Research productivity and altmetrics of NIRF top ranked medical institutions

D. Gnanasekaran[a] and T. Rajkumar[b]

Kalasalingam Academy of Research and Education, Krishnankoil, Tamil Nadu, India – 626 126

E mail: [a]gsekard@gmail.com, [b]trajkumarkvp@gmail.com

This research aims to identify the state-wise list of active medical institutions in India that participated in the National Institutional Ranking Framework (NIRF) ranking (2019-21). A total of 52 institutions were ranked during the three years. However, only 28 of them have remained in the NIRF rankings for all three years. The research performance of these 28 institutions was examined based on their publications indexed in Scopus, Pubmed, and ResearchGate (RG). In addition, the membership registration details, altmetric such as reads, and RG scores were retrieved from ResearchGate. Compound annual growth rate (CAGR) was employed in the retrieved data to identify the growth rate. All India Institute of Medical Sciences, New Delhi is in the top position based on NIRF as well as ResearchGate Scores. SRM Institute of Science and Technology tops in NIRF score growth rate (6.50%) and Saveetha Institute of Medical and Technical Sciences is leading in ResearchGate score growth rate (55.41%). Kasturba Medical College, (Manipal and Mangaluru) and St. John's Medical College do not have contributions in ResearchGate. The overall publication growth rate of these 28 institutions put together is high for PubMed (13.08%) followed by Scopus (10.06%) and ResearchGate (8.77%). The study recommends that the institutions may encourage their faculty members to make their published research works available in ResearchGate to in order to boost the institution's visibility.

Keywords: NIRF, Ranking, ResearchGate, RG Score, Medical Institutions, Memberships, Publications, Altmetric

Introduction

India's Ministry of Human Resource Development (MHRD) [now Ministry of Education] launched a ranking system known as the National Institutional Ranking Framework (NIRF)[1] on 29th September 2015. The NIRF ranks HEIs based on various parameters[2]. Published research works, indexed in academic databases, is one of the parameters.

Academic databases collect the bibliographic information of trusted and peer-reviewed published research works, index them, and make them retrievable by author, title, subject heading, keyword, etc, and provide bibliometrics of the records[3]. Scopus, Web of Science, PubMed and ERIC are so of the popular databases.

Scopus, an interdisciplinary database, covers 43000+ titles from 10000+ publishers around the world that indexes literature published by the journals, books, and conference proceedings from science, technology, medicine, social science, arts, and humanities (https://www.scopus.com/home.uri)[4]. PubMed was created by the National Library of Medicine, USA indexed more than 33 million literatures from biomedical and life sciences domains and available online since 1996 (https://pubmed.ncbi.nlm.nih.gov/about/)[5].

Academic Social Networking Sites (ASNSs) provide platforms for the researchers to collaborating, store the research works, exchange of ideas and open discussions that lead to the free flow of information[6] and provide altmetrics that are complement to the broadly used citation-based metrics. Altmetric includes citations on social networks, discussions on blogs and websites, institutional repositories, bookmarks on reference managers, etc. Only 28.5% of the Indian research publications get social media coverage[7] which is lesser than the global average. Solanki et al. (2019)[8] found that only 32.1% of the research output of 100 most productive institutions in India were indexed in altmetric.com, a major social media aggregator.

ResearchGate (RG)[9], social media platform for scientists, introduced in the year 2008 which combines bibliometrics and altmetrics to provide an effective metric to measure the research performance. RG offers the members to create a profile, upload and

share the published research works based on the copyright policy of the journals, interact with the researchers on the same set of interests, etc.

The RG altmetrics are correlated with other conventional metrics[10, 11]. It has gained popularity and has attracted more attention for open discussions, creating relationships among the researchers with the same set of interests, and altmetrics[12,13].

Review of literature

RG score is an effective indictor to measure research performance[14] and it realistically mirrors the research activity level of the institutions[15]. Cho (2021)[16] examined highly cited academic papers in social sciences and measured the altmetric such as views, readers, blogs, Wikis, and Tweets using PlumX metrics and found that most of the papers had one or more readers in Mendeley and had one or more references in Wiki. Sivakumaren, Sophia, and Sheeba Rani (2018)[17] and Sivakumaren and Rajkumar (2019)[18] examined the publications of NIRF ranked Indian academic institutions and found more than half of the publications were indexed in Scopus followed by the Web of Science and Indian Citation Index.

