

Scientific publishing: a free-choice elective course for undergraduate Medical Students challenged by COVID-19 pandemic

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Short Report

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Abstract

Background: Scientific publishing is a crucial key competency in the newly integrated five years' competency based undergraduate medical program adopted in Egypt since 2018. However, writing and publishing in peer-reviewed journals can be an overwhelming duty especially with the condensation of main curriculum and the challenge of the covid-19 pandemic.

The aim of this work was to describe our experience in the design and implementation of a scientific publishing elective course challenged by the COVID-19 pandemic.

Method: A four weeks' duration course was offered for the 3rd year medical students by six staff members of different specialties and experience on how to prepare a review article to be ready for submission to an academic journal. Course learning outcomes focused on appropriate structure and writing of a review article, authorship and author order in research team, selecting suitable journal for publication and writing a cover letter for the submitted article. The students worked individually & in teams in synchronized and a-synchronized session. At the end of the course student and staff feedback were taken.

Results: Out of 143 students joined the course, 89.6% students felt more knowledgeable about scientific publishing and 64.8% felt confident about submitting a good review article. Chief Points of strengths mentioned by students were Competent supervisors, an authentic experience in writing and publishing, team work, and properly prepared lectures. They showed their interest in joining an advanced level. While, limited course duration and face to face sessions due to covid lockdown, unsuitable timing of course delivery within the academic year, difficulty in communication and cooperation among team members with high work load for both students and staff, were the main points of weakness reported by both students and staff.

Conclusion: scientific publishing is a suitable and interesting elective course for undergraduate medical students if successfully delivered in appropriate timing and duration with frequent synchronized sessions

Introduction

Scientific research is quintessential to enhance health-care delivery services. Through research, medical students acquire skillful critical thinking, the facility to criticize literature, writing experience, cooperation lessons and communicating results practice with the scientific community. Conducting undergraduate researches, whichever formally or informally, has been proven to reinforce the student's attitude toward scientific research later in practical life in addition to increasing likelihoods of continuing a profession in academic medicine. This, blended with the reality that there is higher rivalry for clinician jobs than ever before, give upsurge toward publication serving as a procedure of personal and professional progress evaluation ¹. Nevertheless, publishing academic research in international peer-reviewed journals may be a discouraging job for healthcare workers either medical or nursing in a university basis, particularly in countries wherever English is not the first language².

In Egypt, a low- middle income country in the northern of Africa, one of the major competencies of the Egyptian national academic reference standards (NARS) is to be a researcher and a lifelong learner³. Though research methodology and scientific research have been already included in the main undergraduate curriculum, scientific publishing is still looked as an extracurricular activity.

Electives at medical colleges can support medical scholars to advance their selves both personally and professionally in areas of interest that are not encompassed in the normal curriculum⁴⁻⁶. They form an essential part in medical students' education by escalating medical scholars' knowledge in areas outside of the systematic curriculum, improving scholar welfare, training medical undergraduates' valuable skills, and persuading final career choices⁷. Fortunately, elective courses have received a significant amount of weight in Egypt's recently implemented integrated programmed for undergraduate medical students³. This encouraged us to propose scientific publishing as an elective course for our medical students. However, during COVID-19 pandemic many challenges faced medical educators to deliver elective courses in a proper way.

The purpose of this study is to describe our experience in the design and implementation of a scientific publishing course challenged by the COVID-19 pandemic in one of the largest medical schools in Egypt. The study findings could be utilized to provide recommendations to optimize the benefits of the Elective Program for future students. It could be of use to those designing any program in which students have the power to design their own curriculum, whether that be through liberal electives, or as in the case of most medical programs, through the use of a fixed number of optional modules.

Methods

We conducted this cross-sectional study at the school of Medicine, Zagazig University, Egypt. A five-years integrated program has started for undergraduate medical students in our university in which the elective courses weigh 11 credit hours. This course "scientific publishing" is a newly designed and introduced elective course (4 credit hours). It was approved by the curriculum committee in February 2021, to be taught for the first time in the academic year 2020-2021.

