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Pregnant mothers' awareness of rheumatic diseases in Balqa Governorate: A study of maternity center visits

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ABSTRACT

This study aims to analyze the level of awareness and knowledge amongst pregnant women about rheumatic diseases and the relevant potential impact on pregnancy, and to examine the relationship between certain demographic variables (such as age, education, and health insurance) and this awareness. Data were collected via a questionnaire directed at 281 pregnant women in Balqa Governorate, Jordan.

Data collection period spanned from February 20 to April 20, 2025. The chi-square test was used to analyze the relationships between the main variables. The results showed that most participants were aware of the term "rheumatic diseases," but awareness of their effects on pregnancy was limited, especially among those with limited education.

The study also revealed a significant disparity in awareness between financially insured and uninsured women, reflecting the need to improve awareness, especially in communities with less access to health services. The study recommends strengthening educational efforts about rheumatic diseases, making medical information more available to uninsured women, and intensifying awareness campaigns in maternity centers.

Keywords: *Rheumatic diseases, pregnancy, health awareness, pregnant women, Jordan.*

1. INTRODUCTION

Rheumatic diseases include a group of diseases related to the musculoskeletal system, particularly those affecting women of childbearing age. Therefore, it is important to understand the impact of these diseases on pregnant women, as this requires continuous medical follow-up due to the immune changes associated with hormonal changes. This affects the disease's activity and progression, requiring adjustments in medication.[1]

Rheumatic diseases affect the muscles, joints, bones, ligaments, tendons, and bones. Numerous rheumatic diseases exist, such as rheumatoid arthritis (RA), which causes inflammation of the joint lining and can result in bone deformity and erosion; systemic lupus erythematosus (SLE), which affects the skin, joints, kidneys, heart, lungs, and blood vessels; and antiphospholipid syndrome (APS), which raises the risk of blood clots and pregnancy complications [2]. Pregnant women with rheumatic diseases face a number of health consequences. They may experience an increased risk of premature birth, preeclampsia, and low birth weight. Pregnancy can also increase the severity of symptoms [3]. Another challenge is the potentially severe effects of medications used to treat the disease on the fetus [4]. Pregnancy increases the symptoms of

rheumatic diseases, such as joint pain, fatigue, and exhaustion [5]. Some rheumatic diseases, such as systemic lupus erythematosus, are also more likely to experience severe flare-ups during pregnancy [6]. Although some pregnant women with rheumatic diseases, such as rheumatoid arthritis, may notice a resolution of symptoms during pregnancy [3].

Better disease management is achieved with early detection of symptoms, which reduces the risk of disease progression or complications such as preeclampsia and its associated risks. Early diagnosis enables physicians to initiate safe and effective therapeutic interventions to ensure the safety of both mother and fetus [7], while maintaining the goal of treatment, which is to prevent damage and deformities of organs and joints [8].

Early detection may face several challenges, which limit its effectiveness. The most important of these is a lack of awareness of the symptoms and risks of rheumatic diseases, which prevents pregnant women experiencing symptoms from seeking medical help. Furthermore, the similarity of symptoms of normal pregnancy with those of some early rheumatic diseases may delay accurate diagnosis [9]. Furthermore, pregnant women experiencing symptoms for the first time may not be referred to a rheumatologist, delaying diagnosis and treatment.[10]

Expected mothers face several challenges that may hinder their access to information about rheumatic diseases. These challenges may include poor internet access in some areas [11]. The spread of inaccurate and popular information via social media can mislead pregnant mothers about rheumatic diseases and pregnancy [10; 12]. Cultural norms may also play a role in limiting a woman's ability to seek medical advice openly or discuss health conditions and symptoms with her husband. Low levels of education are associated with lower awareness of rheumatic diseases and other health topics [10]. A family's economic and social status can affect its ability to obtain information from accurate and reliable medical sources or afford health care [11].