Although there are more accounts in RG, it is not used effectively[19, 20] and it was even related to productivity and stress[21]. Arts and humanities disciplines are underrepresented whereas biologists are over-represented in RG[22]. The academics from Brazil and India are heavily using RG[23], and the researchers focus on the network centrality[24]. Rankings make perceptions of prestige and quality explicit[25]. RG Score is directly related to the number of publications and does not correlate with the citation it gained. It is not the right indicator to compare the research quality of an institution[26,27]. The reads score has failed to show how much attention the full texts get[28] but sharing the knowledge on social media platforms increases the visibility of the published works and improves the citations, discovery process, and altmetric scores for the publications[29,30]. It was found that ResearchGate and Google Scholar show the different values for the same authors due to the different mechanism, coverage policy, and strategy followed by these platforms[31].

Very few studies were carried out globally to measure the research performance of the institutions using RG metrics and there is no study concentrating on the medical institutions in India. Hence, the authors decided to examine the contributions of the Indian medical institutions in Scopus, PubMed, and RG. Also, the study examines the altmetrics of the data available at RG for these institutions.

Objectives of the study

- To find the state-wise details of medical institutions that participated in the NIRF ranking;
- To find the active medical institutions in India according to NIRF ranking;
- To examine the publication growth rate of the active institutions based on the publications available at Scopus, PubMed, and ResearchGate;
- To find out the membership details, reads, and scores obtained by the active medical institutions in RG; and
- To offer suggestions to the institutions and RG to improve the metrics.

Methods

The medical institutions' NIRF ranking information for three years (2019-21) were gathered from the NIRF website and the details are given in Tables 1 and 2.

As a result, it was chosen to focus solely on the 28 active institutions' research progress and altmetrics. The institutions' NIRF 2019 data was retrieved in the second week of April 2019, and the NIRF 2021 data was collected in the second week of September 2021. The publication details of these institutions were fetched from Scopus, PubMed, and RG. The Scopus database has a larger number of journals in the medical and life sciences fields. PubMed database focused to biomedical and life science research. This is the reason why these databases were chosen.

The names of the institutions were used in Scopus and PubMed affiliation searches, as well as RG for literature retrieval. The following is an example search for retrieving literature for the year 2019.

Table 1 — Details of institutions that participated in the NIRF Ranking

Year	Participated Institutions	Ranked Institutions	No. of Institutions ranked in all three years
NIRF 2019	113	30	28
NIRF 2020	118	40	
NIRF 2021	111	50	

