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Naveen Chaparwal

MOHANLAL SUKHADIA UNIVERSITY' Udaipur Rajasthan, naveenchaparwal56@gmail.com

P.S. Rajput

Mohan Lal Sukhadia University, drpsrajput@mlsu.ac.in

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NIRF Ranking 2020: A Webometric Analysis of Websites of Top 10 Medical Institutions

Naveen Chaparwal

Junior Research Fellow

Department of Library and Information Science

Mohan Lal Sukhadia University, Udaipur, Rajasthan, INDIA, 313001

E-mail: naveenchhparwal56@gmail.com

ORCID iD: <https://orcid.org/0000-0002-8854-535X>

Dr. P.S. Rajput

Assistant Professor & In-Charge Head

Department of Library and Information Science

Mohanlal Sukhadia University, Udaipur Rajasthan, INDIA, 313001

E-mail: drpsrajput@mlsu.ac.in

ORCID iD: <https://orcid.org/0000-0002-0354-2556>

Abstract

This study examines the top 10 Indian Medical Institute websites ranked in NIRF (National Institutes Ranking Framework) 2020. The study focused on webometric analysis, which examines the domain, domain age, all three types of web impacts factors and Alexa traffic rank of websites etc. To collect data in this study, various small SEO tools such as smallsetools.com and dulichecker.com had used to find out domain age, page speed, domain authority, page authority and total, internal and external links of Medical Institute websites covered in this study. Findings revealed that the "All India Institute of Medical Sciences" institute website having the oldest domain registered on February 25, 1997, and achieved the highest Domain Authority score 58 with the first position among all institutes. It was found from the study that three institutes from Uttar Pradesh state were achieved palace in NIRF ranked top 10 medical universities of India. Among the top 10 medical institute websites, the highest page authority score was 57, achieved by

"Banaras Hindu University." It was also observed from the findings that "Sanjay Gandhi Postgraduate Institute of Medical Science" has had the highest website speed in both mobile and desktop and first position in simple web impact factor and internal web impact factor. The external web impact factor "Post Graduate Institute of Medical Education and Research" got first among all universities.

Keywords: Webometric; Webometric Analysis; NIRF Ranking 2020; Medical Institutions websites; Web Impact Factor; Domain and Page Authority; Link Analysis; Page Speed; Alexa Rank.

1. Introduction

The National Institutional Ranking Framework (NIRF) was approved by the MHRD (Minister of Human Resource Development) and launched by the Honourable on September 29 2015. This framework outlines a methodology to rank institutions across the country. The National Institutional Ranking Framework has been publishing the top 100 Indian Higher Education Institutions based on broad parameters covered, such as Teaching, Learning and Resources, Research and Professional Practices, Graduation Outcomes, Outreach and Inclusivity and Perception. The present study covers the top 10 Medical Institute Websites of India listed in NIRF Ranking 2020. This research was structuring a webometrics analysis by focusing on top 10 Medical Institute Websites activities and impact, with the help of webometrics indicators.

The term webometrics was first coined by Almind & Ingwersen (1997). Webometrics is a statistical analysis of any website; it is the quantitative study of web-related phenomena. Webometrics study as quantitative aspects of the construction and use of information resources, structures and technologies on the web by applying bibliometric and informetric approaches. Webometrics is a measurement of the web such as web page content, parts of webpages, links structures, internal and external links, search engine, user searching and browsing behaviour. Webometrics ranking is the system of rating websites based on composite indicators of visibility and activity measures. For any nation, academic websites were the essential internet communication tools. The success of any university depends on the website, web approachability, and visibility on the web. Websites are essential to assess their presence on the web to evaluate their educational and research performance. Universities are ranked based on quality and research

results reflected through website presence and domain, repositories and informal scholarly communication.

This study focuses on the webometric assessment by examining domain age, page speed, domain authority, page authority and total, internal and external links, page and domain authority, Alexa traffic rank analysis and web impact factor analysis of top 10 medical institute websites India ranked by NIRF 2020.