Previous Studies

While the interaction between rheumatic diseases and pregnancy has gained increasing attention, research specifically examining pregnant women's awareness of these conditions remains scarce. Existing studies have primarily explored related topics, such as women with rheumatic diseases' awareness and understanding of medication safety during pregnancy [13], as well as the challenges they face when planning pregnancy, navigating prenatal and postnatal care, and breastfeeding.[14]

Rheumatic diseases, particularly autoimmune diseases, vary and impact women of reproductive age differently and pose significant risks to both maternal and fetal health. Active disease during pregnancy is associated with complications such as pre-eclampsia, preterm birth, intrauterine growth restriction, and increased maternal cardiovascular risk [9]. Conversely, proactive prevention and preconception planning can mitigate these adverse outcomes.[3]

Awareness levels among pregnant women in developing countries are disparate, influenced by demographic and educational factors. For example, an online survey in Syria (n = 641 participants) revealed a significant lack of awareness of rheumatic diseases, although specific determinants were not identified [15]. In Saudi Arabia, a study (n = 252 participants) found that 52.4% of participants were aware of rheumatoid arthritis, with a strong association between higher education levels and increased knowledge of the disease [16]. In Jordan, pregnant women's awareness was linked to their own and their husbands' educational backgrounds, as well as access to information about symptoms and disease risks.[17]

Jordanian studies confirm a widespread lack of awareness of rheumatic diseases and their pregnancy-related effects, attributing this gap to limited education, cultural barriers, and inadequate access to specialized healthcare [10, 12]. This underscores the serious knowledge deficit in areas such as Balqa Governorate.

The current study aims to address this gap by assessing awareness levels among pregnant women attending maternity centers in Balqa. The results will inform targeted strategies to enhance education, improve healthcare delivery, and empower women through informed decision-making during pregnancy.

2. METHODS

Study Design and Participants

The study was conducted through a descriptive and quantitative cross-sectional survey, with data collected during the period from February 20 to April 20, 2025. The survey consisted of three sections, beginning with demographic characteristics, followed by awareness of rheumatic diseases, and sources of information regarding these diseases. The survey sample was based on pregnant women attending maternity centers in Balqa Governorate, Jordan. The final sample size was 281 participants.

Instrument

The questionnaire was developed based on several previous studies. It was distributed to participants in Arabic, using their preferred method—either in paper format or electronically (via a Google Form), which was shared through WhatsApp. Participation in the study was considered as implied consent.

Data Management and Analysis

Data was entered into SPSS software, version 17.0, to conduct univariate and bivariate analyses describing all survey variables. As most study variables were measured at the nominal and/or ordinal level, descriptive statistics were used to summarize the basic features of the data. Responses to the questions were analyzed using the Chi-square test when comparing socio-demographic groups or ordinal data.

3. RESULTS

The following is a presentation of the findings obtained through analyzing the data collected from the study participants. The presentation begins with a presentation of the participants' demographic characteristics, providing a comprehensive picture of the target sample selected from pregnant women in Balqa Governorate, Jordan. This is followed by an analysis of the statistical relationships between demographic variables and awareness levels about rheumatic diseases and their potential effects on pregnancy.

Table 1: Participants' Demographic Characteristics

The following table shows the distribution of participants according to key demographic variables such as age, educational level, employment status, and health insurance status.

#	Variables	Type	number	percentage %
1	How old are you?	☐ 29–18	145	51.6%
		☐ 30–39	119	42.3%
		☐ 40–49	17	6.0%
Total			**281**	**%100**
2	level of education	☐ No formal education	77	27.4%
		☐ Middle school and less	31	11.0%
		☐ High school or equivalent degree	100	35.6%
		☐ College or higher Education	73	26.0%
Total			**281**	**%100**
3	Are you currently employed?	☐ Yes	172	61.2%
		☐ No	109	38.8%
Total			281	**%100**
4	Health insurance status	☐ Insured	245	87.2%
		☐ Not insured	36	12.8%
Total			**281**	**%100**

The study population predominantly consisted of young individuals, with the largest group (51.6%) being between 18 and 29 years old, followed by those aged 30-39 (42.3%), and a smaller segment aged 40-49 (6%). This age distribution reflects the sample's focus on younger pregnant women, which could influence their levels of awareness and how they access information. In terms of education, 35.6% of the participants completed secondary education or an equivalent level, while 26% held a university degree or higher. Notably, 27.4% had no formal education, a factor that might affect their health literacy and ability to find reliable information about rheumatic conditions. Regarding employment, a significant 61.2% of the women were currently working, indicating a relatively active workforce, which could impact their exposure to health-related information through social and professional networks. Furthermore, a large majority (87.2%) of the participants had health insurance, likely to improve their access to healthcare services and the potential for early diagnosis and management of rheumatic symptoms.

