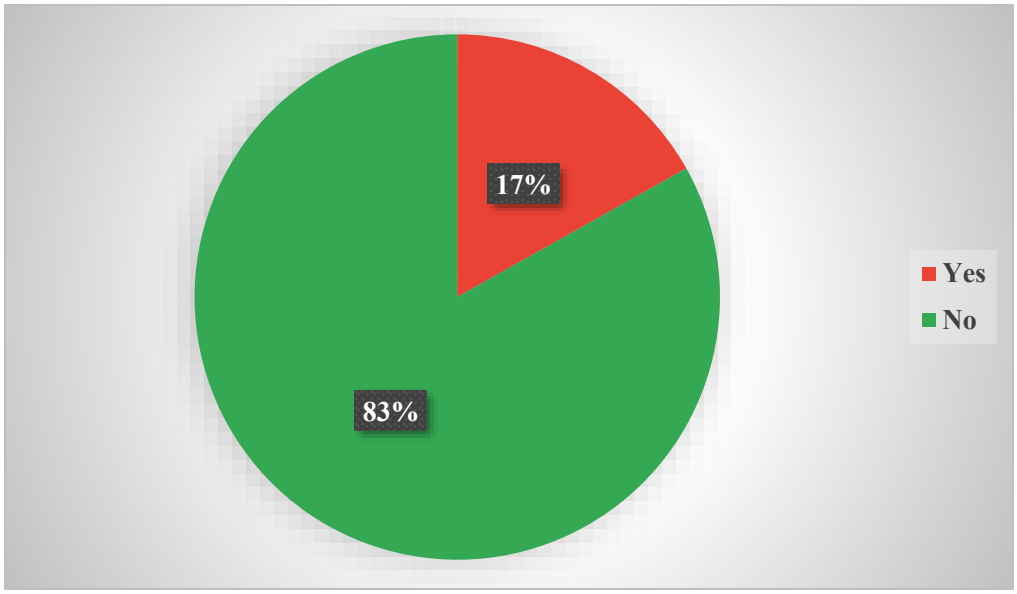


**Figure 4: Hears of AS distribution among study participants**

Participants were asked where Ankylosing Spondylitis was more common. Most of them answered I don't know (n=187, 53.4%), followed by women (n=71, 20.3%), then equally common (n=58, 16.6%), and at least Men (n=34, 9.7%). Figure 5 shows the distribution of the Most Common AS among study participants.

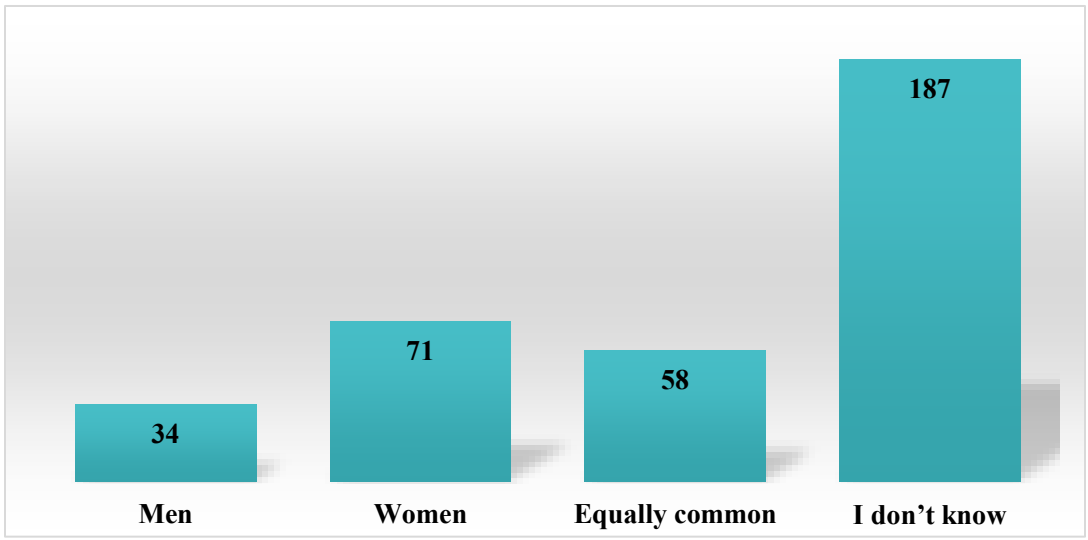


**Figure 5: Most Common of AS distribution among study participants**

Participants were asked about the Knowledge Assessment for Ankylosing Spondylitis. Their responses and results are presented in Table 1.

