

Bibliometric Evaluation of Moroccan Physicians of physical medicine and Rehabilitation Publications in PubMed

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Abstract. *Background:* Moroccan Physicians in Physical Medicine and Rehabilitation (MP PMR) seek recognition at the international and national levels through publications. To our knowledge, no bibliometrics have been made to quantify these publications in indexed international journals. The aim of the study is to analyze and quantify the Moroccan Physicians in Physical Medicine and Rehabilitation publications in indexed international journals. *Methods and materiel:* Is an observational study, we searched all the articles of the MP PMR published in the PubMed database until December 2019. The number of MP PMR articles was reported by academic academic centers, article type and indexed journal type. *Results:* We have found 26 articles since the creation of PMR in Morocco. The number of articles is correlated with the number of MP PMR remaining to 75 doctors and especially the ten professors. However, their contribution compared to their colleagues from other countries is promising. Scientific publications were limited to clinical cases in half of the cases. English was the dominant language of the works. Collaboration with foreign PMR was only with the French in 38.46% of cases. Only one French magazine took 34.61% of the works. *Conclusion:* A lot of effort needs to be made by everyone, MP PMR and politicians to improve the quality and quantity of publications, research methodology and medical writing is one way, learning English in is another. Collaboration with other foreign collaborators is a necessity for a better visibility of publications. (www.actabiomedica.it)

Key words: Moroccan Physicians; Bibliometric Evaluation; PMR

Introduction

«Publish or perish» is an expression that encourages scientific researchers to publish as regularly as possible the results of research work in scientific journals. The more we publish; the more visibility and collaboration at the international level, the more motivation and new ideas emerge. A new term could soon replace it: «Cooperate or perish». Research has become interdisciplinary, complex and beyond the capabilities of a single individual, university, or research institute. In addition, it has become highly internationalized in recent decades, leading to numerous collaborations between researchers from different countries. It is by

collaborating and publishing with others that one can maintain high performance in research. Otherwise; scientific productivity is a well-known indicator of the state of development of a country (1, 2).

Physical Medicine and Rehabilitation (MPR) is recognized as a medical specialty in Morocco in 1994. The medical specialty is officialized by the Organization World Health Organization (WHO) at the international level in 1968. During this existence, the Moroccan Physicians in Physical Medicine and Rehabilitation (MP PMR) spared no effort to promote the specialty. Internationally, they communicated through the publication. To our knowledge, this publication is not known. The aim of the study is to analyze and quantify the Mo-

roccan Physicians in Physical Medicine and Rehabilitation publications in indexed international journals and discuss strategies for better visibility.

Methods

To approach the scientific contribution of the MP PMRs and take stock of the situation, we used the on-line biomedical database “PubMed”. We searched every newspaper where a MP PMR published an article. However, the log had to be indexed in the Medline Databases. We used the following keywords with all possible combinations: Physical Medicine or Physical Rehabilitation or Physical Medicine or Functional Rehabilitation AND Morocco or Morocco. We insisted not to use confusing terms such as Sport and Physical Rehabilitation, Science and Exercise Medicine, Sport and Physical Education, Sports Performance and Physical Rehabilitation, Physical Therapy. All the selected works were analyzed; the reports without paternity of the MP PMR were excluded. The presence of MP PMR as the first author was mandatory. We categorized the type of studies into letters, historical articles, congresses, evaluation studies, reviews, case reports, case series, editorials, comparative studies, and clinical trials. We did research according to 7 MP PMR university centers (ie, Ibn Sina University Hospital in Rabat, Mohammed V Military Teaching Hospital in Rabat, Sheikh Khalifa Hospital in Casa Blanca, Ibn Rochd University Hospital Center in Casablanca, University Hospital Center Mohammed VI in Marrakesh, Avicenna Military Hospital in Marrakech, Hassan II University Hospital Center in Fes, and Mohammed University University Hospital in Oujda).

Results

Until December 2019, MM PRMs published a total of 26 articles on PubMed. Eleven articles (42.30%) were published in two rehabilitation journals: nine in Annals of Physical and Rehabilitation (and its predecessor in Fresh edition “Annales de médecine Physical et réadaptation”) and two in the Journal Rehabilitation

Medicine (Fig.1). There are so many cases as well as articles in rehabilitation and other journals (Fig.1).