2. Related works

A webometric study conducted by Kadam & Bhusawar (2021) analyzed websites of 25 top-ranked Indian higher education institutions. They found that the websites of Anna University ranked first in Alexa traffic rank. Patel & Vyas (2021) carried out a webometric study of Open University Websites in India with the help of WISER Index Ranking, Social media Connectivity and Alexa Ranking. This study suggests that Open Institutes websites need to attract more external links and web impact factors. Verma & Jaiswal (2020) explored the websites of Medical Institutes of India, their parameters being linked analysis, web impact factor and WISER ranking. Their study found that the SRM Institute of Science and technology website has a faster load time on google search with 84. Stephen (2019) conducted a "webometric analysis of central universities in the north-eastern region, India". In their study, the best traffic rank websites are North Eastern Hill University and Tripura University. Ramalingam (2019) did a webometrics analysis of Deemed University Websites of India. In this research author calculated the internal, external and back-link of the website. In their study, the author suggests that the websites of deemed universities need to attract more. Maharana et al. (2012) invested web impact factor and link analysis of 16 Indian Institute of Technology (IIT) websites of India.

3. Objectives of the present study

The main objectives of this study are webometric analysis of the top 10 medical institutes websites. The present study focused on the following objectives are:

- To examine the domain age and domain extensions of selected institutes websites.
- To identify the domain authority and page authority of selected institutes websites.

- To investigate the Webpage speed and mobile responsiveness of selected institutes websites.
- To examine the global as well as Indian Alexa traffic rank of selected institute websites.
- To identify the link analysis and web impact factor of selected institute website.

4. Hypothesis

$H_{0(1)}$ = There is no significant difference between website page speed on mobile and desktop.

5. Methodology

The present study investigates a webometric analysis of the top 10 medical institutes of India. The study confined 10 Indian Medical institutes from the National Institutional Ranking Framework (NIRF) website of the year 2020. The study focused on all 10 Medical Institutes websites by observation and collected the information of domain address. Collections of data for webometrics analysis various tools employed to investigate institutes websites covered in this study. In order to collect data, various small SEO tools used for collecting data like smallsetools.com and dulichecker.com had used to find out domain age, page speed, domain authority, page authority and total, internal and external links of websites. In this study, Alexa traffic rank was administrated to find out the global and Indian rank of the website. The normality of data Kolmogorov-Smirnova and Shapiro-Wilk test has been applied it was found that data were normally distributed or data was parametric in nature for which table 7 attached in Annexure.

6. Data Analysis and Interpretations

6.1 List of Institutes and their websites addresses & domain registration date

Table 1: List of Institutes and their websites address & domain registration date

Sr. No.	Name of Institute	Abbreviation	Website Address	City	Domain Registration Date
1	All India Institute of Medical Sciences	AIIMS	https://www.aiims.edu/en.html	New Delhi	25-Feb-97

2	Post Graduate Institute of Medical Education and Research	PGIMER	https://pgimer.edu.in/PGIMER_PORTAL/PGIMERPORTAL/home.jsp	Chandigarh (Punjab)	20-Aug-10
3	Christian Medical college	CMC	https://www.cmch-vellore.edu/	Vellore (Tamil Nadu)	24-Aug-99
4	National Institute of Mental Health & Neuro Science	NIMHANS	https://nimhans.ac.in	Bangalore (Karnataka)	31-Dec-13
5	Sanjay Gandhi Postgraduate Institute of Medical Science	SGPGI	http://www.sgpgi.ac.in	Lucknow (U P)	28-Feb-03
6	Banaras Hindu University	BHU	http://www.bhu.ac.in	Varanasi (U P)	31-Jul-03
7	Amrita Institute of Post Graduate Medical Education & Research	AMRITA	https://www.amrita.edu/school/medicine	Kochi (Kerala)	14-Aug-98
8	Jawaharlal Institute of Post Graduate Medical Education & Research	JIPMER	https://jipmer.edu.in	Puducherry	18-Apr-06
9	Kasturba Medical College	KMC	https://manipal.edu/kmc-manipal.html	Manipal (Karnataka)	27-Sep-99
10	King George's Medical University	KGMU	https://www.kgmu.org/	Lucknow (U P)	27-Jul-12

