

Rheumatology as a Career Choice for Medical Students in Saudi Arabia: A Cross-Sectional Study

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ABSTRACT

Background: Rheumatology is the branch of internal medicine concerned with the care and diagnosis of auto-inflammatory, autoimmune, and rheumatic disorders affecting the bones, musculoskeletal, and other organs. There is an international concern that rheumatology has lost its interest as a sub-specialty for internal medicine residents. The aim of this study is to explore university medical students and interns' interest in rheumatology as a career in Riyadh City, Saudi Arabia.

Methods: This is an online cross-sectional survey study that was conducted on universities medical students in Saudi Arabia between January and April 2024. This study examined influencing factors of students' exposure to rheumatology and attitude towards rheumatology as a career. Logistic regression analysis was used to identify predictors of planning to practice rheumatology as a career.

Results: A total of 466 students participated in this study. The majority of respondents (88.6%) reported having prior exposure to rheumatology during their medical education. Among these, 29.0% had 4-8 hours of exposure. Most of the students first encountered rheumatology during the clinical years of medical school (53.4%). A small percentage (6.4%) are planning to pursue rheumatology as a career. Among those interested in rheumatology, 60.0% were influenced by work hours and lifestyle, while 50.0% cited both having a family/friend with a rheumatologic disease and research experience. Conversely, lack of clinical exposure (46.1%) and knowledge about the subject (43.6%) were the primary negative factors. The majority of respondents agreed or strongly agreed that rheumatology physicians play an integral part in Saudi Arabia's healthcare system (79.2%) and enjoy their work (57.7%). Conversely, fewer respondents agreed or strongly agreed that Saudi Arabia has a very serious shortage of rheumatology physicians (25.3%) and that there is a lack of diversity in pathology in rheumatology (25.1%). Students' willingness to practice rheumatology as a career based on their university of study ($p < 0.05$).

Conclusion: Our study found that most medical students were exposed to rheumatology during clinical years, although few plan to pursue it as a career. Work-life balance and personal ties are positives, while clinical exposure and knowledge are hurdles. Medical curricula should include more hands-on rheumatology training and knowledge to promote interest in this important profession.

Keywords: Career; Interns; Medical; Rheumatology; Saudi Arabia; Students

INTRODUCTION

Rheumatology is the branch of internal medicine concerned with the care and diagnosis of auto-inflammatory, autoimmune, and rheumatic disorders affecting the bones, musculoskeletal, and other organs¹. Rheumatic diseases are chronic inflammatory condition that have various presentation as it affects not only joints, but also internal organs^{2,3}. Because of the complexity and chronicity of the diseases, there is an essential need to be familiar with the clinical presentation for their

proper diagnosis⁴.

The worldwide prevalence of musculoskeletal and rheumatic diseases is on the rise⁵⁻⁷; the fact that the life span of humans has increased, together with the rising environmental risk factors like malnutrition and obesity, the growing population, and advanced early referral strategies and diagnostic tools are factors that have contributed to this growing⁸⁻¹¹. That leads to a rise in the pool of patients who need rheumatologic

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care⁸⁻¹². Despite these advances in diagnosis and detection of these conditions that have enhanced the survival rate to approximately 99%¹³, there is still an enormous demand for rheumatology care services worldwide compared with the workforce available¹⁴⁻²². This lack of specialists adversely affects patient care²³.

There is an international concern that rheumatology has lost its interest as a sub-specialty for internal medicine residents^{24,25}. Early exposure to rheumatology influences the student's interest in rheumatology^{26,27}. Undergraduate medical education can affect career choices and shape future medical perspectives, skills, and practice²⁸. Nevertheless, rheumatology is under-represented across most medical curricula^{29,30}.

Saudi Arabia, like many other countries, lacks sufficient rheumatologists^{24,31}. According to a prior study at the University of Dammam, the preferred specialties for Saudi medical students were emergency medicine, pediatrics, general surgery, family medicine, and internal medicine; lifestyle was the main factor affecting their preferences³².

With an increasing demand for rheumatologic care and a decreasing number of specialists^{20,33,34}, rising rheumatology interest among medical students as a career option is necessary³⁵. Identifying factors that influence their career preferences could give insights to inform strategies that may enhance their interests in Rheumatology and ensure an adequate future workforce to meet the health needs of rheumatic patients. Therefore, this study aims to explore the interest of university medical students who are in their clinical years in rheumatology as a career in Riyadh City, Saudi Arabia.

METHODS

Study design:

This is an online cross-sectional survey study that was conducted on universities medical students in their clinical years in Saudi Arabia between January and April 2024.

