

Analysis of mental health publications from Arab countries in PubMed, 1 987–2002

Mustafa M. Afifi, MMed, DrPH.

ABSTRACT

Objectives: To perform geographical analysis of mental health publications produced in 22 Arab countries from 1987 to 2002 in PubMed, to compare the ratio of mental health to the total number of citations for each country as well as the percentage of each country's mental health publication to the total mental health publications of the all Arab countries and to study the fields and types of mental health research publications in Arab countries during this period.

Methods: A MEDLINE search was performed in July 2003 at the Faculty of Health Sciences, American University of Beirut to ascertain the total number of citations for each Arab country followed by another search in the MeSH database of MEDLINE for citations under the psychiatry and psychology category. The 2 search strategies were then combined by "AND" and inspected to validate its attribution to mental health

research. Moreover, identifying to which mental health fields the publications of the countries were contributing.

Results: The number of mental health research citations published and affiliated to the Arab countries over the last 15 years totalled 338 articles. Kuwait and Saudi Arabia published 37% of the Arab World's mental health publications. The most dynamic mental health fields are substance abuse and depression accounting for approximately 26% of the total mental health publications.

Conclusion: Gulf Cooperation Council countries are very prolific in terms of MEDLINE-indexed biomedical as well as mental health research publications. Child psychiatry, especially attention deficit hyperactive disorders and child autism are not gaining much interest.

Neurosciences 2004; Vol. 9 (2): 113-118

The geographical distribution of publications as an indicator of the research productivity of individual countries, regions or institutions have recently become a field of interest.¹ It has been investigated for the members of the European Union,² the USA,³ the Gulf Cooperation Council countries,⁴ Colombia,⁵ South Korea⁶ and for a Turkish medical school.⁷ The research output of individual⁸ and selected countries⁹⁻¹² for single specialties has also been reviewed. Gaining access to PubMed as well as many other databases is crucial for successful scientific work in the biomedical fields. PubMed is developed by the United States National Center for Biotechnology

Information (NCBI) at the National Library of Medicine (NLM) and it is currently indexing over 12 million biomedical citations extracted from more than 4,600 journals, published in more than 70 countries and dating from the mid-1960s.¹³ PubMed is not only a simple search engine for biomedical citations, but also a powerful tool to conduct certain statistical analyses.¹⁴ The WHO focused its 2001 events, in an unprecedented move on a single public health topic: mental health. This decision was taken based upon the increasing recognition that the magnitude and burden of mental disorders are high, effective treatments exist for most mental disorders, the vast majority of those in need of effective

From the Department of Research & Studies, Ministry of Health, *Oman*.

Received 27th July 2003. Accepted for publication in final form 10th September 2003.

Address correspondence and reprint request to: Dr. Mustafa M. Afifi, Medical Officer, Department of Research & Studies, Ministry of Health, PO Box 393, PC 113, *Oman*. Tel. +968 9035672. Fax. +968 696702. E-mail: afifidr@yahoo.co.uk

treatments do not receive them and there are enormous and unnecessary costs around the world in terms of suffering, disability and economic loss.¹⁵ Despite research activities in the field of psychiatry and mental health existing in the Eastern Mediterranean Region, planned, purposeful research linked to the development and improvement of services and training is rare. In addition, research programs and activities are not aimed at producing information systems. They are scattered, most of the time unrelated or poorly related to needs and are not coordinated through a national health plan.¹⁶ The aim of this work is to perform geographical analysis of the number of psychiatry and mental health publications produced in 22 Arab countries over a 15 year period from 1987 to 2002, to compare the ratio of psychiatry and mental health publications to the total number of citations for each country as well as the percentage of each country's mental health publication to the total mental health publications of the all Arab countries and to study the fields, settings and types of mental health research for each Arab country during this period.

