

Biomedical science journals in the Arab world

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ABSTRACT

Medieval Arab scientists established the basis of medical practice and gave important attention to the publication of scientific results. At present, modern scientific publishing in the Arab world is in its developmental stage. Arab biomedical journals are less than 300, most of which are published in Egypt, Lebanon, and the Kingdom of Saudi Arabia. Yet, many of these journals do not have on-line access or are indexed in major bibliographic databases. The majority of indexed journals, however, do not have a stable presence in the popular PubMed database and their indexes are discontinued since 2001. The exposure of Arab biomedical journals in international indices undoubtedly plays an important role in improving the scientific quality of these journals. The successful examples discussed in this review encourage us to call for the formation of a consortium of Arab biomedical journal publishers to assist in redressing the balance of the region from biomedical data consumption to data production.

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During the 9th and 14th centuries CE, a big surge was recorded in Arab sciences, when the Caliphs of the Umayyad and Abbasid dynasties invited many scientists and researchers to translate all available sciences at that time into Arabic. This initial phase of the development of Arab medical sciences concentrated on the translation of Greek, Persian, and Nestorian works into Arabic.^{1,2} In the following period, a new generation of Arab scientists emerged with their own original concepts and contributions to medicine. The work of scholars as Al-Asma'i (740-828 CE), Al-Razi (Rhazes, 864-930 CE), Abu Al-Qasim Al-Zahrawi (Albucasis, the father of modern surgery, 936-1013 CE), Ibn Sina (Avicenna, 981-1037 CE), Abu Marwan ibn Zahr (Avenzoar, 1091-1161), Abu Al-Walid Mohammad ibn Rushd Al-Qurtubi (Averroes, 1126-1198 CE), Ibn Al-Baitar (-1248 CE), Ibn Al-Nafis Al-Dimashqi (1213-1288 CE), and others dominated the European medical schools for several centuries.

Medieval Arab medical colleges established the basis of medical practice and they contributed largely to the innovations in hospital designs, ambulatory patient care, and mobile clinics. At one time, Baghdad had approximately 60 hospitals,

while Cordova, in Spain, had more than 50 hospitals. The larger hospitals had libraries, outpatient clinics, and medical schools. Furthermore, medical knowledge was codified in writing so that clinical tests would be evaluated to a limited extent.¹

While research and development (R&D) in many areas of knowledge began to thrive, Arabs gave an important attention to the publication of their scientific results. For example, there were 4,000,000 volumes in Baghdad's House of Wisdom (Dar Al-Hikmah), no less than 100,000 volumes in the Mansouri hospital library along with smaller libraries and private collections in Baghdad, 1,000,000 volumes in Cairo's Sultan's Library, 3,000,000 volumes in the library of Tripoli Lebanon (Dar Al-'Ilm),³ and an annual publication of 70,000-80,000 volumes in Muslim Spain.¹ These libraries contained medical references in addition to other scientific works. This demonstrates that when libraries meant nothing to the Europeans of that time, Arab scholars were aware of the importance of scientific publishing while Caliphs and high-ranking authorities supported them by building and maintaining a large number of libraries.

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The present. The golden age for Arab medical sciences faded by the Mongolian invasion of the Eastern Caliphate and the eclipse of the Western Caliphate in Spain. Since then, Arab medical sciences went into a long dormant phase and stood far behind their counterparts in Europe and the United States of America (USA). Since the 1950s, Arab countries have made progress in some health related aspects such as: infant mortality, life expectancy, and access to health care. Unfortunately, these achievements in health and development are less than expected when considering the wealth of natural and human resources available in Arab countries. Many reasons continuously lay obstacles on the way of this progress, such as the Arab-Israeli conflict, the catastrophic health and economic situation in Palestine, Sudan, and Somalia, the difficult conditions of the large Palestinian refugee population mainly in Jordan, Lebanon, and Syria, the consequences of embargos on the people of Iraq and Libya,⁴ and the greatly imbalanced ratio of military spending (approximately 60 billions/year) over spending on R&D (approximately 600 millions/year).⁵ Ultimately, these factors and many others continue to cause an inadequate production and use of medical scientific knowledge in the region. For this reason, biomedical research in the Arab world focuses mainly on curative services rather on R&D.

Scientific publishing in the Arab world is in its developmental stage. While the number of biomedical journals published in the West is not less than 3,000, and is increasing daily, Arab academic journals are limited to less than 300 (***Appendix 1**). Many factors seem to impede quality journals from appearing in the region. Examples of these factors are: (1) the short lifespan of Arab journals, many of which are operated by single editors and are circulated through compressed university fund allocations. For this reason, approximately 20% of the Egyptian biomedical journals listed in ***Appendix 1** ceased their publications. (2) Journals with specially oriented narrow disciplines are rare. The general scope of many Arab scientific journals reduces the chances of highly trained Arab researchers to publish their results in them.⁶ (3) The lack of archiving as well as indexing in major bibliographies that leaves many findings in the dark.⁴ The lack of basic infrastructure for research in many Arab biomedical institutions, which overtly discourages the advance of scholarly output of Arab scientists.⁷

An important characteristic of biomedical journal publishing in the Arab World is the major involvement of academic institutions. Universities publish almost half the Egyptian biomedical journals. In the Kingdom of Saudi Arabia (KSA),