Table 2: Awareness of rheumatic diseases

#	Variables	Type	number	percentage %
5	**Have you ever heard of the term "rheumatic diseases?"**	☐ Yes	192	68.3%
		☐ No	89	31.7%
Total			**281**	**%100**
6	**Do you think rheumatic diseases can affect women of childbearing age?**	☐ Yes	100	35.6%
		☐ No	105	37.4%
		☐ I don't know	76	27.0%
Total			**281**	**%100**
7	**Do you think rheumatic diseases can affect pregnancy?**	☐ Yes	87	31.0%
		☐ No	103	36.7%
		☐ I don't know	91	32.4%
Total			281	**%100**
8	**If your answer is "Yes", what effects do you expect?**	☐ Increased risk of miscarriage	20	23.0%
		☐ Increased risk of premature birth	10	11.5%
		☐ Impact on fetal health	18	20.7%
		☐ Worsening rheumatic symptoms in the mother during pregnancy	7	8.0%
		☐ Difficulty getting pregnant	22	25.3%
		☐ I don't know	10	11.5%
Total			87	**%100**
9	**Do you think some antirheumatic medications may be unsafe during pregnancy?**	☐ Yes	115	40.9%
		☐ No	69	24.6%
		☐ I don't know	97	34.5%
Total			281	**%100**

10	**Do you think early detection of rheumatic diseases during pregnancy is important?**	☐ Yes	218	77.6%
		☐ No	38	13.5%
		☐ I don't know	25	8.9%
Total			281	**%100**
11	**Do you think pregnancy itself can cause symptoms like those of rheumatic diseases?**	☐ Yes	79	28.1%
		☐ No	55	19.6%
		☐ I don't know	147	52.3%
Total			281	%100

The data showed that 68.3% of participants had prior knowledge of the concept of "rheumatic diseases," indicating a relatively widespread public awareness of this field. Despite the lack of detailed understanding of the effects of these diseases on women of childbearing potential, or pregnant women, there was a significant discrepancy in opinions regarding the potential relationship between them. The results also revealed that nearly half of the participants were unaware of the potential complications of several medications prescribed to pregnant women, reflecting a knowledge gap that calls for intensified awareness campaigns. Conversely, the surveys highlighted widespread awareness (77.6%) of the importance of early diagnosis, a positive factor that strengthens prevention efforts. These results highlight the importance of providing clear, data-backed information resources for pregnant women, particularly regarding the management of rheumatic diseases and their consequences, to ensure the safety of both mother and fetus during the various stages of pregnancy.

Table 3: Information sources

#	Variables	Type	number	percentage %
12	**Where do you usually get information about your health and pregnancy health?**	☐ The doctor/nurse at the maternity center	69	24.56%
		☐ Other specialist doctors	53	18.86%
		☐ The Internet	75	26.69%
		☐ Family and friends	46	16.37%
		☐ Books and magazines	17	6.05%
		☐ Television and radio programs	21	7.47%
Total			**281**	**%100**
13	**Have you ever received specific information about rheumatic diseases and their effect on pregnancy from any source?**	☐ Yes	45	16.01%
		☐ No	236	83.99%
Total			**281**	**%100**
14	**Have you ever been diagnosed with any rheumatic diseases?**	☐ Yes	37	13.17%
		☐ No	244	86.83%
Total			**281**	**%100**

The results in the table above reflect the diverse sources participants rely on to obtain information related to pregnancy and health. The most important source was the internet, representing 26.69% of participants, followed by health centers via doctors and nurses, representing 24.56%. This was followed by other specialist doctors (18.86%), and finally, family and friends (16.37%). These results demonstrate the importance of diversifying channels for obtaining health information. They also indicate the need for accurate and reliable information, especially that obtained from the internet and family. The results

also revealed a significant awareness gap that requires targeted educational interventions. The results showed that 83.99% of participants had not received information about rheumatic diseases and their impact on pregnancy.

Regarding diagnosis of rheumatic diseases, only a small percentage (13.17%) reported having been previously diagnosed with rheumatic disease, a percentage expected given the general prevalence of these diseases within the studied population. Overall, the findings reflect the importance of improving health awareness programs, with a focus on incorporating specialized topics such as rheumatic diseases and their impact on pregnancy into educational programs provided to pregnant mothers.