Study population and sampling strategy:

The study population for this study comprised of medical students in their clinical years from any level of study who are currently studying medicine in Saudi Arabia. We did not restrict our study population based on gender, or any other characteristics. Students in the first three years of study were excluded as they are exposed to basics sciences and they don't have any exposure to rheumatology. For some universities, the third year could be one of the clinical years. In Saudi Arabia, the medical program is MBBS program, which is 5 to 6 years followed by one year of internship.

Convenience sampling technique was used in this study to invite the study participants. This sampling technique recruit the study participants based on their availability and willingness to participate in the study. The questionnaire link was distributed through social media platform (WhatsApp). The questionnaire cover letter clearly highlighted the study inclusion criteria in order to encourage individuals who only meet the inclusion criteria to participate in the study. The participants were informed that the participation in the study is completely voluntary and there no incentive to participate.

Questionnaire tool:

The questionnaire tool used in this study was developed based on extensive literature review. The questionnaire tool asked the study participants about their demographic characteristics (age, gender,

university of study, and year of study). In the second section (eight-items), this study examined influencing factors of students' exposure to rheumatology (whether they have had any prior exposure to rheumatology during (internal medicine rotation/course, elective course, rheumatology lectures/examinations), their exposure time to rheumatology during medical school (lectures/examinations), their exposure time to rheumatology as clinical exposure in clinics/hospitals is roughly, when was their first exposure to rheumatology, when did they first become interested in rheumatology, what influenced them to think of rheumatology as a future career, which factors positively affected their decision in practicing rheumatology, and which factors negatively affected their decision in practicing rheumatology). In the last section (eight- items), the questionnaire examined participants' attitude towards rheumatology as a career.

Questionnaire validation:

The face validity of the questionnaire was examined by three rheumatologists independently and they confirmed that the questionnaire items are clear and able to achieve the study objectives.

Statistical analysis:

This study was analysed using the Statistical Package for Social Science Software (SPSS), version 29. Descriptive statistics and inferential statistics were used in this study. Continuous variables were presented as mean and standard deviation. Categorical variables were presented as frequencies and percentages. Logistic regression analysis was used to identify predictors of planning to practice rheumatology as a career. The significance level was assigned as p-value less than 0.05.

RESULTS

A total of 466 students participated in this study. The mean age of the students was 23.8 (1.4) years. The sample consists predominantly of male students, comprising 73.4% of the total. Regarding their universities, the largest groups are from Imam Mohammad Ibn Saud Islamic University (26.8%), King Saud bin Abdulaziz University of Health Sciences (26.0%), King Saud University (24.7%), and Alfaisal University (22.5%). In terms of their academic year, the majority are fourth-year students (37.3%), followed by fifth-year students (32.2%), with third-year students and interns making up 10.7% and 19.7%, respectively, Table 1.

Table 1. Participants' demographic characteristics

Variable	Frequency	Percentage
Age (mean (standard deviation)) years	23.8 (1.4)	
Gender		
Male	342	73.4%
University of study		
Imam Mohammad Ibn Saud Islamic University	125	26.8%
King Saud bin Abdulaziz University of Health Sciences	121	26.0%
King Saud University	115	24.7%
Alfaisal University	105	22.5%
Year of study		
Third year	50	10.7%
Fourth years	174	37.3%
Fifth year	150	32.2%
Internship	92	19.7%

Frequency and influencing factors of students' exposure to rheumatology

A substantial majority of respondents (88.6%) reported having prior exposure to rheumatology during their medical education. Among these, 29.0% had 4-8 hours of exposure, and 26.8% had 1-4 hours. Clinical exposure varied, with 37.6% having 2-7 days and 22.1% having one day. Most first encountered rheumatology during the clinical years of medical school (53.4%), and a small percentage (6.4%) are planning to pursue rheumatology as a career. Among those interested in rheumatology, 60.0% were influenced by work hours and lifestyle, while 50.0% cited both having a family/friend with a rheumatologic disease and research experience. Lower stress and workload positively influenced 30.0% of respondents. Conversely, lack of clinical exposure (46.1%) and knowledge about the subject (43.6%) were the primary negative factors, Table 2.

