



SheRNI+: an Analytical Study of SheRNI Portal through Data Carpentry

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Abstract

The study explores the network structure of the SheRNI platform. The participation of female researchers in R & D domain is significantly imbalancing because of the gender gap. The women researchers face difficulties, biasness and lack of proper guidance that prevent them from matching the pace of growth in their academic visibility. To restrain this, India furnished a platform called SheRNI managed by INFLIBNET. This platform is linked with another master database storehouse run by INFLIBNET i.e., VIDWAN, which is a premier database of researchers working in different academic institutes. Another platform called IRINS is also connected with the premier database storehouse of VIDWAN, this platform connects researchers from different subject domain of all genders, castes, creeds and others. The SheRNI is also connected with this IRINS project platform. The study utilizes factors of academic visibilities like h-Index, number of citations and selected a sample of top 100 female Indian researchers from different domain. Where Prof Anju Bhasin holds the top place by having h-Index 104. This study assesses the top 200 works of these 100 scientists each, the open access friendliness as well the author position to create a clearcut scenario of the female researcher community of India. This work helps in finding the researchers to meet their interested domain of works and peers at the same time.

Keywords: SheRNI; Gender gap; Female participation; Data carpentry; Academic visibility; Open access friendliness

1. Introduction

The research and academic pace in different domain is progressive, but the females remain underrepresented, particularly in India. The participation ratio of male and female researchers is too much eye catching for its huge gap. The gender gap is visibly present in different fields of study where women contribute only a small fraction of researchers. Despite having enough ability to work on a domain, sometimes better than their male peers, they face partiality. Then comes the concept of 'glass ceiling' (Hymowitz, Carol & Schellhardt, Timothy D, 1986) that creates an imaginary barrier on the success path of women in academia. Also the gender inequality becomes roadblock within their carrier path (Sinha & Sinha, 2011). This leads them towards demotivation in their work.

2. Background

In response to the gender discrimination in the Indian academic and research sectors (that can be both public and private), the Information Library Network (INFLIBNET) of UGC created a platform named She Research Network in India or SheRNI, specially for Indian female experts in all disciplines with detailed database in a nutshell. This platform comes with different identities of the researchers like, ORCID, SCOPUS ID, Researcher ID, Google Scholar ID and others as well as different means of research output visibilities like h-Index, publications, citations and so on. Not only this, it also connects related researchers of the same domain as well. This ready to use network platform aims to foster collaboration among the researchers, provides mentorship and advocates for gender inequality in the research landscape of India. This platform is linked with another master database storehouse developed by INFLIBNET i.e., VIDWAN, which is a premier database of researchers working in different academic institutes (Sab et al., 2019). Another

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platform called IRINS is also connected with the premier database storehouse of VIDWAN, this platform connects researchers from different subject domain of all genders, castes, creeds and others . The SheRNI is also connected with this IRINS project platform.

3. Research Questions

The major research questions may be marked as follows-

RQ1: What are the primary key features and functionalities of the SheRNI portal?

RQ2: What insights can data carpentry techniques reveal about the content effectiveness?

4. Methodology

This section aims to show the steps and techniques followed to transform the messy data into tidy data (OpenRefine, n.d.). In a recent domain specific case study shows that sustainable efforts required to boost up the participation of women (Khan & Mondal, 2024). The present study includes selected female researches from different subject domain as per their research visibility and analyzed 16,131 works. The investigation shows that most of the researchers belong to the Physical Sciences field and from IIT Indore. Also, 4,998 works among 16,131 works are open accessible.

4.1. Development of initial dataset

- For the initial dataset development OpenRefine Version 3.7.9 has been used, which is considered to be a very powerful open source data wrangling tool (OpenRefine, n.d.). As the SheRNI portal does not provide data download option directly in .csv or .txt and other formats from the platform, just like other data storagehouse of INFLIBNET i.e., VIDWAN (a premier collection of researchers working in different academic institutes) (Sab et al., 2019). raw HTML formatted data has to be fetched through API call using GREL.
- For the gigantic size, the whole data was fetched in 5 subsets containing 1,00,000 Ids in each subsets. Due to shortage of time only the first 5,00,000 data was used for conducting the research. While collecting data from these 5,00,000 data surprisingly 10,459 number of account details having female researchers' name came. In this process a huge number of false data that doesn't have an account or female researchers' name in the SheRNI portal was eliminated. This elimination process left subset-A with 1,007, subset-B with 2,858, subset-C with 2,991, subset-D with 2,428 and subset-E with 1,175 account details.
- For getting more detailed data OpenAlex API service is required. According to a study OpenAlex has been considered to be a rapidly growing open source data source (Culbert et al., 2024), this feature influenced choosing this source. For OpenAlex data collection, all together 10,160 ORCID and 299 SCOPUS ID was used for API call.