King Saud University, the oldest (1957) university and the largest institution of higher education in the Kingdom, continues to be the major publisher of scientific books and journals.⁶

During the golden age of Arab medical sciences, information was passed among scientists after years and centuries of delay. In the present digital age, scientists and health workers have an unprecedented access to information. The World Wide Web has provided a new communication channel for traditional publication of scholarly research and revolutionized the way of information exchange among researchers.⁸ For example, the full content of the Proceedings of the National Academy of Sciences (PNAS) is posted on PubMed, a popular Internet biomedical citation database, only 4 weeks after the release of the print version.⁹ At present, speed is an important condition for the improvement of medical knowledge. Every new discovery or advance in diagnosis and treatment is important to patients and their physicians. Six weeks after the first case of Severe Acute Respiratory Syndrome (SARS)-associated coronavirus was described by the World Health Organization in 2003, 108 articles on SARS were indexed in PubMed.¹⁰ In contrast to this 'active diffusion' of medical information in the West, printed biomedical journals in Arab countries play a "passive diffusive" role. Publications appear at slow pace and become stand alone posts of scholarly output. Many Arab biomedical journals serve their own faculties and accommodate papers mostly written by faculty members themselves.⁷ These journals are considered useful primarily as archival documents and often not even that.

Data and figures. The geographical distribution of biomedical journals published in Arab countries corresponds very well with biomedical research activity in these countries.¹¹ According to data in ***Appendix 1**, Egypt occupies a leading position in biomedical journal publishing since it hosts 173 journals. Following Egypt are Lebanon,¹⁴ KSA,¹³ Tunisia,¹² and Syria.¹⁰ However, 75% of these scholarly biomedical journals are not indexed in the international bibliographical databases. ***Appendix 1** demonstrates that only 80 of the 280 biomedical journals published in Arab countries are indexed in PubMed and, to a significantly lesser extent, in Index Medicus. Of all biomedical journals published in the Arab world, only the Saudi Medical Journal (Saudi Med J) and Annals of Saudi Medicine are cited in the prestigious Science Citation Index (SCI) of the Institute for Scientific Information (ISI; <http://www.isinet.com>).

In order to analyze detailed data of these journals on PubMed, different query strategies were implemented. The most comprehensive query strategy that was used in this study was written

*The full text including Appendix 1 is available in PDF format on Saudi Medical Journal website (www.smj.org.sa)

according to the following formula: "country name"[p] AND "abbreviated journal name" [journal] AND "year"[pd]. This PubMed query strategy searches for citations of a specific journal published at a certain country for a defined year. Results of this and other queries directed to PubMed were collected in a local database for detailed analysis. According to these results, only 5 journals have a continuous presence in the database; namely, La Tunisie Medicale (Tunis Med) [1965-], Middle East Journal of Anesthesiology (Middle East J Anesthesiol) [1974-], Journal of the Egyptian Society of Parasitology (J Egypt Soc Parasitol) [1981-], Saudi Med J (2000-), and Medical Principles and Practice (Med Princ Pract) [2002-]. The remaining journals do not have a stable presence on PubMed and their indexed citations range from 1-1177 records (***Appendix 1**).

From a total of 15,069 locally published PubMed-indexed citations, approximately 40% originate from Egypt, 24% from Tunisia, 15% from Lebanon, 8% from KSA, and 8% from Morocco. Algeria, Iraq, Syria, Jordan, Sudan, Kuwait, and Bahrain have a total contribution of approximately 5%. A historical review of Arab published citations indexed in PubMed in years 1953-2003 reveals an almost stable trend that only exhibits an important leap starting from the year 2000 until present (**Figure 1**). One possible explanation for this observation is the recent indexation of the Saudi Med J in PubMed with an average of 288 citations indexed per year.

In order to study in detail the aspects of biomedical journals published in the Arab World, we chose the leading 4 PubMed-indexed journals for the period between years 2000-2002 (**Table 1**). These journals are: Saudi Med J (863 citations), Tunis Med (425 citations), J Egypt Soc Parasitol (270 citations), and J Med Liban (152 citations). The analysis of the languages in which articles are published in these journals reveals that Saudi Med J and J Egypt Soc Parasitol exclusively publish in English, whereas Tunis Med almost exclusively publish in French (98.5%). The J Med Liban publishes articles in both English (73%) and French (27%). Although all these journals publish a variety of article types, the most encountered category is 'Journal Articles' (79-94%). A careful study of the keywords occurring in published articles in the analyzed journal demonstrates that the mostly discussed topics are case reports (27% in Tunis Med and 14% in Saudi Med J), risk factors (19% in J Med Liban), and Schistosomia (31% in J Egypt Soc Parasitol; data not shown). **Table 1** also shows that Tunis Med, Saudi Med J, and J Med Liban focus on human subjects (57-100% of papers). This trend is, however, reversed in the J Egypt Soc Parasitol that

publishes articles mostly dealing with animal subjects (87-100%).

Another important aspect that was analyzed in the framework of this review is the number of co-authors of each article published in these 4 journals. On average, the Saudi Med J, J Med Liban, and the J Egypt Soc Parasitol publish papers authored by 3 individuals. In the case of Tunis Med, this number doubles to 6 (**Table 1**). This observation might be a strong indication for an established 'culture' of extended collaborations among scientific groups in Tunisia.

