VOLUME-9, ISSUE-1, JANUARY-2020 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Neurosurgeon

HOW TO WRITE AND PUBLISH A SCIENTIFIC PAPER?

Dr Pankaj Singh*	MBBS (KGMC, Lucknow), MS (SNMC, Agra), MRCS (Edinburgh, UK), MD (Neurosurgery, Sheffield, UK), Executive MBA (London) *Corresponding Author
Dr Vinay Singh	MBBS (MLNC, Allahabad), D. Orth (SNMC, Agra), MRCS (Edinburgh, UK), FRCS (Orthopedics, UK) Current Affiliations: Director & Consultant Orthopedic Surgeon Nims Super-specialty Hospital, Jaipur
Dr Abani Gill	BDS (BRSIMS, Panchkula), MDS (Orthodontics, Nims Dental College, Jaipur) Current Affiliations: MDS Resident, Nims Dental College, Nims University, Jaipur
Dr Payal Sharma	BDS Student, Nims Dental College, Nims University, Jaipur

ABSTRACT The importance of research and publications cannot be overemphasized in the advancement of medicine and science. And so is in the career of a budding medico. Lots of us already know and are convinced with this fact and therefore want to publish *"something"*. However, very few would know how to write a good quality peer reviewed publication. This paper will give you an insight into the process of scientific publication and will help you familiarize yourselves with the different '*Do's*' and '*Don'ts*' of the game by providing you a step-by-step guide for writing and publishing high-quality peer reviewed scientific publications.

KEYWORDS : How, Write, Publish

The importance of research and publications cannot be overemphasized in the advancement of medicine and science (1,2). And so is in the career of a budding medico. Lots of us already know and are convinced with this fact and therefore want to publish *"something"*. However, very few would know how to write a good quality peer reviewed publication. This section will give you an insight into the process of scientific publication and will help you familiarize yourselves with the different '*Do's*' and '*Don'ts*' of the game (3).

A.Why publish?

Absolutely. Right question. Why bother doing something that; first of all '*I don't know how to do*', second; '*is so difficult*' and above all seems to be '*pretty boring and monotonous job*'! Well, you might be right but consider following points before jumping to the final conclusions.

MORAL RESPONSIBILITY:

The *only* way medical research advances is publications. If nobody would have published his or her research before, we would have never been able to see the face of medicine what we see today. Almost every invention and discovery that benefits humankind today reflects the hard work and research of dedicated scientists. And the discovery came to you only when they *published their findings!* Don't you think this is your turn to give something back? To add something to the treasure of knowledge everybody enjoys for granted? Or at least give it a try?

Part of your duty:

Medical research and Audits are two of the main pillars of *Clinical Governance* and, as an NHS employee you are duty bound to follow Clinical Governance and therefore to do medical research and publish. There is no escape if you're working in NHS!

Hard work/ commitment/ goal oriented approach/ teamwork:

A publication is a result of hard work that is done by a team of teammates committed to their goal. There are no shortcuts. If you want to publish you will have to acquire these qualities somehow. So in other words, a publication is a *testimonial that testifies* automatically all these traits in you, without you saying a single word!

Career development:

Taken an interview lately? Or planning to take one in future? Ask your colleagues and seniors the *single most important point* that can turn the table in your favour during the interview. They are right. Research and publications are the single most important aspects that shine through your CV in an interview. Wanna that job, baby?

B.What to publish?

Well, that's a *million dollar question*. But definitely a second step when you've made up your mind that you wanna publish. I will answer your question for sure but let me ask a simple question first. How many *types* of publications you know? Case reports, Clinical studies, Randomized Controlled Trials, Review of literature, Editorials. That's it, one would say, 'my list is about to exhaust now, that's all people publish'! Think twice my friend and have a look on the table on your right. The different types publications described by National Institute of Health runs in three figures (*over 122 types of publications, to be more precise*) (4)! Oh dear, you never imagined that!! Don't worry, neither did I, till I start observing.

Most common type of publication that comes to any one's mind is – ***Case report***. That's very sad, honestly. Case reports are literally destroying the soul of medical research. This is a common 'trap' that keeps people from publishing good papers. Well what's the *problem* with Case reports? Ok, let me explain it. There are number of factors; first, in order to be

publishable the case has to be *unique and rare*, that by definition will be *rare to find!* You may never find one (or not so easily, especially if it's a 'truly rare' case warranting publication). Second, *rate of rejection* of case reports are way too high, ranging in the order of 8090%. A number of prestigious journals don't even consider case reports for submission! Third, case reports are considered to be *most basic types* of publications (level 5 evidence).