4.2. Selection of the researchers

- For selecting the sample researcher data firstly h-Index, total number of works by the researcher, total number of citations received by the researcher were parsed.
- Its time to shorlist top 100 researchers according to h-Index, total number of works by the researcher, total number of citations received by the researcher were parsed. Table-06 shows a panoramic view of the data set.

Table 1: List of top 100 female researchers

Rank	Name	OlxId	h-Index	Citations	Works
1	Prof ANJU Bhasin	https://openalex.org/A5007835333	104	43359	1003
2	Prof Ramni Gupta	https://openalex.org/A5021841146	86	20487	643
3	Dr Rajeswari Sridhar	https://openalex.org/A5032742387	80	46642	644
4	Dr Shilpi Agarwal	https://openalex.org/A5060732785	79	26464	376
5	Dr Soma Mukherjee (Bhattacharya)	https://openalex.org/A5071498845	77	26683	324
6	Dr Shilpee A Dasgupta	https://openalex.org/A5008359350	69	14702	287
7	Dr Rajalakshmi R	https://openalex.org/A5091207166	69	16347	459
8	Dr Soma Das	https://openalex.org/A5067253402	66	34487	399
9	Dr Sunita Varjani	https://openalex.org/A5008815491	65	16603	427
10	Dr Pankaj Raizada	https://openalex.org/A5004260380	64	13558	252
11	Prof Rekha S Singhal	https://openalex.org/A5058497166	63	17527	496
12	Dr Sanjeev Gupta	https://openalex.org/A5053160478	59	12583	431
13	Dr Meenakshi Sankaran	https://openalex.org/A5016144833	55	9388	225
14	Prof Kaumudi Joshipura	https://openalex.org/A5039050159	55	14763	181
15	Dr Ankhi Roy	https://openalex.org/A5048546192	54	10413	500
16	Dr Sharon Dsouza	https://openalex.org/A5087292439	53	9928	214
17	Prof Sanghamitra Bandyopadhyay	https://openalex.org/A5036061149	51	13864	503
18	Prof Perumal Yogeewari	https://openalex.org/A5055370602	51	10921	404
19	Dr Seema Singh	https://openalex.org/A5054926074	51	7280	371
20	Dr. Lata Nain	https://openalex.org/A5032212	50	7286	266

Rank	Name	OlxId	h-Index	Citations	Works
		689			
21	Prof Jayashree Bijwe	https://openalex.org/A5074628397	50	8212	209
22	Prof A Nirmala Grace	https://openalex.org/A5028179040	49	6782	137
23	Prof Richa Singh	https://openalex.org/A5032002504	48	6515	241
24	Dr Suman L Jain	https://openalex.org/A5073357482	47	7951	367
25	Dr R Guha Pradeepa	https://openalex.org/A5070143296	47	20082	178
26	Dr Suvarna Ramachandran	https://openalex.org/A5047277204	46	6827	193
27	Dr Rupali Mahajan	https://openalex.org/A5034352121	46	7015	238
28	Prof Anushree Malik	https://openalex.org/A5048252470	45	7923	195
29	Dr Debrupa Lahiri	https://openalex.org/A5090506759	45	7516	191
30	Prof Ligy Philip	https://openalex.org/A5073118493	44	6506	221
31	Dr Kiran Bala	https://openalex.org/A5054206190	44	8351	183
32	Dr Anuradha Ganesan	https://openalex.org/A5044388477	43	5896	322
33	Prof Dipshikha Chakravorty	https://openalex.org/A5030416693	42	5905	244
34	Dr Swarnlata Saraf	https://openalex.org/A5002430991	42	6719	175
35	Prof M Deepa	https://openalex.org/A5077175040	42	5808	272
36	Dr SushmeeBadhulika	https://openalex.org/A5056774583	42	6687	265
37	Dr Yasmin Sultana	https://openalex.org/A5064337706	42	5897	194
38	Prof YASMIN SULTANA	https://openalex.org/A5064337706	42	5897	194
39	Prof Girdhar K Pandey	https://openalex.org/A5061579085	42	7114	181