Table 1 investigates the top 10 National Institutional Ranking Framework (NIRF) information ranked medical institutes with their website URL, related City (State) and Domain Registration Date. It is noted that the "All India Institute of Medical Sciences" university website having the oldest domain registered on February 25, 1997, and the "National Institute of Mental Health & Neuro Science" institute website had a very recent domain registered in the year 2013. It was also observed from table 1 that three institutes from Uttar Pradesh state and two institutes from Karnataka state were achieved the palace in NIRF ranked top 10 medical institutes of India

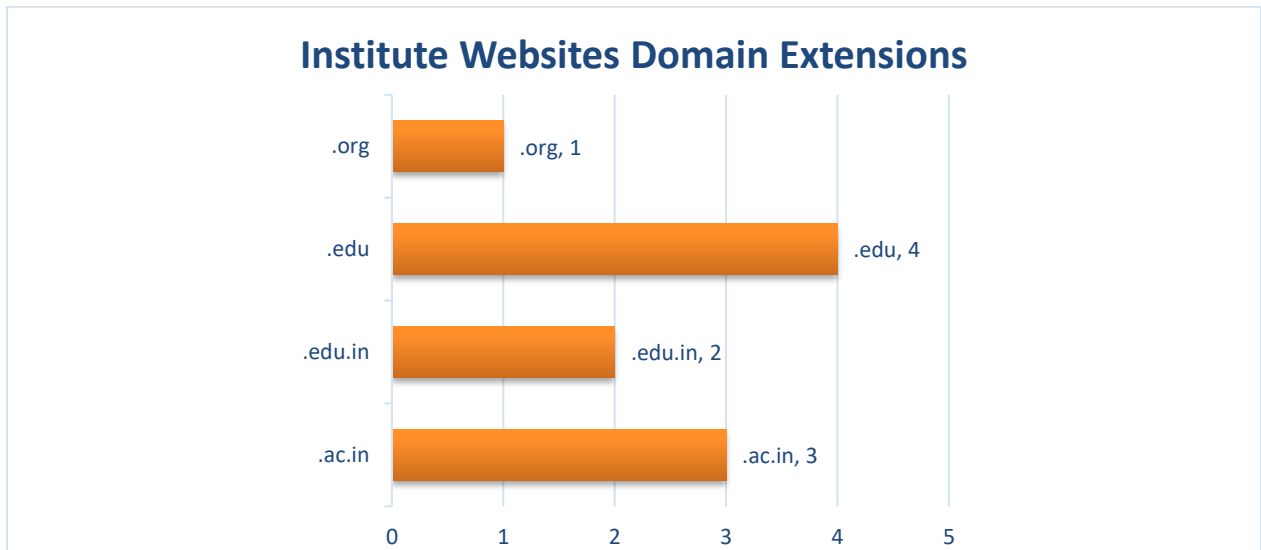
whereas, New Delhi; Punjab; Tamil Nadu; Kerala, and Puducherry have 1-1 institute achieved a place in NIRF ranked top 10 medical institutes of India. (NIRF, 2020).

6.2 Institute Websites Domain Extensions

Table 2: Institute Websites Domain Extensions

Sr. No.	Domain Extensions	No. of Institutes	Percentage %
1	.ac.in	3	30%
2	.edu.in	2	20%
3	.edu	4	40%
4	.org	1	10%

Figure 1: Institute Websites Domain Extensions



Domain extension of a website plays a crucial role while assessing the information from any website; the domain is the main criteria to assess the website's authority. Showing from table 2 and figure 1 that out of 10 institutes, 4 (40%) institutes websites are having domain '.edu', 3 (30%) institutes websites have a domain extension '.ac.in' and 2 (20%) institutes websites have a domain extension '.edu.in.'. In contrast, only one institute's websites (10%) are having '.org' domain has been widely used in the websites of top 10 medical institutes website.

