

# Innovating Against Odds: A Medical Student's Research Journey in a Resource-Constrained Environment

Hamrish Kumar Rajakumar.<sup>1</sup> 

## The Experience

My research journey was sparked by a 1-hour phone call with a peer, where a discussion on a clinical case unraveled disparities in healthcare access, particularly in the early detection of cases. The clinical case we discussed became a catalyst to address these inequities and embark on a journey toward achieving health equity. As we sifted through databases in search of research topics aligned with our interests, we encountered numerous ideas. However, we had to discard many due to non-feasibility with challenges like lack of facilities, high costs, and a limited flow of eligible patients.

At this stage, I had many ideas in my mind, but I barely knew anything about the practical aspects of conducting research. The scary question of how to even start loomed large. This uncertainty is often a significant deterrent for many aspiring researchers. The lack of knowledge and experience in research can be intimidating, causing many to hesitate and fear that their efforts might be futile. This fear of the unknown prevents numerous individuals from taking their first step. I found myself at this exact point, contemplating whether to take the leap into the world of research or to continue with my familiar routine. However, my strong motivation to make a difference drove me forward. This motivation, I realized, is truly enough to set the wheels in motion and initiate the journey. Taking that first step into research, despite not knowing even the "R" in Research, is already halfway to success. The limited access to state-of-the-art laboratories and cutting-edge technologies forced me to explore unconventional avenues. Exploring local healthcare facilities unearthed a wealth of untapped data and patient insights, proving that groundbreaking discoveries could emerge from the most unexpected sources.

Balancing academic coursework, clinical postings, and the role of a principal investigator proved to be a formidable challenge as a medical student. The demands and stresses of these three facets necessitated the cultivation of meticulous planning, adaptability, collaboration, and a disciplined work ethic. Due to the finite nature of time, I had to prioritize tasks based on urgency and

importance, allowing me to effectively manage research commitments alongside academic responsibilities.

The learning curve was steep, as theoretical classes on research methodology only provided a foundational understanding. However, theory alone could not prepare me for the practical world of research. The gap between theory and practice became apparent as I began literature reviews, proposal drafting, and hands-on project implementation. Under the guidance of mentors supplemented by online resources, each step became a learning opportunity, enhancing my skills in statistical analysis and scientific writing.

Choosing the right mentors is crucial for a medical student to start research. A good mentor was not just about offering professional guidance – they were also a source of encouragement, always there to keep me positive and offer constructive feedback on my mistakes. Their mentorship was invaluable in keeping me on track, offering insights and strategies that helped me overcome challenges. On the other side, I learned to avoid fake mentors who offered no genuine support and often seemed more interested in their agenda. A pivotal factor in sustaining my research journey was the collaborative experience with my research partner. As a synergistic duo, we became an unstoppable team facing challenges head-on, celebrating shared triumphs, and fueling each other's passions. Our collaboration extended beyond individual contributions, forging a partnership that is still a cornerstone of our achievements. This partnership not only accelerated the pace of research but also instilled resilience in facing challenges. Sharing the workload lightened individual burdens, making the research process more manageable and enjoyable. Beyond scientific exploration, we nurtured a connection that transcended the professional sphere, creating a foundation of trust, understanding, and unwavering support.

Our milestones echoed the progression of our research journey. From selecting impactful topics to securing ethical approval, collecting high-quality datasets, and proficiency in advanced statistical tools marked significant milestones. Presenting our

<sup>1</sup> Final Year M.B.B.S Student, Government Medical College, Omandur, Government Estate, Chennai, India. Student Editor, IJMS

**About the Author:** *Hamrish Kumar Rajakumar is a final-year medical student pursuing MBBS at Government Medical College, Omandur, Government Estate, Chennai - 02, India. He aspires to be a cardiothoracic surgeon. Currently, he serves as a student editor at IJMS. In addition, he is actively involved in various research projects and clinical internships and has presented his findings at several national and international conferences.*

### Correspondence:

Hamrish Kumar Rajakumar

Address: Government Medical College, Omandur, Government Estate, 169, Wallajah

Rd, Police Quarters, Triplicane, Chennai, Tamil Nadu 600002, India.