Rank	Name	OlxId	h-Index	Citations	Works
40	Dr Amita Aggarwal	https://openalex.org/A5054123086	41	8114	450
41	Ms Tamalika Chakraborty	https://openalex.org/A5057451459	41	8170	360
42	Dr Nalini Namasivayam	https://openalex.org/A5040169898	41	5632	199
43	Dr R B Rastogi	https://openalex.org/A5061468727	40	6289	140
44	Dr Sudipta Das	https://openalex.org/A5032903615	40	6019	297
45	Dr Swati Mukhopadhyay	https://openalex.org/A5010777211	40	4856	201
46	Prof Sunetra Sarkar	https://openalex.org/A5031371794	39	4989	385
47	Dr Ankita	https://openalex.org/A5072214852	39	5757	282
48	Prof Mita Nasipuri	https://openalex.org/A5000210772	38	6115	624
49	Prof Jyoti Jadhav	https://openalex.org/A5066749033	38	4268	119
50	Prof Swati Biswas	https://openalex.org/A5011840568	38	5971	174
51	Prof Sudeshna Sinha	https://openalex.org/A5085836158	38	4206	240
52	Dr Manviri Rani	https://openalex.org/A5055873276	38	4488	182
53	Dr Rakhi R. B.	https://openalex.org/A5039697118	38	7235	94
54	Dr Kumud Malika Tripathi	https://openalex.org/A5067231598	38	3923	113
55	Dr Monika Agarwal	https://openalex.org/A5057945296	38	4499	151
56	Prof Nagasuma Chandra	https://openalex.org/A5085789773	37	4920	268
57	Prof G Kalpana	https://openalex.org/A5004766079	37	6895	174
58	Dr Shweta Malode	https://openalex.org/A5013579642	37	4007	123
59	Dr Pinky Agarwal	https://openalex.org/A5087762989	37	5932	174

Rank	Name	OlxId	h-Index	Citations	Works
60	Dr Anjali Awasthi	https://openalex.org/A5083902647	37	6337	248
61	Dr Tulika Malviya	https://openalex.org/A5067537380	37	4303	221
62	Dr Shruti	https://openalex.org/A5049441805	37	4487	184
63	Dr Preetha R	https://openalex.org/A5025541144	37	6255	519
64	Dr Swagata Dasgupta	https://openalex.org/A5020262211	36	4486	215
65	Dr Krishna Pramanik	https://openalex.org/A5048474932	36	4821	138
66	Dr Aditi Mathur	https://openalex.org/A5047589660	36	4694	155
67	Prof Monica Gulati	https://openalex.org/A5010367903	36	4379	236
68	Dr Sushila Arya	https://openalex.org/A5029267597	36	4388	138
69	Dr Debarati Chatterjee	https://openalex.org/A5026518696	36	14800	170
70	Prof. Sandhya S Visweswariah	https://openalex.org/A5027255071	35	3645	201
71	Prof Kusum Deep	https://openalex.org/A5021797294	35	5509	241
72	Dr.Pandima Devi K	https://openalex.org/A5016632550	35	4674	133
73	Prof S Velmathi	https://openalex.org/A5036622326	35	3961	203
74	Dr Attreyee Ghosh	https://openalex.org/A5057599116	35	6567	215
75	Prof Shailaja Patil	https://openalex.org/A5032380051	35	4292	207
76	Dr Suparna Mukherji	https://openalex.org/A5083996327	35	7156	129
77	Dr Geetha Manivasagam	https://openalex.org/A5029800626	35	9068	166
78	Dr Anita Sudhaik	https://openalex.org/A5080392802	35	4609	80
79	Dr U Sandhya Shenoy	https://openalex.org/A5018543837	35	3328	76