Course Team composition

It is composed of six staff members who have good experience in student mentoring, editing, writing, publishing, and publication ethics. The course leaders: Two faculty members of different specialties; medical microbiology and immunology and clinical toxicology and forensic medicine designed the course, prepared the educational material, selected the team members, and participated in teaching, mentoring and assessment. Teaching staff: Four staff members; from anatomy and clinical toxicology departments participated to teach the course and assess the students.

Student groups and class size:

In March 2021, a call to participate in the elective courses (5 courses) were announced among the 3rd year medical students (1126 students) through the official online platform; Microsoft teams. The course enrollment was according to the choice of students. After joining the course, students were divided into 18 groups (7-8 students/instructor). Each course team member supervised 3 groups.

Course Description:

Prerequisite: no special prerequisites were required as the students have studied (In their first and second years) English for medical students and research methodology courses in their curriculum before joining the course.

Goal: Scientific publishing course focused on how to prepare a review article to be ready for submission and to support medical students to practice their skills as they prepare the manuscript for submission and publication. By the end of the course, all participants would submit a manuscript and a cover letter to an academic journal.

Course Activities: The educational learning outcomes and proposed tasks were declared at the beginning of the first class to outline the course road map (**Table 1**). The students were allowed to withdraw after the first session. Course activities were designed to facilitate collaboration with research team members, effective leadership skills in learning, Group communications in research, multidirectional feedback in the various learning contexts. Course duration was 4 weeks. To apply the knowledge and practice the skills delivered in each session, the students worked either individually or in teams. Activities were announced. Students' roles within the teams were declared, each one of them select the preferred role in each activity (**figure 1**).

Assessment and grading:

Being a pass or fail course, each student was requested to attend one face to face workshop in campus, an interactive session with his/her mentor, and multiple online discussion sessions between the research team and the group mentor.

-Formative assessment either individual or group work" was distributed over the course weeks;(figure 1). Summative assessment in the form of "Group work" is a copy of submitted review article, a cover letter, and a proof of submission from each research team.

Course evaluation:

Students' feedback. At the end of the course, students were asked to complete a multiple choice and free response survey asking for their feedback on the course. The survey was designed by Microsoft documents, and the students were asked to anonymously answer it via the on-line shared link.

Out of the total 17 items, there were questions about their reason to join the course (One item and one open question), satisfaction towards the course content (8 items), student self-assessment (Knowledge, Attitude, Practice) (3 items and one open question), and their motivation to join an advanced course (one item). A free to response section for points of weakness, and strengths.

Staff feedback. Constructive interviews by course leaders and the course teaching team to discuss the challenges, and opportunities for improvement.

Data analysis

The data acquired from the study were entered into Microsoft Excel 2007 (Microsoft Corporation, Redmond, WA, USA) and analyzed by means of the IBM SPSS Program.

Results

Out of 878 students who selected their elective courses, 143 (16.8 %) joined this one: “scientific publishing course”. Only 126 (88.11%) students completed the questionnaire, their responses were analyzed. They were 48 (38.4%) females and 77 (61.6%) were males with average age 21y.

The majority of students (96.8%) stated that their main motive to join the course was their interest in scientific publishing, only 11.1% of students joined the course because it was the only available one. About 30.2% of students indicated that they had a previous experience and want to improve their skill and 13.5% of students sought it was a career development chance **(table 2)**.

Figure (2) summarizes student self-assessment regarding knowledge and skills introduced throughout the course: About 80.8% of them agreed that they could select a good title, 73.6% recognized the principles of international publishing, 76% searched for credible references and 75.2% formulated a proper research question and 64.8% reported that they could submit a good review article. As regard student satisfaction about the course; about 68.8% of students agreed that the course met their expectations, 89.6% students felt more knowledgeable about scientific publishing and 56% reported their willing to join research teams to publish another type of manuscript and 82.4% of students found teamwork satisfactory **(Table 3)**.

