



# Breaking the Curse: Opening Students' Eyes to Pathology and Oncology Research

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## Abstract

Research is a particularly underexplored professional activity for physicians, leaving many medical students compelled to pursue a clinical career. However, the XXI century requires that physicians innovate and perform research that fuels their practice; students should have early exposure to research to explore it as a career path. It should be encouraged in the undergraduate program by having students take part in case reports, short communication presentations, and research seminars. As part of an educational strategy, students worked with faculty members to deliver a gynecologic oncology pathology case report as a poster for the Oncology Conference of Medical Students. We used a quantitative approach with a descriptive and cross-sectional design to assess the effect of poster presentations on developing student's research skills. The sample comprised 118 medical students enrolled in the Pathology courses that presented a total of 23 posters. The judges who assessed had a medical specialty in Pathology, Radio-oncology, and Gynecologic Oncology. The results show that students exceeded expectations on the use of language, as it was both formal and technical; and they used relevant bibliographic support and references. However, students performed less well in the clinical case summary. The judges found that although it was coherent and chronologically ordered, they did not include all the relevant laboratory tests and analyses, nor a full description of the diagnosis. This educational strategy has proven to be valuable in promoting Pathology and Oncology Research in students; it allowed participants to adopt a systematic approach and methodologies to document, analyze, and share knowledge.;

**Keywords** Educational innovation · Educational strategy · Academic medicine · Research

## Introduction

The medical professional should always be involved in three vital activities: clinical, teaching, and research [1]. One of the less-explored professional activities for physicians is research, largely because they are more inclined to pursue clinical careers. But research is a key element of academic institutions and part of the evolution of societies, with its main purpose to generate new knowledge [2]. The XXI century requires that medical professionals innovate and perform research that fuels their practice, advances diagnostic techniques, and improves treatment efficacy.

Having a strong foundation for research provides doctors an understanding of evidence-based medicine, that they will apply later to their professional practice [3]. But although the importance of research to medicine is widely accepted, before it becomes a priority it still needs to overcome several barriers, including lack of awareness or formal training, late timing in the curricula, poor dissemination of development, and low compensation for researchers [4].

Universities constantly debate about the skills that they need to help develop in undergraduate medical students. The curriculum is already busy with laboratory sessions, patient and community-based scenarios, and career-exploring activities. Students should also have early exposure to research to consider it as an eligible career path. Some authors suggest that to achieve this research goal, 10–15% of student's workload should be devoted to multidisciplinary research groups, or even develop a transversal research module in the curriculum [3]. According to some researchers, students can be involved even from the undergraduate program in case report

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presentations [1], while others in short communications at conferences and research seminars [5].

Some advantages of getting medical students involved in presenting research findings are: developing scientific skills in early career scientists, facilitates early dissemination of information, develops prestige or reputation for collaboration and job opportunities, and the feedback got after the presentation shapes the organization and interpretation of results prior to publication [6].

Most medical programs focus on developing clinical skills and the typical medical student's main interest is to become a medical specialist who can work at a hospital, and in a big city, if possible [7]. Training students for teaching positions and research is often reserved for specialized summer programs designed for the students who have already demonstrated an interest in pursuing a career as a faculty or as a researcher. Students may be engaged in research through mandatory curricular modules or by extracurricular research activities. Few students intercalate their medical studies with a bachelor of science. In some countries as a graduation requirement, students need to submit a thesis with the results of their research project [8].

Universities consider research in two ways: as an institutional function and as a competency that is announced in the professional profile of their students. A systematic researcher training is a task that has been assigned to postgraduate training while it should instead be accomplished through the academic community as a whole [9]. The goal would be to strengthen interactions between teachers and teacher to student will provide a foundation for knowledge exchange, communication, critical thinking, and research ethics [2]. These changes can trigger an institution culture shift [10].

Communicating knowledge can occur in diverse contexts, including conferences, symposiums, and publications. Conferences and poster presentations provide a forum for interaction between health professionals and researchers where there is increased learning from both sides. Posters are a mean for knowledge transfer that is relatively inexpensive to produce. Research findings can be presented in a concise way and individuals can view it at their own pace. Several symposiums have simultaneous conferences or poster exposures, allowing the audience to ask the presenter about specific details concerning their research.

If the poster presentation is combined with a short presentation, it facilitates discussion between presenter and audience, making the process more engaging and promoting active learning. Several authors point out there are few visits to posters even during designated sessions in symposiums compared to plenary poster presentations which had a bigger audience [11]. Discussion is, therefore, one of the most relevant factors related to poster presentations, with the recommendation of keeping them between 5 and 10 min [12]. It is also an opportunity for networking and future collaboration.

When poster presentations are integrated with a variety of educational activities, knowledge can increase and change

attitudes and behavior [13]. For instance, a poster's graphical design and appearance are key to achieving its purpose of promoting knowledge transfer. A correct layout, with a suitable color scheme, clearly summarized and readable information are crucial elements for the readers' engagement and transmission of knowledge.

