

Publication requirement for faculty promotion in medical institutions in India: ‘Mind the gap’

NANDA CHHAVI, GEETIKA SRIVASTAVA, AMIT GOEL, AMITA AGGARWAL

ABSTRACT

Background. We assessed the balance between the number of publications required by medical teachers and the publication space available in the Indian medical journals.

Methods. The Medical Council of India (MCI) website, its guidelines and documents were searched and we extracted data on the number of medical colleges, undergraduate and postgraduate seats and faculty requirement. The required number of assistant professors and associate professors was calculated. The publication requirements were estimated according to MCI’s February 2020 guidelines. A publication which satisfied the above guidelines for promotion was counted as ‘eligible publication’. Indian medical journals indexed in any of the MCI-permitted databases were identified, and the number of eligible articles in them in 2019 was counted.

Results. India has a total of 79 798 MBBS seats, 33 025 postgraduate seats and 4231 superspecialty seats in MCI-certified medical institutions and to teach them 35 285 assistant professors and 23 116 associate professors are required. Assuming that each publication could serve a maximum of 3 teachers, we will need approximately 50 696 eligible publications in the next 7 years. A search of applicable databases, identified 162 unique Indian medical journals of which 79 were indexed in PubMed/PubMed Central. Among the remaining 63 were indexed in DOAJ, 14 in EMBASE, 3 in Scopus and 3 were indexed only in WOS-SCIE. These journals cumulatively published a total of 8508 eligible publications in 2019.

Conclusion. The publication space in Indian medical journals is limited, thus there is a need to have a national medical repository such as MedRxiv to prevent publication in predatory journals.

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INTRODUCTION

A gap in availability and demand for trained physicians in India has led to the establishment of a large number of medical colleges in a short period of time. Medicine is a fast-growing

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field of science and every physician needs to keep updated after completion of formal medical education. Critical review of published literature is essential before adopting the findings of research in clinical practice.

The Medical Council of India (MCI) regulated medical curriculum, teacher eligibility and institutional infrastructure till the National Medical Commission (NMC) Act was passed in 2019.¹ The MCI, in the past, has listed a finite number of publications for the faculty to be eligible as a teacher in a medical college.² In February 2020, it also added the successful completion of a biomedical research course.² This is a welcome step as the regulatory authorities want Indian physicians to be well equipped to critically appraise the medical literature as well as plan good research studies.

The MCI has changed the publication requirement for medical teachers from time to time. The most recent notification issued in February 2020 specifies four criteria for publications: Total number of publications, indexing of the journal in which the publication has appeared, types of research work, and the position of an author in the list of authors.² These criteria were laid down to ensure that the published research is of reasonable quality and the author has made substantial contribution to it.

However, the increased demand for publication space has led to the exponential growth of predatory journals. These journals are of poor quality, charge huge amount of money as article processing fee, and the articles are not peer-reviewed. There could be several reasons forcing Indian authors to publish in predatory journals. These could be ease of publication, fast processing of the article, approval of some of them by MCI and non-availability of space in a good quality indexed journal.

We reviewed the number of publications required at present by medical teachers to satisfy the MCI teacher eligibility criteria and the publication space available in medical journals being published from India.

METHODS

The MCI website and relevant documents were searched in March 2020 to extract data on the total number of medical colleges in the country, number of undergraduate and specialty-wise postgraduate seats in each one of them, and the minimal faculty requirement, at various levels of seniority, for medical colleges according to their annual undergraduate, postgraduate or superspecialty student uptake (earlier www.mciindia.org.in; now www.nmc.org.in).

The above information was used to calculate the faculty requirement at the level of assistant professor, associate professor or professor. If optional, then preference was given for junior faculty position over senior faculty. The publication requirement for faculty promotion was taken from the February 2020 guidelines issued by the MCI.² The colleges categorized as those with either 50, 100, 150, 200 and 250 seats, respectively. The colleges with MBBS seats in between these categories were included in next higher group.

Next, we estimated the number of ‘eligible publications’

required in the next 7 years for the promotion of medical teachers in all the medical institutions in India. A publication which fulfilled the most recently defined MCI promotion criteria was counted as 'eligible publication' (Table I). The time period of 7 years was taken because it takes a minimum of 7 years to become professor from assistant professor.

The various Indian medical journals indexed in any of the MCI-permitted databases (PubMed/Medline, Scopus, EMBASE, WOS-SCIE [web of science-science citation index expanded] and DOAJ [directory of open access journals]) were identified followed by the counting of the number of eligible articles they published in 2019. A journal was considered to be an 'Indian journal' if it was either an official journal of an Indian organization or institution.

