

Rheumatology research output in the Arab World: despite the challenges

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SUMMARY

Rheumatology is a field in which diagnostic, pathophysiological, and therapeutic advancements occur daily. These developments are the result of research in basic sciences, translational sciences, and clinical sciences. Physical and financial support, provided by individuals and institutions, is essential for all types of research. The political and economic instability in the Arab world has impacted the advancement of healthcare and the output of research. This review seeks to evaluate the quantity and quality of rheumatology-related research conducted in the Arab world.

This review examined the number of rheumatological clinical publications produced by Arab countries between 2017 and 2021 and cited by PubMed/MEDLINE. Publications with authors from multiple nations were disqualified. Publications were then categorized by type, including randomized controlled trials (RCTs), cohort studies, cross-sectional studies, systematic reviews, narrative reviews, and case reports. Publications were also organized according to the regions of the Arab world: North and East Africa, the Middle East, and the Arabian Peninsula. The review also used data from the world bank to evaluate the gross domestic product (GDP) and total population of Arabian nations in order to calculate a ratio of publications to GDP and publications to population.

Egypt had the highest number of publications among north and east African countries and Arab countries in general, with 261 publications, including the highest number of RCTs, which were 23. With 81 publications, Saudi Arabia had the highest number of publications on the Arabian peninsula. However, no individual country on the Arabian peninsula published an RCT. Lebanon had the most publications in the Middle East, but the majority were reviews and case reports. Tunisia had the highest ratio of publications to GDP. Notably, the number of publications increased during the coronavirus disease 2019 era in some countries.

The Arab world is still able to produce clinical rheumatology publications despite its political instability and lack of resources. The influence of such publications on the daily practice of rheumatology is still debatable.

Key words: Rheumatology research, resources, Arab world.

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■ INTRODUCTION

The purpose of scientific research is to improve the quality of evidence-based medicine practice in an effort to provide better healthcare services. However, increasing research output is contingent upon submitting grants and securing research funding (1). In the current era of inflation and diminishing new grant awards and renewals, it is becoming increasingly difficult for physician-scientists to maintain success in the academic medicine field. The Arab world (Figure 1) is characterized

by a wealth of cultural, economic, political, and medical diversity (2). Despite the presence of world-class institutions, the rise of patriarchal conservatism, civil war, and political instability in some nations have made the practice of medicine and academic medicine particularly challenging. The post-coronavirus disease 2019 (COVID-19) period witnessed a decline in gross domestic product (GDP) in many nations, including the Arab world. Due to extremely limited resources, the majority of Arab world publications are published in journals with a low impact factor (3). In

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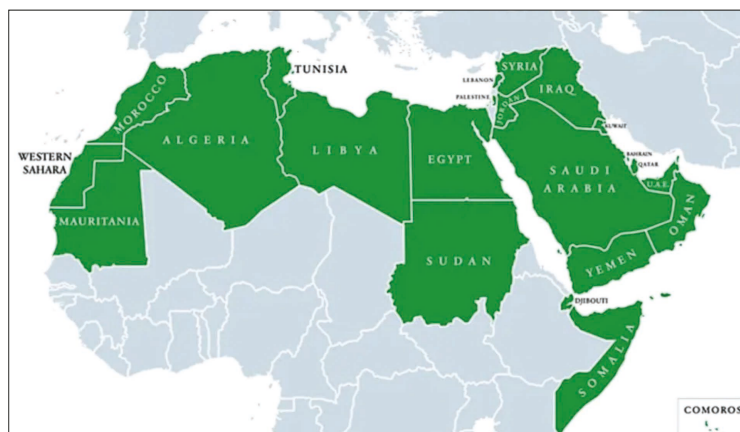


Figure 1 - A map of the Arab world.

order to improve and preserve their publication output, a number of researchers have been eager to collaborate with international groups.

In the Arab world, the quality and quantity of rheumatology research have been contingent on the funding and workforce available. Therefore, the outcomes and designs of studies vary from country to country. This article examined the output and characteristics of clinical rheumatology publications in the Arab world between 2017 and 2021. In addition, we evaluated the number of publications relative to GDP and population.

■ METHODS OF RESEARCH

A PubMed/MEDLINE search was conducted with keywords corresponding to the country being evaluated in addition to 'rheumatology' for all English-language literature published between 2017 and 2021. Included were all case reports, case series, cohort studies, case-control studies, cross-sectional studies, and randomized clinical trials by rheumatology groups from Arab countries. The Arab countries studied are the 22 Arab League members (Figure 1). In addition, the reference lists of selected manuscripts were manually screened for eligible articles. Not included were any publications not indexed in PubMed/MEDLINE. All publications that resulted from collaborations between two

or more countries or between a Rheumatology service in an Arab country and a non-Arab country were excluded. The World Bank's website (<https://data.worldbank.org>) was accessed to obtain the average GDP in Arab countries between 2017 and 2021. In addition, the population of each country was obtained from the website of the World Bank.

■ RESULTS

North and East Africa

With 261 publications, Egypt reached its highest level of publication output in the past five years. Case-control studies represented the majority of rheumatology publications from Egypt, followed by cross-sectional studies. There were 23 clinical trials. Tunisia generated 77 publications, the majority of which were case reports, followed by cross-sectional studies. Tunisia had, surprisingly, the highest ratio of publications to gross domestic product (GDP). The majority of Morocco's 38 publications were cross-sectional studies. Algeria and Sudan contributed minimally to the total output, with Sudan publishing two randomized controlled trials (RCTs). Somalia, Mauritania, Djibouti, and Libya made no contributions. The publication output increased significantly after the COVID-19 era.