Email: [hamrishkumar2003@gmail.com](mailto:hamrishkumar2003@gmail.com)

Editor: Francisco J. Bonilla-Escobar  
Student Editors: Eugenia M. Ramos-Dávila  
Proofreader: Amy Phelan  
Layout Editor: Julian A. Zapata-Rios

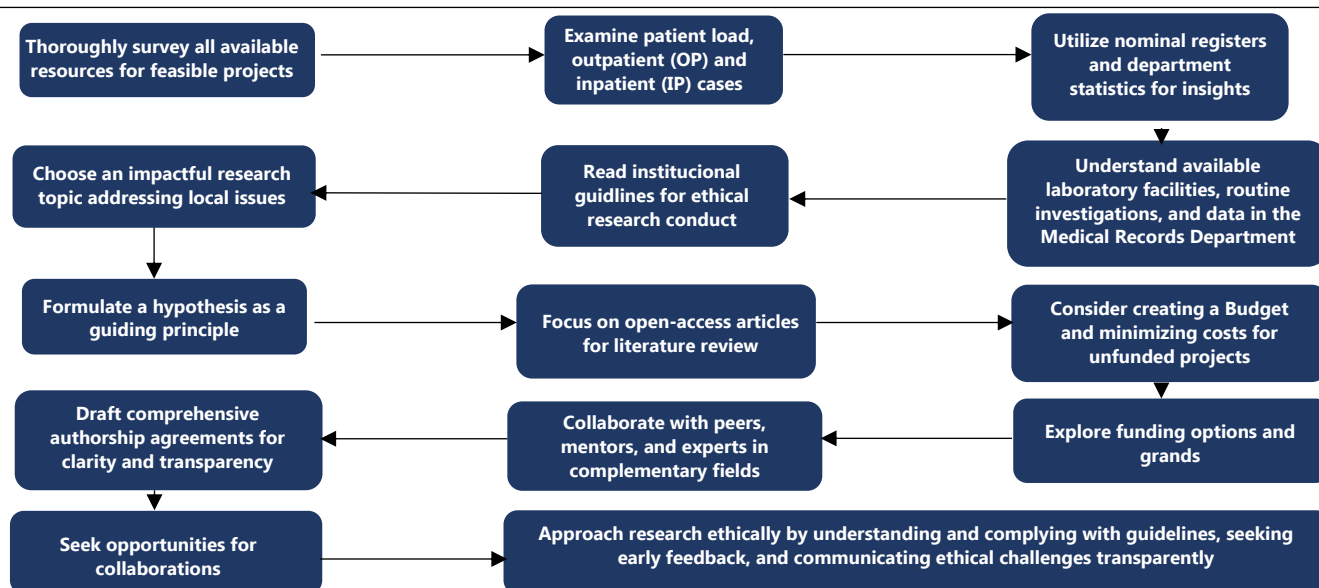
Submission: Dec 23, 2023  
Revisions: Jan 22, 2024  
Responses: Jan 23, 2024  
Acceptance: Jul 14, 2024  
Publication: Jul 25, 2024  
Process: Peer-reviewed

research at conferences was a rewarding milestone, allowing us to share insights, receive constructive feedback, and establish credibility within the academic community. Setbacks provided valuable lessons. Statistical challenges prompted extra efforts in attending online workshops and referring to YouTube videos to grasp the right statistical tests and their interpretation. The lack of specialized training opportunities highlighted the need for proactive skill acquisition. The issues of this research odyssey taught me the importance of effective communication and conflict resolution in maintaining a collaborative research environment.

In conclusion, my research journey from the inception of an idea born in a phone call to the presentation of research findings at

conferences, each step has contributed to my growth, both academically and personally. Beyond academic pursuits, the shared odyssey with my research partner has created a lasting alliance that transcends professional spheres, a testament to the power of collaborative exploration in the pursuit of greater understanding and innovation. Figure 1 illustrates an easy guide that students facing resource constraints can adopt to initiate their research journey in similar environments. Additionally, I recommend students direct all available resources and focus their research on diseases with low prevalence in high-income nations where information is scarce. This encourages the exploration of less-studied areas, potentially yielding novel insights and innovative solutions that contribute significantly to medical knowledge and address global healthcare gaps.

**Figure 1. A Simplified Flowchart for Students: A Practical Guide for Initiating Research in Resource-Constrained Environments.**



**Building Resilience in the Research Journey**

Navigating the research journey has required resilience and a strategic mindset to overcome various challenges I have faced.

