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Research performance of Postgraduate Institute of Medical Education And Research (PGIMER), Chandigarh: A Scientometric Analysis

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ABSTRACT

The paper attempts to analyze the research profile of Postgraduate Institute of Medical Education & Research, Chandigarh, on several parameters including its status, growth rate, impact, international collaborative research patterns, media of communication. The paper also evaluates the research characteristics under 10 broad subjects and of 10 productive authors. Scopus International multidisciplinary bibliographical database has been used to retrieve the 10 years data covering the years 2011-2020.

Keywords: Scientometric analysis, Authorship pattern, Subject domain, Scientometric study, Research productivity, PGIMER, Chandigarh.

1. INTRODUCTION

The Medical Council of India (MCI) was established in 1934 under the Indian Medical Council Act, 1933, now repealed, with the main function of establishing uniform standards of higher qualifications in medicine and recognition of medical qualifications in India and abroad. MCI was established to maintain uniform standards of medical education (both undergraduate and postgraduate), recommend recognition/ de-recognition of medical qualifications of medical institutions of India or foreign countries, permanent / provisional registration of doctors with recognized medical qualifications, reciprocate with foreign countries in the matter of mutual recognition of medical qualifications, etc. There are 229 recognized medical colleges, and 71 colleges have been permitted U/S 10A of the Indian Medical Council Act, 1956 during the year under review.

Postgraduate Institute of Medical Education and Research (PGIMER) is a premier medical and research institution in Chandigarh, India, consistently ranked in the top among the institutes for medical education in India and is an 'Institute of National Importance'. It has educational, medical research, and training facilities for its students. It is the leading tertiary care hospital of the region and caters to patients from all over Punjab, J&K, Himachal Pradesh and Haryana. It has all the latest facilities including all specialties, super specialties and sub specialties.^[3] Apart from the clinical services, PGI boasts of training in almost all disciplines of Medicine including post graduate and post doctoral degrees, diploma and fellowships. There are more than 50 such training courses in the institute.^[4]

2. REVIEW OF LITERATURE

Some relevant studies have been undertaken on the evaluation of the research output of different institutions both in India and abroad. For example few studies were conducted on evaluation of institutes and their departments by Jeevan and Gupta [3,4] on Indian Institute of Technology, Kharagpur, Singh, Gupta and Kumar [10] on Indian Institute of Technology, Roorkee, Kumbar, Gupta and Dhawan [5] on University of Mysore and Nederhof [8] on university departments of a agricultural university in Netherlands . Some studies had also been conducted at the broader level, which includes evaluation of research at the group of institute's level [6, 9]. Still broader studies are available which deals with the evaluation of scientific activity, including institutional activities [7]. Few quantitative studies have been carried in the past analyzing Indian overall medical or biomedical research. Reddy *et al.*[6] analyzed the extent of research activities in major Indian medical colleges and concluded that only a few medical colleges (10 out of 128) are active in research. Arora *et al.*[7] examined the extent of research undertaken in Indian medical colleges and concluded that majority of the 88 Indian medical colleges receiving research grants from ICMR did not produce any research paper in 1991. Only 10% of the projects funded to Indian medical colleges ended up in publications in indexed journals. Deo[8] examined the current status of undergraduate Indian medical education and research and discussed the steps that need to be taken to promote research at grassroot level.

Satyanarayana[9] examined Indian contribution in biomedical research (3605 papers in 1990 and 3241 papers in 1994) as indexed in three databases, such as Index Medicus, Excerpta Medica and Tropical Disease Bulletin. Srivastava and Diwakar[10] provided a comparative analysis of Indian biomedical papers (4732 in 1999 and 6088 in 2007), using SCI database. Kundra[11] analyzed the research collaboration (as reflected in co-authored papers) in Indian medical research from 1900 to 1945, by focusing on the pattern of collaboration in basic and applied research, multiplicity of authors and types of collaboration. Dutt *et al.*[12] analyzed 2183 papers by Chinese researchers and 1034 papers by Indian researchers in the field of plant-based medicine during 1990–2004 as indexed by PubMed. Arunachalam[13] examined the relevance of Indian medical research during 1981–1985 using Science Citation Index database and concluded that Indian global share of research in medical sciences is very small compared to our contribution in other SandT fields. Arunachalam[14] re-examined the relevance of Indian medical research by repeating the above study by using MEDLINE database from 1987 to 2004. He examined 19,916 Indian medical papers in 1440 journals, of which 14,822 were published in journals with impact factor less than 1.0 in contrast to only 58 papers in journals with impact factor more than 8.0. Dandona *et al.*[15] assessed the health research output and concluded that both the magnitude and distribution of research output are not commensurate with the disease profile and burden. In the later much broader study, Dandona *et al.*[16] examined Indian medical publications in PubMed database and unpublished research reports available in the public domain from 2001 to 2008. According to this study, public health research in India has grown in the past decade, but continues to be inadequate in scope and quality, considering the country's daunting disease burden.

