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**Discussion Points**

1. Peer research is a time-efficient and cost-effective way to publish good research
2. Peer research can inculcate research interest and aptitude in medical students
3. Challenges faced in cross-country research collaborations
4. The importance of the mentor-mentee relationship in peer research programs

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## ABSTRACT

Research and research teachings worldwide have undergone significant changes with advancements in the past decade. From students actively seeking research opportunities to participating in research workshops, it has given rise to a new era of mentor-mentee programs. The peer research mentorship program (PRMP) conducted by International Society for Chronic Illnesses (ISCI) facilitates a global collaboration that not only improves the quality of research but also encourages interpersonal relationships and incorporates expertise from different fields. In this article, medical students and early graduates share their experience of participating in a cross-country peer-to-peer mentorship and comment on their learnings and observations. This is an experience report of mentors and mentees in the ISCI sponsored PRMP. Mentees learned a lot about metabolic syndrome, alternative medicine, and narrative reviews and the mentor became more confident in her scientific writing skills, leadership qualities while also gaining in-depth knowledge about the integrative management of Metabolic Syndrome.

**Key Words:** International Educational Exchange, Medical students, collaboration, networking, Research (Source: MeSH-NLM)

## INTRODUCTION.

Medical doctors practicing in tertiary level hospitals in low- and middle-income countries (LMICs) like Pakistan and India spend the majority of their time treating and managing patients and less time engaging in medical research. Seldom would you find a professor or an academic physician at these hospitals who conducts good quality, authentic research and at the same time mentor medical students. The lack of both government funds and state-of-the-art research infrastructure further aggravates this challenge in the medical field.<sup>1,2</sup> Hence, several Mentor-Mentee research collaborations have grown over the years.<sup>3,4</sup>

International research collaborations are carried out by researchers from different areas of expertise with geographical and cultural differences. These produce opportunities to learn when working on high-quality projects, and improve communication skills to facilitate growth and development, both professionally and personally. These are cost-effective and sustainable solutions for stimulating the development of soft and scientific skills and promoting health-related research in LMICs.<sup>5</sup> This encourages an exchange of scientific knowledge and produces opportunities to acquire communication skills. Furthermore, papers produced by international research collaborations are more likely to be cited than others by domestic collaborations.<sup>6</sup> At a national level, such projects increase scientific and technological capacity hence, boosting economic performance.<sup>7</sup> However, several challenges may hinder a smooth and progressive collaboration. These include but are not limited to: unclear points on sharing of credit and responsibilities, confusion regarding meeting timings as a result of different time zones among continents, disagreement amongst researchers, or attrition of members could arise. Social and geopolitical tensions have caused the waning of certain collaborations, for example, the recent reduction in research alliances between China and the USA.<sup>8</sup>

In this article, medical students and early graduates share their experience of participating in a cross-country peer-to-peer mentorship and comment on their learnings and observations.

## EXPERIENCE REPORT

### Organization and Research Program

Interventions are needed globally to provide guidance and strategies on peer-research mentorship. One such research program is the Peer Research Mentorship Program (PRMP) launched by the International Society for Chronic Illnesses (ISCI), a non-profit venture with the vision of improving the quality of life of people living with chronic conditions, in August 2021 to guide new researchers in an organized manner.<sup>9</sup> PRMP leadership consists of the Project Head, National and Regional Project heads (NPH/RPH), Mentor of Mentors, and at last, mentors and mentees. **(Figure 1)** Teams are created by the leaders of PRMP on the basis of the topic of interest and study design selected by each researcher in their PRMP Application Form available on ISCI's website while simultaneously making an effort to promote diversity in terms of geography, and designation. **(Figure 2)** Mentor to mentee ratio is maintained at 1:5 in most teams. Hence, depending on the availability of mentors, the program enrolls medical students as mentees at the beginning of each rotation. As of July 2022, there are 70 research groups active in PRMP with 70 mentors and 450+ mentees consisting of medical students, interns, resident doctors, recent medical graduates, biomedical engineering students and fresh graduates, and PhD students from 15+ countries in Asia, North America, Europe, and Africa.

