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Research: Quality Or Quantity Which Is More Important?- A Narrator Review

Dr. Suraj Multani[1], Abhishek Banerjee[2], Ananya Pyne[3]
1(Associate Professor, Department of Public Health Dentistry, Chhattisgarh Dental College & Research Institute, Sundra, Rajnandgaon (C.G.), India.)
2(Intern, Department of Public Health Dentistry, Chhattisgarh Dental College & Research Institute, Sundra, Rajnandgaon (C.G.), India.)
3(Intern, Department of Public Health Dentistry, Chhattisgarh Dental College & Research Institute, Sundra, Rajnandgaon (C.G.), India.)

Abstract:
Background: *The objective of this narrator review is to give an insight view of analysing the research through qualitative and quantitative aspects, so that it will be helpful for future researchers while designing, implementation as well as assessing research that will add up the high quality research in the field of public health.*
Methods: *An extensive literature search was perform through Google scholar, books, blogs etc. and the articles that has given importance to qualitative assessment (through application of bibliometric indicators and mapping, and peer review) and quantitative assessment (through journal impact factor, total number citation, average number of citation, and the number of authors per paper) and also to the articles related to provide view regarding open access and close asses were selected to write this narrator review.*
Results:
Evaluation of individual's research is tedious and multi-dimensional phenomena that include both qualitative and quantitative approaches. Bibliometrics use mathematical and statistical methods to measure scientific output; thus, they provide a quantitative- not a qualitative assessment of individual research performance. h-index is a very popular bibliomertric indicator while, the g-index was introduced to distinguish quality by giving more weight to cited articles
Conclusion:
Quality should always prevail over quantity of a research. Although in the current scenario researchers prefer to pay the publishers to publish their research rather than making quality research. Open access is an interesting idea, to disseminate the information for the global society. Information should not be for those who can afford it, but it should be accessible to all.
Key Words: Research, Quality, Quantity, Open access, Close access, Publication charges

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I. Introduction

Research may be pursuing information through diligent search or investigation or experimentation aimed towards invention and interpretation of recent information.

Categories Of Research:

- **Empirical and Theoretical Research-** The philosophical facet of research is essentially of two types, one is empirical one is theoretical research. Health research chiefly follows the empirical approach. It is based mostly upon the observation and knowledge quite abreast of the speculations and abstraction. Epidemiological research, for instance, depends upon the overall assortment of observation of the health related phenomena of interest in outlined population. Empirical and theoretical research complement one another in developing and understanding of the phenomena, in predicting future events, and in prevention of the events harmful to the overall welfare of the population of interest. Quantification within the empirical research is achieved by three related numerical procedure-
  - **A) Measurement of variables**
  - **B) Estimation of population parameters**
  - **C) Statistical testing of hypothesis**

- **Basic and Applied Research-** Research is often divided into basic and applied research. Basic research is taken into account to involve a search for knowledge without any defined goal of utility and applied research is problem oriented and is directed towards the solution of existing problem.
- **Health Research Triangle- it consists of the following-**
  - **Biomedical Research-** deals primarily at the cellular level.
  - **Health Services Research-** deals with issues, environment surrounding men which promotes changes at the cellular level.
  - **Behavioural Research-** deals with the interaction of men with the environment[1].

Hierarchy Of Evidence Based Studies:

Systemic Review and Meta-Analysis
↓
Randomized Controlled Trial
↓
Non- Randomized Controlled Trial
↓
Cohort Studies
↓
Case Control Studies
↓
Cross-Sectional Studies
↓
Case-Series
↓
Expert Opinion[2].