Ok, so what are the **other categories** you can publish? It's a good idea to be a part of a clinical study going on in your department or even better a *multicentric randomized controlled trial*. However, the problem in this approach is that you can't start a multicentric trial or a big clinical study yourself until you are quite senior and by that time you already would have published enough papers not to worry about reading this document! Apart from that, you

Types of publications *			
1	Abbreviations	62	Herbals
2	Abstracts	63	Historical Article
3	Academic Dissertations	64	Humor
4	Account Books	65	In Vitro
5	Addresses	66	Indexes
6	Advertisements	67	Instruction
7	Almanacs	68	Interview
8	Anecdotes	69	Journal Article
9	Animation	70	Juvenile Literatur
10	Annual Reports	71	Laboratory Manu
11	Architectural Drawings	72	Lecture Notes
12	Atlases	73	Lectures
13	Bibliography	74	Legal Cases
14	Biobibliography	75	Legislation
15	Biography	76	Letter
16	Book Illustrations	77	Manuscripts
17	Book Reviews	78	Maps
18	Bookplates	79	Meeting Abstracts
19	Broadsides	80	Meta-Analysis
20	Caricatures	81	Monograph
21	Cartoons	82	Multicenter Study
22	Case Reports	83	News
23	Catalogs	84	Newspaper Articl
24	Charts	85	Nurses' Instructio
25	Chronology	86	Overall
26	Clinical Conference	87	Patents
27	Clinical Trial	88	Patient Education
28	Clinical Trial, Phase I	89	Periodical Index
29	Clinical Trial, Phase II	90	Periodicals
30	Clinical Trial, Phase III	91	Personal Narrativ
31	Clinical Trial, Phase IV	92	Pharmacopoeias
32	Collected Correspondence	93	Phrases
33	Collected Works	94	Pictorial Works
34	Collections	95	Popular Works
35	Comment	96	Portraits
36	Comparative Study	97	Posters
37	Congresses	98	Practice Guidelin
38	Consensus Development Conference	99	Price Lists
39	Controlled Clinical Trial	100	Problems and Ex
40	Corrected and Republished Article	101	Programs
41	Database	102	Prospectuses
42	Diaries	103	Publication Comp
43	Dictionary	104	Publication Form
44	Documentaries and Factual Films	105	Published Erratu
45	Duplicate Publication	106	Randomized Cont
46	Editorial	107	Research Support
47	Encyclopedias	108	Resource Guides
48	Ephemera	109	Retracted Publica
49	Essays	110	Retraction of Pub
50	Eulogies	111	Review
51	Evaluation Studies	112	Scientific Integrit
52	Examination Questions	113	Sermons
53	Exhibitions	114	Statistics
54	Festschrift	115	Support of Resea
55	Fictional Works	116	Tables
56	Forms	117	Technical Report
57	Funeral Sermons	118	Terminology
58	Government Publications	119	Twin Study
59	Guidebooks	120	Unedited Footage
60	Guideline	121	Union Lists
61	Handbooks	122	Validation Studies

*Adapted from Medical Subject Headings (MeSH), NIHhttp://www.nlm.nih.gov/mesh/pu

can give your contribution to these studies (which is mostly limited to data collection and digging out old medical charts!) in hope that your name would be somewhere in authors' list. That may not be the case unfortunately, as there are *predefined criteria* by ICMJE (International Committee of Medical Journal Editors http://www.icmje.org/ ethical_1author.html) to claim an authorship of any publication. If your contribution is not enough to warrant an authorship you will have to satisfy with your name in the *acknowledgements* section only. That can be quite depressing.