Arab biomedical journals do not only publish articles first-authored by Arab scientists. On average, corresponding Egyptian authors write 86% of the papers published in the J Egypt Soc Parasitol (data not shown). Authors of 10 different nationalities (lead by authors from KSA) write the remaining 14% of articles. In the case of J Med Liban the percent contribution of local Lebanese authors decreases to 73% leaving the way for a large involvement of corresponding international authors, mainly those from the US, France, and KSA. The same observation is noted in the Tunis Med J in which Tunisians author 70% of the published articles. Participations from international authors come from 7 countries, the most important of which are France and Morocco. Interestingly, these figures totally change in the case of the Saudi Med J, where Saudi corresponding authors contribute only to 56% of the published articles. Authors of 29 other nationalities contribute to the remaining 44% of published articles. The most international participants are from neighboring Arab countries (Jordan, Oman, and Iraq) or non-Arab countries (Turkey, India, and Germany; data not shown).

On-line publishing. While collecting information regarding the journals listed in ***Appendix 1**, only a limited number of these journals had a proper presence on the Internet with a restricted access to their content. For example, only 2 of the 173 published biomedical journals in Egypt have on-line content. This further demonstrates that while authors and researchers now communicate at the speed of thought, Arab biomedical journals remain shy of this electronic wave. As a consequence of this general absence, the research published in Arab biomedical journals becomes inaccessible to scholarly communication. To overcome this situation, local and limited efforts aim at indexing the content of Arab biomedical journals. For example, a Saudi medical bibliography index (alias, Saudi MedBase) is solely dedicated to the published research in 9 of the most prominent medical journals published in the Kingdom between years 1979 and 1999.¹²

*The full text including Appendix 1 is available in PDF format on Saudi Medical Journal website (www.smj.org.sa)

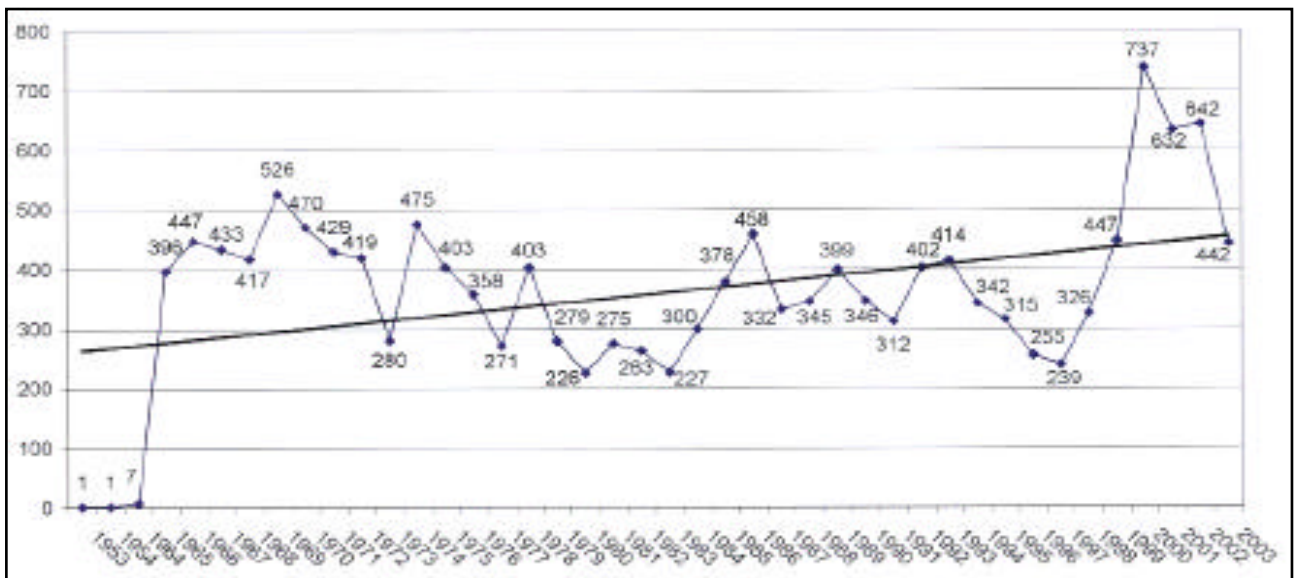


Figure 1 - Yearly data for articles published in Arab biomedical journals cited in PubMed (1953 to 2003).

Table 1 - Selected detailed features of articles published in the leading Arab biomedical journals for years 2000-2002.