**Table 1: Knowledge Assessment for Ankylosing Spondylitis (AS)**

| Statement | Yes | No | Not Sure |
|---|---|---|---|
| AS is caused by bacterial or viral infection | 21 (6%) | 55 (15.7%) | 274 (88.3%) |
| Is there a genetic component linked to AS (e.g., HLA-B27 gene) | 54 (15.4%) | 28 (8%) | 268 (76.6%) |
| Do you think AS can be diagnosed using imaging tests like X-ray or MRI | 155 (44.3%) | 12 (3.4%) | 183 (52.3%) |

Participants were asked Do you personally know anyone diagnosed with AS The most frequent answer No (n=315, 90%), followed by Yes - relative or colleague (n=22, 6.3%), then Me (n=13, 3.7%).

Participants were asked in their opinion, how serious Ankylosing Spondylitis is as a health condition; Most of them were I don't know (n=185, 52.9%), followed by Somewhat Serious (n=102, 29.1%), then Very Serious (n=49, 14%), and at least Not Serious (n=14, 4%). Figure 6 shows participants' Perceived Seriousness of AS.

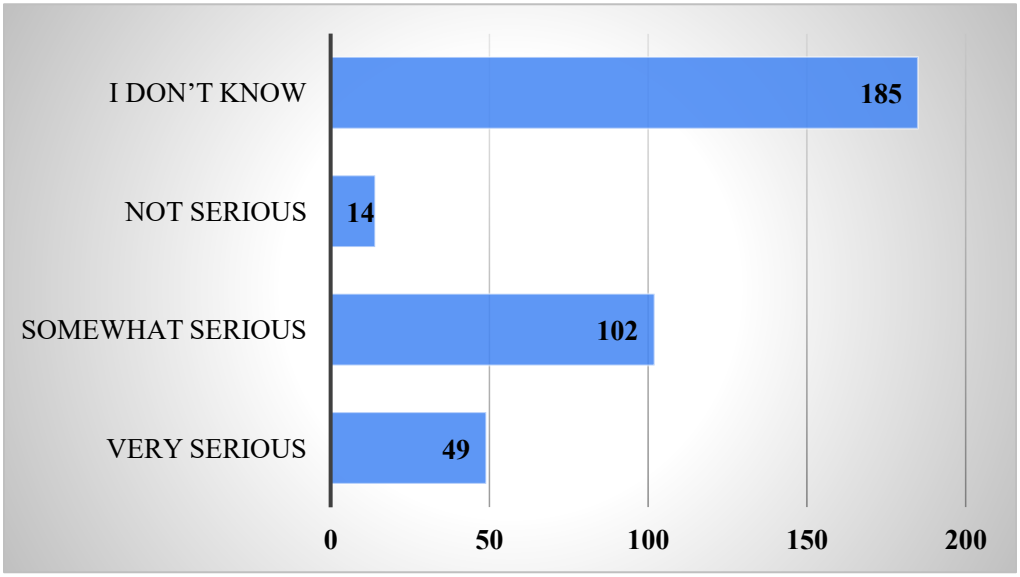


**Figure 6: Perceived Seriousness of AS Distribution Among Study Participants**

## DISCUSSION

## CONCLUSION

The results showed statistically significant associations between knowledge about Ankylosing Spondylitis and each of age, nationality, educational qualification, occupation, and prior awareness of the disease, while no significant association was found with gender.

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**ANNEX 1: DATA COLLECTION TOOL**.

**1. Age:**
a. 18–29 b. 30-39 c. 40-49 d. 50-59 e. 60-69 f. 70 and more
**2. Gender:**
a. Male b. Female
**3. Nationality:**
a. Saudi b. non-Saudi (Resident)
**4. Educational Qualification:**
a. High School
b. Bachelor's
c. Master's
**5. Occupation:**
a. Student
b. Employed (Non-Healthcare)
c. Employed (Healthcare)
d. Unemployed
e. Retired
**6. Do you suffer from any chronic back or joint pain?**
a. Yes b. No
**7. Have you ever heard of Ankylosing Spondylitis (AS)?**
a. Yes b. No
**8. Ankylosing Spondylitis is a type of:**
a. Bone infection
b. Autoimmune inflammatory disease
c. Digestive disorder
d. Heart disease
e. I don't know
**9. What part of the body does AS primarily affect?**
a. Spine and lower back
b. Lungs
c. Knees and elbows
d. Liver
e. I don't know
**10. AS is more common in:**
a. Men
b. Women
c. Equally common
d. I don't know
**11. AS typically begins at what age group?**
a. Childhood
b. Teenage to early adulthood (15–30)
c After 50
d. I don't know