Table 2 — State-wise participation and ranking of institutions

S. No.	State	2019				2020				2021				Ranked at least in a year (2019-21)		(Active Institutions) Ranked in all 3 Years	
		PI	%	RI	%	PI	%	RI	%	PI	%	RI	%	RI	%	RI	%
1	Andhra Pradesh	5	4.42	1	3.33	4	3.39	1	2.50	3	2.70	1	2.00	2	3.85	0	0.00
2	Chandigarh	3	2.65	1	3.33	2	1.69	2	5.00	2	1.80	2	4.00	1	1.92	1	3.57
3	Chhattisgarh	2	1.77	0	0.00	1	0.85	0	0.00	1	0.90	0	0.00	0	0.00	0	0.00
4	Delhi	8	7.08	6	20.00	7	5.93	6	15.00	7	6.31	7	14.00	7	13.47	6	21.43
5	Goa	1	0.88	0	0.00	1	0.85	0	0.00	1	0.90	0	0.00	0	0.00	0	0.00
6	Gujarat	6	5.31	0	0.00	2	1.69	0	0.00	1	0.90	0	0.00	0	0.00	0	0.00
7	Haryana	4	3.54	0	0.00	2	1.69	1	2.50	1	0.90	1	2.00	1	1.92	0	0.00
8	Karnataka	19	16.81	5	16.67	20	16.95	7	17.50	19	17.12	9	18.00	10	19.23	5	17.86
9	Kerala	3	2.65	0	0.00	4	3.39	0	0.00	5	4.50	1	2.00	1	1.92	0	0.00
10	Madhya Pradesh	5	4.42	0	0.00	3	2.54	0	0.00	3	2.70	0	0.00	0	0.00	0	0.00
11	Maharashtra	13	11.50	1	3.33	12	10.17	3	7.50	12	10.81	4	8.00	4	7.69	1	3.57
12	Manipur	1	0.88	1	3.33	1	0.85	1	2.50	1	0.90	1	2.00	1	1.92	1	3.57
13	Odisha	2	1.77	2	6.67	3	2.54	2	5.00	4	3.60	4	8.00	4	7.69	2	7.14
14	Pondicherry	7	6.19	1	3.33	7	5.93	2	5.00	5	4.50	2	4.00	2	3.85	1	3.57
15	Punjab	3	2.65	2	6.67	4	3.39	2	5.00	3	2.70	1	2.00	2	3.85	1	3.57
16	Rajasthan	3	2.65	0	0.00	4	3.39	1	2.50	6	5.41	2	4.00	2	3.85	0	0.00
17	Sikkim	1	0.88	0	0.00	1	0.85	0	0.00	1	0.90	0	0.00	0	0.00	0	0.00
18	Tamil Nadu	17	15.04	6	20.00	24	20.34	8	20.00	21	18.92	10	20.00	10	19.23	6	21.43
19	Telangana	0	0.00	0	0.00	3	2.54	0	0.00	3	2.70	0	0.00	0	0.00	0	0.00
20	Uttar Pradesh	10	8.85	4	13.33	11	9.32	4	10.00	9	8.11	4	8.00	4	7.69	4	14.29
21	Uttarakhand	0	0.00	0	0.00	1	0.85	0	0.00	2	1.80	0	0.00	0	0.00	0	0.00
22	West Bengal	0	0.00	0	0.00	1	0.85	0	0.00	1	0.90	1	2.00	1	1.92	0	0.00
	Total	113	100.00	30	100.00	118	100.00	40	100.00	111	100.00	50	100.00	52	100.00	28	100.00

(PI – Participated Institutions; RI – Ranked Institutions)

Scopus:

(AF-ID("Saveetha Institute of Medical and Technical Sciences" 60109606)) AND (LIMIT-TO(PUBYEAR, 2019))

PubMed:

((Saveetha Institute of Medical[Affiliation] AND Technical Sciences[Affiliation]) OR (Saveetha University[Affiliation])) AND (("2019/01/01"[Date - Publication] : "2019/12/31"[Date - Publication]))

RG:

"Saveetha Institute of Medical and Technical Sciences" OR "Saveetha University"

RG does not have the feature to refine the results collected for a certain affiliation by year. As a result, the number of publications and altmetric data for the institutions for the years 2019 and 2021 were manually retrieved. The data was then analysed using Ms-Excel software to determine several metrics for the institutions, such as memberships, publications, reads, and RG scores. The tools of percentage analysis and compound annual growth rate (CAGR) were used.

Analysis

State-wise participation and ranking of institutions

Table 2 shows the participation and rating of institutions in NIRF for three years (2019, 2020, and 2021). In these years, the NIRF rating included

colleges from 22 different states. More institutions from Tamil Nadu, Karnataka, Maharashtra, and Uttar Pradesh participated.

NIRF score and growth rate of the institutions

Table 3 displays the NIRF score and institution rankings in detail. During 2019-21, 52 institutions from 15 states appeared on the list for at least one year. Ten institutions each from Tamil Nadu and Karnataka, as well as seven from Delhi, appeared on

the list, accounting for 51.92 % of the total institutions. There were 28 active institutions from ten states that appeared on the list in all three years. AIIMS (New Delhi), PGIMER, and CMC (Vellore) have held the top three spots and JIPMER has remained in eighth place in all three years. Nineteen universities have failed to retain their positions, while 5 institutions have risen in the rankings. CMV, Punjab and SVIMS were able to get a spot in 2019 and 2020 lists but lost its position in 2021 list.

