A Review on Medical Students’ Research

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Abstract: Medical sciences are of the most growing sciences. Every day new methods, drugs, treatment options, diagnostic options and tools, prevention methods and etc are found. Many times, information used to treat a specific disease is out of date. Sometimes, a medical option that is being used is ruled out. During the past decades, accessing up-to-date information was more or less impossible. Also, much crucial information could not be published due to several limitations. The progress in computers, handheld devices and internet has made it very easy to access valuable information. Using them will result in an immediate improvement of general health and can decrease faults of medical staff. Medical student training centers must take into consideration these options and update their methods. They should find new methods that to help students to interest them in research. An overall review of current methods shows that only a mixture of early research encounter, peer to peer research education (a senior student who mentors a small group of younger students), good research funds, supporting them to participate in congresses in the country or even abroad and also implementing marketing techniques will result in physicians who will change the pace and generalize evidence based medicine implementation.

Keywords: Student Research, Medicine, Medical Student, Education, Mentorship

1. Introduction

Medicine is an applied science that aims to improve and maintain the general health. A composition of disease characteristics, preventing and treating them and their diagnosis makes and defines medicine (1, 2).

This science is rapidly growing and keeping up with it with old methods is not possible (3, 4). Even though it is essential to make experienced physicians to go with the current flow, changing their approaches is much harder than training young doctors and medical students (4).

The progress of science has made it easier to transfer data and information. Developments in computers, internet, and electronics have led to an immediate transfer of science. Nowadays, even the farthest person interested in recent research can reach the most up to date information and science with a blink of an eye (4-6).

Before, many obstacles were present in the way of accessing science materials. Buying journals were very hard for physicians from developing countries. Some countries could not access to any of material published in top research centers at all. Also, many had no chance of submitting their experiences, opinions and researches to journals. Reviewing the manuscripts was even harder (7-9).

Publishing in journals have also never been easier. Many online journals have been created and have made an environment for even the worst researches (10).

Thus, medical students who are being trained in this era should take advantage of the facilities and improve their knowledge. This will result in an overall health improvement (11). Although student research has improved, their research activities have few impacts on science and health improvement. On the other hand, academic centers should clearly recognize the situation and the change made in this matter and focus on training students who know how to use the best possible material. They should be able to identify researches that can be dependable and rely on which information that is provided. Also, learning research skills will help them become better teachers. This shows that an immediate change must take place and both academic centers and students must alter their approaches (12).
This study will review current methods of medical students’ training to become scientists or researchers and focuses on the barriers of medical research education.

2. Student Research Committees

Every medical faculty should have a research committee. The goal of this committee should be to train the students and to teach them basic scientific methods. These committees must familiarize students with these skills and answer these questions (13):

- Why should they pursue research?
- What will they achieve by research?
- Basic computer and internet skills such as Microsoft office or etc.
- How to find a proper research subject
- What should they focus on their first research project
- How to search for the answers of their questions
- Academic search
- Proposal writing
- Statistics software
- Abstract writing
- Submitting an abstract to a congress
- Poster presentations
- Oral presentations
- Scientific writing
- Submitting a manuscript to a proper journal
- Basic communication skills when contacting a journal
- Evidence based medicine

Although limited, student research committee must have the power to independently determine the fund of projects. These committees have previously proven their benefits. Many articles have been published as a result of these committees (14-78).

Downsides: the independence of this committee may lead to abusing students by seniors or even professors. Thus, a careful supervision is necessary. However this supervision must not undermine the independence of the committee. Also, students be completely familiar with their rights at the beginning of their participation.

The role of this committee should be discussed in detail.

3. Early research encounters

Students must be exposed to research methods at early stages. This will lead to an early research engagement. The students must be handled by a committee such as the Student Research Committee.

Students must get familiar with research in their first term and should have a limited window for finishing research projects.

Downsides: if not guided carefully, using force may result in opposite results. Rules must be made for the students in order to protect students’ rights.

4. Student mentorship program

Student mentorship program is based on a peer to peer education. A senior student (mentor) must pick three to five students (mentees) and teach them basic research knowledge. After a significant amount of time, the mentee must become skillful enough to play a mentor’s role, and picks his/her own mentees. This will result in a network that passes research skills to other students (Figure 1) (79, 80).

Figure -1: Networks made by Students mentorship program.

Downsides: if not mandatory, a decline may be seen in the number of mentors. Also, mentees who are supposed to become mentors might not fulfill their obligations and refuse to teach other students (81).

Student mentorship program must be discussed in detail in a separate article.

5. Student congresses

Congresses that are totally handled by students are a place where they can experience conducting a scientific community. Also, students will get familiar with other students, many whom are more advanced. They will meet new ideas and new rules and their creative engine will be turned on (82).

The most useful result of these congresses is that usually after a student attends an out of the city
Congress, they will become more motivated and a three day congress will strongly drive a huge amount of students towards research (83).

Downsides: on the other hand, usually the group who handles and hosts the congress goes under a lot of stress. Despite the experience they gain, no short time achievements will be recognizable for them. Almost always, after a congress, many students of the hosting university will quit research and follow other activities.

It is crucial to make rules that increase the benefits of hosting a congress. Rules that result in a huge point for the visitors and few points for the hosts will damage the purpose and result in a short time increase in motivations and will lead to a reconstruction of their purposes.

6. Specialty congresses

Although student based congresses are necessary, nothing will make a student learn like a congress that is conducted by experienced scientists who have handled many congresses. They will observe, and take in every moment of such gatherings. Even participating as a passive participant will strongly motivate the students (84, 85).

Downside: few downsides can be considered for these events. However, they cannot be enough and can only help on a preliminary level. Still, they are vital and it should be arranged for students to attend such occasions.

7. Journals

Perhaps the most amazing achievement of a young scientist is to publish their work. As discussed earlier, since the resources were limited, it was impossible for students to publish their first works. Nowadays, with the progress made in digital technologies, a huge opportunity has been made which enables students to publish their work (86).

Editors of journals must empty a space for students so they can publish their work. On publishing student conducted studies, they must focus on the matter that they are motivating their students. However, the editors themselves are the result of people who sacrificed for them to learn, and ought to contribute to the improvement of medical students knowledge.

By the current approach, young scientists who have few resources will publish their articles in low level journal that only publish for money. Many of them need to publish their work for reasons that are not understandable by scientists who live in developed countries. We feel that those scientists should change their attitude and hear what is being said by young scientists who are willing to contribute to world science from their own country and have decided not to emigrate.

8. Journals that focus on publishing students works

As mentioned in the previous section, journals publish students’ research much harder. Even though the reason might be understandable in a situation with limited resources, nowadays this idea should be avoided.

We purpose that journals must be set to publish every article written by students. These articles should be carefully and publicly reviewed. All reviews should be available online for others to view and learn.

9. Conclusion

This article focused on different aspects that may increase the willingness of students, especially medical students, to pursue research. As mentioned above, creating student research committees and research centers is the most helpful method of achieving this goal.

These centers must be carefully supervised by employees who only focus on student research. Membership in these committees or centers should be completely mandatory. A significant amount of students’ credit should be considered for this. The curriculum also must be designed in a way that involves the students in all aspects of research, from finding a title to submitting the manuscript. Even teaching other students (with supervision) is also beneficial and leads to higher knowledge.

Open access journals that are publish students’ works, and focus on teaching research methods is crucial. The review process should be available online to all students and the credit should be similar to other articles published in scientific journals.

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