Journal	Year	Authors	Subject analyzed %	Language of articles %	Total citations
Saudi Medical Journal	2000	697 Average: 2.5	Animal: 2.5 Human: 84.6	English: 100	279
	2001	659 Average: 2.7	Animal: 2 Human: 70.2	English: 100	245
	2002	971 Average: 2.9	Animal: 1.2 Human: 56.9	English: 100	339
Tunis Medical Journal	2000	664 Average: 5.6	Animal: 2.5 Human: 98.3	French: 98.3 Arabic: 0.8 English: 0.8	118
	2001	782 Average: 5.8	Animal: 1.5 Human: 100	French: 98.5 English: 1.5	136
	2002	1,033 Average: 6	Animal: 2.3 Human: 99.4	French: 98.8 English: 1.2	171
Journal Egyptian Society Parasitol	2000	293 Average: 3.2	Animal: 86.8 Human: 47.2	English: 100	91
	2001	297 Average: 3.3	Animal: 100 Human: 43.8	English: 100	89
	2002	297 Average: 3.3	Animal: 100 Human: 45.6	English: 100	90
Journal of Medicine Liban	2000	204 Average: 2.8	Animal: 1.4 Human: 100	English: 62.2 French: 37.8	74
	2001	181 Average: 2.9	Animal: 3.2 Human: 100	English: 80.6 French: 19.4	62
	2002	66 Average: 4.1	-	English: 75 French: 25	16

Similarly, Lebanese and Syrian bibliography systems maintain an index for the published research of Lebanese and Syrian scholars and researchers (<http://www.aub.edu.lb/libraries/medical>).⁷

Nasser and Abouchedid⁷ estimated that the typesetting costs of a print journal in Lebanon range from US\$7-10 per page and that prices are lower in other parts of the Arab world. Because of cheap labor involved in print publishing and the high costs of electronic publishing technology, publishers in the Arab world have been discouraged to move in the electronic medium.⁷ Another opposition against electronic publishing has to do with the longevity of the digital documents.¹³ Paper has proved viable for centuries while digital formats are already less viable.

There is accumulating evidence that on-line access of scientific articles have an approximately 4.5 times more impact than printed papers or papers posted on restricted-access sites.¹⁰ This promising indication encouraged 6 of the world's leading medical publishers, of over 1,000 leading international biomedical journals, to enable the free access to their information for more than 100 of the poorest countries in the world.¹⁴ As a result, a physician in a public clinic in a developing country is ought to have the same access to the latest discoveries in biomedicine as a professor in the world's top medical school.¹⁵ As reported by the editor of a leading journal, this free content availability provides an incentive for readers to explore his journal.⁹ In the case of a national journal, the number of subscribers increased with a rate of 5% per year after the appearance of the journal on the World Wide Web and half of the new subscribers were from abroad. Hence, despite the small economy of the journal limiting its international distribution, the on-line availability of the journal provided a unique opportunity to overcome this barrier.¹⁶ Besides this advantageous aspect, the free availability is not expected to cause any perceptible harm to the economy of the journals.⁹ In reality, most of these journals maintain their economic stability by asking authors to pay a processing fee to cover the expenses of archiving the submitted paper in a website, track the submission through rounds of reviewer and author revisions, make editorial judgments, and other daily tasks. In the West, this cost is estimated to be between US\$500^{17,18} to US\$1500¹⁵ while in Arab countries this cost is approximately US\$50 at most.

Arab biomedical journals included in international indices have undoubtedly played an important role in the formation of liable medical information. However, there is a significant number of Arab biomedical journals that do not dispose the

qualifications to be internationally indexed. These non-indexed biomedical journals mainly publish information of local interest, which indexed journals are reluctant to do, escape from the criticism of the international scientific community, and remain far from gaining scientific quality equal to that of indexed journals. In a recent review made by the editors of the Saudi Med J, a sharp increase in the amount of papers submitted to the journal was recorded starting from the year 2000.¹² This date corresponds with the time the journal was first indexed by PubMed and its content was partially released free of charge on-line. This observation clearly indicates that the international scientific community is not indifferent for apparently local but potentially broader scientific information that includes elements of powerful research perspectives.

In conclusion, a limited number of Arab biomedical journals are actively exposed to the international scientific community. This is either carried out by indexing their content in major bibliographic databases or by making it available on-line. Surely, these journals have benefited from this challenge by improving their skills and gaining scientific quality through experience and international reader feedback. The Arab World has the resources, capable people, and public will for change. The successful examples discussed in this review encourage us to call for a more active inter-Arab cooperation and the formation of a consortium for Arab biomedical journal publishers to assist the important potential in the region in redressing the balance from the biomedical data consumption to data production.

References

1. Al-Akili. Natural healing with the medicine of the Prophet [transl.: Imam Ibn al-Qayyim al-Jawziyya (1292-1350 CE): Kitabu Shifa bit-Tibbi Nabawi]. Philadelphia (PA): Pearl Publishing House; 1996.
2. El-Gammal SY. The relation between Greek and Islamic materia medica. *Bull Indian Inst Nist Med Hyderabad* 1997; 27: 39-46.
3. Tadmori OA-S. Dar-ul-Ilm bi Tarabulus alSham fi alQarn alKhames alHijri. Tripoli (Lebanon): Inshaa Press; 1982.
4. Jabbour S. Health and development in the Arab world: Which way forward? *Br Med J* 2003; 326: 1141-1143.
5. World Health Organization. World development indicators. Geneva: WHO; 2001.
6. Islam M. Academic publishing and the university presses: The case in a developing region (Saudi Arabia). *J Schol Publ* 2000; 32. Available from URL: <http://utpjournals.com/product/jsp/321/publishing3.html>
7. Nasser R, Abouchedid K. Problems and the epistemology of electronic publishing in the Arab world: The case of Lebanon. *First Monday* 2001; 6: Available from http://firstmonday.org/issues/issue6_9/nasser/index.html.