Based on a survey undertaken, Sahni *et al.*[17] examined various aspects of 75 (out of 113) major published Indian medical journals, of which 22 are included in Index Medicus. Of these journals, only eight were judged by Indian and foreign referees to be of international standard. Jain[18] examined the visibility and extent of coverage of Indian biomedical and life sciences journals in global alerting services. Pandya[19] examined the Indian medical research output and discussed the factors for low output of Indian authors and institutions and also indicates that although the number of Indian medical journals is rising rapidly over the years, their contents, regularity and quality leave much to be desired.

3. OBJECTIVES

The present studies general objective was to evaluate the publication output of Postgraduate Institute of Medical Education and Research, Chandigarh for the selected period from 2011 - 2020. However the study intended to perform some specific objectives are as follows:

- a) To find out growth of research productivity of PGIMER during 2011-2020
- b) To identify the highly cited research publications and preferred source for publication.
- c) To examine the document by affiliation of research publication during the selected period of study

- d) To examine the document by type of research publication during the selected period of study
- e) To examine the subject wise distribution of research publication and institutional and countries collaboration
- f) To find the most prolific authors from PGIMER, Chandigarh during the selected period of study

4. METHODOLOGY

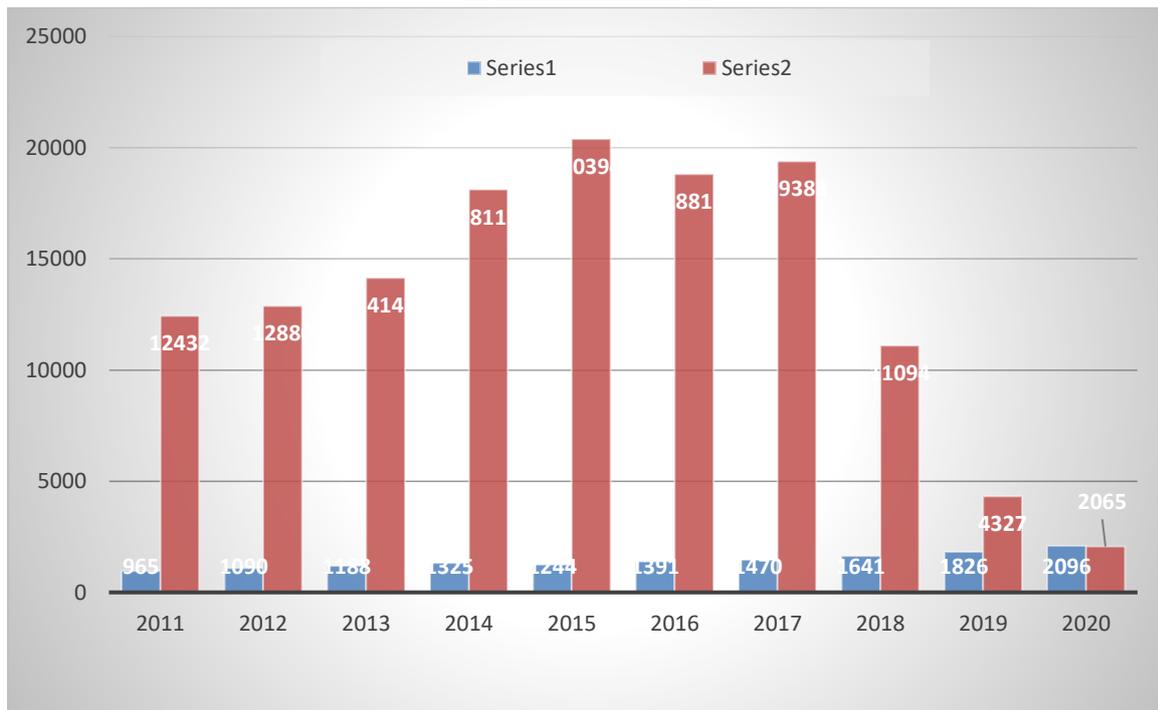
The research performance is one of the essential factors used by accreditation agencies to rank highly learning institutes based on their performance. Research productivity of institutions as whole and the effect of individual researchers' performance, in particular is the basis of evaluation for such recognition agencies. The purpose of this particular study is to analyse the research performance of PGIMER, Chandigarh. The authors have obtained publication data from the Scopus database about it. A search was carried out by accessing the Scopus database. One of the globally leading and largest abstracting and citation database of peer reviewed literature. The following search strategy has been used in the Scopus database to retrieve the data about the study. The search string is used for retrieval of data is "AF-ID ("Postgraduate Institute of Medical Education & Research, Chandigarh" 60000137) AND PUBYEAR, 2020. A total of 14236 publications data were retrieved and processed for data cleaning. Finally, it was scrutinized by the scientific tool and techniques to determine the achievement of the study and objectives.

