

A Bibliometric Analysis of the Journal of All India Institute of Speech and Hearing: 1970-2015

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***Abstract** -The purpose of the present study was to bibliometric analysis of contents of the Journal of All India Institute of Speech and Hearing published from 1970 to 2015 to determine the types and quantities of information contents published, authorship characteristics, research domains of the scientific articles and to investigate changes, if any, in the publication pattern of the journal over the years. The bibliographic data on all the published volumes were collected manually from the print issues of the journal and the data were analyzed using descriptive statistics. It is found that the domain of speech along with its closely allied field language is accountable for the major share of scientific articles in the journal whereas hearing-related articles are comparatively less represented. The study noticed a trend towards intra-institutional, two-author and three-author collaboration. The journal achieved significant progress over the years. However, steps need to be taken to make the journal online, increase global visibility and to attract scientific contributions from across the world.*

Key words: Bibliometric Analysis, Scientometric Analysis, JAIISH

Introduction

The All India Institute of Speech and Hearing (AIISH), then Institute of Logopaedics, was established in the year 1965 and it entered 50th anniversary in 2015. The objectives of the Institute are to generate manpower, promote research, provide clinical care and impart public education pertaining to communication disorders. In line with its objective of promoting research on communication and its disorders, the Institute started a peer-reviewed scientific journal, the *Journal of All India Institute of Speech and Hearing (JAIISH)* in the year 1970 that provides a forum for sharing quality research on speech, language, hearing and allied areas. The JAIISH is published annually in print format with softcopies of the previous volumes available freely on the official website of the publishing organization. A few issues of the journal are indexed in

CINAHL and Education Full Text, the leading EBSCO databases in the fields of allied health and education, respectively. JAIISH is the oldest among the only three peer-reviewed Indian scientific journals on communication disorders. The other two are the *Journal of Indian Speech and Hearing Association* (JISHA) started in the year 1981 and the *Journal of Communication Disorders-AYJNIHH* started in 2016. The JAIISH is managed by an editorial board of well-known speech and hearing and allied sciences subject experts from across the country headed by the Director, AIISH as the Ex-officio Chief Editor. The journal which started in the year 1970 stopped its publication in the year 1994 with the release of Volume 25 and resumed in 2007 with the publication of Volume 26. The 34th volume of the journal has been published in the year 2015, the golden Jubilee year of establishment of its publishing organization, the All India Institute of Speech and Hearing. This presented an opportunity to conduct an analysis of the Journal using bibliometric techniques.

Bibliometrics, also known as scientometrics, is a subfield of information science that deals with the quantitative analysis of scientific output. Case studies assessing the publication pattern of single journals are common type of bibliometric research and several such case studies have been carried out on scientific journals published across the world in various disciplines. These include journals in the field of health/ medical sciences such as *Molecular Medicine* (Kumaravel, Sylvia & Kanagavel, 2011), *Journal Brasileiro de Odontopediatria e Odontologia do Bebê* (Poletto & Faraco, 2010), *Croatian Medical Journal* (Kovacic, Huic, & Ivanis, 2008), *Occupational Medicine* (Smith, 2008), *Journal of Pediatric Psychology* (Brown, 2007), *Medical Principles and Practice* (Al-Qallaf, 2003), *Journal of Forensic Sciences* (Jones, 1998). However, there are only a few bibliographic studies based on the journals in the field of communication disorders and among them, single-journal based studies are very rare. The first 24 editions of *Speech*, the professional journal of the British Society of Speech Therapists published during 1935-1945 were subjected to content analysis by Armstrong and Stansfield (1996). The study focused on two aspects, the development of speech and language therapy as a profession and the authored papers appeared in the journal. Plowman, Mehdizadeh, Leder, Martino, and Belafsky (2013) performed a bibliometric review of abstracts presented at the Dysphagia Research Society annual conventions published in *Dysphagia* and reported the research trends and knowledge gaps in the area of dysphagia. Ross (2013) evaluated 11 years of publication of the *International Journal of Audiology* and reported the progress made by the journal in attracting submissions, publication process and impact factor rating. Stansfield and Armstrong (2016) repeated the content analysis of the journal *Speech* after 20 years by analyzing the contents published between 1946 and 1965 in the renamed journal *Speech Pathology & Therapy*. So far, the JAIISH has not been subjected to any such case study. The only bibliometric study based on the JAIISH was the one carried out by Ramkumar, Narayanasamy, & Nageswara Rao (2016) which assessed the collaborative research in the field of communication disorders based on five-year published output of three journals pertaining to the field including JAIISH.