Pre-requisites for mentees, if they wish to conduct original studies (OS) and case reports (CR), are access to institutional ethics committee (IEC) oversight at home affiliation and permission to share de-identified patient data with researchers from other institutions. These pre-requisites do not apply if a mentee wishes to learn systematic review (SR), meta-analysis (MA), or short communication (SC). To take part in SR/MA, mentees must have prior research experience and at least one original study publication. Since several medical postgraduates waiting to join a residency program are not affiliated to any institute, ISCI does not require university affiliation for participation in PRMP. Pre-requisites for mentors consist of at least one publication in the study design that the mentor wishes to teach and time availability of the mentor for the duration of that rotation. Mentees are needed to dedicate 5-7 hours per week for all study designs while mentees are required to dedicate 5-7 hours per week for SR/MA and 2-3 hours per week for OS, CR, and SC.

Mentees can get in touch with respective mentors via WhatsApp messenger and email. All researchers are required to respond to texts and emails within one week. Mentors arrange fortnightly group meetings to receive updates on mentee activities and solve their doubts. **(Figure 3)** This format of peer-to-peer mentorship makes it easier for mentees in PRMP to seek guidance and actively participate in group discussions thus, reinforcing the Socratic method of teaching. From case reports to meta-analyses, mentees can choose any type of study design they wish to learn. Participation in this program is free of cost; hence, research groups submit their manuscripts to journals with low processing charges. Each rotation of PRMP is six months long, and peer researchers are expected to complete their studies in a time-bound fashion. The quality of research work is maintained by regular quality checks conducted by NPHs/RPHs where they check whether their respective groups are compliant with their timelines and identify inactive members and report back to the Project Head. Authors must submit only to PubMed indexed, peer-reviewed journals to uphold the quality of publications. The end goal of PRMP is to create a network of experienced and trustworthy group of early-career researchers. This workforce will give rise to the possibility of conducting large scale and long term studies of high impact. Results from these studies will be conveyed to policy makers, clinicians, and patients.

### **Mentees**

We signed up for the PRMP in the August-December 2021 rotation and our group included five dedicated mentees who were medical students and intern doctors from Karachi Medical and Dental College and Xinxiang Medical University in Pakistan and JSS Medical College, Baroda Medical College, Government Medical College of Miraj in India. Mentor of the group was a research scholar at Harvard Medical School of Postgraduate Medical Education with 10+ publications (h-index = 2). Team members did not know each other at the time of signing up. After conducting a thorough literature search, we chose to embark on a narrative review on Metabolic Syndrome. As mentees, we were taught how to conduct a literature search, research methodologies, scientific writing, editing, journal selection, and reviewing according to Scale for Quality Assessment of Narrative Review Articles (SANRA) guidelines. Throughout the project, we were encouraged to share our ideas and express our opinions which enabled critical questioning of the literature and making appropriate conclusions from the data. In some instances, we were also asked to teach and guide our fellow mentees, thereby instilling a leadership attitude and fostering an alliance. We were guided through every step in the process, right from framing research questions to corresponding with the journal editor. We were able to

clarify doubts, which would not have been possible had our mentor been a professor, which is the case in most of the research projects. The reason for this is, firstly we have a huge footfall of patients to cater to in our set-up, hence, the professors are preoccupied with clinical duty sparing minimal time for research. Furthermore, our medical school curriculum does not include research and more importance is given to increasing medical knowledge than conducting research studies.