5. RESULTS AND DISCUSSION

Table 1 Year wise growth pattern of publication

Year	TP	TC	ACPP
2011	965	12432	12.88
2012	1090	12880	11.81
2013	1188	14142	11.90
2014	1325	18117	13.67
2015	1244	20394	16.39
2016	1391	18815	13.52
2017	1470	19383	13.18
2018	1641	11094	6.76
2019	1826	4327	2.36
2020	2096	2065	0.98
Total	14236	133649	9.38

Figure1 : YEAR WISE GROWTH PATTERN OF PUBLICATION WITH CITATION



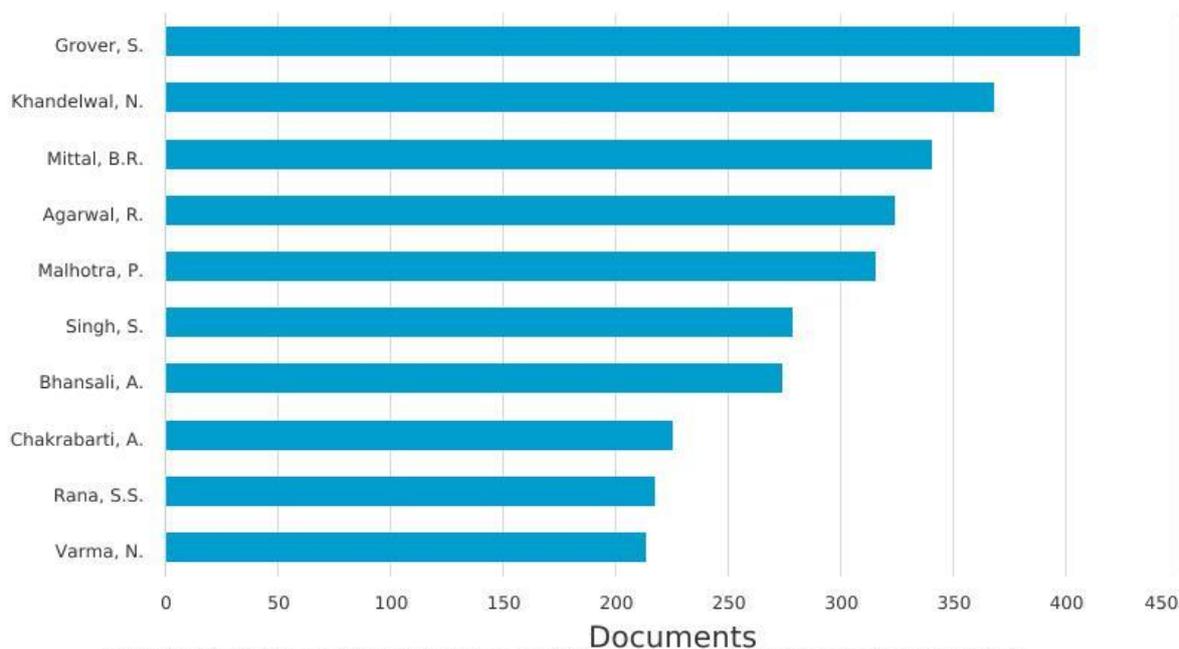
The trend of annual publications and citations over 10 years presented in Table 1 and Figure1. There is a seamless progressive growth is found in both publication and citation counts. Upon analyzing extracted, publications growth is continuously increasing till 2015. This is found to be unexpectly enormous. Further to all –total citation were retrieved with average –citation per paper. The highest citation appeared in 2015. Over the study period publication is continuously increasing, whereas fluctuation trend is found in citation.