Table 2. Frequency and influencing factors of students' exposure to rheumatology

Variable	Frequency	Percentage
Have you had any prior exposure to rheumatology during (internal medicine rotation/course, elective course, rheumatology lectures/examinations etc...)		
Yes	413	88.6%
Your exposure to rheumatology during medical school (lectures/examinations) is roughly (n= 413):		
None	47	11.4%
Less than one hour	37	9.0%
1-4 hours	111	26.8%
4-8 hours	120	29.0%
More than 8 hours	98	23.8%
Your exposure to rheumatology as clinical exposure in clinics/hospitals is roughly (n=413) :		
None	47	11.4%
One day	91	22.1%
2-7 days	155	37.6%
8-14 days	36	8.8%
More than 14 days	83	20.1%
When was your first exposure to rheumatology? (n= 413)		
Clinical years of medical school	221	53.4%
Preclinical years of medical school	146	35.4%
Before medical school	29	7.1%
Internship	1	0.2%
Are you planning to practice rheumatology as a career?		
Yes	30	6.4%
When did you first become interested in rheumatology? (n= 30)		
Clinical years of medical school	12	40.0%
Preclinical years of medical school	11	36.7%
Before medical school	7	23.3%
What influenced you to think of rheumatology as a future career? (Multiple choices question) (n= 30)		
Work hours and lifestyle	18	60.0%
Family/friend is suffering from a rheumatology disease	15	50.0%
Research experience	15	50.0%
Clinical rotation/experience with a patient	12	40.0%
From rheumatology lecture	11	36.7%
Clinical mentor or doctor	11	36.7%
Income potentials	10	33.3%

Job market or availability in fellowship training	7	23.3%
Relative is a rheumatology physician	4	13.3%
Research opportunity	4	13.3%
Which of the following factors positively affected your decision in practicing rheumatology? (n= 30) (multiple choice question)		
Lower stress specialty/workload	9	30.0%
Previous rheumatology teaching	7	23.3%
Inspirational rheumatologist	7	23.3%
Clinical rotation/experience with a patient	7	23.3%
Less working hours for more free time	6	20.0%
Personal experience with a family member or friend	5	16.7%
Continuity of care	5	16.7%
Research opportunity	5	16.7%
Relative is a rheumatology physician	3	10.0%
Research experience	3	10.0%
More opportunities in the job market or in fellowship training	3	10.0%
High income potentials	3	10.0%
Advice from practicing doctor	2	6.7%
Which of the following factors negatively affected your decision in practicing rheumatology? (n= 436) (multiple choice question)		
Lack of clinical exposure	201	46.1%
Lack of knowledge about the subject	190	43.6%
Rheumatology field is boring	155	35.6%
Long length of training period	114	26.1%
Poor/non inspirational teaching	108	24.8%
Rheumatology field is difficult	94	21.6%
Low income potentials	90	20.6%
Concern regarding future position of rheumatology	88	20.2%
Less opportunities in the job market or in fellowship training	74	17.0%
Concern at blurring of roles between doctors and other specialty	54	12.4%
Perceived as an easy subject	36	8.3%
Perceptions that research is necessary	33	7.6%
Advice from practicing doctor	18	4.1%

Students' attitude towards rheumatology as a career

A majority of respondents agreed or strongly agreed that rheumatology physicians play an integral part in Saudi Arabia's healthcare system (79.2%) and enjoy their work (57.7%). Conversely, fewer respondents agreed or strongly agreed that Saudi Arabia has a very serious shortage of rheumatology physicians (25.3%) and that there is a lack of diversity in pathology in rheumatology (25.1%). The statement with the highest agreement was that rheumatology physicians play an integral part in the healthcare system (79.2%), while the lowest agreement was for the statement about the lack of diversity in pathology (25.1%), Table 3.

Predictors of planning to practice rheumatology as a career:

Binary logistic regression analysis identified that there was a statistically significant difference in students' willingness to practice rheumatology as a career based on their university of study (p<0.05). Other factors such as gender and year of study did not significantly influence students' willingness to practice rheumatology as a career (p>0.05), Table 4.

Table 3. Students' attitude towards rheumatology as a career

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Rheumatology physicians play an integral part in Saudi Arabia's health care system	1.70%	5.60%	13.50%	29.40%	49.80%
Rheumatology physicians enjoy their work	1.70%	6.90%	33.70%	37.10%	20.60%
Rheumatology provides a physician with decent income to live well	2.10%	5.80%	44.00%	36.70%	11.40%
Rheumatology physicians' work is complex and difficult	3.40%	9.90%	40.60%	35.60%	10.50%
Rheumatology physicians' work is interesting	8.20%	12.90%	37.10%	29.20%	12.70%
Limited technical examinations and interventions	5.60%	18.70%	46.60%	23.00%	6.20%
Saudi Arabia has a very serious shortage of rheumatology physicians	3.20%	14.40%	57.10%	18.90%	6.40%
Lack of diversity of pathology	9.70%	22.50%	42.70%	17.60%	7.50%