Methods. A sensitive search strategy was undertaken by including the names of Arab countries as well as their variants in the French language, directed to PubMed within a single hour limit (July 4th, 2003). By sensitive search strategy, we mean searching country affiliation in English as well as French because Arab biomedical scientists do not publish their results exclusively in English journals. Moreover, even in English journals, authors from the Arab Maghreb countries and Lebanon prefer to report their addresses in French instead of English. An important percentage of publications also appear in French journals. The ratio of French to English citations is approximately 1:4 in Lebanon, 1:1 in Algeria, and goes up to 2:1 in Tunisia, Morocco, and Mauritania. A sensitive search would help in minimizing the false negative results, namely, excluding some of the country publications in which country affiliation is written in French. Another common error revealed in previous studies was the false positives especially for Lebanon and Jordan, since there are several cities in the United States of America (USA) called Lebanon and many USA universities have "Jordan Halls". Most entries where "USA" was in the full affiliation name were manually deleted and accurate publication counts were produced for each country. An example of a query is Morocco[affiliation] OR Maroc[affiliation], in which the Boolean operator "OR" has the function of collecting all published articles carrying any of the English or French names for the Kingdom of Morocco in the affiliation field.^{14,17,18} The number of MEDLINE-listed biomedical studies published all over the Arab world dating from 1st January 1987 to

31st December 2002 totaled 27,395 citations. The second stage was to search in the Medical Subject Heading (MeSH) database of the MEDLINE for articles under the psychiatry and psychology category for the whole world (mental disorders, behavior and behavior mechanism, psychological phenomena and process, and behavioral disciplines and activities). The two search strategies were then combined using the Boolean operator "AND" to get the psychiatry and mental health publications for each Arab country over the last 15 years. The data of Arab citations of psychiatry and mental health research specified for each country were then extracted from PubMed, transferred to WORD document files to be read and inspected for any inconsistencies and validating its attribution to mental health research. False positive publications for each country were deleted manually, and the process ended by a number of mental health publications in the 22 Arab countries totaled 338 citations. The citations were subjected to data entry using the Statistical Package for Social Sciences (SPSS) version 6, where country name, year of publication, field of the study, type of the study, study settings, and remarks variables were identified. Data analysis using SPSS and Microsoft Excel was carried out to investigate the number of mental health publications for each country, ratio of mental health publication to the biomedical citations for each country, percentage of mental health publications for each country to the total mental health publications of the Arab world, normalizing the average number of citations for each country to population size of the year 2000, and investigating types and fields of mental health studies in the Arab world.

Results. The number of MEDLINE-listed biomedical research citations published and affiliated to the Arab countries over the last 15 years totaled 27,395 articles. The Kingdom of Saudi Arabia (KSA) and Egypt had the highest number of over all publications together accounting for 51% of the Arab World's publications. The number of MEDLINE-listed mental health research papers published and affiliated to the Arab countries over the last 15 years (1987-2002) totaled 338 articles. Kuwait and KSA had the highest percentage of mental health publications relative to the total mental health publications in the Arab world accounting for 37% of the Arab World's mental health publications. Regarding the ratio of mental health studies to the overall citations of each country, approximately 22% of the biomedical citations affiliated to Palestine in PubMed are mental health studies followed by Bahrain (5.7%). However, Kuwait and Bahrain had the highest number of mental health publications when normalizing by population size of each country in

2000 (**Table 1**). The most dynamic mental health fields in the present analysis were substance abuse (15% of mental health publications) and depression (11%), both accounting for approximately one fourth of the total mental health publication. Other significant fields were anxiety disorders (7%), child psychiatry (7%), co-morbidity between mental disorders or between mental and physical disorders (6%), schizophrenia (5%), obsessive-compulsive disorders (4%), geriatric psychiatry (3%), eating disorders (2%), postpartum psychosis (2%), and suicide (2%). The study settings of mental health research in Arab countries were either community based (37.3%), hospital based (51.5%), Primary Health Care facility based (4.1%), or other settings such as work settings, prisons or medico-legal facilities (0.9%) (**Table 2**). The community-based studies outnumbered the hospital-based studies in the leading countries of mental health publications except in KSA (**Figure 1**).