Figure II : HIGHLY PROLIFIC AUTHORS

Documents by author

Compare the document counts for up to 15 authors.

Scopus



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The research profile of most prolific 10 authors of PGIMER contributing during the period of 2011-2020. Five authors who contributed more than the group average were Grover S, Khandelwal N, Mittal BR, Agarwal R, Malhotra P.

Table II: TOP TEN HIGHLY CITED PUBLICATIONS

Sl No.	Authors	Title	Year	Source Title	Citation
1.	Naghavi, M. et al.	Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013	2015	The Lancet	4129
2.	Vos, T. et al.	Global, regional, and national incidence, prevalence, and years lived with disability for 301	2015	The Lancet	3245

		acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study 2013			
3.	Klionsky, D.J. et al.	Guidelines for the use and interpretation of assays for monitoring autophagy (3rd edition)	2016	Autophagy	2975
4.	Wang, H. et al.	Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015	2016	The Lancet	2737
5.	Vos, T. et al.	Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: A systematic analysis for the Global Burden of Disease Study 2016	2017	The Lancet	2078
6.	Afshin, A. et al.	Health effects of overweight and obesity in 195 countries over 25 years	2017	New England Journal of Medicine	1904
7.	Jha, V. et al.	Chronic kidney disease: Global dimension and perspectives	2013	The Lancet	1823
8.	Fitzmaurice, C. et al.	Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 32 cancer groups, 1990 to 2015: A Systematic Analysis for the Global Burden of Disease Study Global Burden of Disease Cancer Collaboration	2017	JAMA Oncology	1811
9.	Forouzanfar, M.H. et al.	Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and	2016	The Lancet	1769

		metabolic risks or clusters of risks, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015			
10.	Naghavi, M. et al.	Global, regional, and national age-sex specific mortality for 264 causes of death, 1980-2016: A systematic analysis for the Global Burden of Disease Study 2016	2017	The Lancet	1717

Table 2 listed the top 10 highly cited publications. Citation received for each publication year is varied from highest 4129 to lowest 1717. Among the top ten highly cited papers, the first two articles have received more than 3000 citations, Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study (2013) Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: A systematic analysis for the Global Burden of Disease Study (2013).

Table III: TOP TEN PREFERRED SOURCE FOR PUBLICATIONS

SI No.	Source	Country	TP	h-index	Cite Score	SJR	SNIP	IF
1.	Indian Pediatrics	India	834	46	1.3	0.285	0.656	0.62
2.	Indian Journal Of Medical Research	India	774	75	2.20	0.507	0.989	1.30
3.	Indian Journal Of Pediatrics	India	715	43	2.30	0.361	0.675	0.92
4.	Neurology India	India	453	43	2.00	0.353	0.784	0.70
5.	BMJ Case Reports	UK	338	20	0.6	0.204	0.364	0.44
6.	Indian Journal Of Dermatology Venereology And Leprology	India	317	43	2.523	0.566	1.206	3.30
7.	Indian Journal Of	India	280	43	1.60	0.482	0.931	0.93

	Ophthalmology							
8.	Indian Journal Of Pathology And Microbiology	India	271	28	1.10	0.236	0.508	0.53
9.	Bulletin Postgraduate Institute Of Medical Education And Research Chandigarh	India	251	02	0.00	0.105	0.00	0.00
10	Diagnostic Cytopathology	USA	186	61	2.0	0.441	0.657	1.52

Table 3 shows the top ten preferred sources. It is observed that the ten publications were published in the Indian Pediatrics. The finding revealed that academicians and researchers prefer to publish their research work with high impact volume.

