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Scientific-Publication Contributions of Egyptian Faculties of Veterinary Medicine Indexed In PubMed between 2000 and 2014: A Comparative Bibliometric Analysis

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Abstract. The current study aimed to quantitatively analyze and compare the research publications productivity of the Egyptian faculties of Veterinary Medicine published between 2000 and 2014 in PubMed-indexed journals. According to their contributions to the total productivity, the 15 Egyptian faculties were ranked as follow; Cairo on the top followed by Assiut, Mansura, Zagazig, Alexandria, Benha, Suez Canal, Beni-Suef, Kafr El-Sheikh, South Valley, Damanhur, Sohag and Aswan. Cairo, Assiut and Mansura produced more than 52% of total publications, while Aswan and Sohag had no publication contribution during the study period. The productivity of most faculties showed a fluctuation pattern (no specific pattern of an increase or decrease), however when the study years were grouped into periods of 5 years each, it was found that most of the faculties presented a progressive increase during the periods 2000-2004, 2005-2009 and 2010-2014. Most faculties have their publications with first author affiliated to them. Authorship pattern analysis revealed that the multiple authorship trends were dominated over the single ones. Multiple-authored papers had two, three, four, five or more contributors. Department's contributions were relatively diverse from faculty to another. The future study will focus on the qualitative analysis of the PubMed publications of these faculties.

Keywords: Bibliometric analysis, PubMed publications, Veterinary Medicine, Egypt

1. Introduction

Egypt is a Middle East and Arab-African country with about 90 million populations; most of them live on the sides of the Nile River. Veterinary Medicine research is mostly related to basic and clinical sciences of domestic animals, birds and fish. Veterinary sciences help human health through the monitoring and control of zoonotic disease transmitted from animals to humans. Egypt has 23 public universities and 15 of them include faculties of Veterinary Medicine. The Faculties of Veterinary Medicine in Egypt from the oldest to the newest are Cairo (1954), Assiut (1961), Zagazig (1969), Alexandria (1974), Benha (1981), Beni-Suef (1982), Suez Canal (1985), Kafr El-Sheikh (1985),

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Mansura (1994), South Valley (1995), Damanhur (2007), Sohag (2008), Aswan (2012) and Minia (2013). There are 19 common departments which do teaching and research programs related to most of the Egyptian Faculties of Veterinary Medicine. These departments are Anatomy, Histology, Biochemistry, Physiology, Animal Nutation, Animal Medicine, Animal Surgery, Animal Behavior, Animal Hygiene, Pharmacology, Parasitology, Microbiology, Pathology, Forensic Medicine & Toxicology, Clinical Laboratory Diagnosis, Poultry Diseases, Zoonotic Diseases, Fish Diseases, Food Hygiene, and Theriogenology. There is one common department for Histology and Anatomy subjects in some faculties such as Cairo, Assiut, Mansura, Alexandria and Benha. There are unique departments in some faculties such as department of Avian & Aquatic Medicine in Alexandria, department of Veterinary Public Heath in Zagazig, and Animal Wealth & Development in Benha. Virology, which is a branch of Microbiology, is an independent department in some faculties such as Cairo, Mansura and Zagazig. According to the SCImago Journal & Country Rank in the period between 1996 and 2013, Egypt was the third of the Middle East and the thirsty second of the world in Veterinary research' publications (http://www.scimagojr.com). The field of library and information science is concerned with the classification and organization of information using many tools of analyses such as bibliometric analysis. Bibliometric analysis is defined as the mathematical and statistical methods used to analyze and measure the quantity and quality of research publications (Pritchar 1969; Ziegler 2009). To measure and analyze the scientific progress of a scientific institution or country, bibliometric analyses commonly use quantitative and qualitative indicators. Quantitative indicator includes the research productivity or output, which is based on the total publications through a specific period. Qualitative indicator measures the quality or impact of the research, which is based on citation analysis and Journal impact factor. Veterinary Science is covered in many indexing databases such as PubMed, Web of knowledge, Scopus, Google Scholar and Biological Abstracts (Jacso 2005), but there is no a local database for the Egyptian Veterinary Research publication can be trusted. PubMed is a free database containing over 24-million citations to articles in biomedical journals and considered a primary tool for searching the biomedical articles (Lu 2011). The PubMed was developed and maintained by the U.S. national center for biotechnology information (NCBI) at the National Library of Medicine (NLM), located at the National Institutes of Health (NIH) (http://www.ncbi.nlm.nih.gov/pubmed). Bibliometric analysis of articles published in PubMed-indexed Journal is an quantitative indicator of the research productivity of countries, regions and institutions (Tutarel 2002). Bibliometric data are frequently used in many fields of medical research in Arab countries (Helal et al. 2014; Afifi 2007; Dakik 2006; Sweileh et al. 2015a; Sweileh et al. 2015b; Zyoud et al. 2014; Benamer et al. 2009a), However, to my best knowledge, there is no an international bibliometric study evaluating Veterinary research outcome from either Egyptian or any other Arab scientific institution has been carried out. Thus the current study aimed to analyze and compare 15-years (2000-2014) period of PubMed-indexed