Rank	Name	OlxId	h-Index	Citations	Works
80	Dr Kavitha L	https://openalex.org/A5073267223	35	2828	104
81	Dr Manju More E	https://openalex.org/A5086147659	35	6659	212
82	Prof BittiandaKuttapa Thelma	https://openalex.org/A5023716414	35	3950	127
83	Dr Savita Lasrado	https://openalex.org/A5081380695	35	31137	104
84	Mrs Vandana Dharmapuri	https://openalex.org/A5090148205	35	6034	184
85	Prof Neena Capalash	https://openalex.org/A5067836927	34	3401	136
86	Prof Sanjula Baboota	https://openalex.org/A5026410761	34	5726	104
87	Dr Suman Kapila	https://openalex.org/A5028255054	34	4091	223
88	Prof Ashu Verma	https://openalex.org/A5060207611	34	2994	214
89	Prof Neena Capalash	https://openalex.org/A5067836927	34	3401	136
90	Dr Ipsita Roy	https://openalex.org/A5075632101	34	4363	164
91	Prof Rashmi Madhuri	https://openalex.org/A5020020447	34	2748	152
92	Dr Tripti Singh	https://openalex.org/A5090998388	34	3984	278
93	Prof Nikhat Manzoor	https://openalex.org/A5081169465	34	3827	140
94	Dr Rekha P D	https://openalex.org/A5039897874	34	4936	139
95	Dr Nirmaladevi R	https://openalex.org/A5046436034	34	3431	111
96	Prof Sushmita Mitra	https://openalex.org/A5079283230	34	6068	297
97	Prof Mitali Mukerji	https://openalex.org/A5054002616	34	4271	161
98	Dr Nidhi Tyagi	https://openalex.org/A5065943367	34	3057	265
99	Dr Sabhyata Bhatia	https://openalex.org/A5038027615	34	3643	105

Rank	Name	OlxId	h-Index	Citations	Works
100	Prof Sujata Sanghi	https://openalex.org/A5037226657	34	3499	182

4.3. Judgement of open access dataset

- For this section top 200 works of 100 selected researchers have been used. For this API service have been deployed. Data was collected from OpenAlex again using the authors' individual OpenAlex Ids. 20,000 data were supposed to be fetched but 16,131 works' data came.
- In this step, affiliation, work domain, year wise works and citation count, DOIs were extracted for analysis. Affiliation related data like what are the past institutes the researchers had worked, as well as the current institution they are working in; subject domain of their work; and yearly works and citation related data can be fetched easily using GRELS.
- This step exposes the open access friendliness of the selected works of the selected authors. For this a powerful ODbL powered data source, Unpaywall (Unpaywall: An Open Database of 20[28] Million Free Scholarly Articles, n.d.) was used. For measuring the open access friendliness necessary data were parsed.

4.4. Extracting SheRNI author position

This step helps finding out the number of works of individual female workers where they are in the 1st author position. This was done by matching names and individual works.

5. Data Analysis

5.1. Analysis of academic visibility

This academic visibility works on the basis of h-Index, total number of works, total number of citations received by an individual author among the selected 100 researchers. Table-06 shows that Prof Anju Bhasin has the highest academic visibility with 104 h-Index, 1,003 total number of works and 43,359 citations she has received, whereas, Prof Sujata Sanghi who has the lowest h-Index among the selected 100 researchers have total 182 works and 3,499 citations.

For more specificity 5 groups had been created on the basis of h-Index with an interval of 15. The group of 30-45 h-Index is having the most number of researchers, works and citations. This table is shown below:

Table 2: Academic visibility

h-Index groups	No. of Ids with this h-Index group	Total no of works	Total no. Of citations received
30-45	73	14998	421366
45-60	16	4658	159810
60-90	6	2320	113224
90-75	4	1987	120276
75-105	1	1003	7235

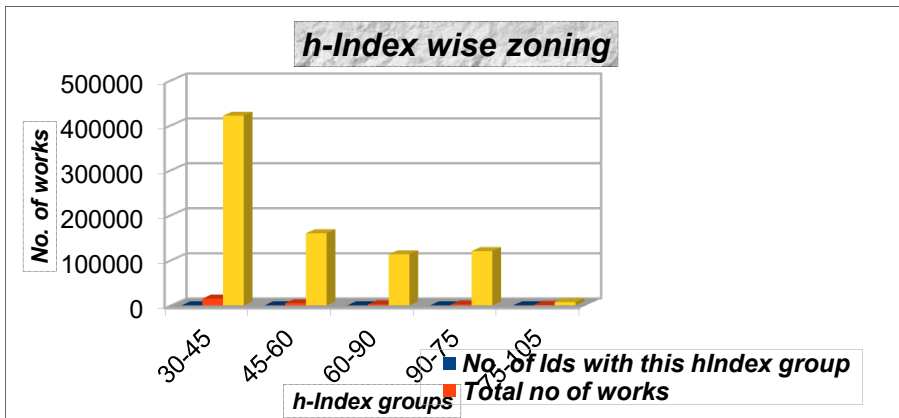


Figure 1: h-Index wise work distribution

5.2. Affiliation and subject domain

On the basis of academic visibility IIT Indore have been found with the most researchers. This selected study shows that there are mainly four subject domain i.e., Life Sciences, Social Sciences, Physical sciences and Health sciences. Physical science domain has the most female researchers. The table-12 identified 11 institutions from where the number of researchers can be get. A total of 622 institutes are in this process.