Working with team members from other nations taught us more about our cultural differences while also honing our communication skills. As we were at different stages of our medical career and at times, we were preoccupied with other commitments, our mentor was lenient with deadlines and task allocation. For example, if a mentee was not able to meet the deadline for a literature search, others would help in completing that task. Working on this project has boosted our confidence in scientific writing and presentation abilities. We had no ethical issues to deal with and had a pleasant work environment. For example, in November and December when medical school exams were around the corner, we were facing difficulty in balancing studies with research. Hence, our mentor guided us on time management and extended the deadline for our research tasks so that we could prioritize medical education at that time. To conclude, in a short period, PRMP has enabled us to gain exposure to various parts of scientific writing and provided us with a valuable research opportunity. We have learned a lot about metabolic syndrome, alternative medicine, and narrative reviews. For medical students in tertiary care institutions in LMICs with limited research aptitude, it is a wonderful opportunity and a valuable learning experience.

### **Mentor**

I screened a lot of information from articles and videos available on the internet and used past experiences to provide the most factually correct information to my mentees. I thoroughly researched the steps of conducting a narrative review and created a timeline for my fellow researchers. I discussed with the PRMP Mentor of Mentors (MoM) and also collected information from online journals, videos, and blogs as and when required. I learned the importance of making efficient timelines, keeping in mind the availability of all members. While teaching every step of a narrative review from the creation of a research question with the Population, Intervention, Control, and Outcomes (PICO) model to conducting a robust literature search on various databases and from drafting the manuscript with the SANRA guidelines to submitting our article to a medical journal, I understood the significance of maintaining deadlines while also giving a breathing room to the mentees. Delegating work to mentees and automating the process of conducting research is of paramount importance in a mentor-mentee relationship.<sup>10</sup> A good mentor-mentee relationship can be nurtured by being humble and accepting one's mistakes as pointed out by the other. I have emerged from this research mentorship experience more confident in my scientific writing skills, leadership qualities, and have also gained in-depth knowledge about the integrative management of Metabolic Syndrome. With this experience, I am now able to manage 3 such research groups in PRMP in the ongoing Jul-Dec23 rotation in which two of my mentees from Aug-Dec21 rotation have taken up research mentorship and now, we are colleagues!

### **Discussion**

Over the last decade, several mentor-mentee research programs have emerged worldwide, especially in low- and middle- income countries. Although such programs are advantageous and fulfil a significant lacunae in medical student education, there is a need for assessing their quality and impact on medical students and healthcare trainees along with assessing mentor satisfaction. Evaluating the efficacy of mentor-mentee research programs is difficult due to the presence of several confounding factors like participation of mentees in multiple research programs, difference in interests of mentees and mentors, and variability in skill and knowledge of mentors.

A mentored student project (MSP) program started by Manipal University in India reported that their mentees experienced improvement in their research skills while research knowledge was not much affected.<sup>10</sup> Ssemata et al. found that lack of a formal mentorship structure, low skill and knowledge level in mentors, unclear roles and expectations were some barriers in these programs. The authors also asserted the need for measurable outcomes of research projects, creation of shared mentor-mentee expectations, and adapting mentoring models to local context.<sup>11</sup> A review conducted by Atlas et al. in 2021 found that these research programs had extensive benefits including research development, psychosocial support, confidence building, and improved chance of getting into residency programs for mentees. Mentors, on the other hand, enjoyed their relationships with students, enhanced teaching skills, and refined curriculum vitae. Due to time constraints of senior mentors, peer mentors were seen as highly approachable.<sup>12</sup> Altonji et al. suggested incorporating mentor training sessions in these programs for enhancing their research and communication skills.<sup>13</sup>

As there is a rise in the number of mentor-mentee research programs, the need for creating a structured and formal mentorship increases. Inculcating these extra-curricular research programs into the medical curriculum through collaboration between independent organizations and medical universities may create a path for uniform distribution of research knowledge and skills. This will also ensure that only skilled and dedicated researchers are given the responsibility of mentorship. A multi-organizational study may provide answers regarding how difference in mentorship style and program structure creates differences in mentee satisfaction and quality of scientific literature produced.

## **Conclusion**

One could infer that peer research mentoring is necessary and justified. Universities must conduct such programs to expose their students to research early on in their medical careers. This will reduce the disparity of opportunities in LMICs.

