

## Stepwise and simple guide to medical writing and research for beginners

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Medical students in Pakistan and from other developing health systems are usually fascinated by the word "Research. They admire research but often find it difficult to take initiatives. Many medical students may feel alienated from this creative process due to lack of emphasis on research, training and mentorship. Considering the limitations in the Pakistani medical system, we suggest a stepwise process for medical students and mentors to organize their innovative skills in research and medical writing.

Firstly, it is important to understand the following five facts about research:

**Fact number one:** research and medical writing are not meant for everyone. Though research in contemporary medicine is generally considered to be a milestone in an academic career; it is not obligatory for those who do not find it interesting. If someone tries and does not feel the need to continue, it would be wise and absolutely appropriate to consider alternate career pathways. If there is no urge to perform research, it is not worth pursuing unless it is a compulsory professional requirement.

**Fact number two:** failures and research go hand in hand. Failure often precedes success. In research process, the word 'success' has different meanings. Interestingly, the meaning changes as one grows in the field of research. Failure makes you resilient and is the main driving force to pursue your goals in research and publications.

**Fact number three:**  $1+1=11$ . Networking and mentorship are often the two tools least emphasized in research. One might be surprised to know that how many people around you are capable of doing things that you find impossible. Collaboration is a fundamental doctrine in research. It provides a mean for researchers to achieve more than they can on their own.<sup>1</sup> It is reported that there is a positive correlation between collaborative research and increased success of publication.<sup>2</sup>

**Fact number four:** Lack of proficiency in the English language is not a barrier in biomedical writing. Research has

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its own language which is called 'creativity'. The translation of 'creativity' into English language may not be considered a barrier to the conception of ideas. English is not the native language for medical students in Pakistan and many health systems around the globe. In many situations, where language resources are limited and assistance is not readily available or affordable, an extra effort is required to overcome this predicament. However, it is not that difficult as it is generally perceived. Medical journals also recognize this limitation of researchers globally and recommend various solutions. Springer and BioMed Central provide free online resources on medical writing and publishing scientific manuscripts. Biomed Central includes an online guide on topics ranging from journal selection, language advice and how to respond to peer reviews.<sup>3</sup> Springer has also developed interactive author training courses, workshops and instructional videos.<sup>4</sup> James Hartley and Vera Sheridan have compiled a comprehensive bibliography for writing academic English when English is not the first language.<sup>5</sup> It includes books, paper, accounts from specific countries and their editing journals and some useful websites. In Pakistan, research workshops are frequently carried out in major cities around the country which provide an excellent platform for networking, writing assistance and mentorship.

**Fact number five:** In the twenty first century, modern medical research is considered almost impossible without basic knowledge of internet and computer skills; however, it is imperative to understand that lack of computer expertise should not preclude ones interest in research. The relevant computer skills can be learned during the process of research as well.

### Step-1: Understanding the philosophy behind research

Ask yourself "why do you want to do research?" The answers may be: Well, I really do not know, it just fascinates me; It will add to my resume and facilitate my professional growth; It is a part of my curriculum so I have to do it compulsorily; I want to try and test my ideas; I want to pursue an academic career in medicine; I want to publish and share my experiences with others; or, all of the above.

There is no single correct answer to this question; however, there is a general consensus that the ultimate goal of

medical research is to improve health care. As the number of publications increases and one climbs the ladder of success in the field of research, there comes a point when one retrospectively identifies the futility of his or her own efforts. It is a matter of self-realization. It is a moment of glory when the researcher unleashes him or herself from the chains of career driven efforts and starts to focus on a superior cause. The thinking process heads to an entirely different direction, which truly complies with the ultimate goal of research: making a difference in patient care.

### Step-2: Finding a mentor

It is often a matter of chance that one comes across an ideal research mentor. Pakistan ranks 43rd in the world ranking of scientific publications and is expected to be number 27 by 2018.<sup>6</sup> With growing trends in medical writing and research, the young scientists in Pakistan are far ahead of their seniors in research. It is noteworthy that a research mentor does not necessarily have to be a senior or a supervisor. He or she can be a colleague, a junior, or even a person one has never met. It is recommended to connect with research mentors in one's own professional environment, which is not that difficult as the experts involved in research are usually well known among their peers. They are generally willing to teach lessons they learned through their mistakes and they are very resourceful in providing valuable tips, especially in the initial phases. Google can still serve as a basic search tool to locate a mentor internationally; however, it is usually preferable to find a local research mentor initially, who has travelled the same road and understands the unique challenges of research in the Pakistani medical system.