Table 3 — NIRF score and growth of the institutions

S. No.	Institution	2019 Score	2019 Rank	2020 Score	2020 Rank	2021 Score	2021 Rank	CAGR (%)
1	Aligarh Muslim University, Aligarh, Uttar Pradesh (AMU)	55.79	13	56.22	15	58.1	15	2.05
2	All India Institute of Medical Sciences, New Delhi (AIIMS)	87.52	1	90.69	1	92.07	1	2.57
3	Amrita Vishwa Vidyapeetham, Coimbatore, Tamil Nadu (AVV)	62.84	5	64.39	7	69.25	6	4.98
4	Annamalai University, Annamalainagar, Tamil Nadu (AU)	46.63	26	46.47	35	49.13	40	2.65
5	Banaras Hindu University, Varanasi, Uttar Pradesh (BHU)	61.66	6	64.72	6	67.62	7	4.72
6	Christian Medical College, Vellore, Tamil Nadu (CMC)	70.32	3	73.56	3	75.33	3	3.50
7	Dayanand Medical College, Ludhiana, Punjab (DMC)	48	24	51.74	26	53.13	26	5.21
8	Dr. D. Y. Patil Vidyapeeth, Pune, Maharashtra (DPU)	49.81	20	52.05	24	55.96	19	5.99
9	Institute of Liver and Biliary Sciences, New Delhi (ILBS)	59.8	9	61.58	11	61.29	12	1.24
10	Jamia Hamdard, New Delhi	51.7	15	52.87	22	53.18	25	1.42
11	Jawaharlal Institute of Post Graduate Medical Education & Research, Puducherry (JIPMER)	61.38	8	63.17	8	67.42	8	4.80
12	JSS Medical College, Mysore, Karnataka (JSSMC)	50.58	17	54.32	20	53.63	24	2.97
13	Kalinga Institute of Industrial Technology, Bhubaneswar, Odisha (KIIT)	46.3	30	48.18	32	50.36	36	4.29
14	Kasturba Medical College, Mangaluru, Karnataka (KMC)	51.23	16	62.84	9	53.75	23	2.43
15	Kasturba Medical College, Manipal, Karnataka (KMC)	61.4	7	53.83	21	63.6	10	1.78
16	King George`s Medical University, Lucknow, Uttar Pradesh (KGMU)	58.53	10	62.2	10	64.67	9	5.11
17	M. S. Ramaiah Medical College, Bengaluru, Karnataka (MSRMC)	46.61	27	50.02	30	50.05	37	3.62
18	Maulana Azad Medical College, Delhi (MAMC)	54.01	14	55.31	17	56.35	17	2.14
19	Post Graduate Institute of Medical Education and Research, Chandigarh (PGIMER)	77.88	2	80.06	2	82.62	2	3.00
20	Regional Institute of Medical Sciences, Imphal West, Manipur (RIMS)	46.6	28	45.93	38	46.5	43	-0.11
21	SRM Institute of Science and Technology, Chennai, Tamil Nadu (SRMIST)	49.14	22	49.06	31	55.74	20	6.50
22	Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Uttar Pradesh (SGPGIMS)	64.16	4	70.21	5	72.45	5	6.26
23	Saveetha Institute of Medical and Technical Sciences, Chennai, Tamil Nadu (SIMATS)	47.41	25	46.49	34	52.91	27	5.64
24	Siksha `O` Anusandhan, Bhubaneswar, Odisha (SOA)	49.57	21	52.72	23	54.13	21	4.50
25	Sri Ramachandra Institute of Higher Education and Research, Chennai, Tamil Nadu (SRIHER)	58.45	11	57.9	13	58.92	14	0.40
26	St. John's Medical College, Bengaluru, Karnataka (SJMC)	56.68	12	57.83	14	60.83	13	3.60
27	University College of Medical Sciences, Delhi (UCMS)	48.69	23	55	19	51.89	30	3.23
28	Vardhman Mahavir Medical College & Safdarjung Hospital, New Delhi (VMMC)	50.19	19	56.12	16	56.2	18	5.82
29	All India Institute of Medical Sciences Bhubaneswar, Odisha (AIIMS)	0	0	0	0	51.87	31	NA

