



ORIGINAL ARTICLE

Medical school dean's scientific production of the main universities by continent

Produção científica dos reitores de medicina das principais universidades por continente

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Abstract

Introduction: promoting scientific research is one of the main functions of universities. Medical schools should not be an exception; deans should also have appropriate research experience that allows them to have a different perspective on the importance of research in undergraduate medicine.

Aim: to determine the medical school dean's scientific production of the main universities by continent.

Methods: an observational, analytical, and transversal study. We identify the medical school dean's scientific production of the 20 universities with the best position from South America, Central America, North America, Europe, Asia, Africa, and Oceania, according to the Ranking Webometrics 2022, in the Scopus database.

Results: 140 directors or deans of medicine were evaluated, of which 136 (97.1%) had published an article at least once in their life, 128 (91.4%) in the last five years, 103 (73.6%) in the previous year, and 93 (66.4%) in the current year. The total number of published articles was 24.5 (Me=98), receiving a total of 1,251,766 citations (range 0 to 101,868), an H-index 24 (range 0 to 140), and in collaboration with 154,711 coauthors.

Conclusions: the medical school dean's scientific production from the main universities by continent was high, with notable differences between those who came from universities in Asia, North America, and Europe compared to Oceania, Africa, South America, and Central America.

Keywords: research, dean, schools medical, journal articles, citation databases,

Resumo

Introdução: promover a pesquisa científica é uma das principais funções das universidades. As escolas médicas não devem ser uma exceção. Os reitores também devem ter uma experiência de pesquisa adequada que lhes permita ter uma perspectiva diferente sobre a importância da pesquisa na graduação em medicina.

Objetivo: determinar a produção científica dos reitores de medicina das principais universidades por continente.

Métodos: estudo observacional, analítico e transversal. Identificamos a produção científica dos pró-reitores de medicina das 20 universidades com melhor posição da América do Sul, América Central, América do Norte, Europa, Ásia, África e Oceania, segundo o Ranking Webometrics 2022, na base Scopus.

Resultados: foram avaliados 140 diretores ou reitores de medicina, dos quais 136 (97.1%) publicaram artigo pelo menos uma vez na vida, 128 (91.4%) nos últimos cinco anos, 103 (73.5%) no ano anterior, e 93 (66.4%) no ano corrente. O número total de artigos publicados foi de 24,5 (Me=98), recebendo um total de 1,251,766 citações (intervalo de 0 a 101,868), índice H = 24 (intervalo de 0 a 140) e em colaboração com 154,711 coautores.



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Conclusões: a produção científica dos reitores de medicina das principais universidades por continente foi alta, com diferenças notáveis entre aqueles que vieram de universidades da Ásia, América do Norte e Europa em comparação com Oceania, África, América do Sul e América Central.

Palavras-chave: pesquisar, reitor, escolas médicas, artigos de jornal, bancos de dados de citações

Introduction

Research in medicine is of great importance for the development of society (1). All treatments, interventions, drugs, forms of care, and aftercare in the medical field or health care system came from discoveries (2). Currently, medical care must be based on assertive, well-founded decisions that are obtained methodically and systematically (3).

Universities are one of the research development since it contributes directly and indirectly to their main mission, on, which is teaching (4). In recent years, involving medical students in scientific research has gained interest due to its multiple benefits (5). Additionally, it has been reflected in the need for teachers who teach research to have adequate academic training, as well as research that can be reflected in information databases (6).

However, on many occasions, the question can be raised as to whether those who are in charge of the institutions that train future researchers in medicine, in particular the deans, should or should not also have appropriate research training, reflected in their scientific production since at the time of reaching these administrative positions it allows them to have a different perspective on the importance of research in undergraduate medicine (7).

Currently, university rankings are a phenomenon that measures the reputation of universities and higher education institutions, and directly influences their image and prestige in the eyes of thousands of potential students around the world (8). Finally, there is still no similar article with this type of analysis in the scientific literature. The principal objective was to determine the medical school dean's scientific production of the main universities by continent.

Methods

Study design

Observational study; analytical and transversal.

Process

A systematic search was carried out in three stages: the first consisted of looking for the twenty best-positioned universities by continent with a school or faculty of Human Medicine. There is a big gap in the education and research fields between North America and the rest of the countries; therefore, we divided The American continent into three regions (North America, Central America, and South America) to know the reality of research in Latin America. We select the universities based on the second edition (July 2022) of the Ranking of Webometrics of World Universities (<https://www.webometrics.info>) (9), which includes 140 university faculties from 34 countries.