Many points of strengths were mentioned by the students: Competent cooperative supervisors, an authentic experience in writing and publishing, team work, appreciating how faculty are caring to equip them by updated skills, and properly prepared lectures. Additionally, students reported their interest in joining an advanced course in scientific publishing. On the other hand, points of weakness were limited course duration, Limited number of face-to-face sessions, unsuitable timing of course delivery within the academic year, no free available plagiarism and editing programs, random distribution of the students in teams, difficulty in communication and cooperation among team members, high work load compared to other available elective courses and that the only research type introduced in the course was “review article”.

Regarding staff feedback; the main reasons for staff to join the course were their belief of the significance to mentor students on publishing a proper scientific paper. In addition, the research publishing activity of students benefits both the student and their institutions as it definitely escalates the faculty research production. Despite having few face to face sessions with the students and relying mainly on online sessions, staff members were enthusiastic and satisfied about intimate contact and communication with students. Diversity of specialties of the staff members together with their cooperation and understanding were a main point of strengths in the course. Others include matching learning objectives with the course activities and teaching and learning methods, practical application and hands-on training of students on each step in scientific publishing and helping students to choose their roles. However, several points of weaknesses were revealed during designing and implementation of the course: Limited number of staff members which in turn increased the workload, duration of the course was short and pressed in the academic year. Maybe it would be better if given during the summer and with more face-to-face sessions

Discussion

Electives are sources of 'communicable skills' in undergraduate medical curriculum which endorse not only knowledge and skills objectives but also the attitudinal ones⁸. The contribution of elective course in professional development of undergraduate medical students in scientific publishing field is an opportunity to increase their publishing potential; a current need for career enhancement¹.

The majority of students selected to join our course based on their interest in scientific publishing.

"I was really excited about it", "I want to share in publishing scientific papers in famous journals and get my CV improved", "my lifelong dream is to become a researcher and scientific writing is an integral essence of being a researcher.", all those students' quotes reflected their awareness and motivation towards the importance of scientific publishing.

Inadequately designed curricula and barriers to research have not enabled students to realize the crucial importance of research to clinical practice⁹. This was not the case in our course where learning objectives in our course were designed to nurture the interest of students in scientific publishing, improve their writing and research skills, exhibiting leadership, teamwork and creativity¹⁰. Moreover, the teaching and learning methods were selected to equip the students with the aforementioned skills. The effectiveness of such methods was evident in student satisfaction about the course content and even their interest in joining advanced levels⁹.

Using small group learning model helps in improving perceptions, limiting barriers, motivating students and improving the quality of mentoring⁹. This was applied in our course design where each staff member supervised 8 students /group. Faced by COVID-19, we were forced to decrease the physical gathering and contact with students which was a main limitation in the course design, as stated by both students and staff members. However, we used different online communication channels (Microsoft teams, WhatsApp,

e-mails, zoom) as an alternative to be able to follow up the students on a regular basis. **Papapanou et al.**¹¹, reported that COVID-19 pandemic has definitely disturbed the well-established, traditional structure of medical education. The restrictions on of physical attendance enhanced the increase in usage of an online learning tools, including both asynchronous and synchronous teaching sessions.

Suter¹² stated that good review paper can clarify the state of knowledge, explain apparent contradictions, identify needed research, and even create a consensus where none existed before. This goes parallel to our course design in which we chose review article as an example to be practiced by our students. Another crucial factor for such selection was that the duration of the course was not enough to conduct other research types. However, students at the end of the course were motivated to learn how to publish researches other than review article

Students showed satisfaction regarding working as a team. Team work encourages students to share experiences and learn from others. Teamwork has become a major focus amongst healthcare professionals for doctors, the art of teamwork needs to be developed from the early stages of training, in order to minimize fragmentation of care and its detrimental impact on patients. The World Health Organization emphasizes the importance of doctors adopting a multi-disciplinary team approach, yet amongst medical students, collaborative work is often disregarded. Fundamentally, the system that produces future doctors overlooks the importance of teamwork. Therefore, the undergraduate curriculum must be reshaped to embed teamwork within its principles. Future doctors will thus be equipped with lifelong abilities to collaborate closely amongst peers in order to deliver care holistically¹³.