## **Summary -Accelerating Translation**

Research and research teachings worldwide have undergone significant changes with advancements in the past decade. From students actively seeking research opportunities to participating in research workshops, it has given rise to a new era of mentor-mentee programs. The peer research mentorship program (PRMP) conducted by International Society for Chronic Illnesses (ISCI) facilitates a global collaboration that not only improves the quality of research but also encourages interpersonal relationships and incorporates expertise from different fields. In this article, medical students and early graduates share their experience of

participating in a cross-country peer-to-peer mentorship and comment on their learnings and observations. This is an experience report of mentors and mentees in the ISCI sponsored PRMP. Mentees learned a lot about metabolic syndrome, alternative medicine, and narrative reviews and the mentor became more confident in her scientific writing skills, leadership qualities while also gaining in-depth knowledge about the integrative management of Metabolic Syndrome.

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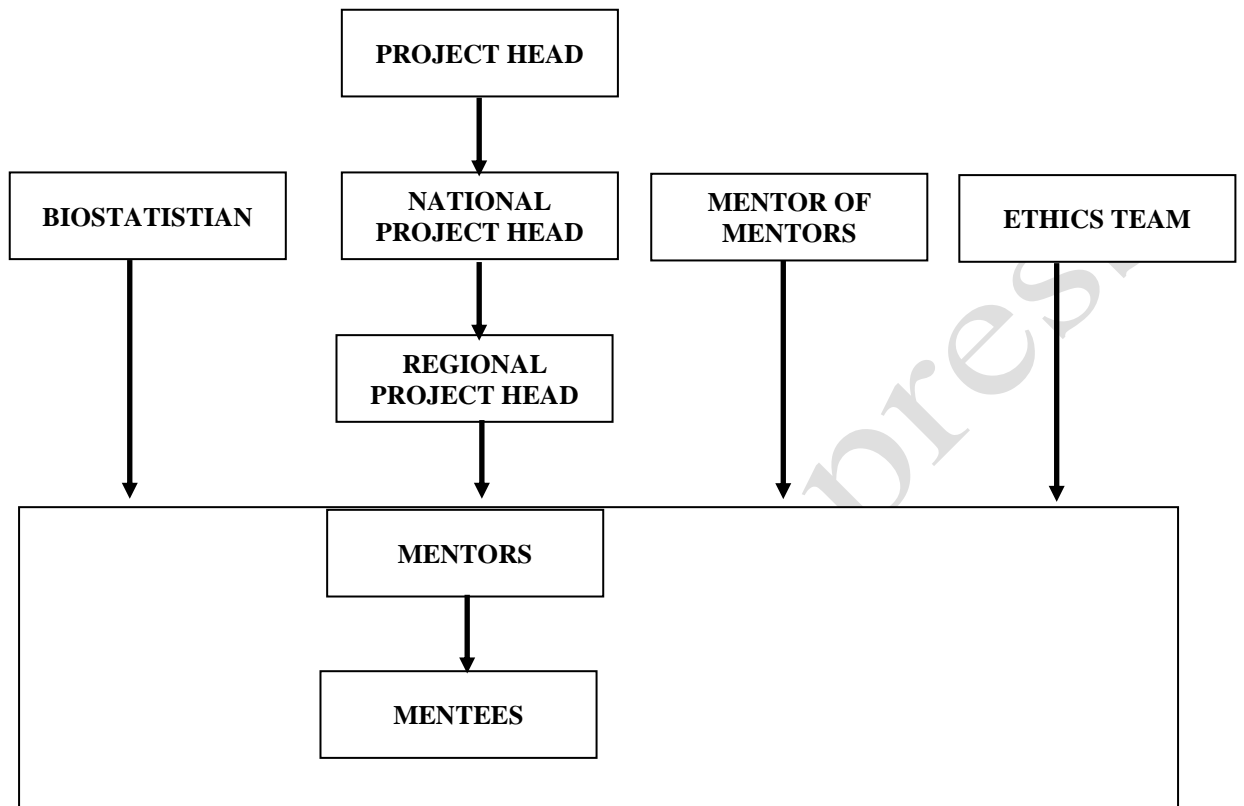