8. Goodrum AA, McCain K, Lawrence S, Giles CL. Scholarly publishing in the Internet age: A citation analysis of computer science literature. *Inform Process Manag* 2001; 37: 661-675.
9. Cozzarelli NR. For free access, follow the brick red buttons. *Science* 2001; 292: 51-52.
10. Editorial. Scientific publishing picks up speed. *CMAJ* 2003; 168: 13.
11. Tadmouri GO, Tadmouri NB. Biomedical research in the Kingdom of Saudi Arabia (1982-2000). *Saudi Med J* 2002; 23: 20-24.
12. Yaqub BA, Al-Deeb SM. Saudi Medical Journal: A college by itself! *Saudi Med J* 2003; 24: 4-6.
13. Rothenberg J. Ensuring the longevity of digital documents. *Sci Am* 1995; Jan: 24-29.
14. Editor's Choice. Health information for the developing world: From desert to garden. *Br Med J* 2000; 321: 776-777.
15. London LE. "Free" medical publishing venture gets under way. *Br Med J* 2003; 326: 11.
16. Germenis AE, Kokkinides PA, Stavropoulos-Giokas C. Non-indexed medical journals in the Web: New perspectives in the medical literature. *Int J Med Int* 1997; 47: 65-68.
17. Pistotti V. Electronic publishing in medicine: Where are we? *JOP J Pancreas (on-line)* 2001; 2: 301-305.
18. Eysenbach G. Open access monopoly may threaten smaller journals. *Br Med J* 2003; 326: 766.

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Appendix 1
Biomedical journals published in the Arab world. Years cited under PubMed and Index Medicus (IM)
indicate the time coverage of the databases for corresponding journals.

Country	Journal	PubMed*	IM†
Algeria	Archives: Institut Pasteur d' Algerie (Arch Inst Pasteur Alger)	1970-1972; 1977-1978; 1980; 1986; 1988-1989; 1992; 1998	1923-
	Le Bulletin Trimestriel du Planning Familiale (Bull Trimest Plan Fam)	1993	
	Revue d'information Scientific et Technioue - RIST Technologies Avancees		
Bahrain	Bahrain Medical Bulletin		
	Journal of the Bahrain Medical Society (J Bahrain Med Soc)	1990-1992	
Egypt‡	African Journal of Urology		
	Ain Shams Dental Journal		
	Ain Shams Medical Journal (Ain Shams Med J)	1970-1971; 1976-1977; 1990	
	Al-Azhar Bulletin of Science		
	Al-Azhar Dental Journal		
	Al-Azhar Journal of Dental Science		
	Al-Azhar Journal of Microbiology		
	Al-Azhar Journal of Pediatrics		
	Al-Azhar Journal of Pharmaceutical Sciences		
	Al-Azhar Medical Journal (Al-Azhar Med J)	1977; 1995	
	Alexandria Dental Journal (Alex Dent J)	1976-1977	
	Alexandria Journal of Pediatrics		
	Alexandria Journal of Pharmaceutical Sciences (Alex J Pharm Sci)	1989	
	Alexandria Journal of Veterinarv Science		
	Alexandria Medical Journal (Alexandria Med J)	1980	
	Annales du Service des Antiquites de l'Egypte (Ann Serv Antiq Egypte)	1968; 1977; 1979	
	Applied Endocrinology in Egypt		
	Arab Journal of Biotechnology		
	Armed Forces Medical Journal		
	Assiut Medical Journal		
	Benha Medical Journal		
	Biological Current Content of Egypt		
	Bulletin de l'Institut d'Egypte (Bull Inst Egypte)	1969; 1981	
	Bulletin of Pharmaceutical Sciences - Assiut University		
	Bulletin of the Egyptian Hospitals Association		
	Bulletin of the Faculty of Medicine - Alexandria University		
	Bulletin of the Faculty of Pharmacy - Cairo University		
	Bulletin of the Faculty of Physical Therapy		
	Bulletin of the Faculty of Science - Alexandria University		
	Bulletin of the Faculty of Science - Assiut University		
	Bulletin of the Faculty of Science - Cairo University		
	Bulletin of the Faculty of Science - Zagazig University		
	Bulletin of the High Institute of Public Health - Alexandria University (Bull High Inst Public Health)	1978	
Bulletin of the National Research Centre			
Bulletin of the Nutrition Institute of the Arab Republic of Egypt			
Bulletin of the Ophthalmological Society of Egypt (Bull Ophthalmol Soc Egypt)	1965-1972; 1974-1976; 1978		
Bulletin: Alexandria Faculty of Medicine (Bull Alexandria Fac)	1980		
Cahiers d'Alexandrie (Cah Alex)	1966		
Cairo Today (Cairo Today)	1983		
Cataract and Cornea			
Current Psychiatry - Ain Shams University			
Delta Journal of Science			
Dirasat Sukkaniyah (Dirasat Sukkaniyah)	1981-1985; 1987; 1992		
Eastern Mediterranean Journal (East Mediterr Health J)	1999-2001	1995-	
Egyptian Dental Journal (Egypt Dent J)	1966-1980; 1983-1990; 1992-1995		
Egyptian Journal of Applied Endocrinology			
Egyptian Journal of Aquatic Biology and Fisheries			
Egyptian Journal of Bilharziasis (Egypt J Bilharz)	1974-1976; 1978-1979		
Egyptian Journal of Biology			

Appendix 1 Cont'd.....