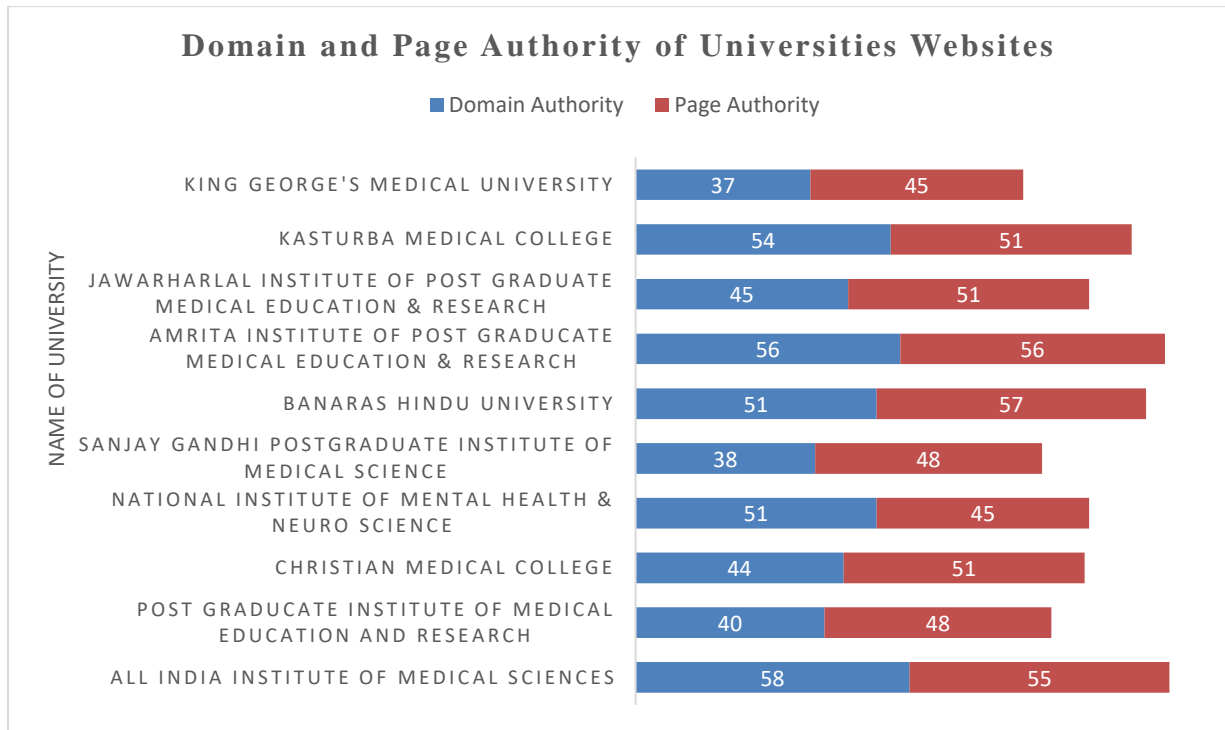
6.3 Domain and Page Authority of Institutes websites

Domain and Page Authority is a search engine ranking score out of 100 that predicts how well a website will rank on search engine result pages (SERPs). Domain Authority is calculated by evaluating multiple factors, including linking root domains and total links, into a single Domain Authority score. It is observed from Table 3 and Figures two that the "All India Institute of Medical Sciences" website achieved the highest Domain Authority score, 58, with the first position. Whereas, "Amrita Institute of Post Graduate Medical Education & Research" has the second place with 56 scores, "Kasturba Medical College" is in third place with 54 scores, "Banaras Hindu University" has the fourth place with 51 scores and "Jawaharlal Institute of Post Graduate Medical Education & Research" occupies the fifth place with 45 scores. While "King George's Medical University" institute website obtained only 37 domain authority scores out of 100 points, the lowest score among all respondent institutes.