The aim of the present study was to perform a bibliometric analysis of the *Journal of All India Institute of Speech and Hearing* in order to identify the types and quantities of information contents published, authorship characteristics, research domains of the scientific articles and to investigate changes, if any, in the publication pattern of the journal over the years.

Materials and Methods

The present study analyzed the entire journal issues published from 1970 to 2015 and the bibliographic data set for the study was collected manually from the print issues of the journal. The data were coded volume-wise and entered in spreadsheet format based on study objectives. Only descriptive statistics were applied for the analysis of the data.

As already mentioned, the journal which started in the year 1970 ceased in 1994 and resumed publication in the year 2007. Thus there is a gap of 15 years in journal publication which is quite a long period. Considering this, in addition to analyzing the entire journal issues published till 2015 as a whole, the changes if any, in the publication pattern of the journal over the years were analyzed by dividing the publication period of the journal into two:

1. Early Years of Publication (EYP) i.e. V. 1 to V. 25 published from 1970 to 1994.
2. Later Years of Publication (LYP) i.e. V. 26 to V.34 published from 2007 to 2015.

Procedure: The total number of publications and the number of scientific articles, dissertation abstracts, editorial articles, and other articles were calculated volume-wise along with their percentage of occurrence. The authorship pattern in terms of author gender, single and collaborative authorship in EYP and LYP and the level of collaborative authorship-local, national and international- were analyzed. In addition, the most prolific authors were ranked according to the number of scientific articles contributed to the journal in the years 1970-2015, 1970-1994, and 2007-2015. Further, the organizational affiliation of all the authors who contributed to the journal was analyzed in terms of the number of authors from each organization. Also, the number of articles according to the research domains of the journal-speech, language, hearing, multidisciplinary- in all volumes and in EYP and LYP was analyzed.

Data Analysis & Results

Totally, 34 volumes of the journal were published from 1970 to 2015. Except volume 29 which was published in two issues, all other volumes were published in one issue. Eight volumes (5 & 6, 16 & 17, 22 & 23, 24 & 25) of the journal were published as combined two-volume set.

Totally, 787 items of information were published in the 34 volumes of the journal. Of these, scientific articles accounted for majority (502 nos., 63.78 %) of the contents. A considerable share of contents (248 nos., 31.51%) was constituted of abstracts of the PG dissertations carried out at the publishing organization of the journal. The remaining contents were constituted of editorial articles (28 nos., 3.55%) and other items of information (9 nos., 1.14%) such as letters to the editor, book reviews and reports. The combined volume set of V. 24 & 25 published the highest no. of contents (74 nos.). However, more number of scientific papers (34 nos.) was published in volume 29, the only journal volume published in two issues. No scientific articles were published in volume 9 and 11 and only two were published in volume 18. The editorial articles were missing in volume 2, 3 and 30. The average number of scientific articles published

per volume in the journal was 15. The details of the published issues of the journal and their contents are given in table 1.

The data on published volumes and their contents were further analyzed according to the publication period of the journal. Of the total (559 nos.) items of information published in EYP, 51.34% (287 nos.) was scientific articles. On the other hand, this figure reached 94.29 % (215 nos.) of the total items of information (228 nos.) published in the LYP. In addition, all the volumes of the journal produced in combined volume sets were published in the EYP. Similarly, the content type, PG Dissertation Abstracts was present only in the volumes published in the EYP.