The review of Progrès en Urologie, which deals with pelvic perineal disorders, comes in 2nd position by three articles (11.53%) (Fig.2). The rest of the articles are published in journals of rheumatology, neurological systems and neuropsychology, as well as in journals publishing clinical cases (46.15%). The first article was published in 2004 (3).

The distribution of articles by university centers was as follows: 8 articles for University Hospital Center Mohammed in Oujda (30.76%), 5 articles for Avicenna Military Hospital in Marrakech (19.2%), 5 articles for University Hospital Center Hassan II in Fes (19.2%), 4 articles for Ibn Sina University Hospital Center in Rabat (15.3%), 3 articles for Ibn Rochd University Hospital Center in Casablanca (11.5%) and one article for Cheikh Khalifa Hospital in Casa Blanca (3.84%) (Table.1)

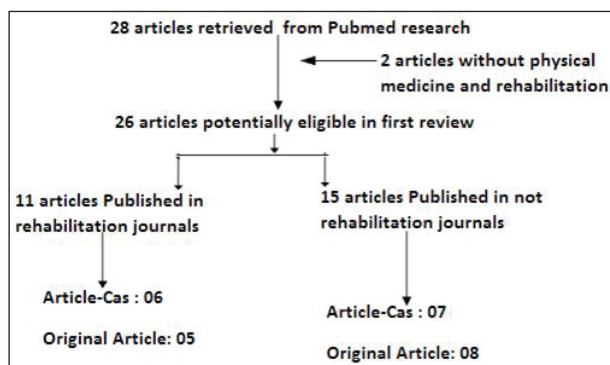


Figure 1. All articles published by MP PMRs (Moroccan Physicians in Physical Medicine and Rehabilitation) in PubMed until December 2019

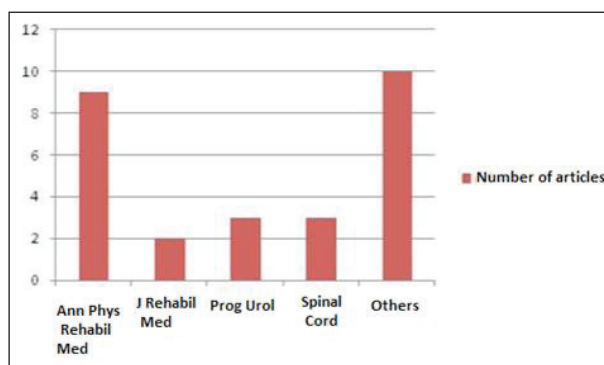


Figure 2. Number of articles published per journal by MP PMR (Moroccan Physicians in Physical Medicine and Rehabilitation) in PubMed until December 2019

The spine was in first place with 6 articles (23.7%) followed by pelvic-perinology with 4 articles (15.38%) and 3 in neuropsychology (11.53%). We noted two articles on disability (7.69%) and one article in pedagogy (3.84%). Regarding the type of research, there were 11 cases reports (42.30%), 10 case series (38.46%), 3 letters (11.53%) and finally two in epidemiology (7.69%). There was no clinical trial, no comparative study or meta-analysis.

Annals Physical Rehabilitation Medicine having had the most important articles (34.61%) came at the top of the list of journals, it had the highest impact factor (4,196). for all journals, the impact factor ranged from 0.819 to 4.196. United Kingdom was the country where we published the most articles with 6 journals, followed by France with 3 journals, finally, a review each for United States and Netherlands. All publications are cited in Table 2.

Discussion

This work has found only 26 articles in recent decades. Although minimal, it reflects at least the existence of a population of MP PMR at the international level. This inventory, which we can describe as deplorable, could be explained by several reasons.

As in many countries, the implementation of this medical specialty has proved difficult and painstaking; it will be structured gradually in Europe and in the world. MP PMR have struggled to find a place among their colleagues, in addition to the structures

and equipment that are lacking, medical and paramedical specialties are fighting a battle against the PMR, despite this tough competition, Physical Medicine and Rehabilitation has been able to maintain itself. So, in order not to perish, the MP PMRs organized congresses, took care of the disability whatever it is, communicated here and elsewhere. The Moroccan Society of Physical Medicine and Rehabilitation "SOMAREF" was created only in 1992. The number of MP PMRs since the 1970s has increased sharply (Fig. 3); this increase does not reflect the needs of the Moroccan population. At present, there are less than 70 MP PMR for 32 million inhabitants (1 MP PMR for 450 059 inhabitants), in France there are 2000 PMR for 66, 99 millions, 3.3 PMR per 100,000 inhabitants.