Types Of Publication Are As Follows

- **Original research** – They are classified as primary literature. They include hypothesis, background studies, methods, and results, interpretation of finding and discussion of possible implication.
- **Review article**- provides a critical and constructive analysis of existing public literature within the field, thorough summary, analysis and comparisons often identifying the precise gaps and problems and provides recommendations for the future.
- **Clinical case study**- these present details of real patient cases from medical or clinical practice. The study is predicted to discuss the signs, symptoms, diagnosis and treatment of disease. These are considered primary literature and typically have a word count similar to that of an original article.
- **Clinical trial**- these describe the methodology, implementation, and results of controlled studies, usually undertaken with large public groups. They require practical work experience as well as, high standards of ethics and reliability[3].
- **Perspective, opinion and commentary**- Perspective, opinion and commentary articles are scholarly articles which express a personal opinion or a new perspective about existing research on a particular topic. These do not require original research, and are, therefore, less time-consuming than original research articles. However, the author must have in-depth knowledge of the subject.

Since perspective, opinion, and commentary articles do not have original research, they are considered secondary literature. However, they are definitely an immense value- addition to the prevailing plethora of scientific literature[4].

- **Book review**- A book review is a form of literary criticism in which a book is merely described (summary review) or analysed based on content, style, and merit[5].

Evaluation of individual's research is tedious and multi-dimensional phenomena that include both qualitative and quantitative approaches. The objective of this narrator review is to give an insight view of analysing the research through qualitative and quantitative aspects, so that it will be helpful for future researchers while designing, implementation as well as assessing research that will add up the high quality research in the field of public health.

II. Research Assessment

It is a broad endeavour. At root, it is an effort to measure the return on investment in scientific-scholarly research. Research assessment includes the evaluation of research quality and measurements of research inputs, outputs and impacts, and embraces both qualitative and quantitative methodologies, including the application of bibliometric indicators and mapping, and peer review.

Research performance is increasingly regarded as a key factor in economic performance and societal welfare. As such, research assessment has become a significant issue for a large range of stakeholders, and there is consequently an increasing focus on research quality and excellence, transparency, accountability, comparability and competition[6].

What Is Bibliometrics?

Bibliometrics use mathematical and statistical methods to measure scientific output; thus, they provide a quantitative- not a qualitative assessment of individual research performance[7, 8]. Within bibliometrics there is a discussion on the way to identify and measure "superstars", and lots of papers discuss the correlation between the various indicators developed for performance measurement[9].

As measurement of the standard of scientific publication, bibliometrics, expressed through various indicators, has become vital for researchers and organisations. For researchers, bibliometric indicators are important because they permit objective measurements of the diffusion and therefore the impact of the articles published by a particular journal among the scientific community. Practically, these indicators can help researchers in selecting the journals to which to submit their manuscripts.

There are three sorts of bibliometric indicators-

- Quality indicators- measure the productivity of a specific researcher or a research group.
- Performance indictors- measure the standard of a journal, researcher, or research group.
- Structural indicators- measure connections between publications, authors, or research fields[8].

Citation Indicators

The development of bibliometrics as a field is strongly linked to the creation of the *Science Citation Index (*SCI) by Eugene Garfield in 1961[10].

During recent decades, an outsized number of different citations indicators are developed and there has been extensive debate about appropriate methods for calculating citation indicators, normalisation procedures, data base coverage and data quality[11].

Limitations Of Citations

1. Citation number depends on the standard of the data based used
2. It does not consider whether the author is found within the author list
3. Sometimes articles can have a substantial number of citations for reasons that might not relate to the standard or importance of the scientific content.
4. Articles published in prestigious journals are privileged as compared with those with equal quality but published in journals of average notoriety.
5. Counting on cultural issues, advantages are often given to citation of scientists from the equivalent country, to scientists from other countries, or to articles written in English instead of in French.
6. Citation number also tends to be greater for review articles than for the original research articles[12].

h-index-

The h-index was introduced in 2005 (Hirsch, 2005) and rapidly became a very popular bibliometric measure. This indicator takes both the number of articles produced and the citation impact of these articles into account. The index was originally developed for analysis of individual, but also been applied at other levels, such as research groups, departments and institutions. Major drawbacks of this index is, it is not field-normalised and no corrections are made for carrier length, which means that the indicator disfavours younger researchers[10].

g-index-

The g-index was introduced to distinguish quality by giving more weight to cited articles. The g-index of a scientist is the highest number g of the articles that together received g^2 or more citations. Egghe pointed out that the g-index value will always be higher than the h-index value, making it easier to differentiate the performance of author. One or several highly cited articles can influence the final g-index of an individual researcher, thus highlighting impact of authors[8].