The aim of this implementation was to conduct an educational strategy to involve students in academic medicine through a poster presentation of a case report.

## Methods

This research study used a quantitative approach with a descriptive, cross-sectional and quasi-experimental design to assess the effect of the poster presentations on developing student research skills. The intervention occurred in a private Latin American university and included 118 (62 female and 56 male) undergraduate students enrolled in pathology courses in the medical school program. They all voluntarily took part in this project.

For the posters' assessment, experts from pathology, oncologic pathology, and oncologic gynecology specialties were recruited. Experts were previously trained in the use of the instrument through a pilot implementation. We used a modified version of the rubric of Segura-Azuara, Eraña, and López to assess the poster presentations (Table 1) [14].

A modified technique from Segura-Azuara et al. was used as follows: 4th-year medical students attending pathology courses were divided into 5-member teams [15]. Each team was given a different gynecologic-oncology pathology case, which included a summary of medical history and pathology slides. Students were instructed to write a 400-word abstract with an introduction, pathologic description, discussion, and references. They received coaching by their pathology teachers until their work was approved for poster printing. The posters were to be presented at the Tecnológico de Monterrey XXX Student's Medical Conference, on April 17, 2018. During this conference, judges assessed the posters and student presentation using the aforementioned instrument, with a 5-point scale for scoring the abstract, poster content, format, and presentation. The poster with the highest score was to be presented at the Annual National Pathology Conference in Mexico.

A descriptive analysis of the students' performance in the elements was done, consisting of mode, variance, and standard deviation. This research considers the methodological recommendations defined by Schumacher (2005) [16]. All participants were informed about the purpose of this research and voluntarily accepted to take part in it. All researchers involved in this project handled with strict confidentiality all sensitive information.

**Table 1** Elements to assess the quality of poster presentations

Elements	Characteristics	Description
Poster format	Poster characteristic	The poster has all of the features: - Title with capital letters. - Last name and the initial letter of the first name of each author separated by a comma and a period. Name of the investigation center. - Institutional and conference logos. - Abstract, Introduction, Clinical case summary, Discussion y References
	Relevance of information provided by figures, diagrams, and tables	The images, diagrams, and graphs are relevant, correctly labeled and referenced using APA format.
	Design	The background, texts, and graphs are attractive and legible. The poster is very attractive.
	Written language	The language used is both formal and technical. It is clear and easy to read. It has no spelling or grammar errors.
Poster content	Introduction	It includes a brief and understandable summary of the document with the aspects of the summary case and discussion. It attracts the reader's attention. It includes the aspects that make the case stand out.
	Clinical case summary	The summary is coherent and in chronological order. It includes relevant laboratory analyses or other tests and describes the diagnosis and treatment used.
	Case discussion	The discussion of the case arises from the theoretical framework and is attached to the clinical case described/ and the clinical case described is according to it. It emphasizes the aspects that make the case stand out.
	References	It includes exhaustive bibliographic research of the theoretical framework that supports the clinical case. It has at least three references using the APA format.

**Results**

Students participated with 23 posters presentations at the conference. The assessment results are presented in Table 2. The results indicate that 65% of students exceeded expectations on the use of language, as it was both formal and technical. About 52% of the posters presented the content in a clear and easy-to-read structure.

Most of the posters (83%) also had an excellent performance in the identification of relevant bibliographic support and references, while only 35% of them presented an excellent clinical case summary. The examiners found that many

posters summarized the case coherently and followed a chronological order; however, many did not include all relevant laboratory test and analysis information and did not describe the diagnosis fully.

**Discussion**

According to the comments received by the experts, interaction with the presenter seems to be one of the most attractive aspects regarding posters exposition. Consistent with what is found in the literature, this interaction relies on the public

**Table 2** Poster assessment of experts

Characteristic	Relative Frequency (n)		
	Regular	Satisfactory	Excellent
Poster characteristic	0% (0)	48% (11)	52% (12)
Relevance of figures, diagrams, and tables	9% (2)	35% (8)	57% (13)
Design	4% (1)	43% (19)	52% (12)
Written language	0% (0)	35% (8)	65% (15)
Introduction	0% (0)	43% (10)	57% (13)
Clinical Case summary	9% (2)	57% (13)	35% (8)
Case discussion	0% (0)	48% (11)	52% (12)
References	4% (1)	13% (3)	83% (19)

opportunity to ask directly to the presenter for specific details about the topic or research method, making it more engaging for both of them. The poster presentation is an educational strategy that promotes active learning and achieves the transfer of knowledge generated by the research.

By slowly engaging students in research activities that seem achievable and easy to follow, they can start valuing its purpose in physician practice. The relevance of this project is based not only on training but also on continuous mentoring and follow up with the professors. Through this, it is possible to open student's eyes to pursue a career path on research, breaking the old curse on depending solely on a clinical path.

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## Compliance with Ethical Standards

**Conflict of Interest** The authors declare that they have no conflict of interest.

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