Initially, all the journal databases were screened, in March 2020, to identify Indian journals. This was followed by a more detailed assessment of individual journals, through their websites and other sources, to check for the inclusion and exclusion criteria. Indian journals listed in PubMed were identified with the search term 'India [pl]'. The list of journals indexed in other databases was downloaded from their websites which are available in the Excel sheet. The Indian medical journals were identified with Excel filter application coupled with manual screening. The screening step was followed by a detailed assessment of each of the identified journal to check for the selection criteria (Table II). The journal selection criteria were identified after a short survey with 50 aspirant teaching faculty, working in two medical institutions in our city, who were due for their promotion in the next 2 years. The websites of all the selected journals were visited to count the number of eligible publications they had published in 2019. This number was multiplied by 7 to estimate the expected number of 'eligible

publications' which could appear in these journals in the next 7 years.

We restricted the inclusion of MD and MS as a postgraduate course. We did not include DNB courses because there is no publication requirement for faculty to teach DNB students. We also excluded the institutions and teachers who were involved in only postgraduate teaching because the faculty requirement for such colleges was not clearly mentioned in the MCI documents.

Assumptions

Several assumptions made at the time of data extraction are summarized below:

1. The following parameters will remain unchanged in the next 7 years: First, the total number of medical institutions; second, the number of undergraduate or postgraduate seats in each medical institution; third, the publication requirement for faculty promotion.
2. All the faculty will be promoted on time, from assistant professor to professor rank, if they would satisfy the publication criteria.
3. All the institutions are working with complete faculty strength as required according to the MCI guidelines.
4. All the approved postgraduate seats are completely filled in all the institutes.
5. Each of the 'eligible publications' will benefit only 3 of the 4 faculty members (first three authors and corresponding author) because at least one of the 4 applicable positions will be shared by either a trainee or a professor.
6. The number of articles published from all the Indian institutes in different international journals will be equal to the number of articles published from foreign authors in various Indian journals.

The study did not need ethics committee approval.

RESULTS

Data search in March 2020 identified 160,371 and 300 institutions imparting MBBS alone, MBBS with postgraduation, and superspecialty training, respectively. The colleges not permitted for MBBS admission ($n=11$) were excluded from the analysis. There were a total of 79,798 MBBS seats, which included 20,365 in undergraduate colleges and 59,433 in postgraduate colleges.

There were a total of 33,025 postgraduate seats in various broad specialties. In addition, there were 48 colleges which had a total of 1198 postgraduate seats (3.6%), which were not included in the analysis because the faculty requirement for such colleges was not clear in the MCI document. There were a total of 4231 seats in superspecialty branches, either medical ($n=2264$) or surgical branches ($n=1967$).

The number of assistant professors, associate professors and professors in various branches, required to satisfy the teachers' requirement for graduate, broad specialty and superspecialty courses are summarized in Table III. We need a total of 35,285 assistant professors and 23,116 associate professors. All these teachers will need a total of 152,087 eligible publications in the next 7 years for being promoted as professors (Table IV).

Assuming that each publication could serve a maximum of three teachers, we will need approximately 50,696 eligible publications in the next 7 years.

Search of applicable databases, identified 162 unique Indian

TABLE I. Criteria laid by the Medical Council of India to accept a publication for promotion of medical teachers

All the following criteria must be satisfied:
1. Research work published as either original papers, meta-analysis, systematic reviews, or case series
2. Publication appeared in a journal included in either Medline, PubMed Central, Science Citation Index Expanded (SCIE), Embase, Scopus, or Directory of Open Access Journals (DOAJ)
3. The author must be either among the first three or the corresponding author

TABLE II. Selection criteria for journals

<i>Inclusion criteria</i>
1. Indian medical journal, i.e. a journal published by an Indian institute, organization or society
2. English language publication
3. Publishing medical sciences articles
4. Publishing at least one issue every year
5. Completed at least one year of indexing in any of the accepted indexing services
6. Last publication appeared in previous 12 months
<i>Exclusion criteria</i>
1. Journal published from India but belongs to a non-Indian organization, institute or society
2. Journal published by a multinational society
3. A conference proceeding or abstract book or textbook
4. A journal which publishes only review articles
5. Primarily not a medical science journal, e.g. pharmaceutical, food sciences or biotechnology journal, etc.