Country	Journals	PubMed*	IM†
	Egyptian Journal of Biomedical Engineering		
	Egyptian Journal of Biomedical Sciences		
	Egyptian Journal of Biophysics		
	Egyptian Journal of Biotechnology		
	Egyptian Journal of Botany		
	Egyptian Journal of Community Medicine		
	Egyptian Journal of Comparative Pathology and Clinical Pathology		
	Egyptian Journal of Dermatology and Andrology		
	Egyptian Journal of Dermatology and Venereology		
	Egyptian Journal of Food Science		
	Egyptian Journal of Genetics & Cytology		
	Egyptian Journal of Medical Laboratory Sciences		
	Egyptian Journal of Medical Microbiology		
	Egyptian Journal of Microbiology		
	Egyptian Journal of Nutrition		
	Egyptian Journal of Nutrition and Feed		
	Egyptian Journal of Occupational Medicine		
	Egyptian Journal of Otolaryngology and Allied Sciences		
	Egyptian Journal of Pharmaceutical Sciences		
	Egyptian Journal of Physiological Sciences		
	Egyptian Journal of Plastic and Reconstructive Surgery		
	Egyptian Journal of Psychiatry - Formerly: Egyptian Journal of Neurology & Psychiatry (Egypt J Psychiatry)	1978-1979	
	Egyptian Journal of Schistosomiasis and Infectious and Endemic Diseases		
	Egyptian Journal of Surgery		
	Egyptian Journal of Urology		
	Egyptian Journal of Veterinary Science		
	Egyptian Journal of Zoology		
	Egyptian Medical Journal (Egypt Med J)	1992	
	Egyptian Medical Review		
	Egyptian Orthodontic Journal		
	Egyptian Orthopaedic Journal		
	Egyptian Rheumatology & Rehabilitation Journal		
	El-Menya Medical Bulletin		
	El-Menya Medical Journal		
	El-Menya Science Bulletin		
	Gazette of Egyptian Society of Dermatology and Venereology		
	Gazette of the Egyptian Paediatric Association (Gaz Egypt Paediatr Assoc)	1973-1977	
	ICPD 94: Newsletter of the International Conference on Population and Development (ICPD 94)	1994	
	Journal of Arab Child		
	Journal of Biomedicine and Biotechnology - Print/On-line		
	Journal of Botany of the United Arab Republic		
	Journal of Drug Research of Egypt		
	Journal of Microbiology of the United Arab Republic		
	Journal of Pest Control and Environmental Sciences		
	Journal of Pharmaceutical Sciences of the United Arab Republic		
	Journal of the Egyptian German Society of Zoology. A, Comparative Physiology		
	Journal of the Egyptian German Society of Zoology. B, Vertebrate Anatomy and Embryology		
	Journal of the Egyptian German Society of Zoology. C, Histology and Histochemistry		
	Journal of the Egyptian German Society of Zoology. D, Vertebrate Zoology and Parasitology		
	Journal of the Egyptian German Society of Zoology. E, Entomology		
	Journal of the Egyptian Medical Association (J Egypt Med Assoc)	1965-1979	
	Journal of the Egyptian National Cancer Institute		
	Journal of the Egyptian Society of Obstetrics & Gynecology (J Egypt Soc Obstet Gynecol)	1975-1976; 1978-1979; 1981; 1991	
	Journal of the Egyptian Society of Parasitology (J Egypt Soc Parasitol)	1981-	1970-
	Journal of the Faculty of Education. Section B: Chemistry & Biology		
	Journal of the Medical Research Institute - Alexandria		
	Journal of Union of Arab Biologists Cairo. A, Zoology		
	Journal of Union of Arab Biologists Cairo. B, Botany		
	Journal of Union of Arab Biologists. Cytogenetics, Ecology and Taxonomy		
	Journal of Union of Arab Biologists. Microbiology and Viruses		
	Journal of Union of Arab Biologists. Physiology and Algae		
	L'Egypte Contemporaine (Egypte Contemp)	1980; 1983	

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Appendix 1 Cont'd.....