In this elective course, students chose freely the topics of their review articles for publishing from different medical specialties, this gave them the opportunity to expand their learning across different academic fields and to dig up their knowledge and encouraging them to follow their interests, as published by other researchers⁷.

Although there was a workload on staff members in this work, they played a crucial role as mentors for the students along the path from choosing a good title, writing a good review article, helping them in distribution of roles and ending by submission of the research. The students expressed their great feelings towards their mentors. **Mabvuure**¹⁴ stated that it is easy to learn fundamental research and skills to undergraduate students, however, medical educators shouldn't only direct students to research opportunities but also to counsel them on the attitudes required for the student's success in a research environment.

COVID-19 pandemic confers many challenges for the course team. The lockdown logistics hinders the normal process of course announcement, staff recruitment, and student enrollment. We hereby faced many restrictions: Firstly, the course timing and duration: it was only a 4-weeks course, that was delivered during a crowded academic schedule. Secondly, is the unavailability of an adequate number of teaching staff member to participate. Thirdly, we accepted large number of students, as an attempt to help our students to finish their electives courses during this overwhelming crisis, where no one could tell when it

will end. However, the students were able to submit their review article with a high work load and great efforts from both mentors and students.

In conclusion, scientific publishing is suitable and interesting for undergraduate medical students that could be successfully delivered as one of the elective courses. Although, many COVID-19 lockdown related challenges were faced in this newly introduced course; the unsuitable timing and duration of the course, large number of students, and small number of teaching staff needed for continuous monitoring of students. However, the students' performance, commitment and satisfaction about the course content and success to submit their review article reflect good preparation of course content and the students' readiness to be a good researcher if suitable support is available. The impact of elective courses on the skills of potential doctors should be further investigated to maximize its benefits.

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Tables

Table 1. Timetable demonstration of course elements

Week	Learning outcomes	Topics	Educational sessions
1	Recognize the course outlines	Introductory session	Recorded session
1	Identify the structure of a scientifically sound research paper	What makes a good paper.	Flipped classroom
1	Structure a review article appropriately	How to write a good review article	Recorded session Face to face session
	Create a brief and engaging title and abstract for your paper		
2	Discuss authorship and author order in research team		-Interactive sessions
2	Write a cover letter for submission to an academic journal	How to submit your manuscript	Recorded session Interactive sessions
3	Select a suitable journal for publication		
3,4	Write a narrative review	How to write a good review article	Recorded session Face to face session Interactive sessions
4	Submit a review article	How to submit your manuscript?	Recorded session Interactive sessions

Table 2: Students' motivations to join the course:

Item	No	%	Yes	%
Interested in scientific publishing.	4	3.2	122	96.8
Have a previous experience and I want to Improve my skill.	88	69.8	38	30.2
The only available course.	112	88.9	14	11.1
Career development chance*			17	13.5
Learn from an experienced researcher*			7	5.6
Explore a new field*			12	9.5