There were two doctors between 1980 and 1987, in the 1990s there were 10 doctors. At the beginning of the 12th century, the number increased to twenty doctors, most of whom were self-employed, in 2011 there were more than fifty-five doctors, currently there are seventy-five doctors, most of whom are in the private sector, not interested in academic work and publications. In the public sector, the number of PRM MM does not exceed twenty (4), who work in outpatient centres or in hospital structures that do not have services dedicated to rehabilitation activities.

Currently, there are only 10 MP PMR professors, scattered among the six university hospitals, the first Associate Professor was in 2002. Most of these academics do not have suitable centres to care for patients; there is only one university hospital service in the whole kingdom. In addition to the shortage of PRM

Table.1: Distribution of articles by academic university centers

Distribution of the Number of Report Stratified by Academic Physical Medicine and rehabilitation	<i>n</i> (%)
University Hospital Center Mohammed in Oujda	8 (30.76%)
Avicenne Military Hospital in Marrakech	5 (19.2%)
University Hospital Centeyèr Hassan II in Fes	5 (19.2%)
University Hospital Center Ibn Sina à Rabat	4 (15.3%)
University Hospital Center Ibn Rochd in Casablanca	3 (11.5%)
Cheikh Khalifa Hospital in Casa Blanca	1 (3.84%)
Mohammed V Military Teaching Hospital à Rabat	0(0%)
University Hospital Center Mohammed VI in Marrakech	0(0%)

Table 2: Moroccan Physicians in Physical Medicine and Rehabilitation publications PubMed

Journal	Title
1. Ann Phys Rehabil Med. 2017;60:244-248	Long-term functional outcomes after primary surgical repair of acute and chronic patellar tendon rupture: Series of 25 patients.
2. Eur J Sport Sci. 2016;16:1226-31	Isokinetic imbalance of adductor-abductor hip muscles in professional soccer players with chronic adductor-related groin pain.
3. Prog Urol. 2015; 25:217-23	Urodynamic profile of voiding disorders persisting after treatment of posterior urethral valve.
4. Ann Phys Rehabil Med. 2010; 53:650-4	Mycetoma (Madura foot): A case report.
5. Ann Readapt Med Phys. 2004;47:621-6	Intradiscal injection of acetate of prednisolone in severe low back pain: complications and patients' assessment of effectiveness.
6. Pan Afr Med J. 2016; 19; 24:254.	Post-traumatic ossification of the medial collateral ligament of the knee: about a case.
7. Prog Urol. 2013 ;23:244-8	Translation and linguistic validation in classical Arabic of the urinary symptom profile (USP) questionnaire.
8. Ann Phys Rehabil Med. 2015; 58:359-61.	. Meralgia paresthetica with lumbar neurinoma: Case report.
9. J Med Case Rep. 2016; 10:28.	Compression of the peroneal nerve by a neurofibroma originating from collaterals of the peroneal nerve: a case report.
10. Ann Phys Rehabil Med. 2019; 6:135-136.	The "Back Book" translated to Arabic.
11. J Rehabil Med. 2015;47:593-8	Prevalence of disability and rehabilitation needs amongst adult hospitalized patients in a Moroccan university hospital.
12. Ann Phys Rehabil Med. 2011; 54:53-8.	Spondylolisthesis on bilateral pedicle stress fracture in the lumbar spine: a case study.
13. Cases J. 2010 Feb 12; 3:60.	Stiff limb syndrome: a case report..
14. J Rehabil Med. 2019; 5:805-812.	Prevalence of disability in Morocco: Results from a large-scale national survey.
15. Ann Readapt Med Phys. 2007; 50:721-3, 718-20.	An unusual complication of intra-articular injections of corticosteroids: Tachon syndrome. Two case reports.
16. Spinal Cord. 2012;50:558-62	Bladder dysfunction in hereditary spastic paraplegia: a clinical and urodynamic evaluation.
17. Prog Urol. 2012; 22:467-74.	Transanal irrigation for bowel and anorectal management in spinal cord-injured patients.
18. PLoS One. 2013; 8:e68560.	Iterative fragmentation of cognitive maps in a visual imagery task.
19. Ann Phys Rehabil Med. 2017; 60:160-163.	Using eye movements to explore mental representations of space.
20. Neuropsychologia. 2016 ;86:141-52	Spontaneous ocular positioning during visual imagery in patients with hemianopia and/or hemineglect..
21. Med Teach. 2019; 41:1319-1320.	Would 'dissent' medical students make better doctors?
22. Clin Neurol Neurosurg. 2011; 113:716-20.	Long term outcome following mild traumatic brain injury in Moroccan patients
23. Ann Phys Rehabil Med. 2010;53:584-90	Anterior superior iliac spine avulsion in a young soccer player.
24. Joint Bone Spine. 2011;78:534-5	Paravertebral mass in a patient with hemoglobin C disease.
25. Spinal Cord. 2011;49(:1079-81	Neurogenic heterotopic ossification of the hands in a patient with spinal cord injury: a case report.
26. Clin Rheumatol. 2012; 31:943-9.	Translation, adaptation and validation of the Moroccan version of the Quebec Back Pain Disability Scale.