Believe me, most people commit that mistake and keep on waiting for '*an odd case*' or hoping their names to be included in a big study based on their relatively '*trivial*' *contribution*. Nevertheless, there are a ***number of avenues*** where you are not dependent on most of these factors mentioned above and hence *can publish relatively easily*. By having a close look on the categories of publications in the table you would have realized that the range of publications is much more wider than you

Review of literature is a comprehensive analysis of the literature on a particular topic. This can be done by anyone *without* the need of having a 'rare' case in your bag. Good reviews are mostly done on a relevant topic where there is lack of consensus for diagnosis or treatment or any other aspect of the problem. It's always a good idea to analyse more recent literature rather than going back to centuries old manuscripts. If you are feeling particularly motivated you can even review a book! Reviews are believed to be quite important and in fact ***MetaAnalysis***, a type of Review of literature where the '*reviews are reviewed*', is considered as one of the highest level of evidence in science. It should however, bedifferentiated from a **Historical Article** that usually gives an account of past events or circumstances significant to the field of study, discovery, an invention, etc. The only downside here could be that some of the journals don't accept *unsolicited* (uninvited) reviews. However, lots of them do, so its better to check the journals *author's guidelines* section or even send a quick mail to editor to check if they will accept a review on that particular topic, before deciding to write a review for that. Historical Article therefore could be another type of publication that you can write on your own. *Overall*; is a type of publication where author describes a number of different articles on the same topic in a single publication.

Biography is a section where you can present works and accomplishments of a person's personal and professional life as well as the presentation of an *obituary*.

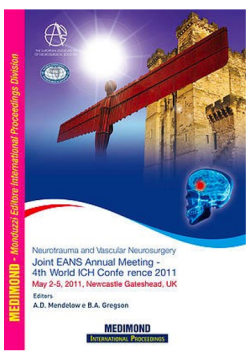
Similarly, another interesting category not in the table above, is '**Medicine in Stamps**', a section published regularly in Singapore Medical Journal (http://smj.sma.org.sg/smjcurrent.html). In this section, journal publishes the short biographies of eminent physicians or medical researchers e.g. *Noble Laureates*, on whom a postal stamp has been published.

Letters to editor are probably *easiest* among all publication types to publish. They are *not peerreviewed* and hence quick to be accepted or rejected. However, there are reasonably good chances that you will get it accepted if you read any article published in the issues of journal before thoroughly, and comment about the contents or scientific aspects. Whereas, it's a non peerreviewed article, still considered as a proper publication and can be a good starting point.

Most of the journals welcome **conference proceedings** from their relevant areas of interest. If you have attended any conference recently, you can write a concise report and submit it to the relevant journal. You need to remember though most of these journals have a *time limit* of mostly couple of months after the conference to submit a report.

However, if you're looking for a *sureshot quick publication* nothing can beat an **Abstract**. When you present a paper in a conference it is automatically published in the official journal of that society. It is quite easy to get a poster accepted in any conference, as they want people to attend and pay for registration fees! Most of the systems don't differentiate between an Abstract and a *proper Publication* including ERAS (Electronic Residency Application System, USA) and ST Training, UK. You can indeed write this as a 'presentation' in your CV as well, hitting two birds with one stone!

Other categories that can yield to a relatively easy publication are **Translated Article** and **Reproduction of interesting articles** with author's permission. But be careful, reproducing an article in full or part without prior permission of author/ journal is considered as *plagiarism!* Some of the journals even publish **cartoons**, **humorous medical caricatures**, **drawings** and **interesting photographs** of medical significance, **personal diaries** or even **laboratory manuals** or simply **lecturenotes** or **patient information handouts**!



C.How to publish?

One of the toughest parts in writing a paper is beginning. Most people struggle to find *where to start?* Well the most important step is to decide what you gonna write and garb a pen and a notebook. And then stick your bums to a chair and table! Start writing your thoughts. Jot down *whatever comes to your mind* about that topic. It doesn't necessary need to follow a logical pattern. For first 5 minutes it might look as a clutter but keep on writing continuously for 30 minutes and then stop. See what you've done. You will find that there are *portions in that clutter* that look very logical and make clear sense. Next step is to tidy it up andtry to put your thoughts in a coherent way.

Whereas, this technique can give you a good start, it definitely takes much more to write a quality publication. In order to achieve that you need to familiarize yourself with different components of a paper. Whereas, format of a paper may vary according to its specific type, for most of the scientific publications follow a structure (5). The different components of a scientific publication are as follows:

1.Title: A good title reflects the purpose of the study and the core idea behind the research. It shouldn't be too long, or containing complex words and *shouldn't* reveal the vital findings of your study. Leave the best for the last!