*Added as free comments by the students

Declarations

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Figures

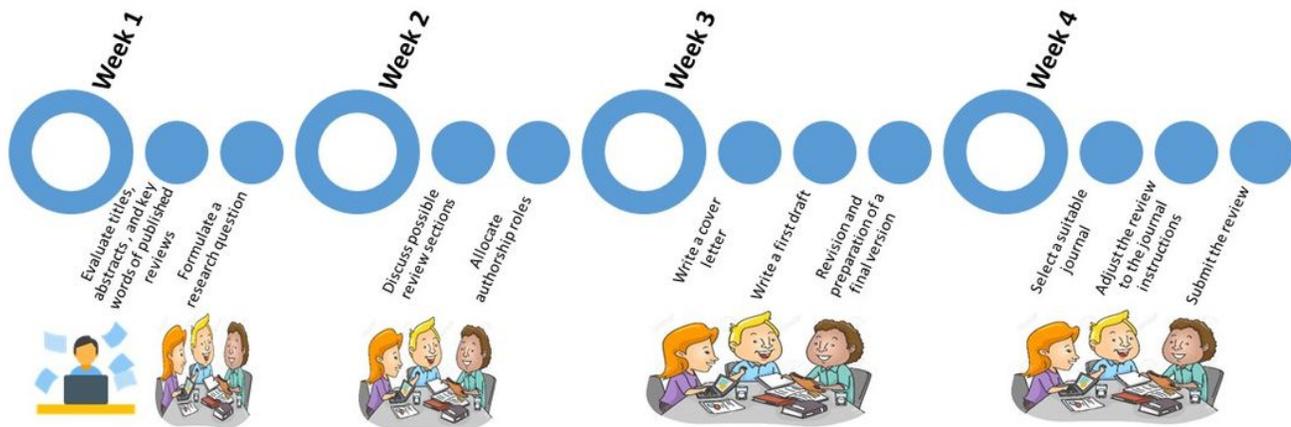


Figure 1

Students' tasks distribution along the course duration

Figure 2

Students' self-assessment at the end of the course

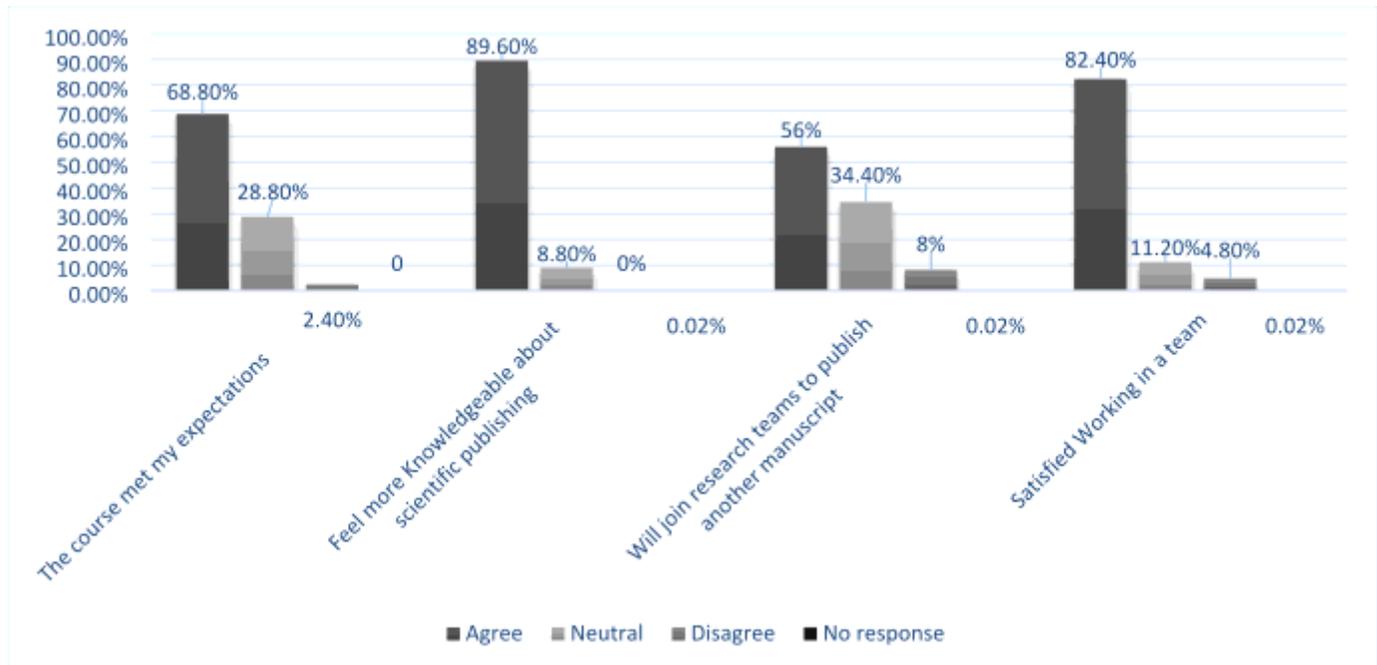


Figure 3

Students' satisfaction towards the course content