Paying To Publish-Is It Worth?

Is it wrong for an author to pay a journal to publish a research paper? This has become one of the most common questions in recent terms. Most things that have value also have costs. Journal's expenses generally are not offset by advertising revenue. Some of the remaining cause can be covered in two ways:

1. Charging users or user's institutions to access content in a journal
2. Charging authors to publish in a journal[13].

There is a perception that is journals collect fees from authors rather than subscribers; those journals will accept work of lower quality in order to collect more fees. While the public is often blocked from accessing academic journal articles, academic, they have access to this content because universities pay for journal subscriptions, often at exorbitant prices. In response to the problems with existing journal publication system, an open access movement has arisen in recent years, promoting free access to academic knowledge.

Open-access publishers like Public Library of Science (PLOS) and the Frontiers journals do not have pay walls preventing the public from accessing articles, and they allow authors to retain the copyrights to their work[14].

Many online journals are ready to publish bad research in exchange for a credit card number. Online scientific journals are springing up at a great rate. There are thousands out there. Many, such as PLOS ONE, are totally respectable. This "open access" model is making good science more accessible than ever before, without making users pay the hefty subscription fees of traditional print journals[13].

Highest density of acceptances was from journals based in India, where academics are under intense pressure to publish in order to get promotions and bonuses. A growing number of online open access journals "are accepting papers just to earn publishing fees, and as a result signs if poisoned by a lot of bad articles", Beall says. Online journals don't have to worry about subscribers; they make their money by charging contributors- who have a strong incentive to get published. So "the more papers they publish, the more money they make" Beall says[14].

The potential damage is far- reaching and difficult to quantify. Poor quality research can probably only be driven out by naming and shaming. Subscriptions are premised (and critically dependent) upon the idea that the contents of the journal are worth paying for. This tends to intent particular behaviour on the part of journals, including a focus on quality of the finished product, and the stringency of the process that confers an air of selectivity; high rejection - rate journals in medicine often are consider more prestigious[15].

The old tradition is the willingness of the scientist and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is world- wide electronic distribution of the peer-reviewed journal literature and completely free and are unrestricted access to it by all scientist, scholars, teachers, student and other curious mind. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make the literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge[16].

Whenever a scientist opts to make their papers open- access, they (or their institutions) are paying for their service. It is important for the public to recognise this. Publishing behind a "pay wall" does not mean a scientist is hiding anything- it is a necessary part of the business models of traditional journals[14]. When journals have a pay wall, they are not gouging the public. These payments cover the cost of editing, printing, formatting, etc. Many journals whether open access or not, are of profit enterprises, but they are enterprises that provide a valuable service to the society[15].

Open Access And Closed Access Journals

I. Open access journals- In 2009 there have been approximately 4800 active open access journals publishing around 190,000 articles[17]. A recent study has estimated that the number of open access journals increased by 500% and the number of articles by 900% during the decayed 2000-2009[10]. An estimated 7.7% of all peer- reviewed articles were published fully in open access journals. As of February 2019, over 12,500 open access journals are listed within the Directory of Open Access Journals[18].

A study of random journals from the citation indexes, AHSCI, SCI and SSCI in 2013 came to the result that 88% of the journals were closed access and 12% by open access.71% of the analysed journals were published by for-profit organisations as against 29% of non-profit organisations. This shows that open access journals are little minority within the analysed sample and therefore the journals published by non-profit organisations also are a minority. 84%of the analysed open accessed journals are published by non-profit organisations. In contrast, 78.4% of the analysed closed access journals are published by for-profit organisations[13].