1. Time Management: Create realistic schedules that balance research commitments, personal life, and self-care. Specific time blocks should be assigned for research tasks, meetings, and relaxation. Setting boundaries helps prevent burnout and ensures sustainable progress.
2. Dealing with Rejection: Manuscript and conference rejections are common. Instead of taking them personally, view them as opportunities for improvement. Seek feedback from reviewers and refine your work. Each rejection can guide you toward enhancing your research quality.
3. Handling Unexpected Hurdles: Loss to follow-up, compliance issues, and other unforeseen challenges are part of the research. It is crucial to develop contingency plans and foster collaborative problem-solving to overcome these challenges.
4. Valuing Negative Results: We should not be disheartened by negative results, but value them as crucial in scientific

research, as they play a significant role in refining hypotheses and guiding future investigations.

5. Team Dynamics: Differences of opinion among investigators or teammates, especially close friends, can arise in research. It is important to acknowledge and openly communicate about these issues to resolve conflicts and understand their potential impact on both personal and professional relationships. Separating personal relationships from professional endeavors is key to ensuring the longevity and success of collaborative research efforts.

**Crafting a Presence**

Completion of research objectives marks the transition to a phase where effective presentation skills become paramount. Medical conferences offer a valuable platform to share insights, gain exposure, and encourage collaboration. Many medical institutions host annual academic events that invite abstracts for paper presentations, case discussions, and poster presentations. Medical students must seize these opportunities and display their work to the wider scientific community.

A key aspect of impactful presentation lies in the creation of visually compelling slides that supplement the spoken narrative. Practicing the delivery of the presentation is equally vital, allowing for the refinement of timing, enhancement of clarity, and anticipation of potential questions. Stage fear can be overcome by thorough rehearsal, and presenting to fellow peers who offer insights to identify and rectify any shortcomings in the presentation. For those new to the stage, creating a script can serve as a backbone to the presentation. However, caution must be exercised to ensure that the script is not merely memorized and recited to the audience. Clear communication is imperative to tailor the message to resonate with the audience, avoiding unnecessary jargon while maintaining scientific rigor. Beyond the presentation itself, networking propels a researcher's career forward. Actively seeking opportunities to connect with peers, mentors, and professionals at conferences and academic gatherings not only provides avenues for collaboration but also contributes to the researcher's professional growth and exposure within the broader scientific community.

### Breaking Down Barriers.

Institutional barriers to research are multifaceted, as evidenced by a study indicating the prevalence of challenges such as lack of awareness (53%), interest (54%), insufficient funds (62%), time constraints (59%), and difficulties in patient follow-up (67%).<sup>1</sup> However, an infrequently discussed yet critical barrier lies in the toxic research culture that permeates many institutions.<sup>2</sup>

This toxic culture presents a challenge to medical students who are often early-stage researchers and fall victim to its traps. The relentless pursuit of authorship, particularly in top-order positions, is driven by personal gains such as promotions. However, this pursuit can lead to the establishment of monopolies, especially in the ethics committees that unfairly reject research proposals. It has profound implications for medical students who are just beginning their journey in the field. Its implications are far-reaching, extending beyond the immediate challenges of rejection and hindrances to research proposals. An environment emphasizing personal gains and hierarchical authorship compromises the genuine spirit of collaborative and ethical research jeopardizing the development of the next generation of medical researchers.

This poses a substantial challenge for medical students, as they may find themselves navigating a landscape where academic credit and recognition are unfairly distributed. The initial stages of a research career are crucial for skill development and cultivating a passion for scientific inquiry. When faced with a toxic culture the potential for disillusionment and disengagement among medical students is heightened. As medical students venture into the realm of research, it becomes imperative to raise awareness about the existence of this toxic culture and its potential pitfalls.

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## Acknowledgments

None

## Conflict of Interest Statement & Funding

The Authors have no funding, financial relationships or conflicts of interest to disclose.

## Author Contributions

Conceptualization: HK. Writing - Original Draft: HK. Writing - Review Editing: HK.

## Cite as

Rajakumar HK. Innovating Against Odds: A Medical Student's Research Journey in a Resource-Constrained Environment. *Int J Med Stud.* 2024 Jul-Sep;12(3):347-349.

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ISSN 2076-6327

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