Table 4 listed top10 highly cited publication

FIGURE III: DOCUMENT BY AFFILIATION

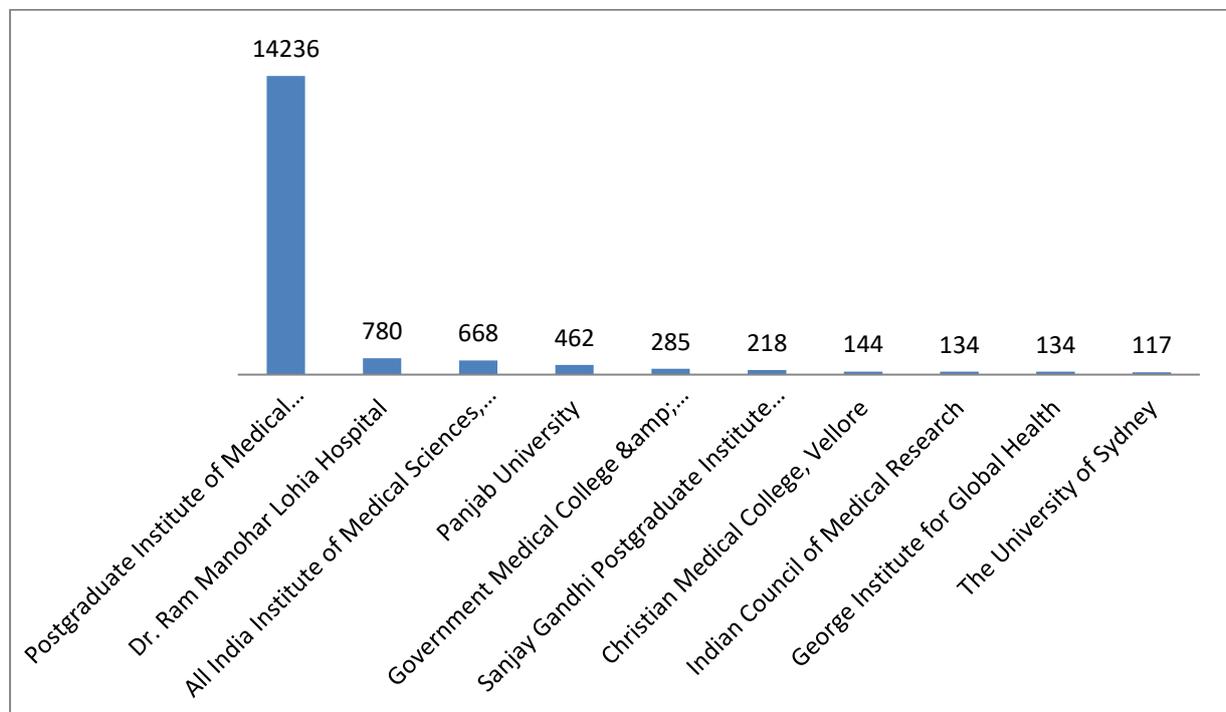
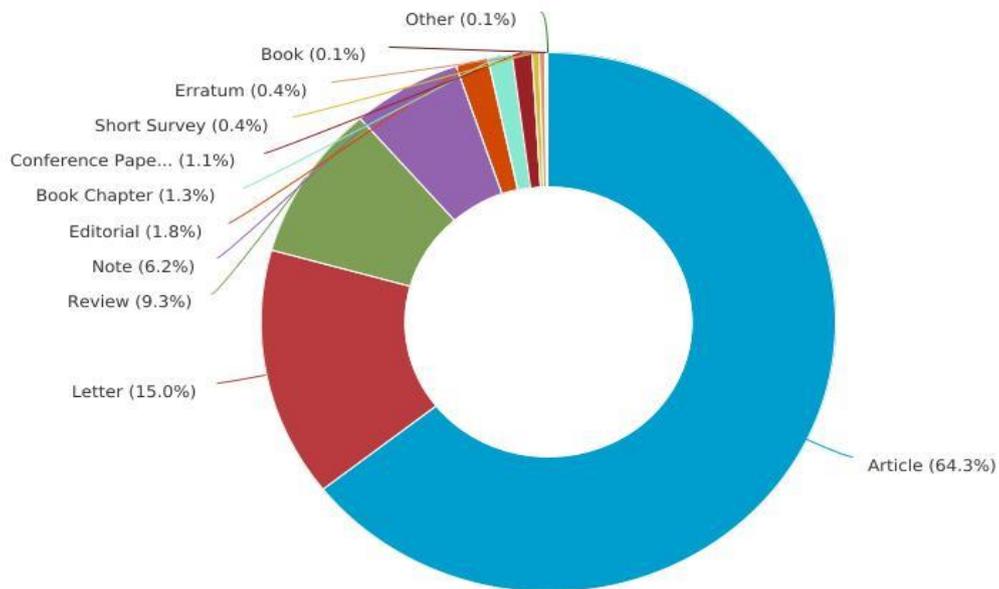