publications produced by authors affiliated to the different Egyptian Faculties of Veterinary Medicine.

2. Method

PubMed database (http://www.ncbi.nlm.nih.gov/pubmed) was searched within a single-hour limit on May 4, 2015. The search words were faculty of Veterinary Medicine and either Cairo, Assiut, Zagazig, Mansura, Alexandria, Benha, Suez Canal, Beni-Suef, Kafr El-Sheikh, South Valley, Damanhur, Sohag, Aswan or Minia University. Articles came out from PubMed search was exported into the author E-mail and printed out for hand searching and further analysis. Further confirmation of the Faculty affiliation was done by checking the address of authors of each article. All articles were reviewed one by one and papers not related to faculties of Veterinary medicine of Egyptian Universities or those published before 2000 or after 2014 were excluded. The total publications of Egyptian faculties of Veterinary medicine on PubMed were calculated in 15 years (2000-2014) and then the publications from different faculties were analyzed and compared on the bases of the following:

- Year wise PubMed publication distribution.
- First authorship trend.
- Authorship pattern.
- Proportion of single-authored papers against multi-authored ones.
- Degree of collaboration in veterinary research. Degree of author collaboration from different faculties were determined in quantitative terms by using the formula given by another study (Subramanyam 1983). The formula is $C = N_M/N_S+N_M$. C = Degree of collaboration, N_M = Number of multi-authored papers and N_S = Number of single-authored papers.
- Department's contribution to the total publication output of each Faculty. Although some articles have no department affiliation, I made an effort to identify the department of the authors through their personal faculty pages and Google Scholar website.

3. Results

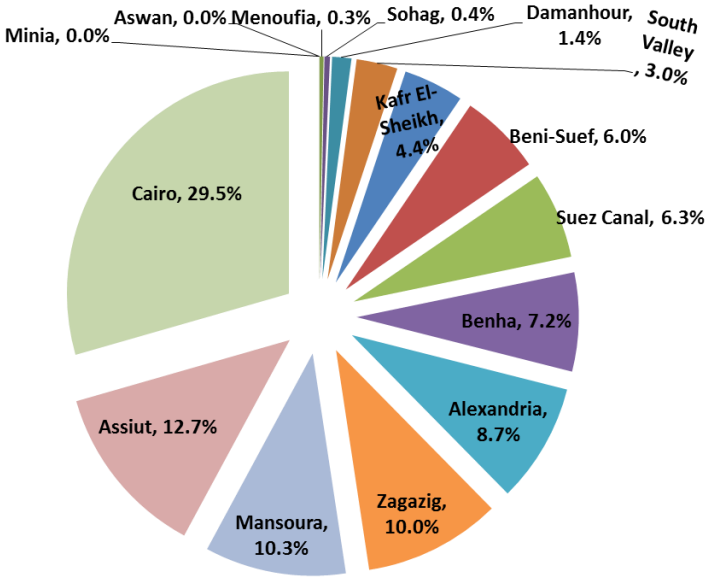
The PubMed search for publications affiliated to the Egyptian faculties of Veterinary Medicine revealed that the total productions between 2000 and 2014 were 712 articles. Only 14% of these publications (100/712) were produced in the period 2000 - 2004, which increased to 23.6% (168/712) and 62.4% (444/712) in the periods 2005-2009 and 2010 -2014 respectively.