The second stage consisted of accessing the official web pages of the universities to register the complete data of the deans of faculties and directors of Human Medicine schools.

Finally, the third stage consisted of searching for the scientific publications indexed in the Scopus database of directors or deans, using a combination of names and surnames; the cases of homonymy were treated individually and used in previous studies (10, 11). The information was collected in the period between September 30 and December 10, 2022, and was carried out by each researcher independently and in the event of disagreement, it was resolved by consensus.

The following data were extracted: the number of articles published in different periods concerning the time of the search (for the year 2022 it was considered until September when the data was collected) the publication of original articles, the number of citations of the publications, the number of co-authors, principal investigators, and the H-index (12). In those cases where articles were not registered in association with the country and current institution of affiliation, it was checked if there was previous scientific production linked to

other places (for example, during their undergraduate and/or postgraduate training).

Ethical considerations

The present study complies with the ethical standards for biomedical research of the Declaration of Helsinki of the World Medical Association since it does not involve human subjects. Therefore, it is exempt from approval by an ethics committee, since the nature of the study is non-interventional.

Analysis of data

For data collection, a registration form was prepared including the variables studied. The data was analyzed in the Microsoft Excel 2019®

program, and subsequently, the statistical quantification was carried out using the STATA v 14.0 statistical package, for the descriptive analysis percentages and frequency measures and average scores of the variables, significant, measures of central tendency and dispersion.

Results

We evaluated 140 directors or deans of medicine; the majority had published at least one article in their lives (97.1%), in the last five years (91.4%), in the previous year (73.6%), and in 2022 (66.4%). All the deans or directors published 24,452 articles, receiving 1,251,766 citations; however, six directors/deans did not receive any citation for their publications (**Table 1**).

TABLE 1 – Characteristics of the scientific production of deans of faculties and directors of the main medical schools in scientific journals indexed in Scopus.

Characteristics	n	%	Me	Range
Any article published in their life	136	97.1		
Any articles published in the last 5 years	128	91.4		
Any article published in the previous year	103	73.6		
Any article published this year (2022)	93	66.46		
Number of articles published	24,452		98	0 – 1,176
Number of citations	1,251,766		2290	0 – 101,868
H-Index			24	0 – 140
Number of co-authors	154,711		421	0 – 15,863

Asian medical school deans or directors published the most articles (n=7,420), followed by North American (n=4,962) and European (n=4,617) regions. We also observed this behavior in original-type articles. Regarding the number of citations received, the North American region

received the most citations (n = 351,558), followed by Asia (n = 346,563) and Europe (n = 333,752). The deans from South and Central America had a lower number of publications and citations compared to their counterparts (**Figure 1**).