2.Abstract: This is a *summary* of your paper. Whereas, abstract is mostly written at last, this is the most important part of your paper as this is the first part read by a reader and a reviewer and usually determines if its worth reading the whole article. **Two types** of abstracts are prevalent depending upon the journal you're targeting structured and unstructured abstracts. *Structured Abstract* where abstract is divided into different sections viz. Background and Objectives, Material and Methods, Results and Conclusions. Most journals also want you to include few Key words. *Unstructured Abstract* no such division in sections is required and a continuous summary is given, though following a similar pattern.

3.Introduction: Introduction, essentially speaking, states *background and objectives* of your paper. The purpose of *Introduction* is to focus the reader's attention to the message authors want to deliver in this manuscript but *NOT* to deliver it! This is done by introducing the topic authors are addressing in the current manuscript. Provide a background on the current state of the particular topic covered in the study. Give a focused review of literature highlighting the controversies, deficiencies and differences of opinion etc, in the current literature. Include carefully selected citations to support or refute these deficiencies/ controversies. Second part of Introduction is stating clearly your *Aims and Objectives*. The first part of *Introduction* should naturally lead to Aims and Objectives. You should state a clear purpose of your study. You should be able to define a unique aim, what are the unique questions this study is trying to address? And how this is distinguished from the previous studies or the new knowledge added to literature by this paper? Remember, defining *clear aims* for your study is the *single most important step* in writing a good quality publication. A study without a clear aim won't appeal to readers.

4.Materials and Methods: This is should be relatively straightforward. You simply need to present a summary of the *stepbystep process* what you have done to conduct the study or research. The common pitfalls here are authors are so involved in the study that they start taking it for granted that the readers will be familiar with the specific technicalities. And therefore fail to sum up the technical details of their experiment comprehensively presented in a language that a relatively nonexpert reader can understand. Classically, in Materials and Methods you should include detail about *study design* i.e. Retrospective or Prospective, Case control or Randomized, Review of literature, Case report, Technical note etc. Give *demographic information* about your cohort i.e. age, sex, number of cases, time frame, followup information etc. Describe any *inclusion or exclusion criteria* for your study. Material and methods section is replaced by *Clinical Details* in a case report. Finally, never forget to mention about the *ethical approvals*. You should not give any results here, as there is a separate section for that.

5.Results: This is the *organized presentation of the collected data*. Try to present the data *systematically* and *follow a pattern*. Haphazard information is difficult to understand for both, readers and reviewers. Be consistent don't present any *unnecessary data* that is not described in Materials and Methods section. Similarly, don't leave anything out what you have mentioned before that you gonna do. You can use *different formats* of presenting your data including; charts, bars, graphs, pie charts, pictures, tables, etc. Chooses that suits best to your manuscript. Don't use figures or tables *just for the sake of using* them. They should present meaningful info rather than making reader to feel being snowed under by the heaps of meaningless data!

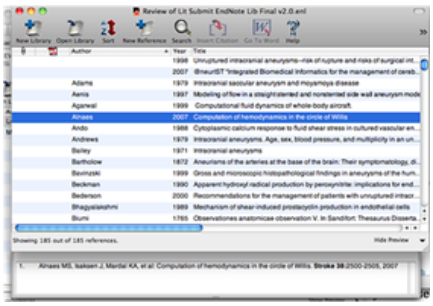
6.Discussion: Authors have *some degree of liberty here* in structuring discussion. But, generally you start with summarizing your results and important findings. Compare your findings with the results from the previously done studies on the same subject. Highlight *similarities and differences* and *offer a scientific explanation* for the discrepancies. These discrepancies and differences may be the important outcome of your study so you need to explain them in the context of your research. You are *allowed to make reasonable assumptions here*, if there are no direct explanations available from literature. Try to explain the clinical implications of your study, if any. However, *don't repeat the findings of the Results section* in Discussion and *don't present any new data* for sure! Last but not least, *recognize limitations of your research*. Remember, no study is perfect!

7.Conclusions: This section concludes the findings of your research. *Don't try to make any speculations or assumptions*. The conclusions are derived from *what you have* observed not from what you *would have* observed!

8.References: These are the citations of the previous works and studies done. You need to know1.

9.Publish or perish what *reference system* is followed by the journal you are targeting and be consistent with that. Two, most commonly used reference systems ate either **Harvard** or **Vancouver**.