Fig 3 shows documents published by leading institutions in the field of medicine in INDIA. This shows PGIMER is in the top position in publishing research articles in India.

FIGURE IV: DOCUMENT BY TYPE OF PUBLICATION

Documents by type

Scopus



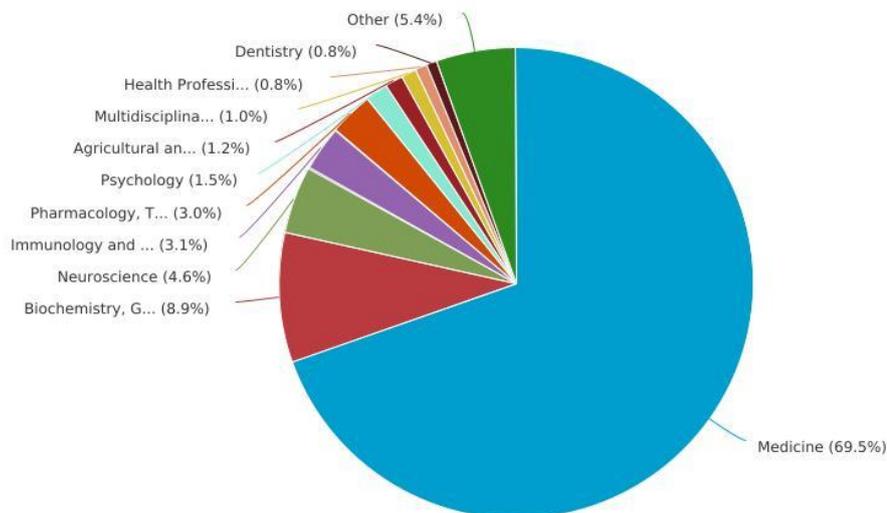
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It is estimated from analysis is that all published records is indicated in Figure IV. The majority 64.3% were articles followed by letter 15% where as the remaining were review, note, editorial, book chapter, conference paper.

FIG. V: DOCUMENT BY SUBJECT AREA

Documents by subject area

Scopus



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Fig. 5 retrieves the document by subject area for 10 years. The maximum publications were of medicine 69.5%, 8.9% were Biochemistry, 4.6% were of neuroscience 3.1% were of immunology, 3.1% were pharmacology, 1.5% were psychology.

6. FINDINGS

- The analysis acknowledges that 2015 is the most productive year with 20394 research papers
- It is apparent during the study period Grover S, Khandelwal N, were found to be the most productive authors with 400 articles.
- Global, regional and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: A systematic analysis for the Global Burden of Disease Study (2013) by Naghavi M et al published in The Lancet is the most cited publication among publications of PGIMER, Chandigarh.
- In the top 10 journal ranking list, Indian paediatrics is the topmost preferred source of publication of PGIMER, Chandigarh with 834 papers.
- The highest no of publications, has appeared in medical discipline and 64.3% were in the form of articles.

7. CONCLUSION

In this study it was observed that PGIMER is one of the leading institution in the field of medicine in India. The research output of PGIMER has gradually increased and showed an exponential progress in later times. 64.3% of published document were articles and the maximum publications 69.5% was of medicine. Five authors who contributed more than group average were Grover S, Khandelwal N, Mittal BR, Aggarwal R, Malhotra P. Apart from clinical services PGI ranked topmost institution in the field of research and is an Institute of National importance.

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