**12. What are the common symptoms of AS? (Select all that apply)**
a. Persistent lower back pain
b. Morning stiffness
c. Pain improves with exercise
d. Fatigue
e. Swelling in the feet
f. I don't know
**13. Can Ankylosing Spondylitis lead to permanent spine deformity if left untreated?**
a. Yes b. No Not sure
**14. AS is caused by bacterial or viral infection.**
a. True b. False c. Not sure
**15. Is there a genetic component linked to AS (e.g., HLA-B27 gene)?**
a. Yes b. No c. Not sure
**16. Do you think AS can be diagnosed using imaging tests like X-ray or MRI?**
a. Yes b. No c. Not sure
**17. Which specialists typically treat AS?**
a. Orthopedic Surgeon
b. Neurologist
c. Rheumatologist
d. Cardiologist
e. I don't know
**18. I believe AS is a common condition in Saudi Arabia.**
a. Strongly Agree b. Agree c. Neutral d. Disagree e. Strongly Disagree
**19. More awareness campaigns should be conducted on AS.**
a. Strongly Agree b. Agree c. Neutral d. Disagree e. Strongly Disagree
**20. Do you personally know anyone diagnosed with AS?**
a. Me b. Yes - relative or colleague c. No
**21. In your opinion, how serious is Ankylosing Spondylitis as a health condition?**
a. Very Serious b. Somewhat Serious c. Not Serious d. I don't know

**APPENDIX 2: Participants' responses to scale items**

| **Age** | Frequency | Percent |
|---|---|---|
| 18-29 | 98 | 28.0 |
| 30-39 | 106 | 30.3 |
| 40-49 | 74 | 21.1 |
| 50-59 | 53 | 15.1 |
| 60-69 | 17 | 4.9 |
| 70 and more | 2 | 0.6 |

| | | |
|---|---|---|
| Total | 350 | 100.0 |

| **Gender** | Frequency | Percent |
|---|---|---|
| Male | 189 | 54.0 |
| Female | 161 | 46.0 |
| Total | 350 | 100.0 |

| **Nationality** | Frequency | Percent |
|---|---|---|
| Saudi | 325 | 92.9 |
| non-Saudi | 25 | 7.1 |
| Total | 350 | 100.0 |

| **Educational.Qualification** | Frequency | Percent |
|---|---|---|
| High School | 76 | 21.7 |
| Bachelor's | 242 | 69.1 |
| Mater's | 32 | 9.1 |
| Total | 350 | 100.0 |

| **Occupation** | Frequency | Percent |
|---|---|---|
| Student | 40 | 11.4 |
| Employed (Non-Healthcare) | 173 | 49.4 |
| Employed (Healthcare) | 49 | 14.0 |
| Unemployed | 56 | 16.0 |
| Retired | 32 | 9.1 |
| Total | 350 | 100.0 |

| **suffer.any.chronic.back** | Frequency | Percent |
|---|---|---|
| Yes | 127 | 36.3 |
| No | 223 | 63.7 |
| Total | 350 | 100.0 |

| **heard.AS** | Frequency | Percent |
|---|---|---|
| Yes | 59 | 16.9 |
| No | 291 | 83.1 |
| Total | 350 | 100.0 |

| **A.S.type.of** | Frequency | Percent |
|---|---|---|
| Bone infection | 45 | 12.9 |
| Autoimmune inflammatory disease | 74 | 21.1 |
| Digestive disorder | 2 | 0.6 |
| Heart disease | 2 | 0.6 |
| I don't know | 227 | 64.9 |
| Total | 350 | 100.0 |

| **part.body.AS** | Frequency | Percent |
|---|---|---|
| Spine and lower back | 193 | 55.1 |
| Lungs | 7 | 2.0 |
| Knees and elbows | 9 | 2.6 |
| Liver | 1 | 0.3 |
| I don't know | 140 | 40.0 |
| Total | 350 | 100.0 |

| **AS.more.common** | Frequency | Percent |
|---|---|---|
| Men | 34 | 9.7 |
| Women | 71 | 20.3 |
| Equally common | 58 | 16.6 |
| I don't know | 187 | 53.4 |
| Total | 350 | 100.0 |