TABLE III. Number of teachers required in medical institutions in India

No.	Subject	Assistant Professor	Associate Professor	Professor
1	Anatomy	1137	651	529
2	Physiology	1203	683	556
3	Biochemistry	1149	651	527
4	Microbiology	1213	691	563
5	Pathology	2065	1890	682
6	Blood bank	152	0	211
7	Pharmacology	1085	683	555
8	Forensic medicine and toxicology	505	339	398
9	Community medicine	2190	993	552
10	Paediatrics	2285	1406	667
11	Medicine	4561	2827	842
12	Psychiatry	438	427	295
13	Skin and venereal diseases	470	459	327
14	Tuberculosis and chest	566	300	399
15	Surgery	4155	2601	754
16	Orthopaedics	2271	1407	599
17	Radiodiagnosis	914	860	522
18	Radiotherapy	461	206	282
19	Ear nose and throat	478	473	478
20	Ophthalmology	749	573	522
21	Obstetrics and gynaecology	2596	1585	696
22	Anaesthesia	2956	1969	733
23	Various superspecialties	1686	1442	1196
Total		35 285	23 116	12 885

TABLE IV. Number of publications required by medical teachers for promotion in India

Post	Number of teachers	Number of publications needed by each of them in next 7 years	Total number of publications needed in next 7 years
Assistant Professor	35 285	3	105 855
Associate Professor	23 116	2	46 232
Total			152 087

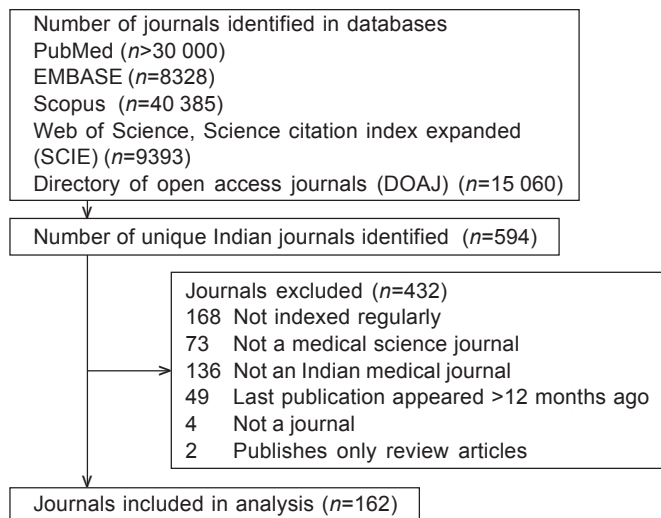


Fig 1. Flowchart showing search results of Indian medical journals

medical journals which were indexed in any of these databases (Fig. 1; Supplementary file 1; available at www.nmji.in). All that were indexed in PubMed/PubMed Central are categorized in that group ($n=79$) followed by DOAJ ($n=63$), EMBASE ($n=14$),

Scopus ($n=3$) and WOS-SCIE ($n=3$). Thus, three journals were indexed only in WOS-SCIE.

These journals cumulatively published 8508 eligible publications in 2019 (Table V) which included 8395 original articles (98.7%), 28 systematic reviews/meta-analyses (0.3%) and 85 case series (1.0%).

Each of the included journals published a median (range) of 31 (2–580) eligible articles in 2019. One hundred and fifty of 162 journals (93.2%) had published below 100 articles every year (Table V). Overall, about one-third publications appeared in merely 8 journals. Among all the articles, 4589 (53.9%) articles were indexed in PubMed/Medline or PubMed Central (Table VI).

Twenty-five of 162 journals (15.4%; 22 indexed in PubMed, 3 indexed in WOS) were indexed in SCIE. The median impact factor for these journals was 0.993 (range 0.172–2.128).³

DISCUSSION

The faculty in various medical institutions need a minimum of 50 696 eligible publications in the next 7 years, for their promotion. A total of 162 unique medical journals are published from India. These medical journals cumulatively publish 8508 eligible publications every year, which primarily include original articles (98.7%). Most of the Indian medical journals publish less than

TABLE V. Distribution of articles published by eligible medical journals in 2019

Journal category	Number of journals	Number of total articles published in 2019 (%)	Cumulative proportion of total articles (%)
<50	116	2755 (32.4)	2755 (32.4)
51–100	34	2278 (26.7)	5033 (59.1)
101–200	4	535 (6.3)	5568 (65.4)
201–300	5	1265 (14.9)	6833 (80.3)
>300	3	1675 (19.7)	8508 (100)
Total	162	8508 (100)	8508 (100)

TABLE VI. Number of eligible articles published by Indian medical journals in 2019

Database	Number of journals	Number of eligible articles published in 2019 (%)
PubMed	79	4589 (53.9)
Directory of open access journals	63	2527 (29.8)
EMBASE	14	1117 (13.1)
Scopus	3	140 (1.6)
Web of science	3	135 (1.6)
Total	162	8508 (100)

100 articles in a year, only 50% are available on PubMed, 15% have an impact factor and their median impact factor is below 1.