Middle East

Lebanon continues to lead the Middle East with 38 publications and the highest publications-to-GDP ratio. The majority of published works consisted of narrative reviews. However, no published RCTs were found. Numerous publications from Lebanon had to be excluded because they were the result of collaborations with groups from other nations. The majority of Iraq's 25 publications were case-control studies. From Iraq, four RCTs were published. There were twelve publications by Jordan. Case reports made up the majority of the study. Similar to Lebanon, no RCTs from Jordan were published. Numerous Jordanian researchers were involved in international partnerships.

Arabian Peninsula

With 81 publications, Saudi Arabia leads the Arabic Gulf in Rheumatology research. None of the publications were RCTs, which is notable. Cross-sectional studies were the most prevalent type of publication, followed by cohort studies. The second country in terms of rheumatology output, Qatar, also did not publish any RCTs between 2017 and 2021. The majority of published works were case reports. The United Arab Emirates (UAE) ranked third behind Qatar with 16 publications, but no RCTs.

Somalia, Djibouti, Libya, Comoros, Palestine, and Mauritania were the only Arab nations with no Rheumatology publications between 2017 and 2021.

DISCUSSION

Considering the existing conflicts could aid in elucidating our findings. Conflicts are a common occurrence in the Arab world, posing a serious challenge to the financial and physical support of medical research (4). Physically, the conflicts are individual and organizational in nature. On an individual level, the greatest difficulty is locating faculty members with experience in de-

signing and conducting qualitative research studies. Research is negatively impacted by power dynamics at the organizational level. Finding a funding source is always a matter of negligible chance from a financial perspective.

As RCTs are the most important type of studies that require funding and physical input (5), the Arab world has produced a small number of them. However, the output of some nations is encouraging. In five years, Egypt published 24 RCTs while Iraq published four trials. Despite this, the total RCT output from the Middle East remains low.

The majority of publications in the Middle East consist of case reports, narrative reviews, and cross-sectional studies, which require minimal financial and physical coverage. The Middle East could still participate in regional and international collaborations to modify guidelines, despite wars and economic collapses. Despite the decline in GDP, the COVID-19 era has increased rheumatology research output, particularly in Lebanon and Iraq.

In spite of the availability of funds, the absence of research-oriented physicians in the Arabian Peninsula may account for the low output in some nations. The lack of pub-

Table 1 - A summary of the number of publications with assessment of the mean gross domestic product (GDP) between 2017 and 2021 along with the total population.

Country	Number of publications	Mean GDP (billion USD)	Population	Publications/Mean GDP	Publications/Population
Morocco	38	118.4	37,873,000	0.32	1×10^{-6}
Algeria	5	166	43,850,000	0.03	1.2×10^{-7}
Tunisia	77	43.19	11,935,000	1.79	6.45×10^{-6}
Egypt	282	311.49	104,258,000	0.90	2.7×10^{-6}
Sudan	9	51.14	44,909,000	0.18	2×10^{-7}
Jordan	12	43.56	10,269,000	0.28	1.17×10^{-6}
Syria	4	27.07	18,275,000	0.15	2.2×10^{-7}
Lebanon	39	37.10	6,769,000	1.05	5.76×10^{-6}
Iraq	25	208.10	41,179,000	0.12	6.1×10^{-7}
Saudi Arabia	81	769.14	35,340,000	0.11	2.29×10^{-6}
Qatar	19	168.85	2,930,000	0.11	6.48×10^{-6}
Kuwait	8	100.21	4,328,000	0.08	1.85×10^{-6}
Bahrain	3	37.10	1,748,000	0.08	1.72×10^{-6}
Yemen	1	22.05	30,490,000	0.05	3×10^{-9}
UAE	16	395.5	9,991,000	0.04	1.6×10^{-6}

lished rheumatology RCTs produced exclusively by a country from the Arab region continues to be surprising. Saudi Arabia's rheumatology research output appears to have increased during the COVID-19 era, in contrast to other nations where the pattern remained unchanged.

As the number of publications was extremely low in comparison to the population, the ratio of publications to population was comparable between Arab nations.

This review has some restrictions. Importantly, it relies solely on PubMed/MEDLINE as its indexing engine, which may have led to the exclusion of some publications. In addition, joint collaborations were excluded, which may have led to the omission of important publications in the field, particularly RCTs and COVID-19-focused publications.

■ CONCLUSIONS

The Arab region has struggled for a long time with political and economic instability, which has affected the growth of academic medicine and healthcare in general. Rheumatology is an evolving field with respect to pathophysiology and treatment, which is largely driven by research. Despite the difficulties and weak economic GDP growth, Arab countries are still able to produce rheumatological manuscripts on their own or in collaboration. However, both quality and quantity remain highly variable across nations. In terms of the number of rheumatology research publications, Egypt leads the Arab world. During the period from 2017 to 2021, certain nations did not publish any rheumatology manuscripts indexed by PubMed/MEDLINE. From the Arab world, more RCTs with significant impact are required. Perhaps the first step will be more frequent international collaborations to share experiences and raise funds.

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Authorship contributions

GEH conducted a literature search, assisted with the manuscript's organization, interpreted and collected data, and drafted and edited the Review. AJ and IU interpreted and gathered data, assisted in the design of the figures and panel, and authored and edited the Review.

Declaration of Interest

None

Ethics approval and consent to participate

None

Consent for publication

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Availability of data and materials

None

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