Country	Journals	PubMed*	IM†
	Majallat Albuhuth Waaldirasat Alarabiyah (Majallat Albuhuth Waaldirasat Alarabiyah)	1979	
	Mansoura Dental Journal		
	Mansoura Journal of Forensic Medicine and Clinical Toxicology		
	Mansoura Journal of Pharmaceutical Sciences		
	Mansoura Medical Bulletin		
	Mansoura Medical Journal		
	Mansoura Science Bulletin. B, Biology		
	Mansoura Science Bulletin. C, Natural Science		
	Medical Journal of Cairo University (Med J Cairo Univ)	1976; 1986	
	Menoufia Medical Journal		
	Mental Peace		
	Middle East Fertility Society Journal		
	Population Sciences (Popul Sci)	1981-1983; 1985; 1987-1988; 1990-1992; 1995	
	Population Studies - Cairo (Popul Stud Cairo)	1984; 1993	
	Proceedings of the Zoological Society of the Arab Republic of Egypt		
	Psychiatry Update		
	Science & Arts Research Studies - Helwan University		
	Scientific Journal of Faculty of Science - Menoufia University		
	Scientific Medical Journal		
	South Valley Medical Journal		
	Suez Canal University Medical Journal		
	Tanta Medical Journal		
	The African Journal of Mycology and Biotechnology		
	The Arab Journal of Laboratory Medicine		
	The Egyptian Heart Journal		
	The Egyptian Journal of Biochemistry		
	The Egyptian Journal of Chest Diseases and Tuberculosis		
	The Egyptian Journal of Community Medicine		
	The Egyptian Journal of Gastroenterology		
	The Egyptian Journal of Haematology		
	The Egyptian Journal of Histology		
	The Egyptian Journal of Immunology (Egypt J Immunol)		1992-
	The Egyptian Journal of Internal Medicine		
	The Egyptian Journal of Medical Sciences		
	The Egyptian Journal of Mental Health		
	The Egyptian Journal of Neurology, Psychiatry, and Neurosurgery		
	The Egyptian Journal of Otolaryngology		
	The Egyptian Journal of Psychiatry		
	The Egyptian Journal of Radiology and Nuclear Medicine		
	The Egyptian Journal of Surgery		
	The Egyptian Military Medical Journal		
	The Egyptian Orthopaedic Journal		
	The Egyptian Population and Family Planning Review (Egypt Popul Fam Plan Rev)	1977-1980; 1982-1987; 1989-1994	
	The Egyptian Rheumatologist		
	The Journal of Legal Medicine & Forensic Sciences		
	The Journal of the Egyptian Public Health Association (J Egypt Public Health Assoc)	1965-1974; 1976-1980; 1985; 1988-1994	1926-
	The Journal of the Egyptian Society of Endocrinology, Metabolism and Diabetes		
	The Journal of the Egyptian Society of Obstetrics & Gynecology		
	The Journal of the Egyptian Society of Pharmacology and Experimental Therapeutics		
	The Journal of the Egyptian Society of Ultrasonics in Medicine		
	The Journal of the Military Medical Academy		
	The Medical Journal of Ahmed Maher Teaching Hospital		
	The Medical Journal of Cairo University		
	The Medical Journal of Teaching Hospitals & Institutes		
	The New Egyptian Journal of Medicine (New Egypt J Med)	1988; 1990-1993	
	The Scientific Journal of Al-Azhar Medical Faculty, Girls		
	The Zoological Society of Egypt Bulletin		
	United Arab Republic Journal of Microbiology		
	United Arab Republic Journal of Pharmaceutical Sciences		
	Zagazig Journal of Pharmaceutical Science		
	Zagazig Medical Association Journal		
	Zagazig University Medical Journal		

Appendix 1 Cont'd.....

Country	Journals	PubMed*	IM†
Iraq	Annals of the College of Medicine, Mosul		
	Bulletin of Endemic Diseases - Baghdad (Bull Endem Dis (Baghdad))	1964-1966; 1968-1970; 1974-1978	
	Iraqi Dental Journal (Iraqi Dent J)	1972-1973	
	Iraqi Medical Journal		
	Journal of Community Medicine - Baghdad Population Bulletin of ESCWA (Popul Bull ESCWA)	1981; 1984-1988	
Jordan	Al-Amal		
	Arab Journal of Psychiatry		
	Dirasat Sukkaniyah (Dirasat Sukkaniyah)	1994	
	Dirasat: Medical and Biological Sciences (Dirasat Med Biol Sci)	1996	
	Jordan Medical Journal		
	Journal of the Royal Medical Services Majallat Niqabat Attiba Alasnnan Alurduniyah (Majallat Niqabat Attiba Alasnnan Alurduniyah)	1981-1983	
	Population Bulletin of ESCWA (Popul Bull ESCWA) The Jordan Dental Journal (Jordan Dent J)	1989; 1991-1993; 1995-1996 1984	
Kuwait	Bulletin of Islamic Medicine (Bull Islam Med)	1982; 1989	
	Bulletin of the Kuwait Institute for Medical Specialization		
	Kuwait Medical Journal		
	Manshurat Majallat Dirasat Alkhalij Waal Jazirah Alarabiyah (Manshur Atmajallat Dirasat Alkhalij Waal Jazirah Alarabiyah)	1981	
	Medical Principles and Practice - printed in Switzerland	2002-	1988-
Lebanon	Al-Raida (Al Raida)	1992-1993; 1995	
	Almustaqbal Alarabi (Almustaqbal Alarabi)	1980-1981	
	Berytus (Berytus)	1966	
	Bulletin de la Societe Libanaise d'Histoire de la Medecine (Bull Soc Liban Hist Med)	1991-1994	
	Dental News		
	Healthy Living Magazine		
	Interdisciplinary Psychology Journal		
	Le Journal Medical Libanais - Formerly: La Revue Medicale Libanaise (J Med Liban)	1965-1975; 1980; 1986-1987; 1989; 1991-2002	1950-
	Middle East Journal of Anesthesiology (Middle East J Anesthesiol)	1974-1975; 1978-	1983-
	Muslim World (Muslim World)	1970; 1981	
	Population Bulletin of ESCWA (Popul Bull ESCWA)	1977; 1979-1982; 1984-1985	
Revue Dentaire Libanaise (Rev Dent Liban)	1965-1971; 1973-1974		
Revue Medicale du Moyen Orient (Rev Med Maven Orient)	1965-1967		
Samid Aliqtisadi (Samid Aliqtisadi)	1980-1981		
Libya	Garyounis Medical Journal		
	Jamahiria Medical Journal		
Morocco	Bulletin Epidemiologique		
	Hesperis Tamuda: Universite Mohammed V., Faculte des Lettres et des Sciences Humaines (Hesperis Tamuda)	1973-1974; 1982; 1984-1985	
	Maroc Medical (Maroc Med)	1965-1975; 1978-1986	
Oman	Medical Sciences		
	Oman Medical Journal		
	Sultan Qaboos University Journal for Scientific Research, Medical Sciences		
Qatar	Heart Views - Cardiovascular Journal of Hamad Medical Corporation		
	Qatar Medical Journal		
	The Gulf Journal of Dermatology & Venereology		
	The Middle East Journal of Emergency Medicine		
Saudi Arabia	Annals of Saudi Medicine - Formerly: The King Faisal Soecialist Hosniul Medical Journal (Ann Saudi Med)	1995	
	Journal of Family and Community Medicine		
	Journal of the Saudi Heart Association King Abdulaziz Medical Journal Neurosciences		
	Pan Arab Journal of Neurosurgery		
	Saudi Heart Journal		