3.1. Faculty Contributions in PubMed Publications

Egyptian faculties of Veterinary Medicine were ranked according to their total PubMed publications. Cairo had the largest number of publications during the period between 2000 and 2014 (210/712), followed by Assiut (90/712), Mansura (73/712), Zagazig (71/712), Alexandria (62), Benha (51/712), Suez Canal (54/712), Beni-Suef (43/712), Khafr EL-Sheikh (31/712), South Valley

(21/712), Damanhour (10/712), Sohag (3/712), Menoufia (2/712), Aswan (0/712) and Minia (0/712). The percentages of contribution of each faculty to the total publications are shown in Fig. 1. Interestingly Cairo, Assiut, and Mansura together produced more than 52% of the total publications of the 15 faculties studied.

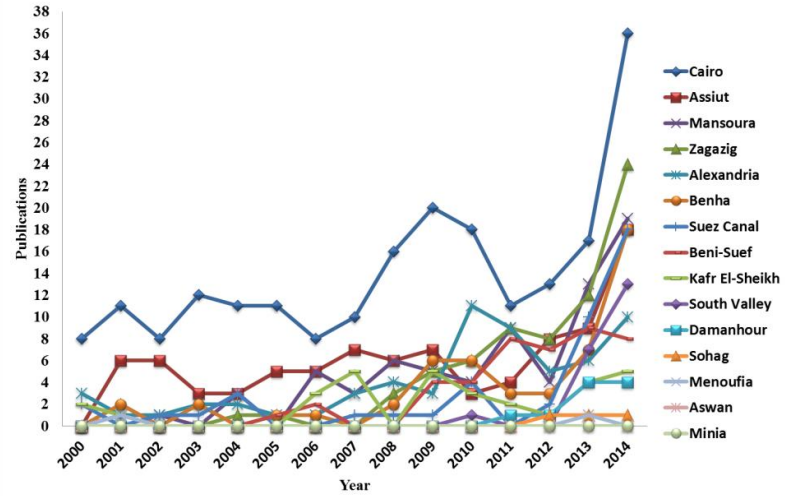
Figure 1: PubMed-Publication contributions of Egyptian faculties of Veterinary Medicine



3.2. Year wise distribution of Faculty publications

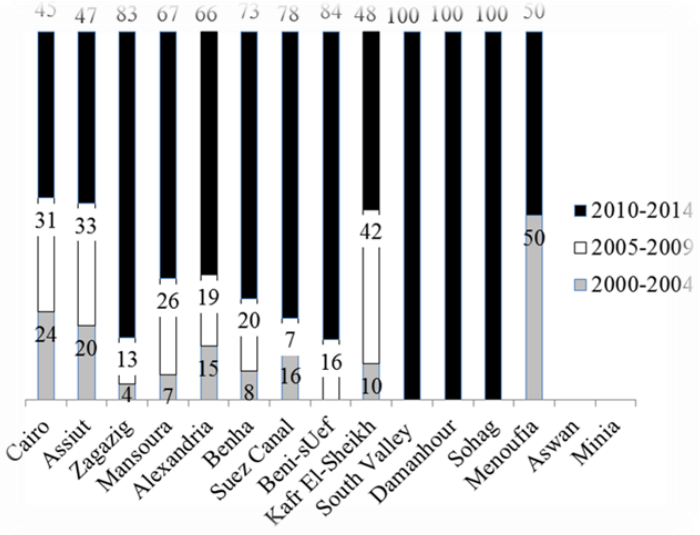
The yearly changes of publication productivity from the studied faculties showed the presence of a fluctuations pattern; no specific patterns of increases or declines were found (Fig. 2). Figure 2: Year wise distribution of publications from different Faculties of Veterinary Medicine in Egypt

3.3. Period wise distribution of Faculty publications



When the years were grouped into three 5-years periods, it was found that percentages of publication contribution of most faculties were the lowest in the period 2000-2004, then increased in the period 2005-2009 and reached the highest contribution percentages in the period 2010-2014 (Fig. 3). Only Suez Canal showed a decline during the period 2005-2009. Some faculties such as Beni-Suef, South Valley, Damanhour and Sohag begun to publish in the PubMed-indexed journals in the period 2010-2014, while Menoufia published only two articles; one in the period 2000-2004 and one in the period 2010-2014 with no publications in the period 2005-2009.