Table 3: Institution wise presentation of researchers

Name of the Institution	No. of researchers associated with the Institutes
All India Institute of Medical Sciences(AIIMS)	5
Banaras Hindu University(BHU)	5
Bhabha Atomic Research Centre(BARC)	5
Council of Scientific and Industrial Research(CSIR)	5
Creative Commons(CC)	5
Indian Institute of Technology Kanpur(IITKanpur)	5
Weatherford College(WC)	5
National Institute of Pharmaceutical Education and Research(NIPER)	6
Indian Institute of Science Bangalore(IIScBanglore)	7

Indian Institute of Technology Delhi(IITDelhi)	7
Indian Institute of Technology Indore(IITIndore)	13

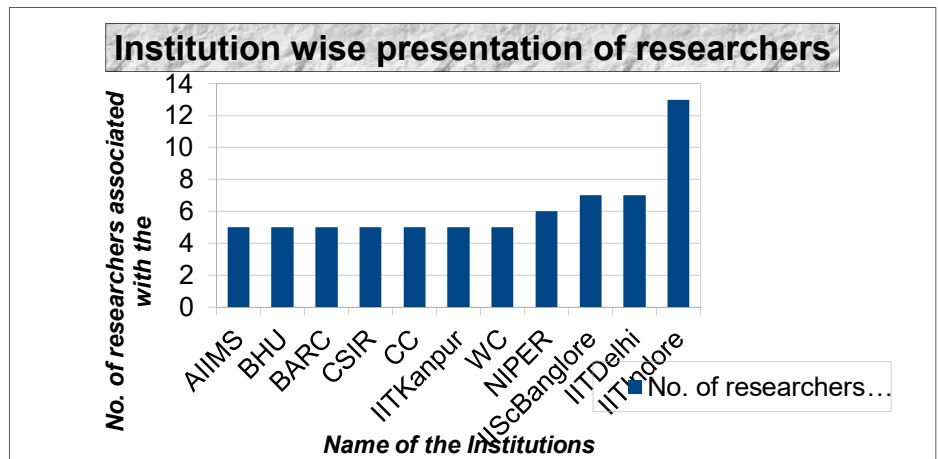


Figure 2: Institution wise presentation of researchers

Table 4: Subject wise distribution of the researchers

Subject domain	No. of researchers associated
Physical Sc.	88
Life Science	75
Health Sc.	66
Social Sc.	14
Blank	4

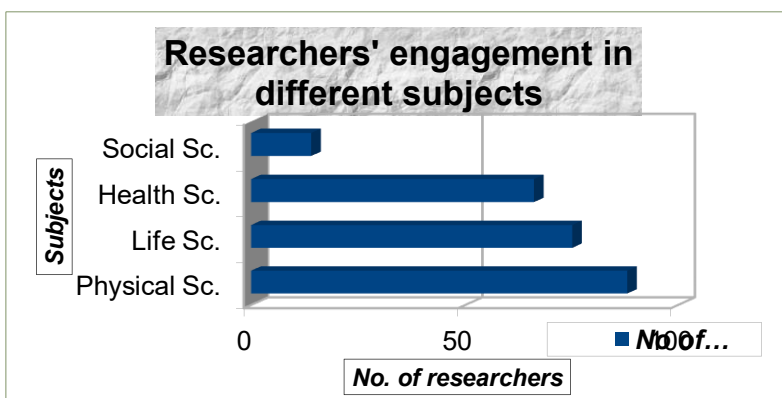


Figure 3: Subject wise distribution of the researchers

5.3. Open Access Friendliness

The open access friendliness framework is based on two major areas, one is the use of the license in oa publication and the oa publication (Mukhopadhyay, 2022). This research work identified 14,348 number of works' journals listed in DOAJ and 1,392 number of works' journals not listed in DOAJ; 10,742 number of close access publications and 4,998 number of open access publications; 2,680 number of oa publications are licensed and the remaining 2,318 number of publications are not licensed; this research work also identified the oacolor of the publications as- 1,734 gold, 1,355 green, 1,284 bronze and 625 hybrid.