Biomedical science journals in the Arab world ... *Tadmouri*

Appendix 1 Cont'd.....

Country	Journals	PubMed*	IM†
	Saudi Journal of Biological Sciences Saudi Journal of Kidney Diseases and Transplantation Saudi Journal of Ophthalmology Saudi Medical Journal (Saudi Med J) The Saudi Dental Journal The Saudi Journal of Gastroenterology	2000-	1979-
Somalia	Somali Medical Journal		
Sudan	Ahfad Journal (Ahfad J) Arab Medical Bulletin - Formerly: Sudan Medical Bulletin Sudan Journal of Population Studies (Sudan J Popul Stud) Sudan Medical Journal (Sudan Med J) Sudan Notes and Records (Sedan Notes Rec) Women 2000 (Women 2000)	1985; 1987; 1992-1995 1983-1984 1991 1953-1954 1992	
Syria	Arab Drug Information Service Arab Journal of Pharmaceutical Sciences Arabic Medical Journal Archiv fur Orientforschung (Arch Orientforsch) Bulletin de la Tuberculose et des Maladies Respiratoires Damascus University Journal Journal of the History of Arabic Sciences (J Hist Arabic Sci) Majallat Tibb Alasnan Alsuriyah (Majallat Tibb Alasnan Alsuriyah) Majallat Tibb Alfamm Alsuriyah Majallat Tibb Alfamm Alsuriyah Medical Syria Newsletter - Arabic	1966 1977-1980; 1983-1984; 1991-1992 1966-1971; 1973 1976; 1978	
Tunisia	Al Usrah Wa Al Umran Al Bashari (Al Usrah Wa Al Umran Al Bashari) Archives de l'Institut Pasteur de Tunis (Arch Inst Pasteur Tunis) Bulletin de l'Association Tunisienne du Planning Familiale (Bull Assoc Tunis Plan Fam) Cahiers Medicaux de Tunisie IBLA: Institut des Belles Lettres Arabes (IBLA) La Tunisie Medicale (Tunis Med) Les Cahiers de Tunisie (Cah Tunis) Maghreb Medical (Maghreb Med) Majallat Aldiwan Alqawmi Lilusrah Waal Umran Ibashari (Majallat Aldiwan Alqawmi Lilusrah Waal Umran Ibashari) Revue d'Histoire Maghrebine (Rev Hist Maghreb) Revue Tunisienne de Geographie (Rev Tunis Geogr) Revue Tunisienne de Sciences Sociales (Rev Tunis Sci Soc)	1987-1988 1978-1997 1994-1995 1989 1965- 1978; 1981 1980-1981 1997 1984-1985 1982-1995 1976-1977; 1979-1983; 1985-1986; 1990-1992	1906- 1929-
UAE	Emirates Armed Forces Medical Journal Emirates Medical Journal Emirates Public Health Quarterly		
Yemen	The Yemeni Medical Sciences Journal Yemen Medical Journal		
Not Specified	Al-Majallah At-Tibbiya Al-Arabiyah - Arab Medical Journal: Arabic Al-Tofoula Magazine Arab Dental Journal- printed in Germany Arab Journal of Health Research Arab Journal of Medicine - AIDS Arab Medico: A'lam At-Tib Wal Saidala - printed in Germany Bulletin of the Arab Group for the Study of Diabetes - Egypt/Saudi Arabia The Middle East Journal of Urology		
<p>*Data extracted by searching for names of Arab countries in the "publisher field" at PubMed (http://www.ncbi.nlm.nih.gov) For example: Egypt[pl], extracts all citations in journal published in Egypt. †Data from http://www.nlm.nih.gov/tsd/serials/lji.html. ‡Data for Egypt are from the directory of Egyptian Research Periodicals (http://derp.sti.sci.eg). UAE - United Arab Emirates</p>			