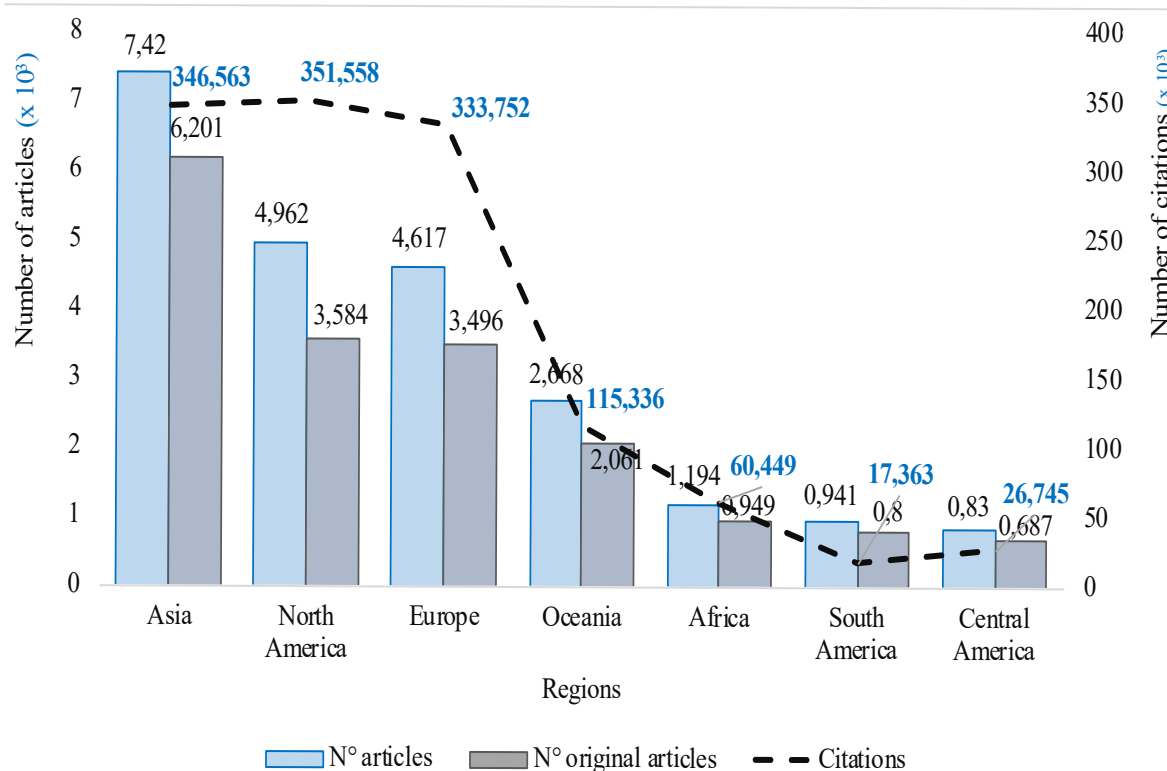









Figure 1. Characteristics of the scientific production of deans or directors of medical schools of the main universities by region in scientific journals indexed in Scopus. Number of publications and citations by region (in the case of America this was divided into North America, Central America and South America).

In respect of the indicators of the Webometrics ranking, greater visibility, transparency, and excellence (most cited documents) are observed in universities from North America, followed by Europe and Asia. In addition, it is observed that

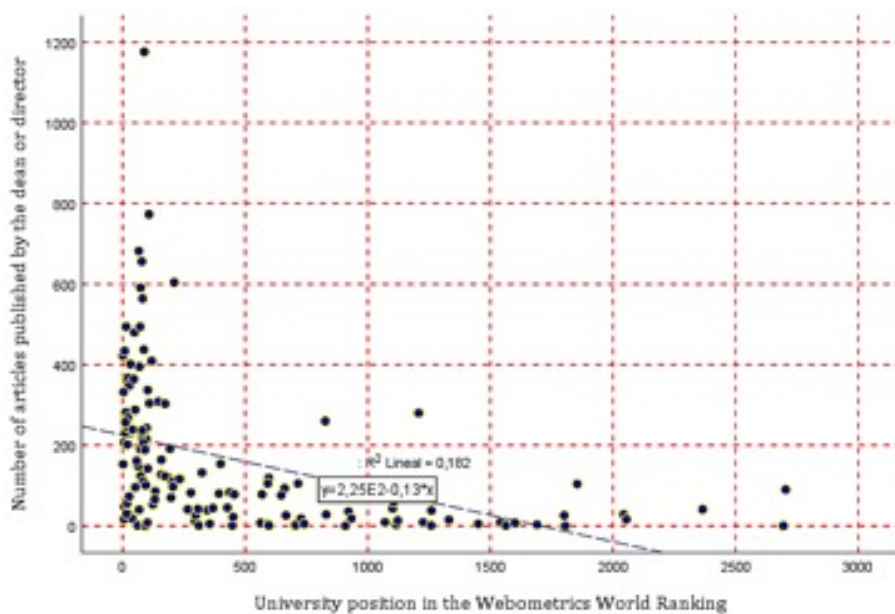
the median H-index of the deans of medicine is higher in those who come from North America (H-index, Me=62.5), followed by Asia (H-index, Me=49), Europe (H-index, Me=41.5), Oceania (H-index, Me=30.0) (**Table 2**).

TABLE 2 – Indicators of the web ranking of universities, H-index, and the number of citations of deans or directors, by region. The data corresponds to the scientific production of the 20 deans or directors of the medical schools or faculties of the 20 best-positioned universities according to the Webometrics ranking by region.