Table 1: Volumes-wise Contents of JAIISH

Vol. No &Year	Total Items	Item types				Vol. No &Year	Total Items	Item types			
		S.A	D.A	E.A	OT			S.A	R.A	E.A	OT
1 - 1970	25	24	-	1	-	19 - 1988	13	10	2	1	-
2 - 1971	26	21	-	-	5	20 - 1989	19	10	8	1	-
3 - 1972	27	26	1	-	-	21 - 1990	9	8	-	1	-
4 - 1973	21	18	2	1	-	22 & 23 1991-1992	53	6	46	1	-
5 & 6 1974- 75	16	15	-	1	-	24 & 25 1993-1994	74	8	65	1	-
7 - 1976	21	20	-	1	-	26 - 2007	18	17	-	1	-
8 - 1977	19	18	-	1	-	27 - 2008	20	19	-	1	-
9 - 1978	35	-	34	1	-	28 - 2009	27	25	-	1	1
10 - 1979	26	25	-	1	-	29--1 - 2010	18	15	-	1	2
11 - 1980	42	-	41	1	-	29--2 - 2010	20	19	-	1	-
12 - 1981	20	19	-	1	-	30 - 2011	28	28	-	-	-
13 - 1982	28	14	13	1	-	31 - 2012	29	28	-	1	-
14 - 1983	18	17	-	1	-	32 - 2013	32	31	-	1	-
15 - 1984	18	17	-	1	-	33 - 2014	18	17	-	1	-
16 & 17 1985-86	13	9	3	1	-	34 - 2015	18	16	-	1	1
18 - 1987	36	2	33	1	-	Total	787	502	248	28	9

S.P.= Scientific Articles; E.A= Editorial Articles; D.A= Dissertation Abstracts; OT=Others

Authorship Pattern

The data on authorship of the scientific articles published in the journal were analyzed to identify author gender, collaborative authorship, organizational affiliation, and the prolific authors.

Author gender: The 502 scientific articles published in the journal were contributed by a total number of 1036 authors. Of them, 51% (530 no.) were male and the remaining 49% (506 no.) were female authors. Period of publication wise analysis of author gender showed that majority (335 nos., 76.3 %) of the authors in the EYP were male. In contrast, majority (402 nos., 67.3%) of the authors of the articles published in the LYP were female authors.

Collaborative Authorship: In order to identify the extent of collaboration among the authors, the number of authors of each of the scientific articles published in the journal was counted and the details are given in table 2. Of the 502 scientific articles, 199 were (39.64%) single-authored and the remaining 303 articles (60.35%) were collaborative. Among the collaborative articles, 2-author collaboration was the highest (142 nos., 46.86%) followed by 3-author collaboration (107 nos., 35.31%) and 4 and more author collaborations (54 nos., 17.82%). The highest number of authors for a single scientific articles published in the journal was six and there were four such papers in the journal.

The collaborative articles / authorship increased remarkably in the LYP of the journal. While during the EYP, only 34.49% (99 out of 287) articles were collaborative, the figure reached 94.88% (204 out of 215) during the LYP. Consistent with the collaborative authorship, the LYP witnessed a notable increase in the number of authors also. In the EYP, the average number of authors per article was 1.52 whereas in the LYP it was 2.87.

Table 2: Single and Collaborative Authorship

Publication Period	Total articles	Single & Collaborative Authorship			
		1	2	3	4+
EYP	287	188 (65.50%)	59 (20.55%)	32 (11.14%)	8 (2.78%)
LYP	215	11 (5.11%)	83 (38.60%)	75 (34.88%)	46 (21.39%)
Total	502	199 (39.64 %)	142 (28.28%)	107 (21.31%)	54 (10.75%)

1= Single author; 2= Two authors; 3= Three authors; 4+= Four and more than four authors

Level of Collaborative Authorship: The data on collaborative authorship was further analyzed to identify the level of collaboration that existed among the authors i.e. local (authors in the same organization), national (authors in different organizations in the same country) and international (authors in different countries). It is found that, of the 303 collaborative scientific articles published in the journal, a huge majority (223 nos.,73.92%) was brought out by local collaboration, followed by national (65 nos., 21.38%) and international collaborations (15. nos., 4.93%).

Period of publication wise analysis of the data showed that, the collaborative authorship in the EYP was constituted of 72 local, 21 national and 7 international collaborations, and that of LYP constituted of 151 local, 44 national and 8 international collaborations. Thus the international collaborations are comparatively less during the LYP.