Regarding the type of studies, the majority were epidemiological studies (61.2%), followed by psycho-metric studies (10.7%) and clinical studies (10.4%) (**Table 2**). The majority (78%) of the psychometric studies were designed to measure depression, anxiety, or obsessive-compulsive disorders. Mental Health System Research comprised less than 5% of mental health studies. Almost half of these studies were in KSA and dealt with various topics such as manpower training and capacity building, evaluation of health facilities and assessing its performance, referral system, utilization of mental health facilities and prescriptions in mental health facilities. Clinical and Health System Research (HSR) studies were higher in KSA than other Arab countries, while epidemiological studies were higher in Kuwait, and review publications were higher in Egypt (**Figure 2**). Basic science research constituted only 5% of all mental health studies and not available by the first ranking countries in mental health publications.

More than half of the studies were published in the last 5 years with a significant increase in number of publications after 1998 (**Table 3**). The trends of mental health studies for 3 selected leading countries in mental health research, KSA, Kuwait and Egypt are shown in **Figure 3**.

Discussion. In recent years, economic difficulties resulting from growing national debts have increasingly forced governments, normally the primary supporter of basic research, to adopt policies that link science and technology programs more closely to broad organizational and societal goals. Consequently, the assessment of research output through citation analysis has progressively developed and necessarily become a priority issue for the scientific research community.¹⁹ Luukkonen defined citation analysis as the method that uses

scientific criteria to measure the contribution of a published paper to the advancement of knowledge.²⁰ Quantifying and weighting the results of research are difficult and debated tasks. The advantages of PubMed as a powerful database and searching tool may be easily degraded if the user does not utilize proper keywords or implement correct syntax which could lead to biased results or even sometimes misleading.²¹ Nonetheless, citation analysis remains a worthy criterion for evaluating the publication records of individual scientists, research units or national performance.

The present data show that the geographical distribution of publications in psychiatry and mental health does not follow the pattern of the distribution of publications in general biomedical research for the Arab countries. From the top 2 ranking countries of the Arab world in biomedical citation only one country remained KSA, to lead the Arab countries along with Kuwait in mental health research. Taking into account that GCC countries have a relatively short history of research, the data show that the GCC countries are very prolific in terms of MEDLINE-indexed biomedical citation, which has been also proved in previous studies,⁴ as well as mental health research publications. However, normalizing publications by different indicators is important as results may vary when using different normalizing indicators or no normalization at all.¹⁸ That was clearly noticed in the current study where KSA was no longer one of the 2 leading countries of mental health publications after attributing the average number of its publications to its population size in 2000.

Mental health research is still relatively neglected in the Arab world. Only 1.2% of the biomedical citations are related to the field of psychiatry and mental health. Health system research constituted less than 5% of the mental health research. There is a real need to address major areas of research activities in the Arab countries as well as other countries of the Eastern Mediterranean Region such as mental health policy, economic evaluation of models of mental health delivery, and evaluation of inter-sectorial linkages.²² Child psychiatry especially attention deficit hyperactive disorders and child autism are not also gaining much interest, although behavioral problems among children and adolescents are high in some Arab countries as well as other developing countries.²³ This calls for more attention to these by health policy makers as well as researchers and clinicians for diagnosing and treating such disorders in Arab countries as well as other developing countries.

In a rapidly changing society like the Arab world, where even the basic demographic structure is incomparable to 20 years ago, it would be inappropriate to follow the same priorities as then. More efforts have to be made to increase policy

Table 1 - Distribution of Arab countries with their total biomedical publication and mental health publications.