Figure 3: Period wise contribution percentage of Faculty publications



When comparing the rate of change (increase or decline) between periods; 2005-2009 versus 2000-2004 (comparison 1), 2010-2014 versus 2004-2009 (comparison 2) and 2010-2014 versus 2000-2004 (comparison 3). It was shown that the publication number from most faculties showed different rates of increases in the mentioned period comparisons, however, Suez Canal and Sohag showed a decline in the comparison 1 (Table 2).

Table 1: Rates of changes in Faculty publications of different period comparisons in percentage

	Comparison 1	Comparison 2	Comparison 3
Cairo	30	15	45
Assiut	12	12	24
Zagazig	50	6	56
Mansoura	30	14	44
Alexandria	29	3	32
Benha	27	6	33
Suez Canal	32	-4	28
Beni-Suef	29	7	36
Kafr El-Sheikh	2	10	12
South Valley	21	0	21
Damanhour	10	0	10
Sohag	3	0	3
Menoufia	1	-1	0
Aswan	0	0	0
Minia	0	0	0

3.4. First authorship trend

It was found that majority of publications of every Faculty of Veterinary Medicine had the 1st author affiliated to such Faculty. Percentages of articles with 1st author were 81.4% (Cairo), 90% (Assiut), 93.2% (Mansura), 81.7% (Zagazig), 91.9% (Alexandria), 96.1% (Benha), 73.1% (Suez Canal), 88.4% (Beni-Suef), 93.5% (Kafr El-Sheikh), 81% (South Valley), 60% (Damanhour), 66.7% (Sohag) and 100% (Menoufia).

3.5. Authorship patterns

The Number of authors of each publication was counted and the percentage of each category was calculated. Number of authors in publications was different from single, two, three, four, five or more than five authors with different frequency in studied faculties. Single-authored papers was most frequent in publications related to Damanhour (20%), two-authored papers was the highest in Alexandria (30.6%), three-authored papers was mostly produced by Assiut (31.1%) after Sohag (33.3), four-authored papers showed the highest percentage in publications from Cairo (26.2%), five-authored papers were highest in

publications from Benha (15.7%), however Beni-Suef (30.2) after Menoufia (100%) produced publications mostly with more than five authors (Table 2).

Table (2): Authorship patterns in publications from different faculties

Number of authors		**Benha**	**Alexandria**	**Zagazig**	**Mansoura**	**Assiut**	**Cairo**
Single author	No	7	10	3	7	5	18
	%	13.7	16.1	4.2	9.6	5.6	8.6
Two authors	No	9	19	12	20	16	40
	%	17.6	30.6	16.9	27.4	17.8	19.0
Three authors	No	11	18	16	12	28	41
	%	21.6	29.0	22.5	16.4	31.1	19.5
Four authors	No	12	9	18	7	20	55
	%	23.5	14.5	25.4	9.6	22.2	26.2
Five authors	No	8	4	8	10	10	24
	%	15.7	6.5	11.3	13.7	11.1	11.4
More than 5 authors	No	4	2	14	17	11	32
	%	7.8	3.2	19.7	23.3	12.2	15.2

Minia	Aswan	Menoufia	Sohag	Damanhour	South Valley	Kafr El-Sheikh	Beni-Suef	Suez Canal
0	0	0	0	2	4	1	4	4
0	0	0	0	20.0	19.0	3.2	9.3	8.9
0	0	0	1	3	4	8	5	8
0	0	0	33.3	30.0	19.0	25.8	11.6	17.8
0	0	0	1	1	4	9	7	9
0	0	0	33.3	10.0	19.0	29.0	16.3	20.0
0	0	0	0	1	2	3	8	8
0	0	0	0	10.0	9.5	9.7	18.6	17.8
0	0	0	0	1	1	3	6	4
0	0	0	0.0	10.0	4.8	9.7	14.0	8.9
0	0	2	1	2	6	7	13	12
0	0	100.0	33.3	20.0	28.6	22.6	30.2	26.7

3.6. Degree of author collaboration

The finding of this study revealed that there are more papers by multi-authors than by singles, thus the collaborative research has been preferred by the scientists over that of solitary research. Degrees of collaboration were high and ranged between 0.8 and 1.0. The degrees of collaboration in publications calculated for different faculties were recorded in Table 3.