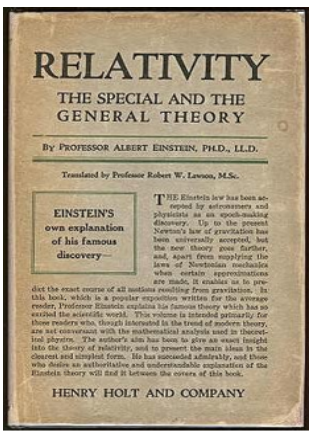
Here, you don't have to be puzzled, if these words sound alien to you. Simply open any published article in the same journal and see how the references are used there. Look for first, are they appear in *alphabetical* or *as it comes sequence*. Second, in the body of the paper, are they used in a *bracket* or *parentheses* in roman numbers or they are used in *author year* style. Now see the **references section**. There are *very subtle differences* in the way they are written but journals want you to stick the way they are used in that journal.



This can be a *pain in neck*, believe me, as you are supposed to be *accurate by comma and full stop!* What to do then? Thanks to the technology. You can use computer power to format the references. The two most commonly used software for formatting references are viz. **Reference Manager** and **EndNote**. I use EndNote regularly and can recommend it with confidence. This is a very useful tool and you can format all your references according to the style of journals in seconds. You can directly *import the references* online from PubMed and can create your own library. The references can either be copied/ pasted to the word document or can be exported. A snap shot of an interphase of EndNote is given here. The only thing here to remember that some of the functionalities cannot be used on Mac, as usual with any other software!

D.Submission:

Remember, the *single most important step* in the whole game of publications is, *submission*. If you can't submit, don't write at all. You're not writing a manuscript to keep in your pocket! Lots of people do this they postpone the submission until very late. Hoping to '*improve*' their manuscript and making it '*perfect*'. You got to remember there is *no such thing 'perfect manuscript'* exists in the world! Even the *manuscripts that won noble prizes* had a number of mistakes when they were submitted. So the best piece of advice I can give you all is ***SUBMIT*** your manuscript its ready *for the first time*. Don't worry about the rejections. They are the inevitable part of game! You can's escape rejections unless you're a *medical Shakespeare!* And even then its not guaranteed. There are more than 10,000 medical journals (I suppose) and there would be couple of hundreds that will suit to your research for sure. Nobody had to submit an article that many times before it gets published!


RELATIVITY

THE SPECIAL AND THE GENERAL THEORY

By PROFESSOR ALBERT EINSTEIN, PH.D., LL.D.

Translated by Professor Robert W. Lawson, M.Sc.

EINSTEIN'S own explanation of his famous discovery—

THE Einstein law has been accepted by astronomers and physicists as an epoch-making discovery. Up to the present Newton's law of gravitation has been universally accepted, but the new theory goes farther, and, apart from supplying the laws of Newtonian mechanics when certain approximations are made, it enables us to predict the exact course of all motions resulting from gravitation. In this book, which is a popular exposition written for the average reader, Professor Einstein explains his famous theory which has so excited the scientific world. This volume is intended primarily for those readers who, though interested in the trend of modern theory, are not conversant with the mathematical analysis used in theoretical physics. The author's aim has been to give an exact insight into the theory of relativity, and to present the main ideas in the clearest and simplest form. He has succeeded admirably, and those who desire an authoritative and understandable explanation of the Einstein theory will find it between the covers of this book.

HENRY HOLT AND COMPANY

Few points to remember for submission:

- Most of the submissions are *online* now days. Open an account on the website of the concerned journal.
- Read the *instructions to authors* thoroughly. They contain important information and your manuscript *won't even go for review* if you don't adhere to them! Most of the journals are pretty strict with that. Look carefully the *word limits*. There are different word limits for different type of manuscript. Case reports are usually more restricted in terms of word limits than original contributions. Also, see what is the word limit for abstract and if the word limit is including or excluding references.
- You can find *templates* for manuscript on journals' site or even in *EndNote*. You can use these templates to format your manuscript.
- Look for the types of files they accept for images or figures and also the guideline for creating artwork. Most journals want all *files uploaded separately* e.g. Manuscript (with no figures but tables can be pasted at the end of the manuscript), consent letter from the patients/ subjects, ethical approval letters, figures, declaration about the contribution agreement form signed by all authors, appendices, if any, etc. Some journals want figures to be embedded in the manuscript, as they should appear.
- Some journals accept *submission by email* as well but it's very rare if they accept manuscript submission by post.

E.Post submission saga: don't keep your fingers crossed!