Table 3: Domain and Page Authority of Institutes websites

Sr. No.	Name of University	Domain Authority	Page Authority
1	All India Institute of Medical Sciences	58	55
2	Post Graduate Institute of Medical Education and Research	40	48
3	Christian Medical college	44	51
4	National Institute of Mental Health & Neuro Science	51	45
5	Sanjay Gandhi Postgraduate Institute of Medical Science	38	48
6	Banaras Hindu University	51	57
7	Amrita Institute of Post Graduate Medical Education & Research	56	56
8	Jawaharlal Institute of Post Graduate Medical Education & Research	45	51
9	Kasturba Medical College	54	51
10	King George's Medical University	37	45

Figure 2: Domain and Page Authority of Institutes Websites



Among the top 10 university websites, the highest page authority score is 57 achieved by "Banaras Hindu University" with the first position; whereas "Amrita Institute of Post Graduate Medical Education & Research" has the second place with 56 scores, "All India Institute of Medical Sciences" is in the third place with 55 scores, "Christian Medical college"; "Jawaharlal Institute of Post Graduate Medical Education & Research"; "Kasturba Medical College" has the fourth place with 51 scores and "Post Graduate Institute of Medical Education and Research"; "Sanjay Gandhi Postgraduate Institute of Medical Science" occupies the fifth place with 48 scores. In contrast, "National Institute of Mental Health & Neuro Science" and "King George's Medical University" institute website obtained only 45 domain authority scores out of 100 points, which is the lowest score among all respondent institutes. It is also observed from table 3 and figure 2 that "Amrita Institute of Post Graduate Medical Education & Research" has got second place in both domain and page authority with 56 scores.

6.4 Page Speed of Institutes websites

Page Speed shows the performance of a page on both mobile and desktop devices. A score of 90 or above is considered fast, and 50 to 90 is considered moderate. Below 50 is considered to be