SN	Country	All biomedical citations	%	MH citations	% from total MH	% from total publications	population size in millions for the year 2000*	The average of all citations/100,000 population	The average of MH citations/100,000 population
1	Algeria	406	1.5	4	1.2	1	30.31	0.1	0.000879798
2	Bahrain	227	0.8	13	3.8	5.7	0.64	2.4	0.135416667
3	Comoros	10	0	0	0	0	0.71	0.1	0
4	Djibouti	28	0.1	0	0	0	0.63	0.3	0
5	Egypt	6536	23.9	52	15.4	0.8	67.89	0.6	0.005106299
6	Iraq	408	1.5	2	0.6	0.5	22.95	0.1	0.000580973
7	Jordan	1344	4.9	9	2.7	0.7	4.91	1.8	0.012219959
8	Kuwait	2184	8	72	21.3	3.3	1.92	7.6	0.250000000
9	Lebanon	1580	5.8	17	5	1.1	3.5	3	0.032380952
10	Libya	322	1.2	12	3.6	3.7	5.29	0.4	0.015122873
11	Mauritania	49	0.2	0	0	0	2.66	0.1	0
12	Morocco	2020	7.4	9	2.7	0.4	29.88	0.5	0.002008032
13	Oman	577	2.1	12	3.6	2.1	2.54	1.5	0.031496063
14	Palestine	58	0.2	13	3.8	22.4	NA	NA	NA
15	Qatar	228	0.8	1	0.3	0.4	0.56	2.7	0.011904762
16	Saudi Arabia	7421	27.1	54	16	0.7	20.35	2.4	0.017690418
17	Somalia	46	0.2	1	0.3	2.2	8.78	0	0.000759301
18	Sudan	659	2.4	3	0.9	0.5	31.1	0.1	0.000643087
19	Syria	145	0.5	2	0.6	1.4	16.19	0.1	0.000823554
20	Tunisia	1966	7.2	17	5	0.9	9.46	1.4	0.011980268
21	UAE	1089	4	43	12.7	3.9	2.61	2.8	0.109833972
22	Yemen	92	0.3	2	0.6	2.2	18.35	0	0.000726612
Total		27395	100	338	100	1.2	281.23		

SN - serial number, UAE - United Arab Emirates, MH - Mental health *UNDP - Arab countries development report 2002, NA - unknown population size

Table 2 - Types of mental health studies and study settings for all Arab countries.

Variables	N	(%)
Type of the study		
Epidemiological study	207	(61.2)
Clinical study	35	(10.4)
Psychometric study	36	(10.7)
Basic science study	16	(4.7)
Review publication	17	(5)
Health System Research	16	(4.7)
KAP study	11	(3.3)
Total	338	(100)
Study settings		
Hospital based	174	(51.5)
Community based	126	(37.3)
PHC facility based	14	(4.1)
Others	3	(0.9)
Non applicable	21	(6.2)
Total	338	(100)

KAP - Knowledge, attitude and practice, PHC - Primary Health Care

Table 3 - Distribution of mental health studies in all Arab countries by year of publication.

Year	N	(%)	Cumulative Percentage
1987	3	(0.9)	0.9
1988	15	(4.4)	5.3
1989	11	(3.3)	8.6
1990	15	(4.4)	13
1991	11	(3.3)	16.3
1992	17	(5)	21.3
1993	10	(3)	24.3
1994	15	(4.4)	28.7
1995	16	(4.7)	33.4
1996	21	(6.2)	39.6
1997	22	(6.5)	46.2
1998	20	(5.9)	52.1
1999	41	(12.1)	64.2
2000	32	(9.5)	73.7
2001	49	(14.5)	88.2
2002	40	(11.8)	100
Total	383	(100)	