Table 3 — NIRF score and growth of the institutions

S. No.	Institution	2019		2020		2021		CAGR (%)
		Score	Rank	Score	Rank	Score	Rank	
30	All India Institute of Medical Sciences Jodhpur, Rajasthan (AIIMS)	0	0	0	0	52.87	28	NA
31	Chettinad Hospital and Research Institute, Tamil Nadu (CHRI)	0	0	0	0	45.32	49	NA
32	Christian Medical College, Punjab (CMC)	50.43	18	55.01	18	0	0	NA
33	Datta Meghe Institute of Medical Sciences, Maharashtra (DMIMS)	0	0	50.21	29	51.52	34	NA
34	Government Medical College & Hospital, Chandigarh (GMCH)	0	0	52.01	25	51.9	29	NA
35	Jawaharlal Nehru Medical College, Karnataka (JNMC)	0	0	0	0	46.04	47	NA
36	K. S. Hegde Medical Academy, Karnataka (KSHEMA)	0	0	46.31	36	46.49	45	NA
37	Krishna Institute of Medical Sciences Deemed University, Maharashtra (KIMS)	0	0	46	37	47.11	42	NA
38	Lady Hardinge Medical College, Delhi (LHMC)	0	0	0	0	54.07	22	NA
39	Madras Medical College & Government General Hospital, Chennai, Tamil Nadu (MMC)	0	0	58.84	12	57.88	16	NA
40	Maharishi Markandeshwar, Haryana (MM)	0	0	48.13	33	50.96	35	NA
41	Mahatma Gandhi Medical College and Research Institute, Puducherry (MGMCRI)	0	0	45.62	40	46.08	46	NA
42	Medical College, West Bengal	0	0	0	0	51.69	32	NA
43	Narayana Medical College, Andhra Pradesh (NMC)	0	0	0	0	46.5	43	NA
44	National Institute of Mental Health & Neuro Sciences, Bangalore, Karnataka (NIMHANS)	0	0	71.35	4	73.62	4	NA
45	Padmashree Dr. D. Y. Patil Vidyapeeth, Mumbai, Maharashtra (DPU)	0	0	0	0	48.07	41	NA
46	PSG Institute of Medical Sciences & Research, Tamil Nadu (PSGIMSR)	0	0	50.44	27	51.62	33	NA
47	Sawai Man Singh Medical College, Rajasthan (SMSMC)	0	0	50.44	27	49.65	38	NA
48	SCB Medical College and Hospital, Odisha (SCBMCH)	0	0	0	0	49.42	39	NA
49	Shri B.M.Patil Medical College, Hospital & Research Centre, Karnataka (SBMPMC)	0	0	0	0	45.11	50	NA
50	Sree Chitra Tirunal Institute for Medical Sciences and Technology, Kerala (SCTIMST)	0	0	0	0	63.04	11	NA
51	Sri Venkateswara Institute of Medical Sciences, Andhra Pradesh (SVIMS)	46.38	29	45.93	38	0	0	NA
52	Tirunelveli Medical College, Tamil Nadu (TMC)	0	0	0	0	46.03	48	NA

NIRF details of active institutions (ranked in all three years)

The Compound Annual Growth Rate (CAGR)[32] was used to determine the NIRF score growth of 28 active institutions from 2019 to 2021, as shown in Table 3.

CAGR

$$= \left[\left(\frac{\text{\# of publications of ending year}}{\text{\# of publications of beginning year}}\right)^{\frac{1}{\text{\# of years}}}\right] - 1$$

Even though AIIMS (New Delhi), PGIMER, and CMC (Vellore) occupied the top three ranks respectively based on the NIRF score, SRMIST tops in the growth rate (6.50%). SRIHER (0.40%), ILBS (1.24%), and Jamia Hamdard (1.42%) show low growth rate. Regional Institute of Medical Sciences, Imphal West, Manipur (RIMS) has negative growth rate (-0.11%).

Publication growth of the institutions

Table 4 shows the details of the publication data gathered from Scopus, PubMed, and RG for the active institutions. Based on the number of publications, AIIMS (New Delhi) and BHU are the top two institutes. AMU, AVV, DPU, JIPMER, KIIT, KMC (Mangaluru & Manipal), SRMIST, SIMATS, SOA, SRIHER, and VMMC all had significantly less publications in PubMed. All of these institutions, with the exception of DPU and SIMATS, have a significant number of publications in RG. There are no publications in RG for SJMC and KMC (Mangaluru and Manipal).