II. Closed access journals- In the 1960s and 1970s, commercial publishers began to selectively acquire top-quality journals that were previously published by non-profit academic societies. There are over 2000 publishers, 5 for profit companies (Reed Elsevier, Springer Science +Business Media, Wiley- Blackwell, Taylor and Frances and Sage) accounted for 50% of articles published in 2013 available data indicated that these companies have profit margins of around 40%. Total expenditures on serials increased 7.6% per year from 1986 – 2005 yet. The number of serials purchased increased an average of only 1.9% per year[13].

Status of Open Access Repositories-A Global Perspective.

Present era is the epoch of digitization that has opened up unprecedented opportunities for the dissemination of scientific knowledge. One much debated way of sharing scientific knowledge is open access.

As repositories expose metadata of each item, they allow the repository content to be found by Google or other search engines such as OAIster.

The escalating cost of journal subscriptions and diminishing library budgets have caused "Serial crisis" in the field of scholarly communication. To overcome this hindrance many academicians resorted to publication of their articles in sites, which are "open "for all and free of cost. Open access has gained much popularity throughout the world as now days more and more research is being published in open access mode. However, open access repositories have entered and arena of explosive growth, so it becomes imperative to identify the trends followed by open access repositories worldwide[19].

Current Scenario In India

The Indian context, open access to science has been facilitated by government funded repositories of student and doctoral thesis, and many Indian society journals are published with platinum open access. There is a need a to increase awareness amongst Indian Academics regarding publication practices, including open access and its potential benefits, and utilise this modality of publication whenever feasible[20].

Open access journals from India were explored which were listed in DOAJ and PMC out of this the PMC identified 135 local and regional journals. Of these 126 are currently published and further results refer to these journals. Only 13 of these (10%) are currently indexed in MEDLINE, and 79(63%) started publishing in the past 2 decades[20].

273 Indian journals are registered with the DOAJ. About two- thirds of these journals are listed from 2014 onwards. Only 77 of these charge article processing fees from authors[20].

Factors Affecting Quality Of A Research

- **Plagiarism**- More common occurrence is the deliberate use of previously published date and/ or text- either the author's own or plagiarized from other author's publications. Three labels which are associated are-
  - Plagiarism- copying from another author's published work.
  - Auto-plagiarism- duplication of previously published by the authors without clearly stating.
  - Salami-slicing- authors have published parts of a study in multiple papers instead of providing the full story in a single story[21].

- **Validity-** Validity in research refers to how accurately a study answers the study question or the strength of the study conclusions. For outcome measures such as surveys or tests, validity refers to how well the assessment tool actually measures the underlying outcome of interest. Validity is not a property of the tool itself, but rather of the interpretation or specific purpose of the assessment tool with particular settings and learners[22].

Recommendations

The following can be done by the researchers to enhance the quality in a respected research-

- Plagiarism should be stopped.
- Journals should publish only quality work.
- Promote open access journals
- Researchers should monitor their ORCID account to ensure relevant citations of published their published work are captured.

III. Conclusion

Quality should always prevail over quantity of a research. Even if the content and number is less, the quality of the research should not be compromised. Quality of research can be assessed by judging the quality of work in terms of conceptual and technological innovation, other than this additional criterion should be taken assessing individual research is teaching, monitoring, participation in the collective task, and collaboration building. Quantity of research is assessed by journal impact factor, total number citation, average number of citation, and the number of authors per paper.

Although in the current scenario researchers prefer to pay the publishers to publish their research rather than making quality research. This has become a major drawback in today's time.We personally believe that open access is an interesting idea, to disseminate the information for the global society. Information should not be for those who can afford it, but it should be accessible to all. With the invention of internet, there is no excuse that everyone should not have access to every new bit of information that is discovered. This viewpoint is idealistic at best, and most likely not shared by many but we would like to think we should not force everyone to share their knowledge, but rather it should be viewed as common place and privilege to share their knowledge with everyone.

On a concluding note, **"Quality is everyone's responsibility and we never have to stop getting better".**

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