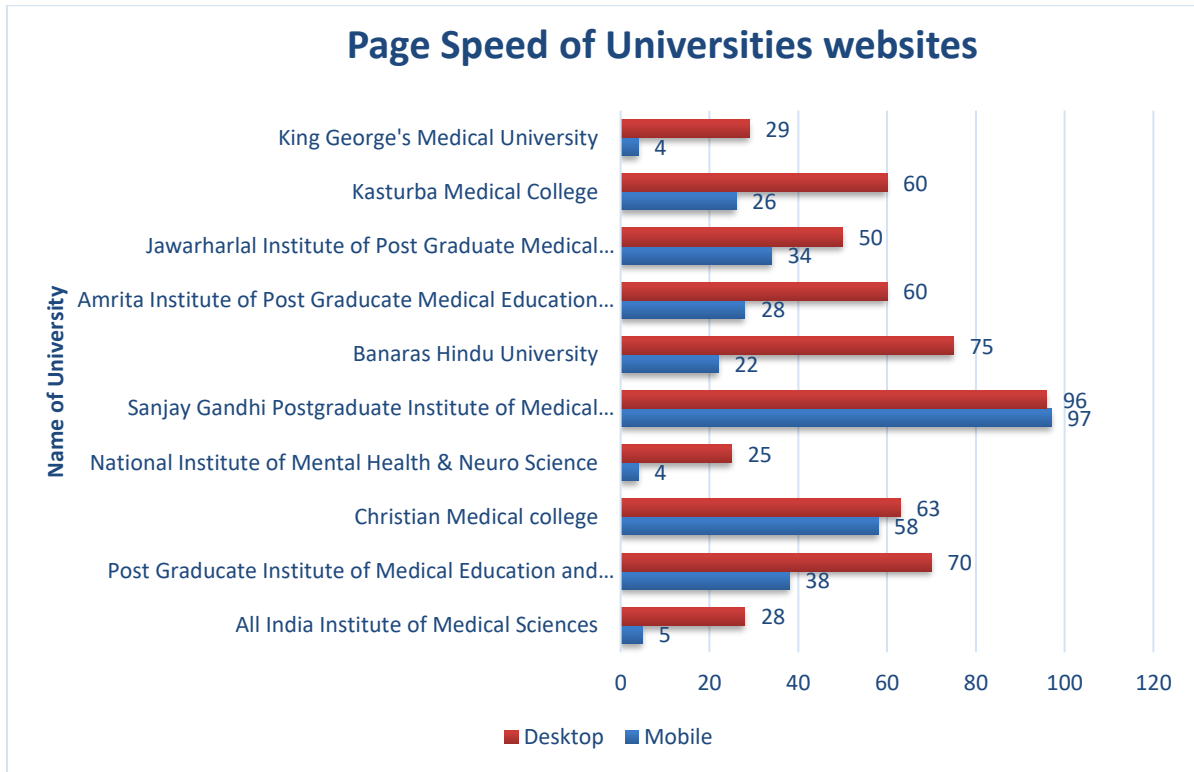
slow. Table 4 and figure 3 indicates the Page Speed of the website. It observed that "Sanjay Gandhi Postgraduate Institute of Medical Science" has to have the highest website speed in mobile while "National Institute of Mental Health & Neuro Science" and "King George's Medical University" having the lowest website speed in mobile among all institutes. It revealed that "Sanjay Gandhi Postgraduate Institute of Medical Science" having the highest website speed on desktop, whereas "National Institute of Mental Health & Neuro Science" having the lowest website speed on desktop among all institutes.

Table 4: Page Speed of Institutes websites

Sr. No.	Name of University	Page Speed		Mobile Responsive
		Mobile	Desktop	
1	All India Institute of Medical Sciences	5	28	Yes
2	Post Graduate Institute of Medical Education and Research	38	70	No
3	Christian Medical college	58	63	Yes
4	National Institute of Mental Health & Neuro Science	4	25	Yes
5	Sanjay Gandhi Postgraduate Institute of Medical Science	97	96	No
6	Banaras Hindu University	22	75	No
7	Amrita Institute of Post Graduate Medical Education & Research	28	60	Yes
8	Jawaharlal Institute of Post Graduate Medical Education & Research	34	50	Yes
9	Kasturba Medical College	26	60	Yes
10	King George's Medical University	4	29	Yes
t-Statistics		-2.067		
Sign. Value		0.053		

As per the t-statistics show in the above table depict the calculated t-value was -2.067, and the p-value was 0.053, which is more than α , i.e. 0.05 at 5% level of significance, which is statistical evidence to accept the null hypothesis. It concludes that there is no significant difference in the speed of the website whether it is used on mobile or desktop.

Figure 3: Page Speed of Institutes websites



The **Page Speed of Mobile** "Sanjay Gandhi Postgraduate Institute of Medical Science" is in the first position with 97. Whereas, "Christian Medical college" has second place with 58, "Post Graduate Institute of Medical Education and Research" is in third place with 38, "Jawaharlal Institute of Post Graduate Medical Education & Research" has a fourth place with 34 and Amrita Institute of Post Graduate Medical Education & Research occupies the fifth place with 28.

The **Page Speed of Desktop** "Sanjay Gandhi Postgraduate Institute of Medical Science" is in the first position with 96. Whereas, "Banaras Hindu University" has the second place with 75, "Post Graduate Institute of Medical Education and Research" is in third place with 70, "Christian Medical college" has fourth place with 63 and "Amrita Institute of Post Graduate Medical Education & Research", "Kasturba Medical College" occupies the fifth place with 60. It also observed that seven medical institutes websites are mobile-friendly, whereas three medical institutes websites are not mobile responsive.

