Are Medical Students Interested in Conducting Research? A Case Study on the Recruitment Outcome of an Elective Research Summer Opportunity

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Abstract
A pilot summer elective research opportunity was made available to medical students at the University of Malta. A call was sent out in June 2021. Interested students sent a short “intention to participate” email to the coordinator which was analysed. One in every twelve enrolled medical students applied. The commonest reason for participation was to gain research experience and knowledge, with a majority expressing no prior experience. Lack of research opportunities may be one of the barriers faced by students, resulting in the poor inclination to conduct research as undergraduates. Identifying specific barriers is recommended in order to provide a tangible research future.

Keywords Medical education · Medical students · Medical research · Research activities · Research priories · Malta

Introduction
In the era of publish or perish, conducting and publishing research has become a requisite for most professional careers as well as those pursuing a postgraduate degree [1]. Yet, most medical students do not have an inclination to conduct any research in their undergraduate studies and this remains true until they obtain their medical degree [2]. Such an attitude is worrying especially considering that clinicians should focus their patient’s care based on the latest research findings and following evidence-based practice [3]. Many contributing factors have been associated with the negative attitude shared by many medical students towards the conduction of research including the availability of research opportunities, research training and experience/s they receive during their student years as well as the presence of a research role model [2, 4, 5]. Several universities, especially within the USA, offer summer research opportunities for medical students to participate in a funded research project. However, this is not the case for medical students attending the University of Malta.

The University of Malta is the only state university in Malta. Its Medical School offers a 5-year Doctor of Medicine and Surgery undergraduate degree on a free-of-charge basis to all residents of Malta and those coming from the European Union countries, provided that the entry requirements are met. It is only during the pre-clinical years that there are two compulsory research essays. Students are offered the opportunity to undergo an intercalated research-based year after finishing off their pre-clinical years (first 2 years). If successful, the student achieves a Bachelor of Science (Honours) in medical sciences.

Every year, the Malta Medical Students Association (MMSA) offers a limited number of exchange summer programmes, as part of the International Federation of Medical Students’ Associations (IFMSA) [6]. Students securing such an exchange opportunity are offered a month’s working experiences in another country’s institution. However, these exchanges are mostly clinical work exchanges and not research based. Indeed, in summer 2021, only 19 research exchanges were available out of a total of 112 exchanges. Medical students wishing to undergo extra-curricular research at their home university need to seek out a potential tutor for the possibility of joining an ongoing research project.
At the end of the 2020–2021 academic year, a novel pilot elective research opportunity for summer 2021 was introduced by a resident academic of the University of Malta. This pilot initiative was set to provide fourteen medical students the opportunity to work in a collaborative COVID-19 research project during summer. The aim of this case study was to evaluate the interest of medical students to participate in an elective summer research opportunity while investigating the reasons and intentions for participating. At the time of the recruitment call, the hypothesis was that a limited number of students would show interest in participating. The objective of this case study was to evaluate whether there is a demand for setting up an elective research hub within medical schools. This article describes the process of student recruitment, the students’ interest in conducting research and the scholarly outcome of this research opportunity.

**Methods**

**Recruitment Call**

A call for an elective research opportunity for medical students was sent out via email on the 10th of June 2021 to all enrolled medical students, with the help of the class representatives of each year. A copy of the recruitment email is available as supplement material. As part of this call, students were informed that 14 places were available for a literature search, data collection and eventual analysis on a COVID-19 in Europe research project. Interested students were instructed to send a short “intention to participate” email to the principal researcher within a week (7-day deadline). A total of 73 medical students (12.25% of the enrolled students) showed an interest in participating in this project.

**Process of Recruitment**

Considering the enthusiasm shown by students in their “intention to participate” email, it was decided that the research project should be extended to accommodate all students. Five sub-projects were created to cover the impact of COVID-19 in (i) European Union (EU) countries, (ii) Mediterranean countries, (iii) Balkan countries, (iv) microstates and (v) non-EU European countries. Only three students were not eligible to participate due to their lack of availability to carry out the research tasks during the specified time frame (July 2021).

A total of 70 medical students were recruited (1st year to 4th year). The “intention to participate” email received from each student was analysed for the following aspects: (i) the reasons to participate, (ii) prior research experience, and (iii) leadership skills. The “intention to participate” emails along with the students’ details were transferred into two spreadsheet columns. Three additional columns were created adjacent to these, to reflect the three themes mentioned above. Relevant details were extracted from the “intention to participate” email and placed in each thematic column respectively. These three themes were considered essential aspects and skills and were taken into consideration when allocating the various research tasks. Those students who had already published research or were deemed to have leadership skills were allocated additional roles as coordinators to help in data analysis and synthesis.

**Results**

**Medical Students’ Characteristics**

A female majority (70% of the responders) expressed interest to participate in the elective summer research opportunity. Table 1 provides a breakdown of the medical students’ characteristics stratified by gender and medical degree (MD) year.

**Intention-to-Participate Reasons**

On analysing the “intention to participate” emails, responders shared eight similar reasons for wanting to participate in this opportunity, as shown in Table 2. The following are selected direct quotes illustrating specific reasons behind the intention to participate in the elective summer research opportunity:

- “This project would give me another view and a different opportunity of working in the research field with other medical students—something which I wasn’t so involved in, in this past couple of years at medical school.”
- “I believe that the MD course tends to overlook the importance of research, especially during the preclinical years, with students having very little opportunities to delve into this field. After all, progress in medicine arises from research.”

| MD year | Total enrolled MD (2020–2021) | Exhibited research interest % of students per MD year | Male | Female |
|---------|-------------------------------|---------------------------------------------------|------|--------|
| MD 1    | 162                           | 15%                                              | 9    | 15     |
| MD 2    | 131                           | 18%                                              | 7    | 16     |
| MD 3    | 166                           | 10%                                              | 3    | 13     |
| MD 4    | 137                           | 5%                                               | 2    | 5      |
• “I enquired faculty a few days back to guide me on how I may find any related [research] summer opportunities.”
• “I am interested in participating because I have never had experience participating in a research project, and the fact that it is current makes it even more interesting to tackle”

### Medical Students’ Participation and Outcomes

Kick-start research meetings were held via ZOOM® during the first week of July 2021. The data collection process was fully explained with live demonstrations of how to access various databases. A co-lead for each sub-project was appointed along with the allocation of several coordinators responsible for various data analyses required once the data collection was over.