Most prolific authors: The authors were ranked according to the number of scientific articles contributed to the journal. Of the 1026 authors, 333 authors contributed only one paper, 87 contributed two papers and 30 contributed three papers. The 10 most heavily contributed authors are given in tables 3. Dr. Nataraja, N.P. who contributed 30 scientific articles to the journal was the top most prolific author of the journal, followed by Dr. S.R. Savithri and Dr. M. Pushpavathi

who contributed 20 and 18 articles respectively. It is noted that among the 10 most prolific authors, eight were from the domain of speech including the first three authors.

The most prolific authors were further analyzed according to the period of publication and it is found that during the EYP also Dr. N. P. Nataraja was the most highly contributed author to the journal with a contribution of 26 scientific articles. The second most prolific authorship was shared by Dr. Bharathi Raj and Dr. Rathna, N. who published 14 articles each. The third prolific author in the EYP was Mr. Kumar P.J. who contributed 11 articles to the journal. It is noticed that of the 30 papers contributed by Dr. N.P Nataraja 26 were during the EYP. Dr. M. Pushpavathy, who contributed 18 articles followed by Dr. N. Sreedevi who contributed 17 articles and Dr. S.R. Savithri who contributed 16 articles were the top three prolific authors during the LYP. It is noted that all the 10 most prolific authors during the LYP were from the domain of speech. Also, there were no female authors among the top ten prolific authors in the EYP whereas seven out of ten prolific authors in the LYP were female.

Table 3: Most Prolific Authors

Prolific authors: Overall (1970-2015)			Prolific authors: EYP (1970-1993)			Prolific authors: LYP (2008-2015)		
Rank	Name	No. of papers	Rank	Name	No. of papers	Rank	Name	No. of papers
1	Nataraja, N. P.	30	1	Nataraja, N. P.	26	1	Pushpavathi, M.	18
2	Savithri, S. R.	20	2	Bharath Raj, J.	14	2	Sreedevi, N.	17
3	Pushpavathi M	18	2	Rathna, N.	14	3	Savithri, S. R.	16
4	Sreedevi, N	17	3	Kumar, P. J.	11	4	Shyamala, K. C.	13
5	Bharath Raj, J.	14	4	Vyasa Murthy	7	5	Goswami, S. P.	12
5	Rathna, N.	14	5	Hegde, M. N.	6	5	Rajashekar, B.	12
6	Prema, K.S	13	5	Shukla, R. S.	6	6	Prema K.S.	9
6	Rajashekar, B.	13	5	Venkatesh, C. S.	6	6	Swapna, N.	9
6	Shyamala, K. C.	13	6	Jagadish, A.	5	7	Geetha, Y. V.	8
7	Goswami, S. P	12	6	Stewart, J.M.	5	7	Manjula R.	8

Organizational affiliation: The All India Institute of Speech and Hearing, Mysuru, the publishing organization of the journal accounted for the majority of authors (673 nos., 64.96%) of the journal. The remaining 363 authors (35%) were belonging to 125 organizations across the country and abroad. These include Manipal Academy of Health Sciences, Manipal with an affiliation of 57 (5.5%) authors, and the JSS Institute of Speech and Hearing with an affiliation of 22 authors (2.1%). It is worth noting that 30 authors (2.9%) affiliated to foreign organizations contributed to the journal. Table 4 shows the organizational affiliation of the authors.

Table 4: Organizational affiliation of the authors

Organization	No. of authors
All India Institute of Speech and Hearing, Mysuru	673
Manipal Academy of Health Sciences, Manipal	57
JSS Institute of Speech and Hearing, Mysore	22
Dr. S.R.Chandrashekar Institute of Speech and Hearing,	16

Bangalore	16
Dr.M.V.Shetty College of Speech and Hearing, Mangalore	16
Ali Yavar Jung National Institute for the Hearing Handicapped*	15
Indian Institute of Science , Bangalore	11
Sri Ramachandra University, Chennai	9
BYL Nair Ch. Hospital & T. N. Medical College, Mumbai	8
Foreign organizations (30)	30
Others (87)	179
Total	1036

* including regional centers

Research Domains of the Journal

The total 502 scientific articles published in 34 volumes of the journal were categorized into four research domains: speech, language, hearing and multidisciplinary. The highest number of scientific papers published in the journal was in the domain of speech (215 nos., 42.82%) followed by hearing (142. nos., 28.28%) and language (125 nos., 24.9%). Only a few papers (20 no., 3.98 %) were multidisciplinary.