Statistical analysis of the relationships between demographic variables and awareness level

This study aims to explore the level of awareness and knowledge among pregnant women about rheumatic diseases and their potential impact on pregnancy, and to analyze the relationship between certain demographic variables (such as age, education, and health insurance) and this level of awareness. Chi-square tests were used to analyze the relationships between variables, with the aim of determining whether there were statistically significant differences reflecting disparities in knowledge based on demographic characteristics. These results help direct future awareness and health interventions toward less aware groups, ensuring enhanced reproductive health and prevention of potential complications associated with rheumatic diseases during pregnancy. The following is a presentation of the statistical relationships extracted between the most prominent variables:1: Relationship Between Age (Variable 1) and Awareness of "Rheumatic Diseases" (Q5)

Age Group	**Yes (Q5)**	**No (Q5)**	**Total**
18–29	100	45	145
30–39	80	39	119
40–49	12	5	17
Total	**192**	**89**	**281**

Relationship Between Education Level (Variable 2) and Belief in Rheumatic Diseases' Impact on Pregnancy (Q7)

Education Level	**Yes (Q7)**	**No (Q7)**	**Don't Know (Q7)**	**Total**
No Formal Education	10	50	17	77
Middle School or Less	5	20	6	31
High School or Equivalent	30	50	20	100
College or Higher	42	25	6	73
Total	**87**	**145**	**49**	**281**

Relationship Between Health Insurance (Variable 4) and Awareness of Medication Risks (Q9)

Health Insurance	Yes (Q9)	No (Q9)	Don't Know (Q9)	Total
Insured	90	60	95	245
Uninsured	25	9	2	36
Total	**115**	**69**	**97**	**281**

Summary of Results:

Variable Pair	Chi-square Value	Degrees of Freedom	p-value	Significance
Age vs. Q5	0.12	2	0.94	No
Education vs. Q7	45.3	6	<0.001*	Yes
Insurance vs. Q9	12.7	2	0.002*	Yes

4. DISCUSSION

The analysis of the relationship between demographic variables and awareness or perceptions related to rheumatic diseases yielded mixed results.

First, although a descriptive look at the cross-tabulation between age and awareness of rheumatic diseases (Q5) showed that younger participants (18–29 years) had the highest number of affirmative responses (100 out of 145), the chi-square test indicated no statistically significant association between age group and awareness ($\chi^2 = 0.12$, $p = 0.94$). This suggests that awareness of the term "rheumatic diseases" was uniformly distributed across different age groups, and age did not play a determining role in whether participants had heard of the term. This finding contradicts some expectations that older age groups might have more exposure to chronic diseases, indicating that general awareness campaigns might be reaching all age segments similarly.

Second, a significant relationship was observed between education level and belief in the impact of rheumatic diseases on pregnancy (Q7), with a highly significant chi-square value ($\chi^2 = 45.3$, $p < 0.001$). Participants with higher education levels were more likely to recognize the potential impact of these diseases on pregnancy. The results demonstrate the essential role of educational attainment in shaping health perceptions and reinforce the importance of targeted educational interventions, particularly among populations with low formal education. For example, 42 of the 73 participants with a university education responded "yes," compared to only 10 of the 77 participants with no formal education.

Thirdly, the analysis identified a statistically significant link between the availability of health insurance and awareness of medication-related risks during pregnancy (Q9), with a chi-square value of 12.7 (*p* = 0.002). Insured women demonstrated higher awareness of these risks (90 out of 245) compared to uninsured women (25 out of 36), suggesting potential inequities in access to critical medical information, likely influenced by insured individuals' greater engagement with healthcare providers. This disparity underscores the necessity of targeted, equitable health communication strategies, particularly for uninsured or underinsured groups. Collectively, the results emphasize the pivotal role of education and healthcare accessibility in fostering informed perspectives on rheumatic diseases during pregnancy. While age showed no notable correlation with awareness, both educational attainment and insurance status emerged as robust predictors of knowledge. These findings should guide the development of future educational initiatives and preventive healthcare programs to enhance maternal health outcomes and bridge existing knowledge gaps.

5. RECOMMENDATIONS

Based on the presented results, it is recommended to improve health education programs targeting women with low educational levels, as a result of the clear statistical relationship between educational level and awareness of the impact of rheumatic diseases on pregnancy. It is suggested that these programs should be simple and easy to understand, using communication methods appropriate to the local cultural context.

The findings also highlight the need to bridge the knowledge gap among uninsured women by providing them with reliable information sources through maternity centers or community awareness campaigns, emphasizing the role of healthcare professionals in communicating this information during medical visits. It is also important to integrate rheumatic disease awareness into prenatal care, through direct discussions about symptoms, medication risks, and the importance of early detection.

Given that general awareness of the term was high but detailed information was lacking, it is recommended to leverage media and digital platforms to disseminate in-depth and comprehensive awareness content, such as educational videos and real-life stories. Finally, since age was not statistically associated with awareness level, this calls for in-depth studies that explore other potential factors, such as previous health experiences, family history, or exposure to health information, with recommendations for qualitative studies to understand the barriers to understanding health risks related to rheumatic diseases in pregnant women.

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