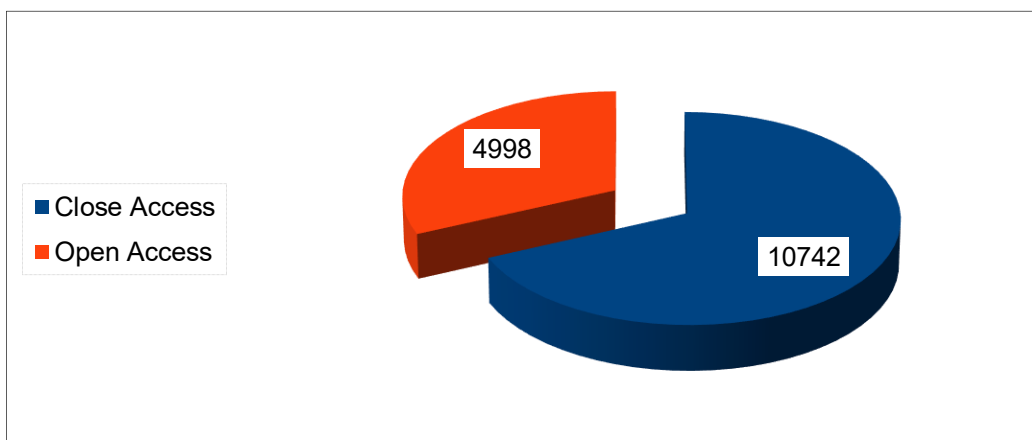


Figure 4: Access status of the works

5.4. Position determination

The selected researchers' sample has 16,131 number of publication, most of them are collaborative in total 2,48,206 authors all together. Most importantly, the author Prof Anju Bhasin with the most academic visibility, does not act as the first author in any of her top 200 publications, and most of the works of her has at least more than 15 co-authors. Also, this compact and strong study shows that female researchers are becoming more engaged in collaborative works (Fell & König, 2016). Dr. Manviri Rani whose h-Index is 38, total number of works are 182 has the most publication among the 100 where she participated as the first author in 119 works and in the other 64 worked as additional author.

Table 5: Rank on the basis of 1st author position

Rank	Name	h-Index	Citations	Holding first author position in works
1	Dr Manviri Rani	38	4488	119
2	Prof Rashmi Madhuri	34	2748	73
3	Dr Soma Mukherjee (Bhattacharya)	77	26683	60
4	Dr Swati Mukhopadhyay	40	4856	56
5	Prof Girdhar K Pandey	42	7114	54
6	Dr Shruti	37	4487	53

Rank	Name	h-Index	Citations	Holding first author position in works
7	Prof Kusum Deep	35	5509	53
8	Dr Anjali Awasthi	37	6337	49
9	Prof Sanghamitra Bandyopadhyay	51	13864	48
10	Prof Neena Capalash	34	3401	47
11	Dr Sudipta Das	40	6019	39
12	Dr Sanjeev Gupta	59	12583	37
13	Prof Jayashree Bijwe	50	8212	37
14	Dr Nirmaladevi R	34	3431	34
15	Prof Kaumudi Joshipura	55	14763	31
16	Prof M Deepa	42	5808	31
17	Prof Sudeshna Sinha	38	4206	31
18	Prof Swati Biswas	38	5971	30
19	Dr Shweta Malode	37	4007	27
20	Dr Debarati Chatterjee	36	14800	27
21	Dr Rakhi R. B.	38	7235	26
22	Dr Pinky Agarwal	37	5932	26
23	Dr Soma Das	66	34487	25
24	Dr Kiran Bala	44	8351	25
25	Dr Sunita Varjani	65	16603	24
26	Dr U Sandhya Shenoy	35	3328	23
27	Dr Suman L Jain	47	7951	22
28	Dr Debrupa Lahiri	45	7516	21
29	Dr Anuradha Ganesan	43	5896	20
30	Dr Seema Singh	51	7280	19
31	Prof Anushree Malik	45	7923	19
32	Prof YASMIN SULTANA	42	5897	19
33	Dr Amita Aggarwal	41	8114	19
34	Dr Nalini Namasivayam	41	5632	19
35	Prof Mitali Mukerji	34	4271	19
36	Dr Shilpi Agarwal	79	26464	18
37	Dr Kumud Malika Tripathi	38	3923	18
38	Dr.Pandima Devi K	35	4674	18
39	Dr Yasmin Sultana	42	5897	17