### Step-3: Journal Clubs

There is a growing trend of journal clubs in teaching hospitals in Pakistan. They are the foundation of research for beginners if undertaken with appropriate preparation and academic zeal. For practical purposes, the person who benefits the most from a journal club is the presenter. Extensive preparation is required to do a journal club presentation. The presenter has to dissect the article under discussion and elaborate on its weaknesses and strengths. Conventionally, though, journal clubs are not always carried out in this spirit, and an interesting article is usually presented based upon the subject matter of the article instead of focusing on the critical analysis of the study. Critical appraisal of a study or an article is a rigorous exercise and is an informal but important way of learning research process. In the beginning one will require help to learn how to approach and read a scientific article. There are checklists and guidelines available online for journal club presentations.<sup>7</sup>

### Step-4: Mortality and Morbidity Meetings

Mortality and morbidity (M&M) meetings provide an

opportunity for analytical thinking. Similar to journal clubs, they inculcate the habit of critical review of a matter under discussion and help to develop a routine of attending to fine details while performing a retrospective review. This exercise also instigates use of alternate techniques that might have prevented a grave event that led to mortality or morbidity. M&M meetings seed the basic values of research without actually performing formal research and are excellent learning tools for novices.

### Step-5: Letters to the Editor

While journal clubs and M&M meetings groom the skill of critical reading, 'Letters to the Editor' could be the first step in accomplishing a publication. A letter to the editor provides a means of communication between the authors and the readers of a journal. A letter to the editor is usually written in response to a recently published article. One can select an article based upon interest and perform a critical review. A brief appraisal is written with usually few references. These letters may provide new insight, make corrections, offer alternate theories, or request clarification about the content of the article reviewed. By providing additional information, the evidence may be strengthened.<sup>8</sup> Letters to the editor are often not subjected to extensive peer review and are published in the subsequent journal issue, depending upon the discretion of the editor. Hence this offers a rapid publication and increases the confidence of the author who is new to medical writing.

### Step-6: Case Reports and Visual Vignettes

Physicians and students come across rare and interesting findings or cases throughout their medical careers. Most do not think of getting their observations published, which is in fact not that difficult. Sometimes, certain findings may not be new to literature, but they have not been reported in a certain population. Etiological factors and disease associations may vary from one case to another. Hence, unique and compelling findings can make a case report or visual vignette publishable. In addition to specialty specific journals, there are many journals which offer case reports and visual vignettes.<sup>9</sup> Images or visual vignettes are popular publication categories which usually do not require lengthy manuscripts. In Pakistan, where tracking a patient is extremely difficult in most situations, an informed consent for photographing and publishing can be obtained while the patient is still accessible. Most journals accept an image quality of 300dpi or more and JPEG format.

### Step-7: Brief Communications

Various journals publish short analytical studies or narrative communications. These categories include brief communications, special communications, brief reports, correspondences, mini reviews and perspectives. Journals

have their specific requirements for such categories. The first step towards any study or publication is literature review. With experience and practice, one learns to perform review of literature using search engines such as PubMed, Ovid or Google Scholar. Brief communications and case reports introduce an author to manuscript writing in methodological formats (Abstract, introduction, methods, discussion, conclusion etc.) 'Discussion' is usually the core of the article and is extensively analyzed by the reviewers before deciding if the article is publishable or not. Some journals accept personal perspectives in the context of literature review and do not require a certain format, hence providing the author more liberty with opinionated writing.

### **Step-8: Retrospective studies or epidemiological studies**

Retrospective or epidemiological studies are relatively easy to perform as compared to interventional studies. All are publishable in the category of original articles. Some highly ranked journals only publish original articles due to the methodology and scientific importance of these types of studies. Retrospective research involves data collection or chart reviews and may be exempt from approval of an institutional review board (IRB). In most Pakistani teaching institutes, the concept of IRB is still lacking, which makes the standardization and ethical attributes of research questionable in many circumstances. The researchers may not realize its importance until faced with a dubious situation. Nevertheless, studies involving data collection retrospectively without patient contact are generally easier to perform and can serve as a good initiative for beginners. Review articles are another category of articles requiring extensive literature review without involving patient interaction.