Grab a phone rather and *give them a call!* Yeah, that's 100% true. This is the *most important secret* in the game of

publication no one will ever tell you. What have you heard about the *timeline* in publications? I mean, how much time do you expect from the submission of a paper and the final acceptance or rejection? It could easily be 6 – 8 months and sometimes may run into years! And do you know where most of this time is consumed? Well, you will be surprised that most of the time your manuscript *sits on the editor's desk* just for a glance *before he can send it for review*. Or even in a *clerk's email* waiting to be *'marked for' editor*. Editors are busy people, mostly professors and clinical directors in their departments. They do the job of editor as an additional responsibility, mostly without any extra remuneration. Seeing your manuscript probably lies on the bottom of the list of millions of things they have to do! So if you think that your job is over after submission and the ball is in their court, you're wrong! *Ball is in no one's court really!* It is just in the air or may be lying outside the court!

The *bottom line* guys, if you want to publish 10 publications in a year's time (I published 20 in a year and half!), the only way to speed the things up is *CALL, CALL, CALL and CALL*. Bombard them with calls and emails requesting to send you manuscript for review ASAP. Believe me, this is the only thing that works in this world!

F.Dealing with rejections:

How to deal with a rejection? Hip, hip hurray! Well done!! Three cheers!!! That's the only way to deal with rejections, honestly. You might think that I have gone mad, but I am not.

What *you gain from a rejection*, especially if it comes quickly? Well lots of things. **First**, every rejection comes with the *reviewers' comments*. These comments are invaluable source of improving the mistakes in your manuscript. No one will give you such a comprehensive feedback as the reviewers can give, who usually are the best in the field of your research. **Second,** *time is money*. If the manuscript comes back to you fairly quickly you can always *resubmit* it to any other journal with all corrections. This time you knew your weak points and rectified them as well so the chances of success are far higher. **Third,** once you have submitted a manuscript somewhere, it is *already formatted* and as lots of journals have almost same formatting requirements, it only needs a little bit of reformatting before it can be resubmitted in any other journal. What you lose by a rejection? Probably nothing. No one asks that how many times a paper was rejected before it finally got published! *So, the true secret of publication lies in submissions and resubmissions!*

Pearls for Authors

Few basic points to help you out:

Most journals want manuscripts prepared *doublespaced* and figures and other relevant materials uploaded as separate files.

Look for *special issues* that suit best to your research. The chances of acceptance are far higher in special issues as they really *'hunt'* for good paper on that topic and mostly cannot publish anything else in that issue other than the topic covered!

Target the right journal. Few points to remember here are choose the right audience, choose a journal with high acceptance rates. Acceptance and rejection rates are usually given in the journal's info. Browse few issues of the journal you are thinking to submit and see what kind of papers they generally publish. If a journal has already published almost same kind of article recently, it's better to search for another one!

Publish in *online journals.* These journals are independent journals and the rates of acceptance are quite higher. The downside however is *low impact factor.*

Find *newly started journals*. Same as online journals, chances of acceptance will be higher but not as prestigious!

Include *big names* in your paper. Most of your consultants and professors have already published lots of papers and have a fair idea of the process of publication so can give you very good guidance, if they are involved as well. Apart from that, whereas the review process is supposed to be 'blinded', the reviewers can usually make a fair guess about the author group involved. The chances are that your consultant may be schoolmate of one of the reviewers or may be they are members of same golf club!

KISS: *'keep it short and succinct'*. Nobody wants to publish epics! The chances of acceptance are much higher where the topic is presented concisely in a comprehensive manner.

Write a good *letter to editor.* A letter to editor is a requirement for submission in most of the journals.

REFERENCES:

1. Asnake M. Cien Saude Colet. The importance of scientific publication in the development of public health. 2015 Jul;20(7):1972-3. doi: 10.1590/1413-81232015207.08562015.
2. Juyal D, Thawani V, Thaledi S, Prakash A. The fruits of authorship. Educ Health (Abingdon). 2014 May-Aug;27(2):217-20. doi: 10.4103/1357-6283.143777.
3. Williams GS, Singh T. Publish or perish: how to secure your first publication. Br J Hosp Med (Lond). 2007 May;68(5):M86-7.
4. Peh WC1, Ng KH. Basic structure and types of scientific papers. Singapore Med J. 2008 Jul;49(7):522-5.
5. Hoogenboom BJ, Manske RC. How to write a scientific article. Int J Sports Phys Ther. 2012;7(5):512–517.