Table 5: Research domains

Vol. & Year	No. of articles	Research Domains			
		Speech	Hearing	Language	Multidisciplinary
1 - 1970	24	14	7	-	3
2 - 1971	21	12	5	-	4
3 - 1972	26	8	7	5	6
4 - 1973	18	8	10	-	-
5 & 6 - 1974-75	15	10	3	1	1
7 - 1976	20	8	10	1	1
8 - 1977	18	-	9	8	1
9 - 1978	-	-	-	-	-
10 - 1979	25	5	16	4	-
11 - 1980	-	-	-	-	-
12 - 1981	19	8	6	5	-
13 - 1982	14	7	2	4	1
14 - 1983	17	6	4	7	-
15 - 1984	17	7	4	5	1
16-17 - 1985-86	9	5	2	2	-
18 - 1987	2	1	1	-	-
19 - 1988	10	5	4	-	1
20 - 1989	10	4	4	2	-

Vol. & Year	No. of articles	Research Domains			
		Speech	Hearing	Language	Multidisciplinary
21 - 1990	8	5	3	-	-
22-23 - 1991-1992	6	2	3	1	-
24-25 - 1993-1994	8	8	-	1	-
26 - 2007	17	8	2	7	-
27 - 2008	19	7	4	8	-
28 - 2009	25	11	5	9	-
29--1 - 2010	15	6	4	5	-
29--2 - 2010	19	7	7	5	-
30 - 2011	28	13	4	11	-
31 - 2012	28	10	7	11	-
32 - 2013	31	10	5	16	-
33 - 2014	17	12	1	4	-
34 - 2015	16	8	3	3	2
Total	502	215	142	124	21

Of the 287 scientific papers published during EYP, 123 numbers (42.85%) were in the domain of speech, 100 nos. (34.84%) in hearing and the remaining 45 nos. (15.67%) in language. On the other hand, of the 215 scientific papers published during LYP, 92 no. (42.79%) were in speech, 42 no. (19.53%) in hearing and the remaining 79 no. (36.74%) in language. Thus there was a decrease of 15.19% in hearing and an increase of 21.07% in language-related papers over the years. The papers in speech on the other hand, were found to be stable with an almost equal distribution in EYP and LYP. The scientific papers in multidiscipline also decreased during the LYP. Table 5 and figure 1 and 2 show the results.

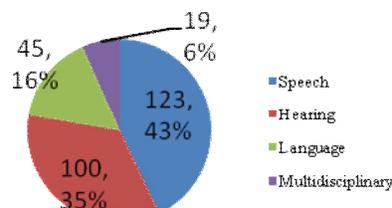


Figure 1: Research domains: EYP (1970-1994)

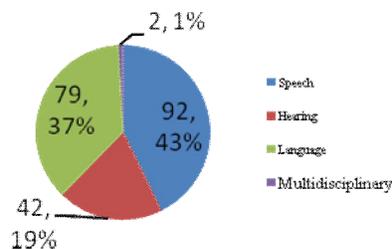


Figure 2: Research domains: LYP (2007-2015)

Discussion

A discipline like communication disorders draws from the literature of many fields and hence the corpus of literature exclusively on communication disorders is very small. Correspondingly the journals covering the entire field are relatively few (Black 2011). The JAIISH is one such peer-reviewed journal which covers the entire field of communication disorders.

The results of the present study revealed that the JAIISH progressed in many ways over the last 45 years. The percentage of scientific articles increased noticeably from 54 % in the early years of publication to 94 % in the later years. Dissertation Abstract, a (normally) uncommon content type in peer-reviewed scientific journals was avoided from the journal issues published in the later years. Also, attempts were made to introduce new sections such as Book Reviews and Letters to the Editor. More importantly, the journal attained regularity and consistency. No journal volumes were published in combined volume set in the later years of publication.

In contradiction to previous findings (van Arensbergen, Weijden & Besselaar 2012; Martinez, Botos, Dohoney, Geiman & Kolla 2007; Symonds, Gemmell, Brisher, Gorringer & Elgar 2006), our analysis showed that the gender difference in contribution of scientific papers to the journal existed only during the early years of publication, i.e. 1970-1994. The difference disappeared gradually and the female authors outperformed their male counterparts in the later years i.e. 2007-2015. Perhaps, this may be partly due to the fact that the number of male researchers in the field of communication disorders in the country is small.

The percentage of scientific papers with single author decreased in the journal from 65.27 % to just 5.11 % over the years and there was a growing trend of collaborative authorship with a predominance of two-author and three-author collaborations. A similar trend in authorship pattern was also observed by Stansfield & Armstrong (2016) in the journal, *Speech* and by Shivakumaraswamy & Muthuraj (2016) in the journal *Indian Journal of Traditional Knowledge*. It is a fact that the scientific disciplines in general are experiencing increase in collaboration. Glanzel & Schubert (2004) reported that the single-authored papers indexed in Web of Science in the year 2003 was just 10.7%. It is important to note, however that majority of the collaboration in the present study was progressing at local level. This was followed by national level collaboration. A very little progress was achieved in international collaboration over the years. This is in contrast to many of the previous single journal study findings. For example, Chai & Xiao (2012) reported 15% increase in international collaboration in the journal *Design Studies* and Garfield et al. (2003) observed constant growth in the internationally coauthored papers in the journal *Bio electrochemistry and Bionergetics*. Ramkumar et al. (2016) also in their study on JAIISH observed the high proportion of two-author and three-author collaborations at local level, thus *corroborating our findings*.

Analysis of author productivity in the JAIISH revealed that of the 1036 authors contributed to the journal, 333 authors (32%) contributed only one paper. This shows diversity of the researchers contributed to the journal and its openness to the professional community in general. Of the remaining authors, ten most prolific authors contributed 165 papers (32.8 %) to the

journal from its inception till date. However, among the papers authored by the prolific authors, only 28 were single-authored. Also, the prolific authors changed totally between the two periods of publication of the journal. The findings on the most prolific authors may be interpreted with caution as the actual productivity can only be calculated taking into account of factors like the number of years in the profession. Analysis of author affiliation revealed that an overwhelming majority of the authors were affiliated to the All India Institute of Speech and Hearing, the parent organization of the journal. Previous studies also noticed such increased contribution of papers from the parent organizations of the scientific journals. Abdulla & Rahman (2009) reported that the University of Malaya contributed 68.8 % of the papers published in its journal, *Jurnal Syariah*. The dominance of AIISH-affiliated authors in the journal is also justifiable on account of the fact that the Institute is a well-recognized and widely acknowledged key organization in the field of communication disorders in the country and the country's major research activities in the field is strongly centred around the AIISH. Garfield et al. (2003) reported that about one third of the papers published in *Bio electrochemistry and Bionergetics* came from a handful of key institutions pertaining to the field. Among the authors contributed to the JAIISH, 30 were from other countries. Though the number is small, it proves the internationality of the journal. However, over the two periods, the level of foreign contribution declined pointing towards decreasing internationalization of the journal.

The domain of speech along with its closely allied area language constituted the major share of scientific research reported in the JAIISH. Some interesting changes were noticed in the spectrum of research domains covered by the journal over the years. The papers on hearing were declined by nearly one-half while those on languages more than doubled.

Conclusions

The present study quantitatively analyzed the Journal of All India Institute of Speech and Hearing, the oldest and most prestigious peer-reviewed Indian scientific journal in the field of communication disorders. The journal contributed immensely towards the growth of the field in the last 45 years by publishing more than 500 scientific papers. However, despite its importance, the number of scientific articles pertaining to the field of hearing and its disorders was comparatively less in the journal. This is a matter of concern and may be addressed by publishing special issues based on peer-reviewed papers from those presented at reputed national level conferences in the field. Also, in order to maintain its international status, the journal should keep on attracting authors from a wide range of countries across the world. For this, the publication frequency of the journal must be increased and the journal be made online with provision for electronic submission, peer-reviewing and editorial processes.

Hopefully, the study results will provide a comprehensive understanding of the *Journal of All India Institute of Speech and Hearing* in quantitative terms and help its parent organization and the journal editorial board in taking decisions on its future growth and development. Additional research could investigate the citation behavior of the journal. Also, the methodological approaches followed in the scientific articles and their change over the years could be explored.

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