| **AS.begins.age** | Frequency | Percent |
|---|---|---|
| Childhood | 7 | 2.0 |
| Teenage to early adulthood (15–30) | 54 | 15.4 |
| After 50 | 101 | 28.9 |
| I don't know | 188 | 53.7 |
| Total | 350 | 100.0 |

| **Can.AS.lead.permanent.spine.deformity.left.untreated** | Frequency | Percent |
|---|---|---|
| Yes | 100 | 28.6 |
| No not sure | 250 | 71.4 |
| Total | 350 | 100.0 |

| **AS.caused.bacterial** | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| True | 21 | 6.0 |
| False | 55 | 15.7 |
| Not sure | 274 | 78.3 |
| Total | 350 | 100.0 |

| **Genetic component** | Frequency | Percent |
|---|---|---|
| Yes | 54 | 15.4 |
| No | 28 | 8.0 |
| Not sure | 268 | 76.6 |
| Total | 350 | 100.0 |

| **Imaging tests** | Frequency | Percent |
|---|---|---|
| Yes | 155 | 44.3 |
| No | 12 | 3.4 |
| Not sure | 183 | 52.3 |
| Total | 350 | 100.0 |

| **specialists.treat.AS** | Frequency | Percent |
|---|---|---|
| Orthopedic Surgeon | 161 | 46.0 |
| Neurologist | 28 | 8.0 |
| Cardiologist | 1 | 0.3 |
| I don't know | 160 | 45.7 |
| Total | 350 | 100.0 |

| **Believe AS condition** | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| Strongly Agree | 81 | 23.1 |
| Neutral | 189 | 54.0 |
| Disagree | 80 | 22.9 |
| Total | 350 | 100.0 |

| **awareness.campaigns. AS** | Frequency | Percent |
|---|---|---|
| Strongly Agree | 279 | 79.7 |
| Neutral | 49 | 14.0 |
| Disagree | 22 | 6.3 |
| Total | 350 | 100.0 |

| **Know anyone diagnosed** | Frequency | Percent |
|---|---|---|
| Me | 13 | 3.7 |
| Yes - relative or colleague | 22 | 6.3 |
| No | 315 | 90.0 |
| Total | 350 | 100.0 |

| **Serious AS health condition** | Frequency | Percent |
|---|---|---|
| Very Serious | 49 | 14.0 |
| Somewhat Serious | 102 | 29.1 |
| Not Serious | 14 | 4.0 |
| I don't know | 185 | 52.9 |
| Total | 350 | 100.0 |

| **What are the common symptoms of AS? (Select all that apply)** | Frequency | Percent |
|---|---|---|
| Persistent lower back pain | 172 | 27.5% |
| Morning stiffness | 107 | 17.1% |
| Pain improves with exercise | 40 | 6.4% |
| Fatigue | 71 | 11.4% |
| Swelling in the feet | 45 | 7.2% |
| I don't know | 190 | 30.4% |

**Chi-square test:**

**Test Statistics**

| | Age | Gender | Nationality | Educational Qualification | Occupation | heard.AS |
|---|---|---|---|---|---|---|
| Chi-Square | 154.309[a] | 2.240[b] | 257.143[b] | 210.263[c] | 194.143[d] | 153.783[b] |
| df | 5 | 1 | 1 | 2 | 4 | 1 |
| Asymp. Sig. | .000 | .134 | .000 | .000 | .000 | .000 |

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 58.3.
b. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 175.0.
c. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 116.7.
d. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 70.0.

(Age, Educational Qualification, Occupation) > 0.05

(Gender) < 0.05

**ANOVA:**

| | | **Sum of Squares** | **df** | **Mean Square** | **F** | **Sig.** |
|---|---|---|---|---|---|---|
| **Age** | **Between Groups** | **.001** | **1** | **.001** | **.001** | **.978** |
| | **Within Groups** | **512.196** | **348** | **1.472** | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **Total** | **512.197** | **349** | | | |
| **Educational Qualification** | **Between Groups** | **.398** | **1** | **.398** | **1.356** | **.245** |
| | **Within Groups** | **102.071** | **348** | **.293** | | |
| | **Total** | **102.469** | **349** | | | |
| **Occupation** | **Between Groups** | **3.671** | **1** | **3.671** | **2.761** | **.098** |
| | **Within Groups** | **462.789** | **348** | **1.330** | | |
| | **Total** | **466.460** | **349** | | | |