Table 4. Predictors of planning to practice rheumatology as a career

Variable	Odds ratio of planning to practice rheumatology as a career	P-value
Gender		
Female (Reference category)	1.00	
Male	0.52 (0.24-1.11)	0.091
University of study		
Alfaisal University (Reference category)	1.00	
Imam Mohammad Ibn Saud Islamic University	3.28 (0.89-12.09)	0.074
King Saud bin Abdulaziz University of Health Sciences	4.81 (1.35-17.12)	0.015*
King Saud University	0.30 (0.03-2.91)	0.298
Year of study		
Third year (Reference category)	1.00	
Fourth years	2.36 (0.29-19.35)	0.423
Fifth year	5.85 (0.76-45.29)	0.091
Internship	2.82 (0.32-24.80)	0.351

*p<0.05

DISCUSSION

Our findings provide a comprehensive view of factors affecting medical student's attitudes toward choosing rheumatology as a career in Riyadh, Saudi Arabia. In our study, most respondents (88.6%) reported having prior exposure to rheumatology during their medical education. Among these, 29.0% had 4-8 hours of exposure. This restricted exposure is in line with what has been reported in most other countries, where exposure to rheumatology teaching was variable in duration and depth. For example, most medical students in the United States (US) receive only a few weeks of musculoskeletal or rheumatology medicine before graduating^{36,37}. Additionally, some of them did not receive any exposure to these fields^{36,37}.

In the United Kingdom (UK), the situation is similar. A questionnaire completed by 23 UK medical schools³⁸ showed that 18 provided some teaching in rheumatology. Nevertheless, in 5 of these, up to half of the students may have received no rheumatology teaching, and about 21.0% responded that they had not been exposed to rheumatology education. Most students (about 61.0%) were exposed to rheumatology for three weeks.

Our study found that most medical students first encountered rheumatology during the clinical years of medical school (53.4%). This is consistent with reports from other regions. In the US, most rheumatology fellows indicated their initial exposure was during the second or third year of medical school, with more than three-quarters

having established their decision during residency and internship³¹. Also, only 9 of 23 medical schools taught rheumatology throughout all clinical years in the UK³⁸. In many medical schools in the UK, rheumatology was integrated into teaching another discipline, and few schools had a freestanding course in rheumatology³⁸. Moreover, a prior study amongst Ugandan clinical year medical students revealed that about 84.0% are heard of rheumatology as a specialty³⁹. These emphasize that rheumatology education tends to be concentrated later in the medical curriculum, which may influence career choices. In Saudi Arabia, in Riyadh medical universities, 4th and 5th years (the last 2 years are the clinical years). However, in King Saud University, 3rd year is considered as clinical years. In the US it is an MD program, which is 4 years program, followed by a residency program. In which the first 2 years are basic sciences and the second 2 years are clinical years. In US, they have pre-med courses before joining the medical MD program.

This is a worldwide problem in that exposure to rheumatology lacks homogeneity and has severe implications for the future workforce in this subspecialty. A need for early and continuous exposure to this subject, not just in undergraduate teaching but even in medical education at large, goes a long way in developing an interest and confidence in it. Available literature supports that early exposure to rheumatology impacts the confidence and career choice of medical trainees, students, and residents^{19,31,40-42}. It has been suggested in the US that this early exposure to rheumatology training for internal medicine residents

and students is a positive predictor of subspecialty choice³¹. Previous studies also concluded that increased exposure during residency and medical school would be the best method for the recruitment of new rheumatologists into the workforce^{31,43}. These underscore the need for integrating education on rheumatology throughout the entire curriculum and not taking each clinical year alone.

Our study found that only 6.4% of respondents intend to pursue rheumatology as a career. This low level of interest reflects global trends and concern for the future regarding the availability of rheumatologists, including in Saudi Arabia regions where the demand for specialized care is escalating⁴⁴. Aligned with our findings, in the UK, rheumatology was one of the least sought-after specialties. When medical students were asked to select 6 out of 21 specialties that they considered would be most useful for them to have received training in following university, only about 9.0% included rheumatology as one of the lowest three specialties⁴⁵. Interestingly, while the interest in rheumatology as a specialty for medical students remains low, those who choose this field exhibit an increasing preference toward academic careers⁴⁶.