professors, there is a terrible lack of resident doctors in specialization and internships. Given the multi-purpose role of PRM centres, PRM MM are absorbed by the high number of patients.

All MP PMRs are French-speaking; therefore, several works are published in non-indexed French-speaking journals. This 73.07% publication rate in English is explained by the change in the edition, indeed, the former French non-indexed PMR journals are currently all in English.

There were 11 cases reports (42.30%), 10 case series (38.46%), 3 letters (11.53%) and finally two in epidemiology (7.69%). There was no clinical trial, no comparative study or meta-analysis. Cases represent almost of publications, as already explained above, the lack of infrastructure and human resources forces PRM MM to focus on clinical cases that are easier to publish. Randomized and clinical trials and comparative studies (which are of a high level of evidence) require time and effort to materialize.

We focused on the first authors of the publications. They contribute significantly to the knowledge and development of their colleagues, they promote medical publication, this allows the comparison of their own practices with those of the professional and scientific community, and therefore, they deserve the most credit (5, 6). Unfortunately, production was not continuous or regular.

The publication was 4 times more important during the second decade (Fig.4). The authors spent internships in PMR services in France in the first decade, they acquired skills and knowledge, and in addition they established relationships allowing them to establish collaborations. Access to the Internet and scientific databases was so easy that all Moroccan universities subscribed to subscriptions. During the second decade, nine new teachers were added.

Only one journal is popular among MP PMR: *Annal Physical Rehabilitation Medicine*, there is one and only reason, this journal published in French and all the authors, being French-speaking, published their works there. Even after editing in English, they continue to publish there. The topics of the articles were varied; they touched on many subjects related to disability, pelvic-perineology, spine, central and peripheral neurological system, pedagogy, neuropsychology and epidemiology.

The overall publication productivity of MP PMRs was encouraging compared to other countries (Fig. 5), but less than expected. As already expressed above, we can attribute this insufficiency to several causes: the lack of appropriate structures for rehabilitation, the

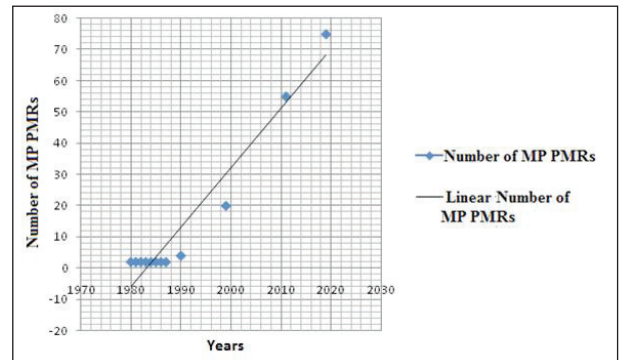


Figure 3. The number of MP PMRs (Moroccan Physicians in Physical Medicine and Rehabilitation) since they took office in Morocco until December 2019

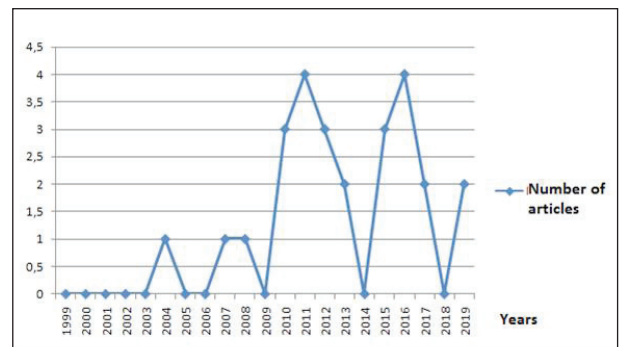


Figure 4. Graph showing the number of articles published per year by MP PMRs in PubMed until December 2019