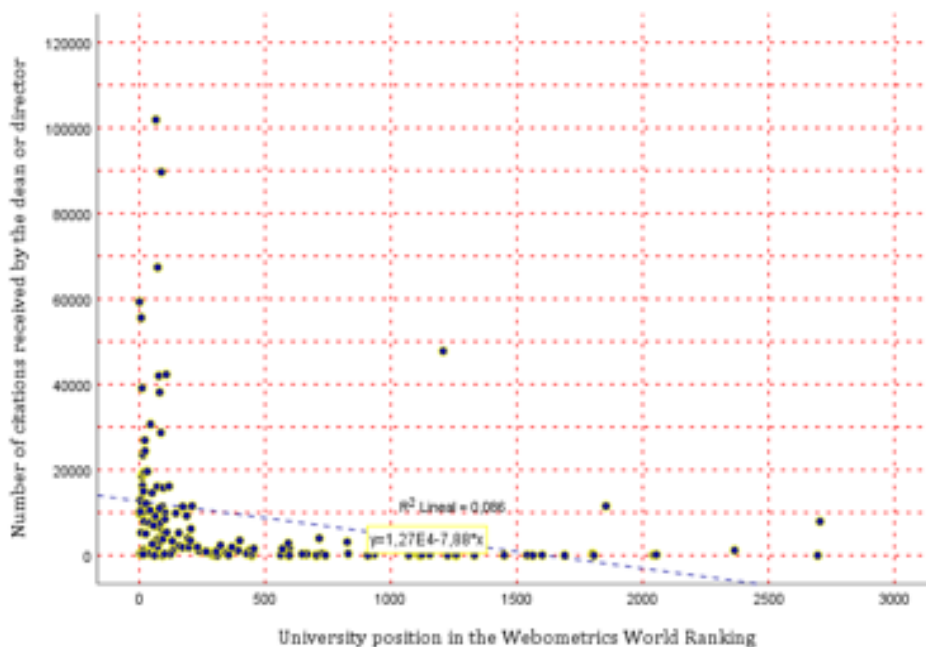
Region	Statistics	University position in the Webometrics World Ranking			Scientific production of the deans or directors		
		Position Impact (Visibility)	Position Opening (Transparency)	Position Excellence	Number of articles published in your life	H-Index	Number of citations
 North America	Median	14	17	25.5	262	62.5	14,059
	Range	34	68	89	477	105	58,878
	Minimum	1	1	1	17	8	426
	Maximum	35	69	90	494	113	59,304
 Central America	Median	1,449	1,251	1,644.5	21	8	169
	Range	4,653	7,420	2,987	260	41	11,540
	Minimum	71	199	304	0	0	0
	Maximum	4,724	7,619	3,291	260	41	11,540
 South America	Median	575.5	534.5	695	27.5	13	496.5
	Range	801	7,545	896	189	28	3,992
	Minimum	130	74	63	1	1	4
	Maximum	931	7,619	959	190	29	3,996
 Asia	Median	228.50	168.5	58.5	305.5	49	10,032
	Range	569	461	228	1,158	133	89,239
	Minimum	90	67	3	18	7	424
	Maximum	659	528	231	1,176	140	89,663
 Europe	Median	139.5	79.5	61	217.5	41.5	72,165
	Range	223	128	147	682	115	101,868
	Minimum	14	5	5	0	0	0
	Maximum	237	133	152	682	115	101,868
 Oceania	Median	306	175	181.5	119.50	30	34,085
	Range	565	327	523	359	81	30,591
	Minimum	86	38	17	5	4	88
	Maximum	651	365	540	364	85	30,679
 Africa	Median	1,955	820.5	668.5	39.5	8.5	291
	Range	5,057	1,399	1,402	279	58	47,781
	Minimum	283	244	292	1	0	0
	Maximum	5,340	1,643	1,694	280	58	47,781

A moderate negative correlation was found between the position of the university in the Webometrics world ranking with the total number of articles published by its deans ($R^2 = 0.18$; $p = 0.00$),

with the total number of citations received ($R^2 = 0.08$; $p = 0.00$), and with the H-index of the director or dean ($R^2 = 0.23$; $p = 0.00$) (Figure 2).