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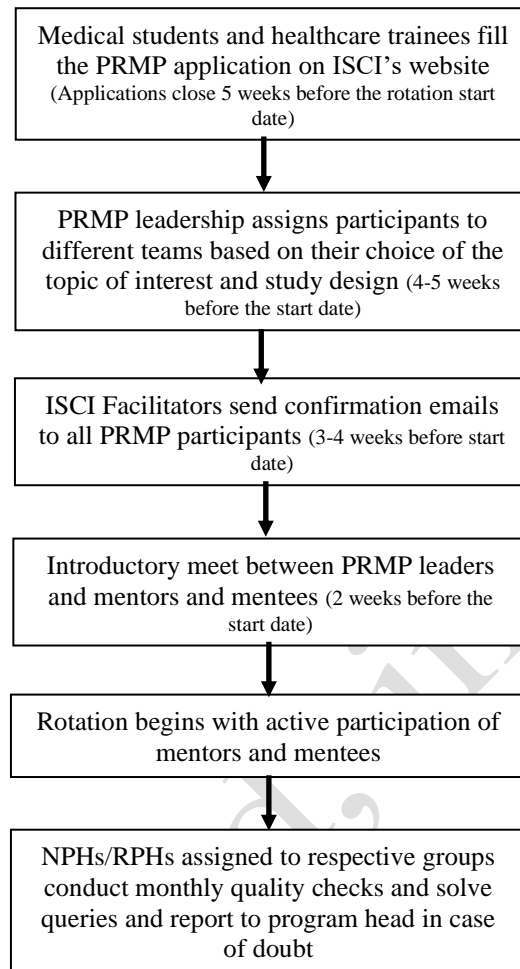


**FIGURES AND TABLES.**

**Figure 1: - Hierarchical Representation of the members of Peer Research Mentorship Program**



**Figure 2:- Process of team allotment by PRMP leadership.**



**LEGEND 2**

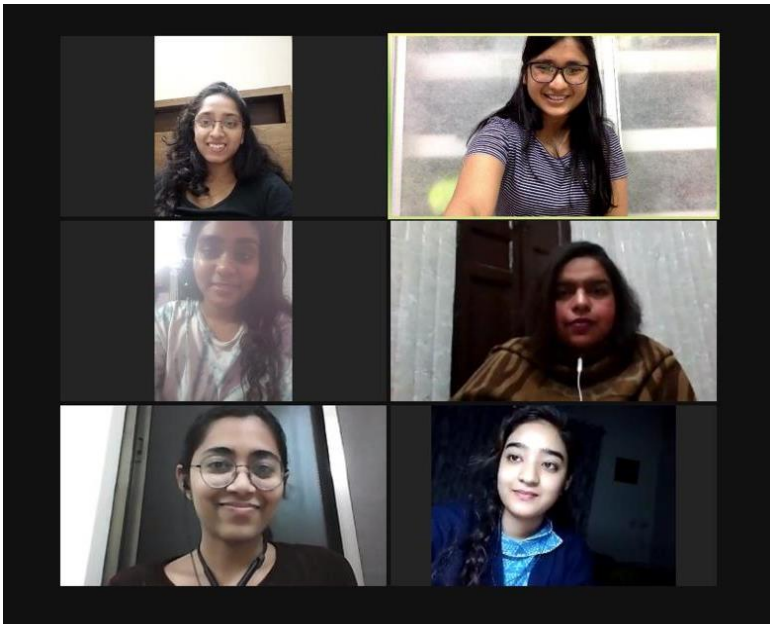
RMP: Peer Research Mentorship Program

ISCI: International Society For Chronic Illnesses

NPH: National Project Head

RPH: Regional Project Head

**Figure 3. Snapshot from a Zoom Meeting During a PRMP Informative Session**



Legend 3:

PRMP - Peer Research Mentorship Program

Top right corner - mentor

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