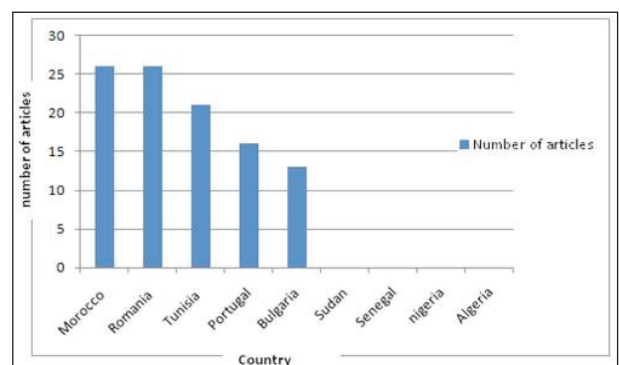


Figure 5. Comparative analysis of the number of studies PMR indexed in PubMed, until December 2019, among some socio-economically close countries worldwide

lack of human resources, the lack of experience, the lack of ideas, the lack of dedication and enthusiasm for research, the lack of organization, the high burden on patients and finally the lack of motivation.

It is time to change our attitude and improve our visibility on a global scale. There are many forms of conduct that require the involvement of everyone, the political and economic power (the business world, insurance and mutual insurance organisations, the Ministry of Health, the Ministry of National Education, the Ministry of Higher Education and Scientific Research) and the medical sector with all its components (MP PMR, UHC, universities and medical schools). The political and economic authorities must multiply the appropriate structures, open residency and teaching positions to increase the number of students. Given the role played by PMR services in combating sedentary life, decubitus complications and disability in general; mutuals and insurance must be involved with a serious policy and a win-win contract, studies show the value of prevention; investing one dollar in prevention would make it possible to earn six dollars in cure (7).

Unfortunately, the cost of a session in the public sector is less than 4 Euros, which casts doubt on the effectiveness of PMR services in health development. The nomenclature of physical medicine and rehabilitation procedures has not yet been established, initiatives for the development and enhancement of medical functional rehabilitation, also known as PRM, are under way. Promising measures should be taken to repatriate other PRM doctors based abroad, more than 120 PRMs are practicing abroad due to the lack of adequate infrastructure in their country, and the daily difficulties of practicing this profession on a private basis. The flight of other PRM MMs, especially young academics in the liberal sector or abroad, must be limited.

On our side, MP PMRs and academics should be introduced to writing methods and medical research (8), medical schools should increase the number of seminars and call on foreign experts. MP PMRs must perfect their English. We encourage systematic reviews and meta-analyses; they are less costly and have the highest level of evidence. The term “Cooperate or perish” replacing “Publish or perish” should encourage MP PMRs to collaborate with their foreign peers to increase visibility on a global scale. In addition, the

creation of a PRM Teachers’ College would give a boost to in-service training and institutional collaboration, or even the publication of a national journal and its subsequent indexing.

The strengths of this study: it is a first bibliometric evaluation of the publication of MP PMR in an African country, it is exhaustive reporting all published articles, and the study compared these publications with those of other MP PMRs from other countries. There were some weaknesses; work could be missing due to research errors due to misspellings of names. We have only included articles published in PubMed, this means the elimination of other publications in non-indexed journals.

Conclusion

It seems that publication is not a priority for some physicians. Although PRM is a newly entrenched specialty in our country; the publication compared to other countries is encouraging. The publication field is large but it does not reach a level where the *h* index of each author can be raised. Almost half of the publication is rich in clinical cases; there was no clinical trial, no comparative study or meta-analysis. There is a lot of effort to be made on all levels to raise the level of publication of MP PMR. Scientific research improves the health status of citizens and consequently the development of the country.

Key messages

- Scientific publications were limited
- English was the dominant language of the works.
- The number of articles is correlated with the number of Moroccan Physicians of physical medicine and Rehabilitation
- The strategies could be used to increase local

Conflicts of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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