Some students ran into database limitations when collecting data for their assigned country. These students took it upon themselves to identify other reliable sources including contacting the country’s Ministry of Health, public health agencies and even the consulate of the country in question. The research perseverance demonstrated by these medical students was inspiring, as was the team effort and attitude observed during the duration of the data collection process. At the end of the data analyses, five scholarly outputs were produced and submitted to different journals. These original articles targeted COVID-19 across European countries [7], across microstates in Europe [8], across the Mediterranean region [9], across the Balkan countries [10] and the COVID-19 situation in Europe following the EURO2020 football games [11].

### Discussion

A minority of medical students across each MD year (1st to 4th) expressed interest in participating in an elective summer research opportunity, coinciding with previous reports [2, 12]. Female medical students appeared to have a higher inclination for research, although this could also be related to a higher female to male student ratio entering medical school [13]. Out of the medical student responders, only a quarter reported to have had prior research experience. It is a known fact that prior research experience is a key motivator to pursue further research opportunities [14]; however, in this case, the lack of research opportunities and skills appeared to be the dominating motivator. Indeed, this was highlighted by multiple students in their “intention to participate” email, as was the acknowledgement that research is an integral part of medical education and their future career. This raises the question of whether the low inclination towards research by medical students is originating from their medical school research experiences and elective research opportunities. Even if formal research engagement projects and taught modules are already set in place, students may be looking for informal hands-on opportunities, such as this study’s, to put theory into practice. This coincides with the results of a previously conducted study in Malta [15]. It was reported that medical students’ engagement in elective research carried a higher satisfaction experience when compared to mandatory research [16]. Other factors may also be contributing to the lack of medical students’ inclination for research, including lack of mentorship or wrongful perception that researchers are isolated from clinical practice and patients’ interaction [14]. Therefore, identifying the specific barriers that may be hindering medical students from engaging in research during their undergraduate period should be the prime priority.

Despite this, several potential reasons could have influenced the higher-than-expected response in participating in this research opportunity. The study’s topic targeting COVID-19 might have been of general interest to medical students, as noted by one student. Additionally, the fact that the research tasks could be performed from the comfort of their home and the opportunity to be co-authors of a publication might have influenced the students’ response towards this opportunity. Another plausible reason for the extensive interest is the fact that published research places

| Reasons for the intention to participate | N   | % of participating students (CI 95%) |
|-----------------------------------------|-----|-------------------------------------|
| To gain research experience and understand what it entails | 21  | 30 (20.49–41.59)                     |
| Prior research experience               | 17  | 24.29 (15.67–35.58)                  |
| Prior degree thesis experience          | 11  | 15.71 (8.83–26.16)                   |
| Have published research                | 8   | 11.43 (5.66–21.21)                   |
| Have volunteered/worked in COVID-19 public health hubs | 8   | 11.43 (5.66–21.21)                   |
| Interest in a research career           | 7   | 10 (4.65–19.51)                      |
| To enhance the curriculum vitae         | 5   | 0.71 (0.27–1.60)                     |
| Have had previous leadership roles     | 4   | 7.14 (2.72–16.02)                    |
newly graduated medical students at an advantage in their job applications.

It is recommended that medical students’ opinions on conducting research are investigated to identify whether investing in elective summer research opportunities and a research curriculum are sustainable and obtain tangible outcomes [16]. After all, the setting up of research opportunities requires dedicated researchers/mentors, human resources, adequate funding and infrastructure. This requires meticulous planning and logistics for many medical schools, yet it is not an impossible mission, as proved by this pilot research opportunity. That said, resources and funding are requisites if such research opportunity programmes are to be permanently set up. Nonetheless, the increased medical students’ interest in research does not necessarily translate into academic-research or physician-scientists careers [17, 18]. However, as illustrated in this pilot study, such opportunities heighten the medical students’ inquisitive attitudes and teamwork which will be part of their daily work as future doctors.

This pilot study carries some limitations. The “call for participation” was distributed through email during the second semester examination period, with a 7-day deadline window for students to express their interest. This specific time frame might have hindered the response rate, especially if students did not check their emails regularly or were concerned that they might have an examination resit later in summer that would negatively impact on their free time. When the recruitment email was received, some students might not have comprehended the research tasks and required outputs of this research opportunity, which might have hindered them from applying. A small medical student cohort was explored; hence, the outcomes of this study do not necessarily reflect the research attitudes and perceptions of the whole medical students’ body.

Conclusions

The commonest reason for participating in this elective opportunity was to gain research experience and knowledge. It appears that lack of research opportunities may be one of the barriers faced by these students. Therefore, it is important for medical schools to identify specific hindering barriers to be able to obtain tangible future research outcomes.

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Author Contribution Only one author contributed to this article and was responsible for the study design, data analyses and writing of the article.

Availability of Data and Material Data is available upon request.

Code Availability Not applicable.

Declarations

Ethics Approval Ethical clearance was obtained from the University of Malta Research and Ethics Committee (ID: 9432_30072020).

Conflict of Interest The authors declare no competing interests.

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