At present, the publication space available in Indian journals is just enough to accommodate the publications needed for promotion of all medical teachers in the next 7 years. Our estimates on the number of publications required is an underestimate as we have not counted faculty working in institutions that are not under the purview of MCI/NMC. These institutions include 13 'All India Institutes of Medical Sciences (AIIMS)' and several other institutes of national importance. Most of these institutions have 300 to 700 faculty members. All these medical institutions are tertiary care hospitals with excellent research facilities. Hence, they are likely to produce more research papers and occupy a large proportion of the available publication space. In addition, this analysis does not count the papers published by professors. Hence, our assessment of the space available is an overestimation.

Similarly, we have not counted articles published abroad and articles published by foreign authors in Indian journals assuming that it may be roughly equal. Thus, it seems the space available for research papers in Indian Medical Journals will fall short of what is needed by faculty in MCI/NMC governed colleges.

A right step in this direction can be deposition of the preprint, such as medRxiv launched by Cold Spring Harbor laboratories, in a repository maintained by Indian Council of Medical Research or by MCI/NMC. All the research deposited shall be a citable manuscript and such a work shall be acceptable for faculty promotion. Such a depository will provide not only a platform to exhibit the unpublished work but will also help in containing the rampant growth of predatory journals published from India.

The MCI accepts original articles, systematic review, meta-analysis, and case-series for promotion but each one of them has certain issues that need to be addressed. Original research work needs money, infrastructure, protected time and training, and majority of our medical faculty have limited access to these

facilities. To perform a systematic review and meta-analysis, it is almost essential to access major databases such as Scopus, EMBASE, etc. In India, very few institutes, barring premier institutes not covered under the MCI umbrella, have access to these databases; further, certain degree of skill and training are needed to meet the standard methods laid down for the literature search, study selection, data extraction, data analysis, data presentation, and data interpretation required in systematic review and meta-analysis. However, most of our faculty rarely gets the opportunity to learn these skills. These limitations are well reflected in that only 28 systematic reviews were published from India in 2019. The publication of case series is getting more and more difficult because most journals do not publish them as full papers but as letters probably due to their concern about the impact factor of their journal.

Is publication an appropriate yardstick for promotion in the medical stream? Such a 'necessity' for publication has led to the appearance of numerous predatory journals, publication of fake data, duplication of studies and duplicate publications.⁴ The largest number of authors (35%) and predatory publishers (27%) are from India.^{5,6} These predatory publications have adversely affected the integrity of scientific research.⁶

Each research project costs money, effort and time. Further, most of the research proposals also include patients' contributions in the form of data, tissue/blood specimens, privacy and discomfort.

In addition to the number of publications, the regulatory authorities need to focus on the quality of publications, their impact and the contribution of each author. The quality of medical journals is commonly assessed by their indexing in PubMed/Medline, SCIE and their impact factor. Only half the Indian medical journals are indexed in the PubMed/Medline or PubMed Central and only 15% are in SCIE and most of them have a low impact factor.

This suggests that we need to improve the quality of biomedical research from India. This will happen slowly and the MCI/NMC is taking steps in the right direction by introducing a biomedical research course and some minimum number of publications. There is also a need to impart training, through hands-on workshops, on systematic review and meta-analysis; such a training must be coupled with access to the databases for literature search. With the increase in research aptitude and knowledge, the quality of research is bound to improve. If along with that we have a public investment in research infrastructure and some protected time for research in medical college for faculty it can hasten the pace of good quality biomedical research from India. Over time another metric about publication can be added, i.e. the quality of publication, its relevance in national context and impact on patient care.

In conclusion, Indian medical journals have a limited space

available to meet the publication requirements of medical teachers in India and the preprint server run by the government may be a useful platform. Further, for the promotion of good quality research in healthcare, we need to focus on multiple aspects including infrastructure, funding, time and research methodology.

Conflicts of interest. None declared

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FORM IV

(See Rule 8)

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|---|---|
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I, Dr PEUSH SAHNI, hereby declare that the particulars given above are true to the best of my knowledge and belief

1 March 2023

Sd-
Signature of publisher