Table 3**: Degree of collaboration between authors**

Faculty of Veterinary Medicine	Single authored article (N_S)	Multiple authored article (N_M)	N_S+N_M	Degree of collaboration
Cairo	18	192	210	0.91
Assiut	5	85	90	0.94
Mansoura	7	69	73	0.90
Zagazig	3	68	71	0.96
Alexandria	10	52	62	0.84
Benha	7	47	51	0.86
Suez Canal	4	41	45	0.91
Beni-Suef	4	39	43	0.91
Kafr El-Sheikh	1	30	31	0.97
South Valley	4	18	21	0.81
Damanhour	2	8	10	0.80
Sohag	0	3	3	1.00
Menoufia	0	2	2	1.00
Aswan	0	0	0	NA
Minia	0	0	0	NA

3.7. Department contributions in faculty publications

Categorization of department was conducted according to the consultation of subject expert and arranged in Table 4. It is observed that the publications related to the faculties of veterinary medicine in Egypt covered some but not all faculty departments. The departments contributed with different proportions in publications related to each faculty (Table 5). The highest contributing

departments were Pharmacology in Cairo (37.5%), Theriogenology in Assiut (28.9%), Animal Medicine (24.7%), Mansura, Animal Medicine and pathology in Zagazig (14.1% each), Parasitology in Benha (21.6%), Histology in Alexandria (16.1%), Pharmacology in Suez Canal (20%), Virology in Beni-Suef (26.8), Theriogenology in Kafr El-Sheikh (22.6), Pathology in South Valley (28.6%) and Anatomy and Pathology (30% each) in Damanhour. Three departments in Sohag produced three papers (33.3% each); Histology, Parasitology and Animal Medicine, while two departments (Poultry diseases and Animal Medicine) in Menoufia published two papers (50% each).

Table 4**: Distribution of faculty publications among different departments**

Cairo			**Assiut**			**Mansura**		
Department	*No*	*%*	*Department*	*No*	*%*	*Department*	*No*	*%*
Pharmacology	79	37.6	Theriogenology	26	28.9	Animal Medicine	18	24.7
Parasitology	17	8.1	Anatomy and Histology	17	18.9	Food Hygiene	12	16.4
Toxicology & Forensic Medicine	15	7.1	Pathology	15	16.7	Histology	10	13.7
Biochemistry	12	5.7	Animal Medicine	8	8.9	Parasitology	6	8.2
Food Hygiene	9	4.3	Animal Surgery	8	8.9	Theriogenology	5	6.8
Theriogenology	9	4.3	Forensic Medicine &Toxicology	5	5.6	Microbiology	5	6.8
Animal Surgery	8	3.8	Poultry Diseases	3	3.3	Animal Hygiene	5	6.8
Animal Medicine	7	3.3	Clinical Laboratory Diagnosis	2	2.2	Virology	3	4.1
Pathology	6	2.9	Fish Diseases	2	2.2	Surgery	2	2.7
Virology	6	2.9	Food Hygiene	2	2.2	Poultry Diseases	2	2.7
Zoonotic Diseases	6	2.9	Animal Hygiene	1	1.1	Pathology	2	2.7
Microbiology	26	12.4	Parasitology	1	1.1	Pharmacology	1	1.4
Fish Diseases	4	1.9				Animal Hygiene	1	1.4
Physiology	3	1.4	Benha			Anatomy	1	1.4

Poultry Disease	2	1.0	*Department*	*No*	*%*			
Anatomy	1	0.5	Parasitology	11	21.6	Alexandria		
			Pharmacology	10	19.6	*Department*	*No*	*%*
Zagazig			Animal Medicine	6	11.8	Histology	10	16.1
Department	*No*	*%*	Fish Diseases	4	7.8	Pathology	9	14.5
Animal Medicine	10	14.1	Anatomy	4	7.8	Pharmacology	8	12.9
Pathology	10	14.1	Biochemistry	3	5.9	Anatomy	7	11.3
Theriogenology	7	9.9	Pathology	2	3.9	Parasitology	7	11.3
Zoonotic Diseases	3	4.2	Food Hygiene	2	3.9	Forensic Medicine & Toxicology	6	9.7
Food Hygiene	6	8.5	Theriogenology	2	3.9	Avian and Aquatic Animal Medicine	3	4.8
Veterinary Public Health	2	2.8	Animal Hygiene	1	2.0	Physiology	3	4.8
Virology	5	7.0	Forensic Medicine & Toxicology	1	2.0	Animal Hygiene	2	3.2
Poultry Diseases	4	5.6	Animal Wealth Development	1	2.0	Biochemistry	2	3.2
Biochemistry	2	2.8	Histology	1	2.0	Theriogenology	2	3.2
Anatomy	2	2.8	Physiology	1	2.0	Microbiology	1	1.6
Animal Wealth Development	3	4.2	Animal Surgery	1	2.0	Animal Nutrition	1	1.6
Microbiology	4	5.6	Zoonotic	1	2.	Animal	1	1.