6.5 Institutes Website and their Alexa ranks (Global and India ranks)

Table 5: Institutes Website and their Alexa ranks (Global and India ranks)

Sr. No.	Name of University	Alexa Rank (Global)	Global Rank	Alexa Rank (India)	India Rank
1	All India Institute of Medical Sciences	45978	3	4561	3
2	Post Graduate Institute of Medical Education and Research	55741	5	5640	4
3	Christian Medical college	23029	10	6309	10
4	National Institute of Mental Health & Neuro Science	94742	7	9300	7
5	Sanjay Gandhi Postgraduate Institute of Medical Science	17998	8	2192	8
6	Banaras Hindu University	54454	4	8597	6
7	Amrita Institute of Post Graduate Medical Education & Research	28359	1	2615	1
8	Jawaharlal Institute of Post Graduate Medical Education & Research	90801	6	7979	5
9	Kasturba Medical College	34198	2	3710	2
10	King George's Medical University	19299	9	3450	9

Table 6 shows Alexa traffic ranking for the top 10 NIRF Ranking Medical institutes websites of the year 2020 at global and Indian levels. Accordingly, the institutes' websites are ranked based on Alexa global and Indian traffic rank. After analysis, researchers conclude that institute "Amrita Institute of Post Graduate Medical Education & Research", "Kasturba Medical College" and "All India Institute of Medical Sciences" achieved 1 to 3 positions and institute "National Institute of Mental Health & Neuro Science", "Sanjay Gandhi Postgraduate Institute of Medical Science", "King George's Medical University" and "Christian Medical college" achieved 7 to 10 position respectively in both global and India ranks. Whereas institute "Post Graduate Institute of Medical Education and Research" achieved five-position global rank & 4 positions in India rank; institute "Banaras Hindu University" achieved four-position global rank & 6 positions in India rank and institute "Jawaharlal Institute of Post Graduate Medical Education & Research" achieved six-position global rank & 5 positions in India rank.

6.6 Web Impact Factor and Link Analysis of Institutes Websites

Table 6 shows the web impact factor and link analysis of medical institutes websites of India. It was noticed that "Amrita Institute of Post Graduate Medical Education & Research" having the highest web pages of 75,600 among the all-selected institute's websites. From the table, it noted that "Sanjay Gandhi Postgraduate Institute of Medical Science" is in the first position with 0.047 of **simple web impact factor (SWIF)** Whereas "King George's Medical University" has the second place with 0.030, "Banaras Hindu University" is in the third place with 0.028, "National Institute of Mental Health & Neuro Science" has the fourth place with 0.018 and "Christian Medical college" occupies the fifth place with 0.015.

Table 6: Web Impact Factor and Link Analysis of Institutes Websites

Sr. No.	Name of University	Web page	Total Links	Internal Links	External Links	SWIF	IWIF	EWIF
1	All India Institute of Medical Sciences	28600	239	176	59	0.008	0.006	0.002
2	Post Graduate Institute of Medical Education and Research	5910	35	35	236	0.005	0.005	0.039
3	Christian Medical college	3330	51	3	57	0.015	0.0009	0.017
4	National Institute of Mental Health & Neuro Science	11000	207	170	34	0.018	0.015	0.003
5	Sanjay Gandhi Postgraduate Institute of Medical Science	1230	58	44	13	0.047	0.035	0.010
6	Banaras Hindu University	16000	453	427	20	0.028	0.026	0.001
7	Amrita Institute of Post Graduate Medical Education & Research	75600	207	194	8	0.002	0.002	0.0001
8	Jawaharlal Institute of Post Graduate Medical Education & Research	19600	274	234	35	0.013	0.011	0.001
9	Kasturba Medical College	46600	116	107	8	0.002	0.002	0.0001
10	King George's Medical University	6630	202	13	18	0.030	0.001	0.002

The **internal web impact factor (IWIF)** "Sanjay Gandhi Postgraduate Institute of Medical Science" is in the first position with 0.035. Whereas "Banaras Hindu University" has the second place with 0.026, "National Institute of Mental Health & Neuro Science" is in third place with 0.015, "Jawaharlal Institute of Post Graduate Medical Education & Research" has a fourth place with 0.011 and "All India Institute of Medical Sciences" occupies the fifth place with 0.006.