Table 4 — Publication details of the institutions

S. No.	Institution	Scopus			PubMed			RG		
		2019	2021	CAGR (%)	2019	2021	CAGR (%)	2019	2021	CAGR (%)
1	AMU, Aligarh	19259	22430	7.92	3404	4065	9.28	16486	19295	8.18
2	AIIMS, New Delhi	36179	42026	7.78	24169	32233	15.48	31876	35753	5.91
3	AVV, Coimbatore	12434	16305	14.51	752	1166	24.52	4407	6156	18.19
4	AU, Annamalainagar	12941	14931	7.41	2744	2970	4.04	10694	11979	5.84
5	BHU, Varanasi	28600	31981	5.75	7629	8878	7.88	31508	35146	5.62
6	CMC, Vellore	10015	11388	6.63	7587	8924	8.45	9332	10937	8.26
7	DMCH, Ludhiana	1400	1627	7.80	945	1171	11.32	1324	1615	10.44
8	DPU, Pune	2163	3021	18.18	369	557	22.86	400	483	9.89
9	ILBS, New Delhi	852	1157	16.53	683	928	16.56	973	1317	16.34
10	Jamia Hamdard, New Delhi	5810	6970	9.53	2149	2860	15.36	4399	4729	3.68
11	JIPMER, Puducherry	5877	7099	9.91	452	591	14.35	4283	5351	11.77
12	JSSMC, Karnataka	998	1270	12.81	547	722	14.89	666	893	15.79
13	KIIT, Bhubaneswar	4714	7084	22.59	125	280	49.67	5769	8408	20.72
14	KMC, Mangaluru	3341	3863	7.53	45	70	24.72	0	0	0.00
15	KMC, Manipal	6732	7882	8.20	141	213	22.91	0	0	0.00
16	KGMU, Lucknow	7489	8462	6.30	2048	2712	15.07	5745	6821	8.96
17	MSRMC, Bengaluru	1134	1292	6.74	460	505	4.78	747	931	11.64
18	MAMC, Delhi	6269	6873	4.71	3812	4395	7.37	5545	6293	6.53
19	PGIMER, Chandigarh	24481	28834	8.53	4268	5810	16.67	18960	22115	8.00
20	RIMS, Imphal West	1228	1330	4.07	222	282	12.71	426	502	8.55
21	SRMIST Chennai	11996	17629	21.23	256	822	79.19	5979	9114	23.46
22	SGPGIMS, Lucknow	8187	9545	7.98	3014	3535	8.30	7803	8969	7.21
23	SIMATS, Chennai	6269	10571	29.86	111	476	107.08	968	1426	21.37
24	SOA, Bhubaneswar	5535	8092	20.91	346	547	25.73	2148	3368	25.22
25	SRIHER, Chennai	2876	3652	12.69	133	519	97.54	2721	3322	10.49
26	SJMC, Bengaluru	1266	1426	6.13	1614	1986	10.93	0	0	0.00
27	UCMS Delhi	4485	4924	4.78	3085	3500	6.51	3145	3400	3.98
28	VMMC, New Delhi	3543	4321	10.43	583	963	28.52	2059	2685	14.19
	Total	236073	285985	10.06	71693	91680	13.08	178363	211008	8.77

In terms of CAGR, the overall growth rate of all institutions put together is high for PubMed (13.08%) followed by Scopus (10.06%) and RG (8.77%). 10 institutions in Scopus, 17 institutions in PubMed, and 14 institutions in RG have growth rates equal to or more than the overall average. SIMATS (29.86%) and KIIT (22.59%) have the highest growth rate based on Scopus publications. SIMATS (107.08%) and SRIHER (97.54%) are the top performers in PubMed. SOA (25.22%) and SRMIST (23.46%) have the highest growth rate in RG.

Memberships, Reads, and RG Score

Memberships and Reads, in addition to publications, are essential factors in calculating the RG score for member institutions. Table 5 shows the memberships, reads, and scores of the active institutions obtained from RG.

In RG 2021, the active institutions had 53102 registered memberships (CAGR, 19.42 %) and 475131 reads (CAGR, 9.96 %). Seven institutions in

memberships and ten institutions in reads have a growth rate equal to or more than the overall average. SRMIST, Chennai has the higher memberships in RG (28.52%) followed by AVV, Coimbatore (10.89%) but in gaining reads BHU (16.90%) tops the list followed by AMU (12.50%).

In terms of growth rate, SIMATS (57.05%), SRIHER (44.01%), and AVV (33.92%) are the highest contributors to memberships. JSSMC (52.92%), SIMATS (46.49%) and DPU (25.48%) are top three performers in reads metric. It is observed that the KMC, (Mangaluru and Manipal) and SJMC have no entry in RG and occupied the least position.