In our study, among those interested in rheumatology, 60.0% were influenced by work hours and lifestyle, while 50.0% cited both having a family/friend with a rheumatologic disease and research experience. These align with prior studies' findings. A previous study conducted among recent graduate doctors in Poland emphasized that personal motivations and work-life balance influence medical specialty choice⁴⁷. When choosing a field, they anticipate the requirement for an improved future work environment and flexible work hours⁴⁷. Similarly, an earlier study among Saudi medical students demonstrated that lifestyle was the predominant factor in choosing a medical career³². Besides, personal interests were shown to affect medical career choice⁴⁸, while participating in research provides medical students with updated information and multiple skills essential to a medical research career, which may raise interest in rheumatology^{49,50}.

Conversely, lack of clinical exposure (46.1%) and knowledge about the subject (43.6%) were the primary negative factors. Students with greater and continuous early clinical exposure have shown more interest in and confidence in the specialty^{51,52}. For example, greater exposure was a good predictor of the choice of rheumatology as reflected by an investigation among Moroccan medical students³³. In our study of Saudi medical students, the lack of clinical exposure and knowledge regarding rheumatology highlights the need for educational programs focusing on theoretical aspects along with practical issues.

Our results show that most respondents agreed or strongly agreed that rheumatology physicians contribute an important role to Saudi Arabia's healthcare system, reported at a percentage of 79.2%. This suggests that Saudi medical students have a good awareness of the role of rheumatologists. Rheumatologists are physicians who specialize in the diagnosis and treatment of auto-inflammatory, autoimmune, and rheumatic disorders, which mandates exhaustive knowledge and long-term management strategies⁵⁴⁻⁵⁸.

In our study, 57.7% of the respondents replied that rheumatologists enjoy their work. This finding is consistent with worldwide literature, which shows a high degree of job satisfaction for rheumatologists. For example, a prior study in the US showed that 92.0% of rheumatologists were satisfied with their jobs⁵⁹. Rheumatologists reported general satisfaction with their profession in Austria⁶⁰. The satisfaction of doctors with their jobs is a crucial factor that impacts the overall well-being of healthcare professionals and the standard of healthcare they deliver⁶¹. However, several factors may be related to this disparity in

the percentage of job satisfaction reports among physicians, which include good relations with supervisors and coworkers, continuous medical education opportunities, intellectual stimulation, and effective communication with patients⁶².

On the other hand, our study showed that only 25.3% of the respondents either agreed or strongly agreed that there is a very serious shortage of rheumatology physicians in Saudi Arabia. This perception contrasts sharply with actual workforce data, as previous studies have highlighted a lack of rheumatologists in Saudi Arabia^{24,31,63}. This difference between perception and reality could be accounted for by insufficient awareness of students about healthcare system demands and critical shortage areas, thus indicating the need for education in these aspects. The worldwide shortage of rheumatology physicians, coupled with the growing burden of rheumatic and musculoskeletal diseases, underscores the need to rapidly increase the number of medical students applying for a career in rheumatology⁶⁴.

The perception of a lack of diversity in rheumatology pathology by only 25.1% of our respondents indicates a generally positive understanding among students regarding the scope of this specialty. Rheumatology represents a very heterogeneous group of conditions, including autoimmune diseases, inflammatory disorders, and different types of musculoskeletal conditions¹. However, medical education needs enhancement so that every student is familiar with the diversity within rheumatology pathology. Improving the medical school curriculum in this respect may help to correct prominent misconceptions of this specialization among students and attract more of them to the specialty. The role of innovative educational tools and methods is very significant. For example, an augmented reality-based app showed a more reasonable understanding of rheumatology pathologies among undergraduate medical students, with an improvement rate of 99%⁶⁵.

In our study, students' willingness to practice rheumatology as a career is based on their university ($p < 0.05$). This may be due to several factors recognized in prior research. Firstly, role models demonstrated a significant impact on the career choice of a medical student^{66,67}. Moreover, several earlier studies indicate that prior clinical exposure to rheumatology was the most significant factor in choosing rheumatology^{45,68,69}. Finally, the prospects of participating in rheumatology mentorship programs, clinical rotations, and electives greatly determine the choice of careers among students^{31,43,70}. Comprehensive, enhancing the accessibility of rheumatology to students through role models, clinical exposure, and education can attract more medical students to the specialty and aid in alleviating the regional and global shortage of rheumatologists.

CONCLUSION

The findings of our study emphasize that the majority of medical students received some level of education in rheumatology, particularly during their clinical years. However, only a tiny proportion of these students intend to pursue it as a career in this field. Work-life balance and personal ties have a positive impact, while limited clinical exposure and knowledge pose substantial obstacles. In order to tackle this issue, medical curricula should enhance practical training and promote knowledge about rheumatology to cultivate interest and comprehension in this crucial discipline.

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and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes

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