			Diseases		0	Surgery		6
Physiology	3	4.2				Theriogenology	10	3.2
Histology	2	2.8	Beni-Suef					
Animal Nutrition	1	1.4	*Department*	*No*	*%*	Kafr El-Sheikh		
Parasitology	3	4.2	Virology	11	26.8	*Department*	*No*	*%*
Pharmacology	1	1.4	Parasitology	7	17.1	Theriogenology	7	22.6
Forensic Medicine & Toxicology	2	2.8	Biochemistry	6	14.6	Microbiology	7	22.6
Animal Surgery	1	1.4	Pathology	4	9.8	Parasitology	5	16.1
			Food hygiene	4	9.8	Pathology	3	9.7
Suez Canal			Theriogenology	3	7.3	Animal Medicine		
Department	*No*	*%*	Pharmacology	3	7.3	Animal Surgery	2	6.5
Pharmacology	9	20.0	Animal Medicine	1	2.4	Animal Nutrition	1	3.2
Theriogenology	5	11.1	Poultry Disease	1	2.4	Anatomy and Histology	1	3.2
Animal Hygiene	4	8.9	Animal Surgery	1	2.4	Food Hygiene	1	3.2
Pathology	4	8.9				Animal Hygiene	1	3.2
Anatomy	3	6.7	Damanhur			South Valley		
Animal Medicine	3	6.7	*Department*	*No*	*%*	*Department*	*No*	*%*
Histology	3	6.7	Histology	1	10	Pathology	6	28.6
Food Hygiene	3	6.7	Anatomy	3	30	Forensic Medicine & Toxicology	4	19.0
Parasitology	3	6.7	Microbiology	2	20	Animal Hygiene	3	14.3
Poultry Diseases	3	6.7	Pathology	3	30	Parasitology	3	14.3
Physiology	2	4.4	Animal Hygiene	1	10	Histology	2	9.5

Microbiology	1	2.2				Animal Behavior	2	9.5
Biochemistry	1	2.2	Menoufia			Microbiology	1	4.8
Forensic Medicine & Toxicology	1	2.2	*Department*	*No*	*%*			
			Poultry Diseases	1	50			
Sohag			Animal Medicine	1	50			
Department	*No*	*%*						
Animal Medicine	1	33.3						
Parasitology	1	33.3						
Histology	1	33.3						

4. Discussion

Bibliometric analysis is an important indicator for quantification of the scientific institution performance and ranking. The current study was carried out to do a bibliometric comparative assessment of the scientific contributions of the Egyptian faculties of Veterinary Medicine published in PubMed-indexed Journal in the period between 2000 and 2014. The PubMed database was chosen due to it is the simplest and most powerful free tool for retrieval of biomedical publications (Tadmouri and Tadmouri 2002; Falagas et al. 2008). The study revealed that the total PubMed-indexed publications from the Egyptian faculties of Veterinary Medicine were 712 papers. This number is relatively low when compared to the research from the faculties of Medicine in Egypt. Mansura Faculty of Medicine, for example, produced about 1765 PubMed-indexed paper during 2012 and earlier. It is may be acceptable that the accurate number of the total Egyptian publications from the faculties of Veterinary Medicine is more than 712, as many researchers publish in non-PubMed-indexed local Journals and some of them may have only printable form with no an internet access. More than 60% of biomedical research in Africa are published in local non-indexed Journal (Gaillard 1992). The current study showed that in the period 2000-2004, Veterinary Medical research output from the Egyptian faculties was 100 papers increased to 168 in the period 2005-2009 and reached 444 papers in the period 2010-2014. In previous bibliometric studies, it was found that the total biomedical publication output affiliated to Egypt and indexed in PubMed was 16835 papers between 1991 and 2010 (Zeeneldin et al. 2012) and 1180 between 2001 and 2005 (Benamer and