The **External web impact factor (EWIF)** "Post Graduate Institute of Medical Education and Research" is in the first position with 0.039. Whereas "Christian Medical college" has second place with 0.017, "Sanjay Gandhi Postgraduate Institute of Medical Science" is in third place with 0.010, "All India Institute of Medical Sciences" has a fourth place with 0.002, and Banaras Hindu University occupies fifth place with 0.001.

7. Results and Discussion

The present study provides a webometric analysis of the top 10 NIRF ranked Indian Medical institutes websites. The following main useful findings discovered from the analysis are:

- It noted that the "All India Institute of Medical Sciences" institute website having the oldest domain registered on February 25, 1997, and the "National Institute of Mental Health & Neuro Science" institute website had a very recent domain registered in the year 2013.
- It was also observed that three institutes from Uttar Pradesh state and two Institutes from Karnataka state were achieved the palace in NIRF ranked top 10 medical institutes of India.
- It observed that the "All India Institute of Medical Sciences" institute website achieved the highest Domain Authority score, 58, with the first position. Whereas the "King George's Medical University" institute website obtained only 37 domain authority scores out of a total of 100 points, which is the lowest score among respondent institutes.
- Among the top 10 medical institute websites, the highest page authority scores 57 achieved by "Banaras Hindu University" with the first position; whereas "National Institute of Mental Health & Neuro Science" and "King George's Medical University" website domain authority score obtained only 45 out of 100 points which is very lowest score among respondent institutes.

- It was observed that "Sanjay Gandhi Postgraduate Institute of Medical Science" has to have the highest website speed in mobile while "National Institute of Mental Health & Neuro Science" and "King George's Medical University" having the lowest website speed in mobile among all institutes.
- It was revealed that "Sanjay Gandhi Postgraduate Institute of Medical Science" having the highest website speed on desktop, whereas "National Institute of Mental Health & Neuro Science" having the lowest website speed on desktop among all institutes.
- It was also observed that seven medical institutes websites are mobile-friendly, whereas three medical institutes websites are not mobile responsive.
- Alexa traffic of website with global and Indian ranks that are calculated and conclude that institute "Amrita Institute of Post Graduate Medical Education & Research", "Kasturba Medical College" and "All India Institute of Medical Sciences" achieved 1 to 3 position and institute "National Institute of Mental Health & Neuro Science", "Sanjay Gandhi Postgraduate Institute of Medical Science", "King George's Medical University" and "Christian Medical college" achieved 7 to 10 position respectively in both global and India ranks.
- It noted that "Sanjay Gandhi Postgraduate Institute of Medical Science" is in the first position in both Simple Web Impact Factor (SWIF) and internal Web Impact Factor (IWIF).
- The External Web Impact Factor (EWIF) "Post Graduate Institute of Medical Education and Research" is in the first position with 0.039.

This study discusses the webometrics analysis of websites NIRF, 2020, ranking top 10 medical institutes of India. Based on this study outcome, it suggested that for the better and effectiveness of browsing of websites they should be mobile responsive because now day most of the information seekers were operates mobile for browsing the websites to access information. Hence, it suggested to administrators of Institutes that the website of top-ranked Institutes should be mobile responsive.

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Annexure- 1

Table 7 Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MobileSpeed	.212	10	.200*	.861	10	.078
DesktopSpeed	.177	10	.200*	.934	10	.488

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction