A Survey on Open Access Publishing Preferences of Indian Scholars

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Abstract This article discusses the findings of a survey to determine the Indian scholarly community's preferences in open access (OA) publishing. Three hundred responses were obtained from five top-ranked Indian life science research institutions. All respondents opined that their research work seeks to reach maximum readership, and 88.7% indicated OA articles can be circulated without restrictions. A vast majority (90.67%) felt that OA journals reach readers, and there was no significant variation among institutions on aspects of OA publishing except for reaching scholars (chi-square=11.010, p=.026). The majority of respondents who prioritized high impact in their choice of publication significantly also favored brand value. The least significance was found in preference for diamond OA, or OA journals that do not charge author fees (chi-square=14.596, p=.006). Those who didn't intend to pay an article processing charge

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(APC) were statistically different among institutions. A diverse opinion was observed among the institutions regarding unrestricted access to the publications for end-users (chi-square=11.722, p=.000) and dislike of publishing in paid OA journals (chi-square=12.116, p=.017). Authors' reasons for publishing in OA journals and attracting more citations as encouragement to publish in OA journals were similar among the institutions. A statistically significant difference was observed among authors who quoted freedom of and free access to scholarship as reasons for publication (chi-square=11.722, p=0.0001). The article recommends libraries and library and information science (LIS) professionals raise awareness of OA and its publishing policies, platforms, and funding agencies and encourage OA by making budgetary provisions for supporting APCs.

Keywords: open access, OA, open access journals, OA publishing, scholarly communication, author charge, APC, author preference

Scientific knowledge from its conception to creation to dissemination to application forms the foundation for the development of humankind (Agrawal 1995). The process of research facilitates the free flow of scholarly knowledge (Olssen and Peters 2005). Scholarly communication has traditionally been facilitated through the "scholarly journal" (Schauder 1994) with stipulated intervals for publishing their scientific research results (Gerbin and Drnovsek 2020). Writer and lawyer Denis de Sallo started the first-ever journal in a print form, titled *Journal des Sçavens*, on January 5, 1665, in France, and in March 1665, Henry Oldenburg in London started the journal *Philosophical Transactions of the Royal Society of London* (Nikam and Babu H 2009). Scholarly journal publishing percolated into India during British rule (Anderson 2018). An established "peer review" process improves publication quality (MacDonell 1999) by building the corpus of scientific knowledge, quality, and reputation of the work of an author and institution (Kilkenny et al. 2009) worldwide and in India specifically (Misra, Ravindran, and Agarwal 2018; Rao 2017).

Throughout the eighteenth to mid-nineteenth century, the nature and quality of journals evolved (Antrop 2005). Papers published in quality journals remained the "most authentic and sought-out medium of recording and dissemination" of scholarly research (Banks 2005). In the twenty-first century, flaws in peer review, the rising cost of subscription rates (also known as the serials crisis), honorary editors withdrawing from commercial journals in protest of price increases, copyright issues, and the emergence of the internet have all led to the open access (OA) movement (Bosah, Okeji, and Baro 2017).

Three notable declarations—the Budapest Open Access Initiative in 2002 (BOAI 2012), the Bethesda statement in June 2003, and the Berlin declaration in October 2003 (Bist and Mohanty 2006; Chan et al. 2002)—initiated OA scholarly journal publishing. OA publishing falls into three classifications: green, gold, and diamond

open access (Hassan Abdelrahman 2020). An author-archived galley proof or publication draft qualifies as green OA (Guédon 2004). An article in a commercial OA journal, sometimes requiring author or institution payment, qualifies as gold OA (Harnad et al. 2004). An article that is published immediately as open access in a journal without any author fees is known as diamond OA (Fuchs and Sandoval 2013).

Authors worldwide choose from several OA models to publish their research based on their publishing preferences and willingness (Kamerlin et al. 2021). Various studies have been conducted to assess the publishing preferences of authors in OA platforms worldwide, and the results are mixed in nature for reasons such as impact factor, speedy publication, wide reach, free access, and no rights hassles (Edelmann and Schoßböck 2020). Because India is a fast developing economy, Indian authors have played a significant role in the OA movement (Alryalat et al. 2020) for the past two decades, and the trend is increasing every year (Mani 2020).

Review of Literature

A worldwide survey of 8,000 authors revealed that 75% were ready to offer their scholarly content free online (Kenneway 2011), irrespective of OA or non-OA platforms. A survey conducted by Michael Boock et al. (2020) of faculty members at six Bulgarian universities assessed to what extent their research was openly available, their awareness of the European Union Competitiveness Council OA and its goal, and their support for the goal and preferences for achieving it. Bryna Coonin and Leigh Younce (2010) studied 309 authors who had published in OA education journals to assess their reasons for choosing a journal in which to publish. The peer review process and journal reputation were found to be more important to authors, whereas citation impact and copyright retention were rated as less important; the study found little correlation between copyright retention and practices of self-archiving (Shen 2011). General feedback from two other studies indicated a lack of awareness among the scholarly community about OA and its publishing model (Kenneway 2011; Rowley et al. 2017).

Kathleen Amos et al. (2012) collected data on authors from the University of Utah for the year 2009 from the Scopus database to compare interlibrary loan costs versus journal subscription costs and also to find any relationship between publishing venue, usage, and cost (Chadwell and Sutton 2014). Seta Jackson (2017) examined why authors at the University of Cape Town were not depositing their published articles into the university's repository. Another study looked at differences in temperament of eight faculty members and six PhD students at Syracuse University toward OA and academic publishing by identifying willingness factors and relationships using the iterative approach of grounded theory; the researchers found that the relationship between two

scholarly communication activities contributed to the concept of OA, and they applied literature comparison methodology to increase the internal validity and generalizability of their findings (Park and Qin 2007). Studies that focused on authors' perceptions of article processing charges (APCs) by OA journals and their willingness to pay for OA publishing (Schroter, Tite, and Smith 2005; Solomon and Björk 2012) found that APC charges without an institution's support are impossible.

As previously noted, authors consider the quality of the publication as the most important aspect in the decision of where to submit their scholarly articles for publication. Gabriel Bosah, Chuma Clement Okeji, and Ebikabowei Emmanuel Baro (2017) found that library professionals consider these same factors when choosing OA journals for publication and also distinguish the challenges faced by library and information science (LIS) professionals in publishing on the OA platform. Librarians are well aware of the types of OA publishing but are less familiar with diamond OA. However, authors value the impact factor and reputation of the publication most in their decision to publish on OA platforms (Bosah, Okeji, and Baro 2017). A study by Baro and Monica Eberechukwu Eze (2017) found that APCs and lower journal impact factors are roadblocks to publishing on OA platforms. Librarians have pioneered creating awareness of OA journals as effective substitutes for commercial and paid journals for authors and researchers (Peterson 2006). A survey of authors by Kwabena Osei Kuffour Adjei and Christopher Mfum Owusu-Ansah (2016) revealed that authors prefer to publish in refereed/peer-reviewed journals with a great reputation that is indexed in quality journal indexes for greater visibility and that free/open access to the internet is not important to 41% of authors.

Angel Hernández-Borges et al. (2006) studied awareness of APCs and willingness to publish in an OA model among Spanish-language medical authors. The researchers suggest that authors, publishers, and governmental and information agencies take into account inequalities among countries and reduce author charges for scholars at institutions from low-income countries. Another study found that peers and co-workers are the most influential factors for authors when deciding on the publication platform (Andersen et al. 2004); interestingly, authors also play a highly influential role in deciding on the publication (Schroter and Tite 2006). To conclude, several studies found that the Indian scholarly community's understanding of OA publishing is lagging behind OA awareness worldwide (Arunachalam 2008; Piryani, Dua, and Singh 2019; Ramachandran and Scaria 2004).

Significance of the Study

We are witnessing the proliferation of open access (OA) publishing, which enables access to scholarly content free of cost with fewer or no copyright barriers. Hybrid OA

manages the cost of publication with APCs. After two and a half decades of the OA movement, authors worldwide have gained a considerable understanding of the OA platform and its publishing philosophy. Because India is a fast developing economy and thus provides a good opportunity for OA proliferation, we aimed to study Indian authors' perspectives on and willingness to publish their research findings in OA journals. Hence, this study seeks to shed light on the attitudes, willingness, and preferences of Indian scholars regarding open access and platforms.

Research Questions

1. Is the Indian scholarly community aware of the importance of OA and commercial OA?
2. What factors influence Indian authors to choose an OA platform to publish their research?
3. What motivates the willingness and preference of Indian authors to publish in OA journals?

Methodology

We set out to collect data from scientists of various institutions in response to the research questions formulated. The Indian research institutions considered for the study are the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), the Indian Institute of Horticulture Sciences (IIHR), the Indian Institute of Science (IISc), the National Centre for Biological Sciences (NCBS), and the University of Agriculture Sciences (UAS), based on Sciastra's life science ranking 2020. The questionnaire was designed to collect data after employing a pilot test with a simple random sampling technique, which was further strengthened for study variables and reliability. The 800 scientists, faculty, and postdoctoral researchers working in the five institutions were the target population, and the sample size was estimated based on the standard sample sizes proposed in the literature (Israel 1992; Krejcie and Morgan 1970; Yamane 1967) at 5% precision and 95% confidence interval, for a minimum of 267. We distributed the questionnaire to 672 (84%) researchers in person based on their availability and through the mail with pre-paid postal stamps for hassle-free return, and we followed up with reminder phone calls and emails. There were 322 responses received, of which we found only 300 duly filled-in responses. Data collection for the study was carried out between November 2019 and January 2020. Appropriate hypotheses are constructed related to the objectives of the study and

are tested using a chi-square test for association of attributes, with 5% as the level of significance.

Data Analysis and Findings

We now present the results of the testing on various aspects related to OA. Based on the diversity in representation, we can assess the difference of opinions expressed by the respondents. That is, is there any significant difference between the opinions expressed by respondents belonging to different institutions? Hence, we consider "institution" as a factor and test the hypothesis constructed on various aspects related to OA. The following gives the null and alternative hypotheses.

- Null hypothesis H0: Institutional affiliation does not significantly influence the opinions expressed by the respondents on various aspects related to open access (OA) publications.
- Alternative hypothesis H1: Institutional affiliation significantly influences the opinions expressed by the respondents on various aspects related to open access (OA) publications.

The test results help categorize aspects that are influenced by the factor "institution" and those that are not influenced by this factor. If a respondent's institution influences opinions, then there will be a significant association between the institution and the level of agreement the respondents have on an aspect. The respondents have expressed their level of agreement on a 4-point Likert scale, in which 4 = *strongly agree*, 3 = *agree*, 2 = *disagree*, and 1 = *strongly disagree*. In a few cases, the opinions are measured on a binary scale of yes or no. In other cases, 4 = *very important*, 3 = *important*, 2 = *not very important*, and 1 = *not at all important*. Table 1 gives the distribution of the respondents.

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The data in Table 1 show that 98.36% filled-in questionnaires were received from UAS, followed by 96.77% from NCBS, 89.55% from IIHR 20%, 89.29% from IISc, and 86.96% from JNCASR.

The data in Figure 1 show absolute responses from scientists on the importance of cost-free access to research articles reaching maximum readers; their work reaches a greater number of readers through OA publishing, and they do not want any restrictions to be imposed on their work.

Table 1.1. Distribution of Respondents

Sl. no.	Institution	Total scientists	Questionnaire		Overall percentage
			Administered	Duly filled	
1	IIHR	86	67 (77.91)	60 (89.55)	20.00
2	IISc	63	56 (88.89)	50 (89.29)	17.00
3	JNCASR	51	46 (90.20)	40 (86.96)	13.00
4	UAS	144	122 (84.72)	120 (98.36)	40.00
5	NCBS	38	31 (81.58)	30 (96.77)	10.00
Total		**382**	**322 (84.29)**	**300 (93.17)**	**100.00**

Note: Numbers in parentheses indicate percentages.

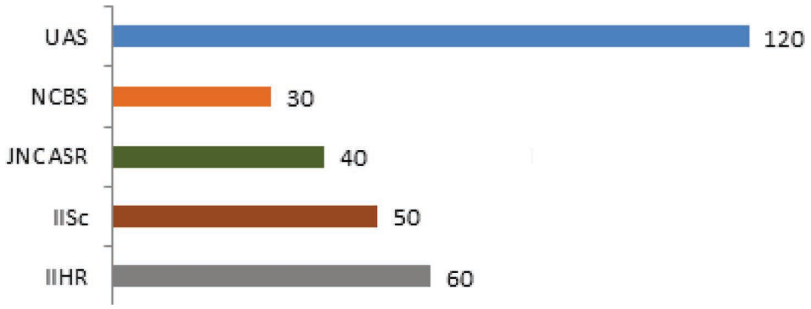

Figure 1.1.

AuQ1

Data in Figure 2 illustrate that 20% of scientists from JNCASR, followed by 10.8% from UAS, 6.6% each from IIHR and NCBS, and 6% from IISc, strongly agreed that cost-free OA publication attracts a better impact factor. Among the respondents who agreed are 54.2% from UAS, 52% from IISc, 40% from NCBS, 32.5% from JNCASR, and 31.7% from IIHR. Similarly, one can review the percentages of respondents who have either disagreed or strongly disagreed.

On whether the factor of a stringent peer review policy influences their decision to publish in OA journals, 7.5% of scientists from UAS agreed it was very important, followed by 6.7% from IIHR, 4% from IISc, and 2.2% from NCBS, as shown in Figure 3. Those who most viewed the adoption of strict peer review as not very or not at all important for their publications were from JNCASR, followed by UAS.

Figure 4 shows that 88.7% of all respondents opined that circulation of OA articles without any limit is positive, and an overall 11.3% did not agree with the statement. From the chi-square test, we conclude that there is no institutional influence on the opinions expressed by the scientists on this aspect.

From the data presented in Figure 5, we note that a majority of respondents (68.7%) from all the institutions agreed that plagiarism will increase as a result of OA. Those who disagree that plagiarism will increase as a result of OA were 45%, 43.3%, 30%,

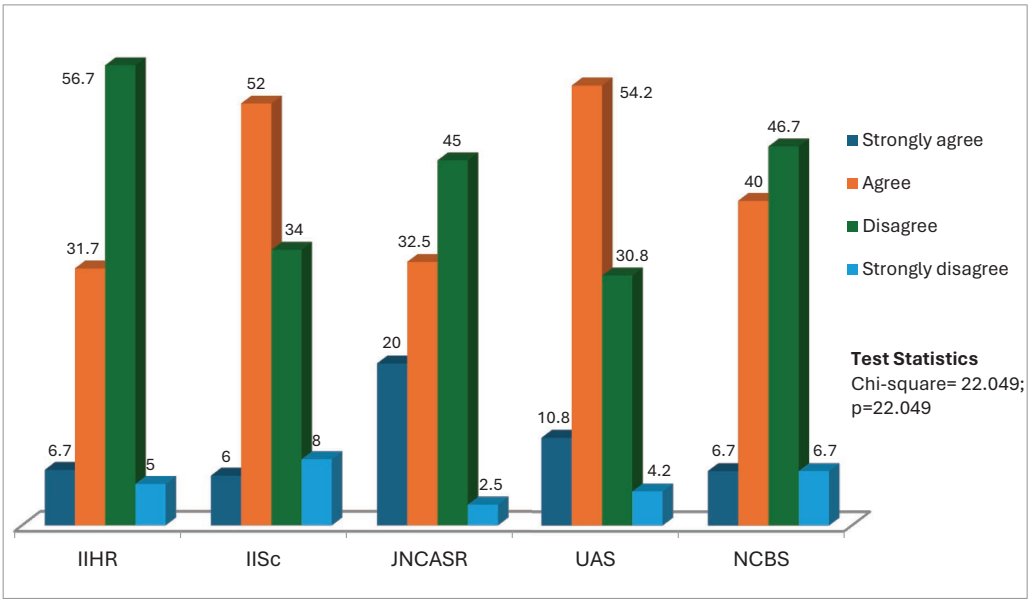

Figure 1.2. Cost-free OA publication attracts better impact factor

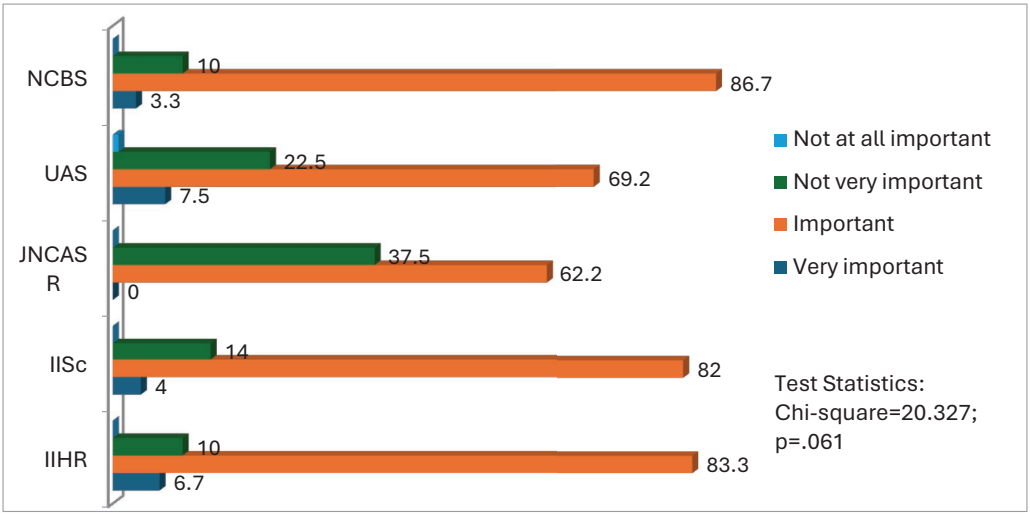

Figure 1.3. Adoption of stringent peer-review policy by OA journal

28%, and 23.3% from IIHR, NCBS, JNCASR, IISc, and UAS, respectively. From the chi-square test, we see that the institution the respondent belongs to influences the scientists' opinions regarding an increase plagiarism due to OA journals.

For responses on the aspects of OA publishing, among the scientists who opined that "Papers won't reach readers like commercial journals," 90.67% responded that the papers published on the OA platform do reach readers. The respondents' opinions on "Copyright is liberal" were mixed, with 59% not agreeing and 41% agreeing to this aspect.

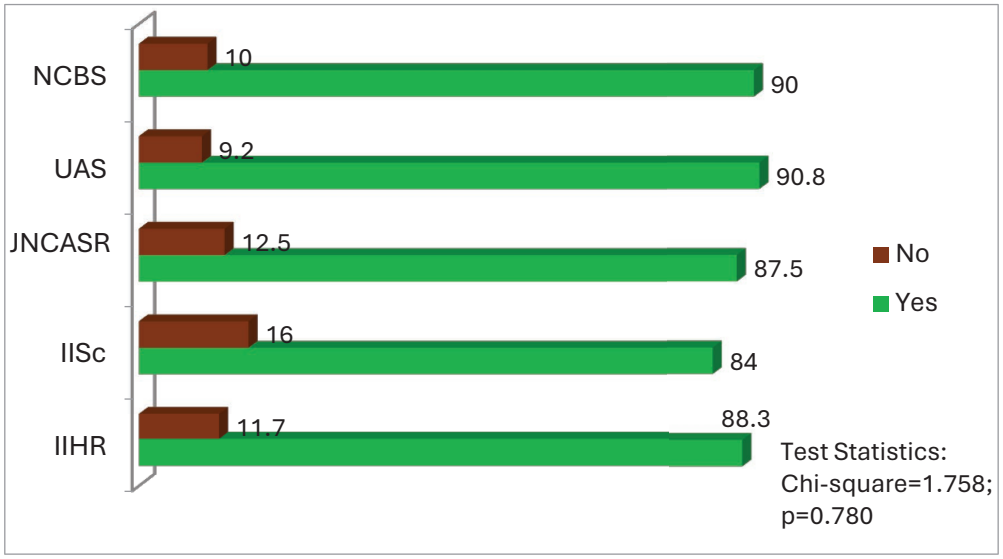

Figure 1.4. Circulation of restriction-free OA articles helps

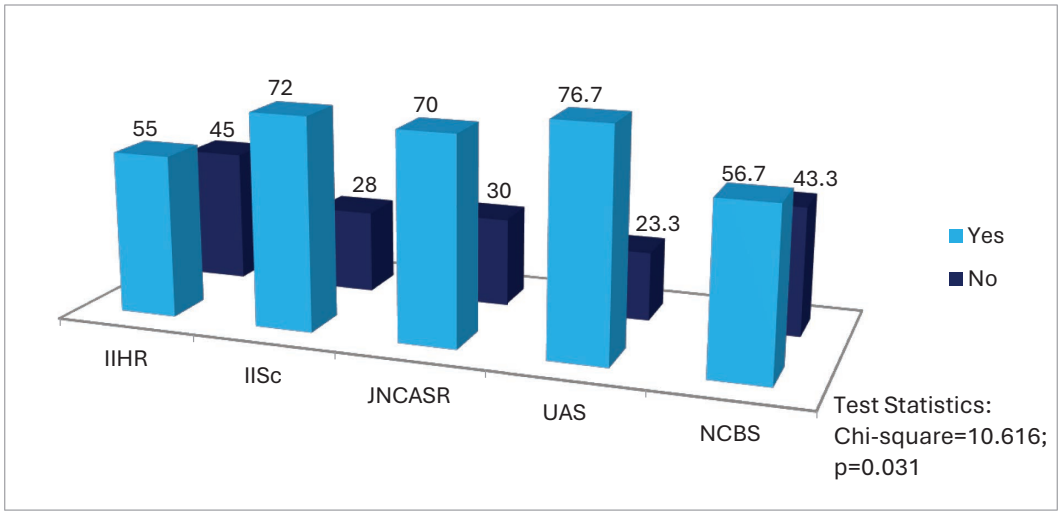

Figure 1.5. OA articles contribute to plagiarism

Author preferences on publishing in subscription (commercial) journals are shown in Figure 6. A majority of NCBS (70%) respondents preferred subscription journals, followed by 37.5% from JNCASR, 36.7% from IIHR, 28.3% from UAS, and 26% from IISc. The chi-square test reveals a significant influence of institutions on the opinions expressed (chi-square=20.462, p=0.0001).

Details of the aspects that motivate the scientists when choosing where to publish are given in Figure 7. A majority of scientists (121) selected journal impact factors, with 45.45% from UAS and 22.31% from IISc. Ninety-five respondents chose pure

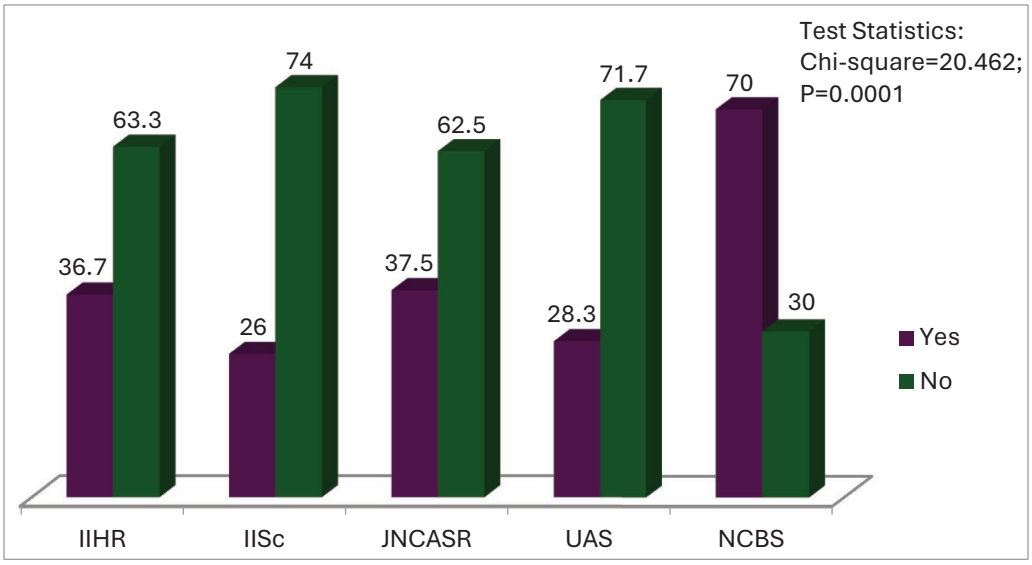

Figure 1.6. Authors' preferences for publishing in paid journals

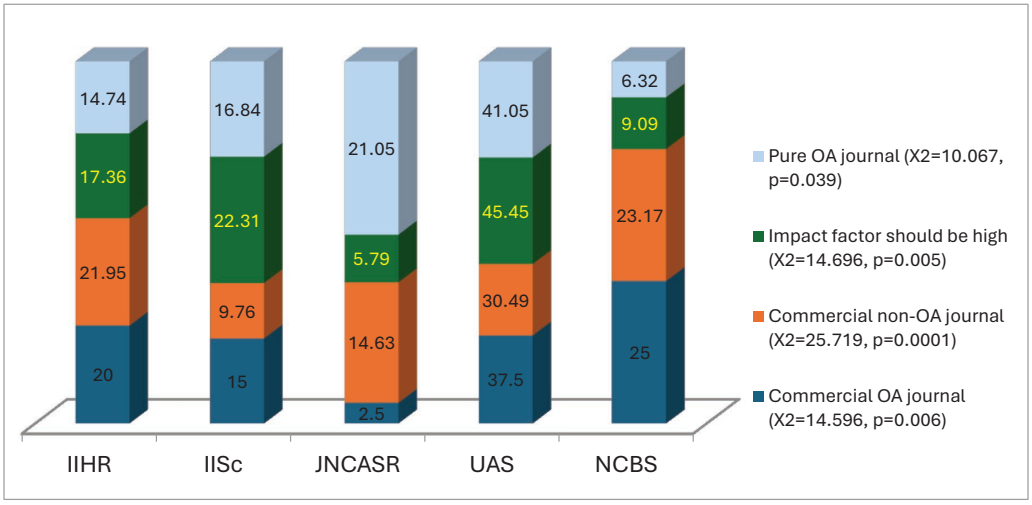

Figure 1.7. Authors' publication choices

open access journals, with 41.05% from UAS followed by 21.05% from JNCASR. Commercial non-OA journals were opted for by 82 respondents, with 30.49% from UAS followed by 23.17% from NCBS. Finally, a minority of respondents chose paid OA journals (37.5% of UAS and 25% of NCBS responses). From the test statistics, a significant institutional influence was found on all the aspects that motivate scientists to choose OA for publishing their work.

The rationale for not publishing OA has been obtained and presented in Figure 8. After analysis, it was found that institution has an influence on the opinions expressed on aspects such as "Can't afford to pay," "Don't want to pay," and "Paid journals are

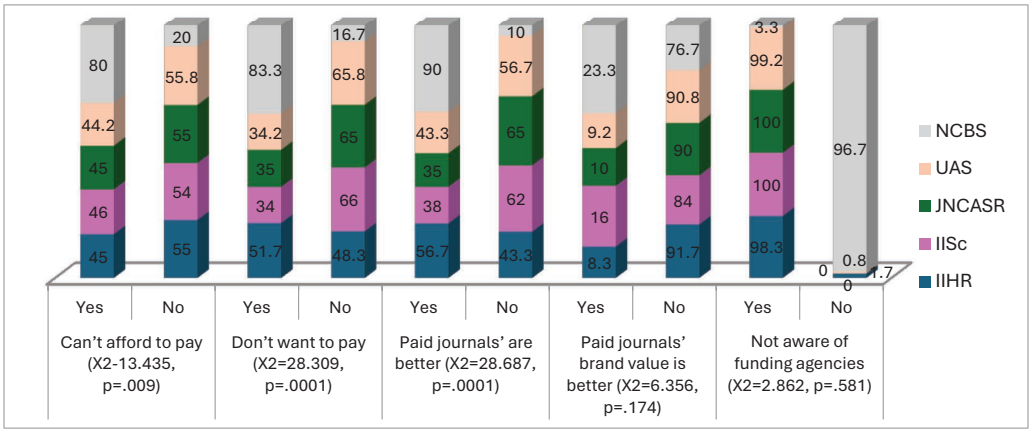

Figure 1.8. Rationale for not publishing in OA journals

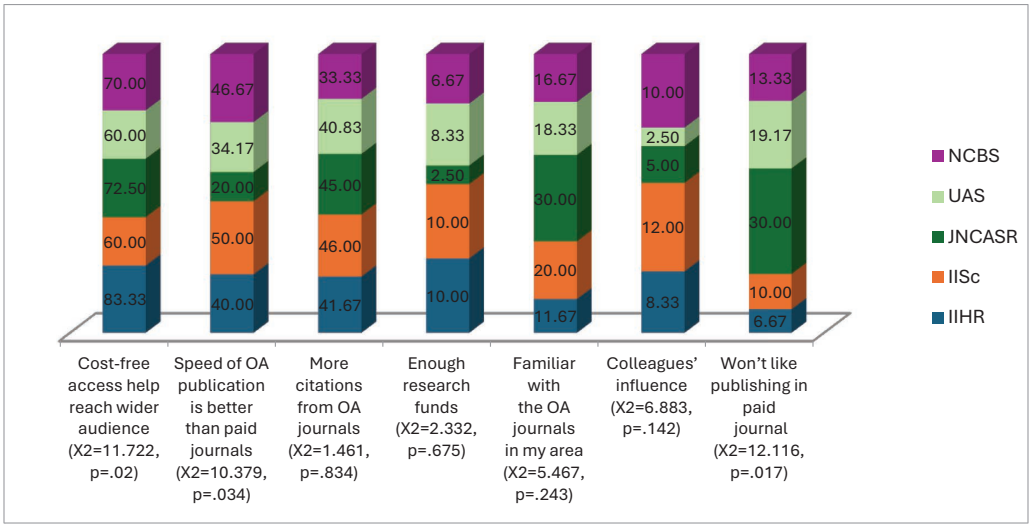

Figure 1.9. Rationale of authors for publishing in OA journals

better." Also, respondents who opined on the better brand value of commercial subscription journals (chi-square=6.356, *p*=.174) were not influenced by the institution to which they belong. Similarly, respondents reported their ignorance of funding agencies (chi-square=2.862, *p*=.581). A high 83.3% of respondents from NCBS do not want to pay APCs, followed by 51.7% from IIHR, 35% from JNCASR, 34.2% from UAS, and 34% from IISc. Ninety percent of NCBS respondents opined that paid or subscription journals are better than OA journals, but only 23.3% of NCBS respondents felt that paid or subscription journals have better brand value. Eighty percent of NCBS respondents reported that they cannot afford APCs, followed by 46% from IISc, 45% from IIHR and JNCASR, and 44.2% from UAS.

From Figure 9, we note that the institution influences the opinions expressed by the respondents on aspects such as "Cost-free access helps reach a wider audience,"

"Speed of OA publication is better than paid journals," and "Won't like publishing in paid journal." The institution didn't influence other aspects. From this, we conclude that among aspects that motivate authors to choose OA journals, the influence of their institution has to be taken into consideration.

Discussion

Most survey respondents felt that OA publication reaches a greater number of readers and that cost-free OA publication attracts a better journal impact factor. The test statistics found that the respondent's institution has a significant influence (*p*-value less than the level of significance 5%) on their opinions regarding OA publishing. On the factor of a stringent peer review policy of an OA journal, it was noted that the expected frequencies are less than 5, and using a pooling technique, the resultant chi-square test value is 15.412 and the *p*-value is 0.0039. From this, we conclude that there exists a significant difference between the opinions expressed by the scientists belonging to different institutions, which means respondents have different opinions on the review process being adopted by the OA journals. Hence, one has to consider the institution while relating OA to the review process.

Circulation of restriction-free OA articles was perceived to help articles per data subjected to the chi-square test, and it can be concluded that there is no influence of institutions on the opinions expressed by the scientists. Open access journals are new to the Indian subcontinent as scientists have no or less clarity regarding the integrity of OA journals. Hence, over 60% of respondents were not willing to publish their research in OA journals. Fewer respondents have a preference for OA, and there exists a significant difference between responses (Schroter, Tite, and Smith 2005). Statistical importance was observed, and no significant variations among institutions on all facets of OA publishing with a chi-square of 11.010 and a *p*-value of.026 were found.

The choice of publication in subscription journals was analyzed to find a chi-square of 20.462 and a *p*-value of.000, which is significant and indicates that the support and resources the researchers get from their institutions influence their decisions as to the type of journal in which to publish their work. Furthermore, a researcher who gets financial support from their respective institution may prefer a commercial journal or a hybrid (gold OA) journal as opposed to a researcher who does not receive support. For the choice of publication, a majority of respondents preferred a high impact factor for publication, with a chi-square value of 14.696 and a significant *p*-value of .005. A journal's brand value was favored for publication at a chi-square of 25.719 and a *p*-value of.0001. Thus, we can conclude that their institution's support influences the researcher's opinion on the brand value of the journal.

Researchers belonging to different institutions perceive the OA options available in commercial journals differently, with a calculated chi-square test value of 14.596 and a *p*-value of 0.006, which is not significant. Respondents' lack of awareness of funding agencies was on par with one another statistically between institutions, with a chi-square value of 2.862 and a non-significant *p*-value of .581. The aspect of inability to afford APCs leads to a chi-square value of 13.435 and a *p*-value of.009 and was statistically not significant among the responses.

A diverse opinion was observed among respondents of different institutions on unrestricted access to the publications for end-users, with a chi-square of 11.722 and a *p*-value of 0.02. Interestingly, there is a difference in the opinions related to the time taken to publish the research work (chi-square=10.379, p =.034). There is a significant difference in the opinions about publishing in commercial journals with the authors disliking publishing in paid journals, with a chi-square value of 12.116 and a *p*-value of.017.

Our study found that 40.83% of respondents from UAS—on par with 41.67% from IIHR, 46% from IISc, 45% from JNCASR, and 33.33% from NCBS—opined that the aspect of attracting more citations encourages authors to publish in OA journals (chi-square=1.461, p=.834). Interestingly, researchers belonging to various institutions agree that familiarity with the free journals in the author's field of research is also a reason for increased preference to publish in OA journals (chi-square=5.467, p=.243).

A majority of respondents said that there will be an increase in audience (90.67%) as well as in plagiarism (68.7%) for OA publishing. Eighty-one percent of scientists from all institutions did not agree with the statement that "papers will be used for commercial benefits." In addition, 72.67% did not agree that by "publishing in an OA journal, the scholarly integrity would be at stake."

Conclusion

The significant difference between the opinions expressed by the scientists belonging to different institutions may be attributed to a lack of awareness and unwillingness to publish their research in OA journals in the areas and subjects they deal with, ranging from the pure sciences of IISc and NCBS to the applied sciences of JNCASR, UAS, and IIHR. Furthermore, IISc is ranked the top research institution in India and among the top 200 research institutions in the world; hence, its researchers may be inclined to publish in high impact factor journals. Journals' brand value can be attributed to this perceived difference with other institutions. In-house funding support for gold OA publishing, the inability to afford APCs, dislike of publishing in paid journals, and the idea that an OA article attracts more citations are also influencing factors.

Researchers from other institutions of the study have different choices for where to publish their work, and a majority of them did not prefer a commercial journal for publishing their research. But interestingly, the majority of the respondents from all institutions surveyed did not agree with the statement that papers will be used for commercial benefits and that scholarly integrity will be at risk as a result of publishing in an OA journal.

OA has grown in evolution to include green, gold, and diamond models. As a result, all commercial publishers have adopted OA policies for sustainable publishing. Citation, impact factor, and brand value of publications are motivating factors for any author publishing their work, irrespective of the type of OA publication. According to Melinda Kenneway (2011), APCs for publishing in OA journals remain controversial. It is suggested that publishers and library professionals help authors by educating them on OA publishing and raising awareness of other services available to them (Hirwade and Rajyalakshmi 2006). OA has evolved and is here to stay.

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