Bakoush 2009). Furthermore, Egypt contribution to the world's biomedical publications increased from 0.09% in 1996 to 0.14% in 2006 (Afifi 2007). The current study found that Cairo had the largest number of publications, followed by Assiut, Mansura, Zagazig, Alexandria, Beni Suef, Suez Canal, Kafr El-Sheikh, South Valley, Damanhour, Sohag and Menoufia faculties of Veterinary Medicine, while Aswan and Minia had no publications on PubMed between 2000 and 2014. That is not surprising; at least for the most of the faculties, ranking according to their total publications was correlated to the old -year of establishment. Earlier established faculties are supposed to have a better scientific environment and infrastructure along with a large number of academic staffs producing relatively more publications than recently established faculties. Mansura (ranked the 3rd in publication criteria) was out of this expectation, as it is relatively recent to other faculties came later in publication-based ranking. This ranking of faculties of Veterinary Medicine in Egypt according to their PubMed publications doesn't mean the same for the quality of the research (impact or importance).

Although, there was a fluctuation pattern of productivity between 2000 and 2041, most of the faculty showed an increase in the publication output in the period 2010-2014 comparing to periods 2000-2004 and 2005-2009. This positive growth in publication behavior of Veterinary researchers during this time is likely due to international collaboration through the scholarship funded by the higher ministry of education in Egypt, improved technology communications and increased research funding through many funders such as the Science and Technology Development Fund (STDF), which begun funding research projects in Egypt since 2008.

The current study indicated researchers from different faculties of Veterinary Medicine in Egypt prefer to do research in collaboration. This result is in an agreement with results of other previous studies that reported the Veterinary researchers like to work in a team (Chanda. Arya 2012; Chanda. Arya and Sharma 2012). Research become interdisciplinary and scientists in different departments or areas of specialization have to work in a team in order to fulfill the goals of research and to have their papers published in better Journals. Multiple-authored scientific productivity is a common characteristic feature of applied sciences (Kasa et al. 2014) and one of its advantage is the increased citations of articles (Persson et al. 2004). The degree of collaboration was high in different faculties and ranged from 0.80 to 1.00. That indicate dominance tendency toward scientific collaboration between researchers affiliated to faculties of Veterinary Medicine in Egypt. It is known that collaborative research support exchanges of the knowledge and improve the publications (Ahmad et al. 2012).

Department analysis showed a better research production in some department than other, where some departments had no representation in PubMed-indexed publications. It is a common phenomenon that some departments are more active in scientific publications than the others. For example, three of 32 departments in the faculty of Medicine in Mansura produced more than 49% of total publication; 35% accounted to Urology and Nephrology and 7% for each

pediatrics and parasitology departments (Helal et al. 2014). Among 144 departments related to 9 medical schools in Libya, only 9 departments produced more than 49% form the total publications and 65 departments produced no papers during 20 years (Benamer et al. 2009b). Thus the variation in department productivity is likely due to difference in the quality and motivations of researchers, international collaboration, infrastructures and modern equipment availability.

To the best of author knowledge, this is the first report analyzing and comparing the research productivity of faculties of Veterinary Medicine in Egypt in the period 2000-2014. The current study discuss the quantitative analysis of publications, however, it is important to analyze the impact of the Veterinary research output from the faculties of Veterinary Medicine in Egypt through analysis the citations and impact factor of Journals published this studies.

5. Conclusion

The current study highlighted the research productivity of different Egyptian faculties of Veterinary Medicine and ranked them according to their total publications. Such ranking will be delivered to the Veterinary committees and authorities related to the ministry of higher education in Egypt. The ranking determined the actual position of each faculty of Veterinary Medicine as well as the scientifically active departments regarding to their publication productivity on the PubMed, and that could motivate healthy competition between Egyptian Veterinary medicine faculties and their departments to increase their publications in peer reviewed Journals. The finding of the present study should serve as a starting point for offering funds needed to the research activities of different Veterinary faculties and departments, and will be a driving force for improvement the Veterinary research in Egypt. The future study will focus on the evaluation of the quality of the 712 publications produced by the Egyptian faculties of Veterinary Machine through analysis of the citations and Journal impact factors.

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References

Afifi, M. (2007). Egyptian biomedical publications in PubMed, 1996-2005. *J Egypt Public Health Assoc*, 82 (1-2): 91-104.

Ahmad, S., Jan, S. U. and Khan, F. (2012). Lotka's Law of Scientific Productivity: Theory and Application. *PUTAJ Humanities and Social Sciences* 19 127 – 134.