The pinnacle of research is experimental or interventional studies. As the name implies, these are studies in which the participants undergo some kind of intervention in order to evaluate its impact. They are the most methodologically rigorous designs of research and are usually published as original articles. Since this article is intended for beginners, the details of advance studies are beyond the scope of this article.

It is important to note that the Pakistan Medical and Dental Council (PMDC) does not acknowledge any credits for Letter to the Editor, Case Report, Review Article/Chapter/Textbook, Dissertation/Thesis or Letter of Acceptance.<sup>10</sup>

### **Step-9: Overcoming the fears of the unknown**

Writing a manuscript is an endeavor which requires a Leech phenomenon (a metaphor). A leech phenomenon can be described as a gradual process of learning research through

persistence, resilience, patience, failures, critique and pursuance. Acknowledgement is the greatest consolation for a scientist. When submitting or publishing an article, an author is presenting his or her work for critical evaluation by experts in the same field. This is an academically daring venture which promotes confidence and achievement.

Completion of a manuscript does not constitute completion of the article. Article submission is a laborious process. Compliance with instructions to authors, citation styling, cover letter, title page, manuscript format, IRB approvals, copyright, authors' agreement and declaration forms, ethical considerations, consents, image specifications, processing or publication fee and system of online submission vary broadly from one journal to another. After an initial review is completed, processing time between the submission of an article to its publishing varies greatly among different journals; however, this discussion is beyond the scope of this article. To address these issues, fact number three, as described earlier, plays a crucial role. Seeking help and sharing are important determinants of success in collaborative research. In Pakistan, the concept of research coordinators or research managers is still primitive, so most of the managerial work also has to be done by the primary investigator or corresponding author.

The statistical portion and design of studies are often dreaded components of research for physicians in Pakistan. This may be primarily due to lack of integration of bio-statistics in undergraduate medical training along with non-clinical nature of these subjects. The introduction of research workshops and the mandatory dissertation requirement during Fellowship training of the College of Physicians and Surgeons of Pakistan (FCPS) have brought more attention to research methodology for post graduate medical trainees. Bio-statistical support is accessible to physicians in Pakistan now and should no longer be a limiting factor in conducting research.

### **Step-10: Last but not the least: ethical considerations and avoiding conflicts of interest**

In any medical setting, a supervisor or superior is not obligated to be a co-author if he or she has not made significant contributions to the manuscript. This may not be applicable to the publication of dissertation or thesis. No one can or should qualify for authorship unless a substantial contribution to the manuscript is present. Peer pressure and subordination are two factors which influence many young researchers in Pakistan to accommodate others as co-authors to oblige professional or non-professional relationships. In many circumstances where a team of senior-junior is involved in research, it is advisable

to discretely assign individual responsibilities, and decide about financial considerations, authorship sequence and privileges for poster or oral presentations. It is imperative to bring this information to the attention of IRB, if applicable, or the relevant governing body to ensure compliance and to avoid any conflicts of interest in the future.

The first lesson to be taught to young researchers in Pakistan should be about plagiarism. High profile journals use multiple software programmes to identify plagiarism.<sup>11</sup> It is very important to maintain originality of a manuscript, especially when citing other scientific articles. Given the fact that a limited number of medical journals are published in Pakistan, a central body should govern these journals to avoid plagiarism. Though journals are supposed to perform an extensive peer review of articles, there is still a possibility that the legitimacy of research can be overlooked. In recent years there is a high turnout of medical publications from Pakistan which renders the need to establish a central regulatory body overseeing medical research in the country.

### So where to begin?

Critical reading is the key to unlock the creative mind. Extensive review of literature is the first step in manuscript preparation. Select a topic of interest and choose the type of article you want to work on. Then look for a suitable journal and make sure that the manuscript will fit the journal's scope and will be interesting to its readers. Carefully review the instructions for authors. Obtain copies of the last three or four journal issues and read the articles from the same category you intend to submit. Create a team or join a team of collaborators. Sometimes joining a team is the best option to network with individuals sharing a similar passion. For any type of article, try to publish in local journals first. One may even start with submitting to non-indexed journals recognized by Higher Education Commission (HEC) of Pakistan and PMDC.<sup>12</sup>

Medical research can bring knowledge, respect, acknowledgment, confidence, travel opportunities and astounding career prospects. Though it is self-rewarding in many ways; however, the ultimate goal of medical research i.e. patient care, should always be prioritized.

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