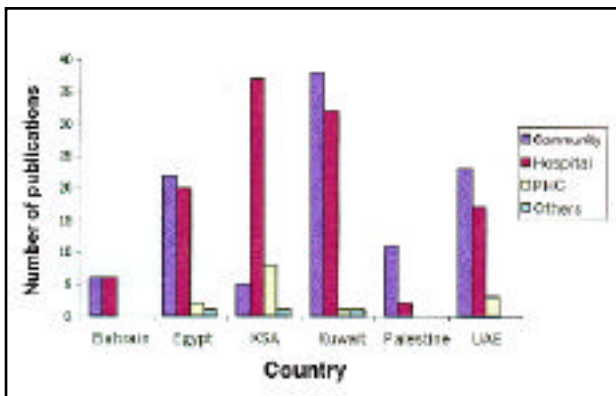


Figure 1

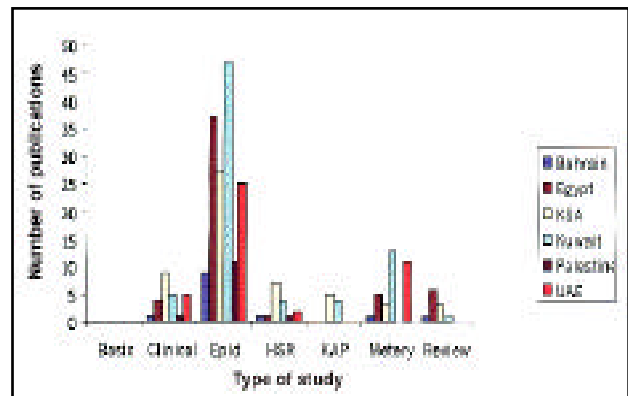


Figure 2

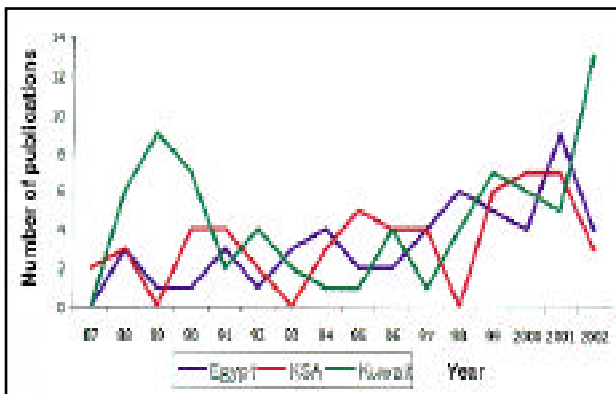


Figure 3

Figure 1 - Study settings in some Arab countries. PHC - Primary Health Center, KSA - Kingdom of Saudi Arabia, UAE - United Arab Emirates

Figure 2 - Distribution of type of studies over some Arab countries. Epid - Epidemiological, HSR - Clinical and Health System Research, KAP - Knowledge, attitude and practice. KSA - Kingdom of Saudi Arabia, UAE - United Arab Emirates

Figure 3 - Mental health studies over 15 years in Egypt, KSA and Kuwait. KSA - Kingdom of Saudi Arabia

makers' awareness as well as public awareness to promote mental health activities and research. A great shift in the age distribution of population has occurred over the last 2 decades. Child and adolescent psychiatric disorders have been seen more frequently and earlier in their life span. The epidemiological transition results in prolonged life expectancy and increase in number of geriatric population who have good access to health services. Therefore, geriatric psychiatry has to get more attention. Mental health problems of youth, women and the elderly have been identified as emerging priorities in previous studies.¹⁶

Certain limitations of the present study have to be acknowledged. Researchers from the Middle East might publish their studies in journals of a local nature that may not be Medline indexed. The number of publications for each Arab country would significantly differ if these journals were taken into account. Another limitation is the shortage of using only the year 2000 population size as the normalization factor. An average of the 15 years population size for each country should be taken, but unfortunately enough data were not available. Added to the above is the use of ratios could be

misleading, especially with small numbers. However, this could be more evident if normalization by the gross domestic product indicator was adopted and for the same reason it was avoided and normalization was carried out only by population size. Not many studies have been undertaken in the Arab world for geographical analysis of biomedical publication. None of these, to the best of my knowledge, reviewed the publications for single specialty. Moreover, the qualitative aspect of the current study was not carried out in any of the Arab countries.