Arya, C. (2012). Authorship Trends and Collaborative Research in the Field of Veterinary Medicine. *International Journal of Information Dissemination and Technology*, 2 (1): 50-53.

Arya, C. and Sharma, S. (2012). Authorship Trends and Collaborative Research in Veterinary Sciences: A Bibliometric Study. *Chinese Librarianship*, 34 38-47.

Benamer, H. T. and Bakoush, O. (2009). Arab nations lagging behind other Middle Eastern countries in biomedical research: a comparative study. *BMC Med Res Methodol*, 9 26.
Benamer, H. T., Bredan, A. and Bakoush, O. (2009). A negative trend of biomedical research in Libya: a bibliometric study. *Health Info Libr J*, 26 (3): 240-5.
Benamer, H. T., Bredan, A. and Bakoush, O. (2009). Scientific publication productivity of Libyan medical schools: a bibliometric study of papers listed in PubMed, 1988-2007. *Educ Health (Abingdon)*, 22 (2): 310.
Dakik, H. A. (2006). Research productivity of the medical faculty at the American University of Beirut. *Postgraduate Medical Journal Postgraduate Medical Journal*, 82 (969): 462-464.
Falagas, M. E., Pitsouni, E. I., Malietzis, G. A. and Pappas, G. (2008). Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. *Faseb J*, 22 (2): 338-42.
Gaillard , J. (1992). Use of publication lists to study scientific production and strategies of scientists in developing countries. *Scientometrics*, 23 (1): 57-73.
Helal, R., Abou-ElWafa, H. and El-Gilany, A. (2014). Publication Productivity of Faculty of Medicine, Mansoura University Indexed in PubMed. *Ann Med Health Sci Res*, 4 (Suppl 3): S278-85.
Jacso, P. (2005). As we may search - Comparison of major features of the Web of Science, Scopus, and Google Scholar citation-based and citation-enhanced databases. *Current science.*, 89 (9): 1537-1547.
Kasa, M., Ibrahim, U. and Momoh, K. (2014). Bibliometric Analysis of Publication Output Patterns of Faculty Members of Agriculture And Veterinary Complex of A Nigerian University. *The Information Manager*, 14 (1-2): 21-28.
Lu, Z. (2011). PubMed and beyond: a survey of web tools for searching biomedical literature. *Database (Oxford)*, 2011 38-51.
Persson, O., Glänzel, W. and Danell, R. (2004). Inflationary bibliometric values: The role of scientific collaboration and the need for relative indicators in evaluative studies *Scientometrics*, 60 (3): 421-432
Pritchar, A. (1969). STATISTICAL BIBLIOGRAPHY OR BIBLIOMETRICS. *Journal of Documentation*, 25 (4): 348-349.
Subramanyam, K. (1983). Bibliometric studies of research collaboration: A review. *Journal of Information Sciences*, 6 (1): 33-38.
Sweileh, W. M., Al-Jabi, S. W., Shanti, Y. I., Sawalha, A. F. and Zyoud, S. H. (2015). Contribution of Arab researchers to ophthalmology: a bibliometric and comparative analysis. *Springerplus*, 4 42.
Sweileh, W. M., Zyoud, S. H., Al-Jabi, S. W. and Sawalha, A. F. (2015). Contribution of Arab countries to breast cancer research: comparison with non-Arab Middle Eastern countries. *BMC Womens Health*, 15 25.
Tadmouri, G. O. and Tadmouri, N. B. (2002). Biomedical research in the Kingdom of Saudi Arabia (1982-2000). *Saudi Med J*, 23 (1): 20-4.
Tutarel, O. (2002). Geographical distribution of publications in the field of medical education. *BMC Med Educ*, 2 3.
Zeeneldin, A. A., Taha, F. M. and Moneer, M. (2012). Past and future trends in cancer and biomedical research: a comparison between Egypt and the world using PubMed-indexed publications. *BMC Res Notes*, 5 349.
Ziegler, B. E. (2009). Methods for bibliometric analysis of research : renewable energy case study.

Zyoud, S. H., Al-Jabi, S. W., Sweileh, W. M. and Awang, R. (2014). A bibliometric analysis of toxicology research productivity in Middle Eastern Arab countries during a 10-year period (2003-2012). *Health Res Policy Syst*, 12 4.