Rank	Name	h-Index	Citations	Holding first author position in works
40	Dr Pankaj Raizada	64	13558	16
41	Prof. Sandhya S Visweswariah	35	3645	16
42	Prof Richa Singh	48	6515	15
43	Dr R B Rastogi	40	6289	15
44	Dr Krishna Pramanik	36	4821	15
45	Dr Attreyee Ghosh	35	6567	15
46	Dr Geetha Manivasagam	35	9068	15
47	Prof Dipshikha Chakravorty	42	5905	14
48	Dr Sabhyata Bhatia	34	3643	14
49	Prof Ligy Philip	44	6506	13
50	Prof Nagasuma Chandra	37	4920	13
51	Dr Swarnlata Saraf	42	6719	12
52	Prof Sunetra Sarkar	39	4989	12
53	Dr Ankita	39	5757	12
54	Prof Perumal Yogeewari	51	10921	11
55	Dr Anita Sudhaik	35	4609	11
56	Dr Rajeswari Sridhar	80	46642	10
57	Dr R Guha Pradeepa	47	20082	10
58	Prof S Velmathi	35	3961	10
59	Dr Nidhi Tyagi	34	3057	10
60	Prof G Kalpana	37	6895	8
61	Dr Savita Lasrado	35	31137	8
62	Dr Rupali Mahajan	46	7015	7
63	Prof Neena Capalash	34	3401	7
64	Prof A Nirmala Grace	49	6782	6
65	Dr Monika Agarwal	38	4499	6
66	Dr Preetha R	37	6255	6
67	Dr Swagata Dasgupta	36	4486	6
68	Prof Monica Gulati	36	4379	6
69	Mrs Vandana Dharmapuri	35	6034	6
70	Dr Tripti Singh	34	3984	6
71	Prof Sushmita Mitra	34	6068	6
72	Dr Suvarna Ramachandran	46	6827	5
73	Prof Shailaja Patil	35	4292	5

Rank	Name	h-Index	Citations	Holding first author position in works
74	Dr Suparna Mukherji	35	7156	5
75	Dr Manju More E	35	6659	5
76	Prof Nikhat Manzoor	34	3827	5
77	Prof Ramni Gupta	86	20487	4
78	Prof Rekha S Singhal	63	17527	4
79	Dr SushmeeBadhulika	42	6687	4
80	Prof BittiandaKuttapa Thelma	35	3950	4
81	Dr Ankhi Roy	54	10413	3
82	Dr Sharon Dsouza	53	9928	3
83	Ms Tamalika Chakraborty	41	8170	3
84	Prof Jyoti Jadhav	38	4268	3
85	Dr Tulika Malviya	37	4303	3
86	Prof Sanjula Baboota	34	5726	3
87	Dr Ipsita Roy	34	4363	3
88	Dr Meenakshi Sankaran	55	9388	2
89	Dr. Lata Nain	50	7286	2
90	Dr Suman Kapila	34	4091	2
91	Dr Kavitha L	35	2828	1
92	Prof ANJU Bhasin	104	43359	0
93	Dr Shilpee A Dasgupta	69	14702	0
94	Dr Rajalakshmi R	69	16347	0
95	Prof Mita Nasipuri	38	6115	0
96	Dr Aditi Mathur	36	4694	0
97	Dr Sushila Arya	36	4388	0
98	Prof Ashu Verma	34	2994	0
99	Dr Rekha P D	34	4936	0
100	Prof Sujata Sanghi	34	3499	

6. Conclusion

To knock out the gender inequality all must work on this problem. To enrich the research and development arena with multiplicity, women researchers must work with their optimum potentiality without any hesitation to achieve the best. The SheRNI platform is working beautifully to enrich the female researchers' academic visibility not only for the researchers' own personal advantage or increasing the profile visibility but also for the betterment of the society as well. This research work will be helpful for prospering this visibility of the female researchers, who are enlisted in the SheRNI database storehouse, more intensely with data wrangling approach, by using one of the most popular open source data carpentry tool OpenRefine.

The SheRNI platform have been launched just a few days back this year, hopefully within few years in the near future it will be able to enrich with more and more databases. This will not only help connecting and collaborating the females but the other keen researchers belonging to different gender to find and match works from their interest, which will eventually broaden up the R & D sector of different subject domains in a holistic way.

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