AIIMS (New Delhi), BHU, PGIMER, SRMIST, and AMU occupied the top 5 positions in the year 2019 in RG score and retained their positions in 2021 with a small change in 4th and 5th positions. Almost all institutions have retained their positions with minor differences. AMU was in 4th position and SRMIST was in 5th position in the year 2019, but in the

Table 5 — Memberships, Reads, and RG Score

S. No.	Name of the Institutions	Members			Reads			RG Score		
		2019	2021	CAGR (%)	2019	2021	CAGR (%)	2019	2021	CAGR (%)
1	AMU, Aligarh	3528	4592	14.09	58010	59399	1.19	16003.60	20095.10	12.06
2	AIIMS, New Delhi	2106	2682	12.85	39643	46544	8.35	27693.50	34577.70	11.74
3	AVV, Coimbatore	3226	5786	33.92	19276	21743	6.21	6261.82	8518.44	16.64
4	AU, Annamalainagar	1433	1680	8.28	22117	25541	7.46	7323.44	8865.86	10.03
5	BHU, Varanasi	3732	4587	10.86	60945	80338	14.81	22940.30	29130.30	12.69
6	CMC, Vellore	1349	1647	10.49	10017	12479	11.61	10153.10	12661.70	11.67
7	DMCH, Ludhiana	131	169	13.58	1993	2375	9.16	1184.53	1560.58	14.78
8	DPU, Pune	390	558	19.61	2774	4368	25.48	1088.39	1412.63	13.93
9	ILBS, New Delhi	123	142	7.45	2913	3339	7.06	1779.63	2089.80	8.36
10	Jamia Hamdard, New Delhi	803	943	8.37	17522	19875	6.50	6039.52	7353.49	10.34
11	JIPMER, Puducherry	870	1085	11.67	13529	13882	1.30	5558.71	8043.55	20.29
12	JSSMC, Karnataka	147	234	26.17	1262	2951	52.92	741.71	1276.15	31.17
13	KIIT, Bhubaneswar	3299	5194	25.48	22451	23156	1.56	6036.04	8292.96	17.21
14	KMC, Mangaluru	0	0	0.00	0	0	0.00	0.00	0.00	0.00
15	KMC, Manipal	0	0	0.00	0	0	0.00	0.00	0.00	0.00
16	KGMU, Lucknow	700	934	15.51	12861	14794	7.25	7179.02	8842.51	10.98
17	MSRMC, Bengaluru	194	227	8.17	1590	1914	9.72	1023.83	1265.62	11.18
18	MAMC, Delhi	331	395	9.24	7634	9038	8.81	3260.53	3838.00	8.49
19	PGIMER, Chandigarh	1224	1608	14.62	24870	30830	11.34	17706.9	23428.50	15.03
20	RIMS, Imphal West	101	118	8.09	710	801	6.22	361.90	473.54	14.39
21	SRMIST Chennai	10421	15146	20.56	26929	37840	18.54	13203.40	20124.30	23.46
22	SGPGIMS, Lucknow	621	746	9.60	8611	9665	5.94	7203.09	8532.51	8.84
23	SIMATS, Chennai	611	1507	57.05	7899	16950	46.49	2236.60	5402.05	55.41
24	SOA, Bhubaneswar	697	990	19.18	9758	13373	17.07	3877.09	6027.90	24.69
25	SRIHER, Chennai	691	1433	44.01	9070	9420	1.91	3351.19	4761.27	19.20
26	SJMC, Bengaluru	0	0	0.00	0	0	0.00	0.00	0.00	0.00
27	UCMS Delhi	176	249	18.94	4923	7498	23.41	2064.74	2779.43	16.02
28	VMMC, New Delhi	333	450	16.25	5684	7018	11.12	2707.76	3636.06	15.88
	Total	37237	53102	19.42	392991	475131	9.96	176980.00	232990.00	14.74

year 2021, the latter has moved one position ahead and occupied 4th position. It is observed that the KMC (Mangaluru and Manipal) and SJMC have no memberships, publications, and scores in RG and occupied the least position. AIIMS (New Delhi) is in the top position in NIRF and RG scores. KMC (Mangaluru and Manipal) is in the least position in RG with 0 scores but occupied 9th position in NIRF. SIMATS (55.41%) is leading in RG score growth rate but shared the second position with 3 other institutions in the NIRF ranking. Fig. 1 gives the Growth Rate of Members, Reads, and RG Score.