References

1. Tutarel O. Geographical distribution of publications in the field of medical education. *BMC Med Educ* 2002; 2: 3-10
2. Hefler L, Tempfer C, Kainz C. Geography of biomedical publications in the European Union, 1990-1998. *Lancet* 1999; 353: 1856.
3. Thompson DF. Geography of U.S. biomedical publications, 1990 to 1997. *N Engl J Med* 1999; 340: 817-818.
4. Deleu D, Northway MG, Hanssens Y. Geographical distribution of biomedical publications from the Gulf Corporation Council countries. *Saudi Med J* 2001; 22: 10-12.

5. Rosselli D. Latin American biomedical publications: the case of Colombia in Medline. *Med Educ* 1998; 32: 274-277.
6. Lee CS. Productivity of SCI Korean medical papers: 1996-1997. *J Korean Med Sci* 1999; 14: 351-358.
7. Güllüolu BM, Aktan A. Scientific publications at a Turkish medical school. *Acad Med* 2000; 75: 760.
8. Powner DJ, Kellum JA. Declining critical care research publications by authors from U.S. Institutions, 1990-1999. *Acad Med* 2001; 76: 1261-1263.
9. Weisinger JR, Bellorin-Font E. Latin American Nephrology: Scientific production and impact of the publications. *Kidney Int* 1999; 56: 1584-1590.
10. Sorrentino D, De Biase F, Trevisi A, Bartoli E. Scientific publications in gastroenterology and hepatology in Western Europe, USA and Japan in the years 1992-1996: a global survey. *Digestion* 2000; 61: 77-83.
11. Mela GS, Mancardi GL. Neurological research in Europe, an assessed with a four year overview of neurological science international journals. *J Neurol* 2002; 249: 390-395
12. Favaloro EJ. Medical research in New South Wales 1993-1996 assessed by Medline publication capture. *Med J Aust* 1998; 169: 617-622.
13. The National Center for Biotechnology Information (USA). The NCBI Handbook. Available from: URL: <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?call=bv.view..S howSection&rid=handbook>
14. Tadmouri GO, Tadmouri NB. Biomedical research in the Kingdom of Saudi Arabia (1982-2000). *Saudi Med J* 2002; 23: 20-24.
15. Saraceno B. Mental health in EMRO: the future is now. *East Mediterr Health J* 2001; 7: 332-325.
16. Mohit A. Mental health in the Eastern Mediterranean Region of the World Health Organization with a view of the future trends. *East Mediterr Health J* 2001; 7: 353-362.
17. Tadmouri GO, Tadmouri NB. A Major Statistical Pitfall in the Strategy of Search on PubMed. *Saudi Med J* 2004; 25: 7-10.
18. Shaban SF, Abu-Zidan FM. A quantitative analysis of medical publications from Arab countries. *Saudi Med J* 2003; 24: 294-296.
19. Mela GS, Cimmino MA, Ugolini D. Impact assessment of oncology research in the European Union. *Eur J Cancer* 1999; 35: 1182-1186.
20. Luukkonen T. Bibliometrics and evaluation of research performance. *Ann Med* 1990; 22: 145-150.
21. Robinson KA, Dickersin K. Development of a highly sensitive search strategy for the retrieval of reports of controlled trials using PubMed. *Int J Epidemiol* 2002; 31: 150-153.
22. Mubbashar MH, Saeed K. Development of mental health services in Pakistan. *East Mediterr Health J* 2001; 7: 392-396.
23. Al-Sharbati MM, Al-Hussaini AA, Antony SX. Profile of child and adolescent psychiatry in Oman. *Saudi Med J* 2003; 24: 391-395.