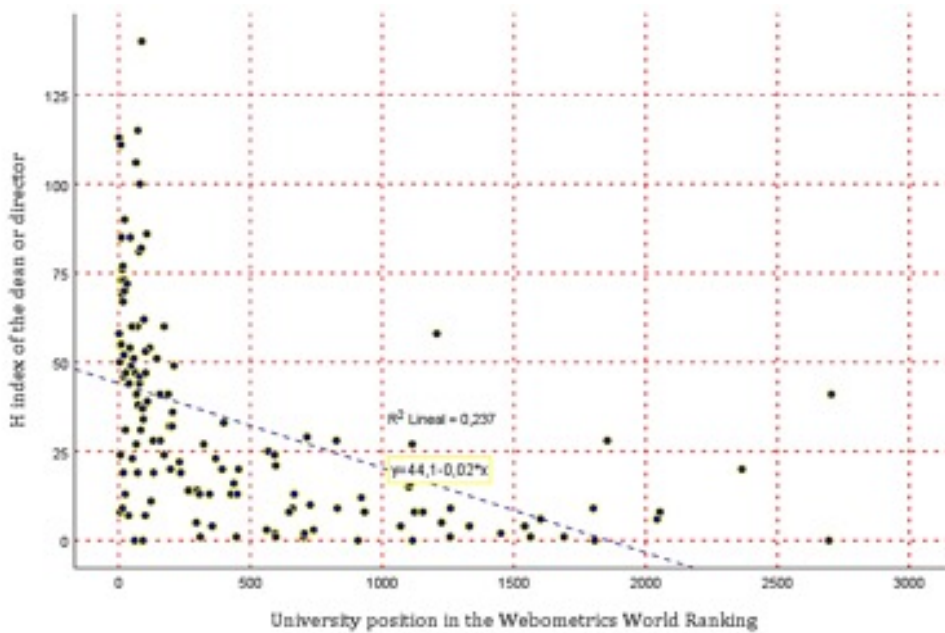


a)



b)

Figure 2. Analysis of the linear relationship between the University's position in the Webometrics World Ranking with the number of articles published by the dean/director (a), number of citations received by the dean/director (b), and H-index of the dean/director (c); respectively.



c)

Figure 2 (cont.). Analysis of the linear relationship between the University's position in the Webometrics World Ranking with the number of articles published by the dean/director (a), number of citations received by the dean/director (b), and H-index of the dean/director (c); respectively.

Concerning the number of articles published since 2018, since 2021, and 2022 there is a predominance in the scientific production of deans of

faculties or directors of medicine from the Asian continent with 1,639 articles, 539 articles, and 233 articles, respectively (**Figure 3**).