Fingdings

The data analysis and interpretation part has given some insights into the research output and altmetrics of the medical institutions. Out of the 52 institutions that participated in NIRF ranking during 2019-2021, only 28 institutions were found active and got ranking in all three years. More active institutions are from Tamil Nadu, Delhi, Karnataka, and Uttar Pradesh.

AIIMS, PGIMER, and CMC have held the top three spots in NIRF ranking. AIIMS and BHU are the top two institutions based on the number of publications and RG Score. PubMed has the highest total growth rate of all institutions, followed by Scopus and RG. The private institutions are performing well based on the growth rate. SRMIST has higher RG memberships (28.52%) followed by AVV (10.89%) but in gaining reads BHU (16.90%) tops the list followed by AMU (12.50%). It seems that high membership does not yield for score and it needs active participation of the members in the forum.
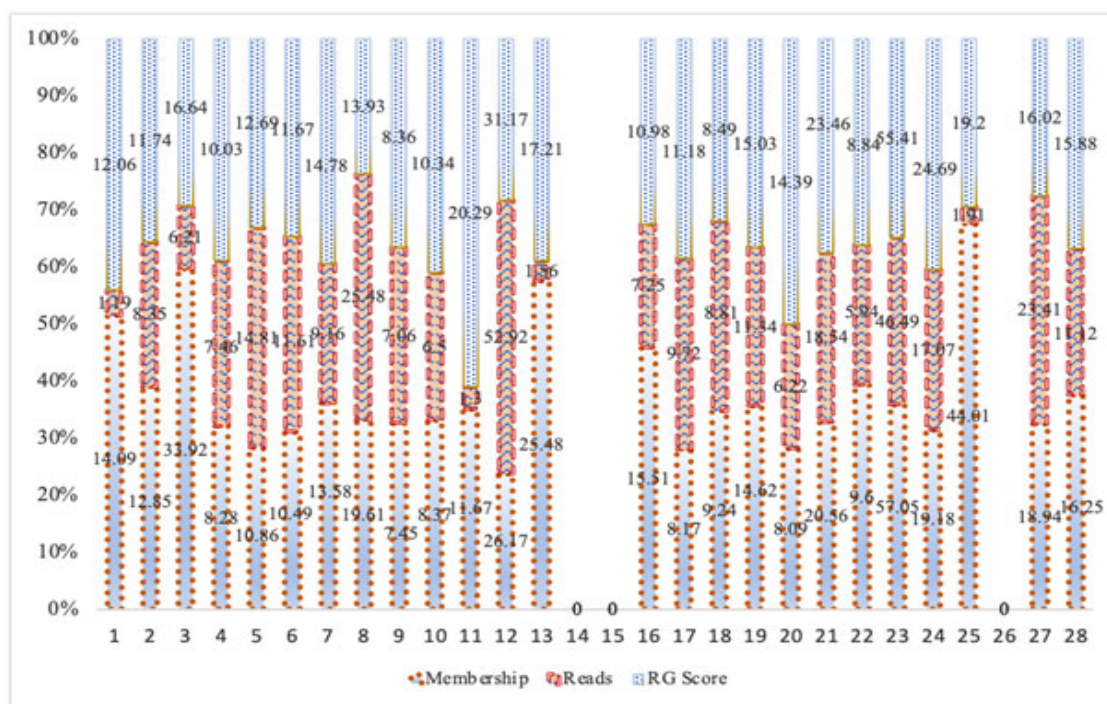
Fig. 1 — Growth Rate of Members, Reads, and RG Score

Conclusion

The study looked at the research contributions of the top medical institutions, according to their NIRF rankings, in the Scopus, PubMed, and RG databases, as well as their altmetrics in RG. The results indicate that some institutions have more membership but fewer publications and on the other side, some institutions have more publications but fewer reads. Having a larger RG membership will not help for achieving high scores. Publications, projects, Q&A, and followers all factor into the score. The Reads are determined by the requisite publications, projects, and the researchers' participation in the Q&A activity. Asking and answering questions in the forum will facilitate professional contact with researchers around the globe who share similar interests, as well as raise the individual's and institution's RG Score. The faculty members may join as members of social media platforms, archive the research works and actively participate in the open discussions to increase the institution's publication and rise the altmetric score.

Acknowledgment

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