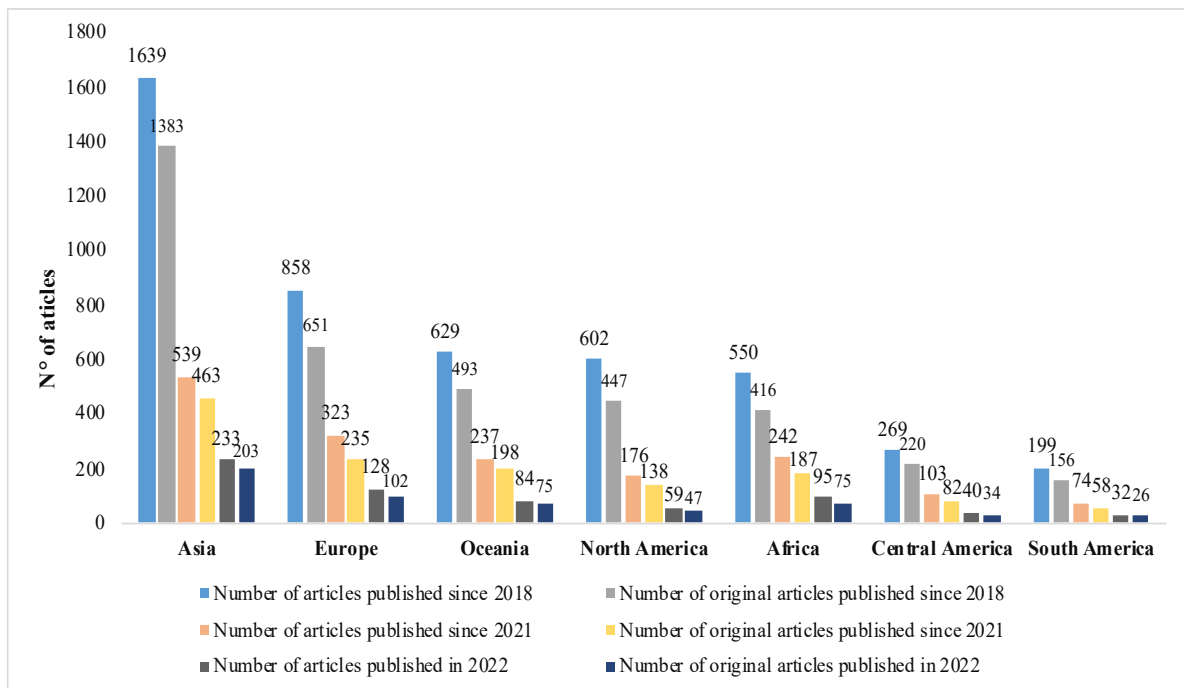


Figure 3. Scientific production of deans or directors of faculties or directors of medical schools by continent. Number of articles published in different time intervals.

Discussion

At present, the role of research in the growth of universities is undeniable, since promoting it leads to improving the quality of teachers, generating innovations, and increasing the prestige of the institution and its economic status (13). However, some universities do not internalize this concept, being more evident in developing countries.

Our study found that 97.1% of the deans of the main universities by continent had published an article in their life, this percentage is much higher than studies carried out at a local level such as Argentina (38.7%) (14), Peru (24.0%) (15), Colombia (27.3%) (16).

The governance of universities has changed profoundly in recent years. The dean or director is thus transformed into the main actor for these organizations, he must ensure that continuous quality improvement highlights the faculty programs offered to students and that the educational results for students are of the highest level. The dean must promote and support quality teaching and research (17).

Regarding scientific production, our study showed that the deans from the main universities in Asia presented 49.5% (n=2,458) more articles than their peers from the USA and 60.7% (n=2,803) compared to Europe, this could be because in the last decade the number of researchers in Asia has grown considerably in recent years (18). Similarly, according to the report, published by Japan's National Institute for Science and Technology Policy (NISTP) in collaboration with Clarivate, the People's Republic of China now publishes the most scientific research articles per year, followed by the US. In the USA and Germany, in addition, the number of citations of the investigations carried out by the People's Republic of China represented 27.2% of the most cited articles in the world; this figure exceeded that of the United States, which added 24.9% and the United Kingdom ranked third with 5.5% (19).

Likewise, it should be noted that the scientific production of the deans from Africa, South America, and Central America was considerably

low compared to their peers from Europe, Asia, and North America, this is possible because Latin America and the African continent are among the regions with the fewest number of high-quality research universities in the world. No Latin American or African university is in the top 100 in world rankings, and relatively few academics and scientists from the region are among those with the most academic citations (20).

Our findings showed that a better position of the university in the world ranking was associated with a greater scientific production (p=0.00) and a greater number of citations (p=0.00) of its deans of medicine, in agreement with what was reported by Goodall (21), who found a significant positive correlation between lifetime citations of a university chancellor/president and the position of that university in the world ranking, these findings show that the best universities are led by the best researchers.

In the specific field of medicine, there is no doubt that research represents a fundamental pillar of medical activity, this allows us to infer that the best researchers may have greater knowledge about the academic world and better performance as leaders. In addition, the research history of an authority such as the dean can also have a symbolic value, since it sends a signal about the values of the institution (22). Lastly, being a reputable researcher can raise a leader's status within the academic community and improve their negotiating skills. However, another possible interpretation is that universities select the best researchers for reasons of prestige and to help collect research grants. Another is that the research capacity is highly recognized by its leaders (23).

Another aspect to highlight is that the publications made this year by the deans of medicine from Asia and Europe accounted for 54.3% of the publications made, showing that the deans from these regions have constant research activity.

Limitations

Our study has the following limitations: firstly, we didn't consider other types of contributions

that the deans could have made, such as the publication of books, and advisory services for undergraduate theses or specialties. Secondly, we did not consider other prestigious databases and other university rankings. Finally, only the 20 universities with the best ranking by continent were included, not including other impactful university metrics.

Conclusions

In conclusion, the scientific production of the deans of the faculties of medicine from the main universities by continent was high, however, it was found that the deans from universities in Asia, North America, and Europe presented a scientific production notably higher than their peers from Oceania, Africa, South America, and Central America.

Notes

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Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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