## Medicine students' perception of peer teaching at a university in Mexico

Patricio García-Espinosa <sup>1,2 o (1)</sup>, Edgar Botello-Hernández <sup>1</sup> <sup>(1)</sup>, Juan Pablo Ruíz-Padilla <sup>1</sup> <sup>(1)</sup>, Rebeca Aguayo-Samaniego <sup>1</sup> <sup>(1)</sup>

1 Universidad Autónoma de Nuevo León. Facultad de Medicina. Hospital Universitario "Dr. José Eleuterio González". Nuevo León, México. 2 Instituto Mexicano del Seguro Social, Unidad Médica de Alta Especialidad # 25. Nuevo León, México.

#### **ABSTRACT**

Introduction: peer teaching is common in universities and allows students to teach their peers from the early academic years. During the COVID-19 pandemic, medical students have had to learn through online classes, but peer teaching has helped them overcome these educational challenges. Objective: to describe the experiences and perceptions of Medicine students about the peer teaching model. Method: an observational, descriptive and cross-sectional study was carried out. A self-conducted survey was applied integrating sociodemographic variables and personal experiences. It was shared among the medical students and the model was evaluated, the number of 366 students between 1-12 semester of the Autonomous University of Nuevo León was found as the minimum necessary sample. Results: 258 (61 %) women were identified, it was considered by 334 (79 %) that the instructors taught in a good or excellent way, it was referred by 333 (78.7 %) that they had a good or excellent clarity of the explanations. In addition, 295 (69.7 %) stated that the instructors. The best rated departments were radiology (72.3 %) rating it as good, pathology (69 %) and embryology (68.7 %). Conclusions: It was found that the students' perception of the peer teaching model is positive, that it can serve to complement the teachers and can be very useful in the current pandemic situation.

Keywords: COVID-19; Education, Medical, Undergraduate; Students; Teaching.

U niversities have many teaching models for their students and among them the so-called "peer teaching" method, whereby students are in charge of teaching their peers from the first academic years. This is an ancient model, as old as the Aristotelian school that relied on archons who were older students; however, it has gained strong interest throughout the world during the last decades<sup>1</sup>.

In this model, those in charge of instructing the youngest are older and more experienced students, who have previously demonstrated that they have

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•Corresponding author: Patricio García-Espinosa e-mail: <u>patricio.garciaes@uanl.edu.mx</u>

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The authors declare that there are no conflicts of interest.

the experience in the subject or specific area to instruct  $it^2$ .

Peer teaching is widely used in public universities, where an "expert" student coordinates a group of novice students. This model has been developed and refined in many universities, such as Penn State University that gives its students the opportunity to propose extracurricular courses and propose school tutoring sessions to support their peers. Likewise, the University of California has students who teach their peers in curricular or formal lessons<sup>2</sup>. In Japan this is especially important for language teaching<sup>3,4,5</sup>.

At present, many of the university teaching models are based on competition due to the need for the acquisition of knowledge to be more focused on the needs of the student. Competency-based teaching has given students more autonomy, independence and self-regulation, obtaining the ability to learn at their own pace<sup>4,5,6</sup>.

The growing popularity of this model has prompted higher education students to develop in multiple areas, for example, the career of Medicine at the authors' institution, which trains schoolchildren to become doctors capable of operating in a clinical setting, while conducting research and coaching their peers. Many medical educational centers today practice this approach for their disciples<sup>7,8</sup>.



During the COVID-19 pandemic, illustration in medicine has radically changed<sup>9</sup>; face-to-face classes were replaced by online classes, compromising the practical application of the topics; in turn, peer teaching has been applied during this situation to face these educational challenges, the participation of senior schoolchildren with tutoring skills in a virtual platform has helped amateur students to gain clinical skills and science knowledge basic.

Despite the popularity of peer teaching and standardization in medical education centers, the opinion of medical students towards this practice remains unknown to many institutions and countries. In this research, it was proposed to describe the experiences and perceptions of Medical students about the peer teaching model, at the Autonomous University of Nuevo León, Mexico; in February 2021.

#### METHOD

**Type of study:** a descriptive, cross-sectional observational study was conducted in February 2021 with students from the Faculty of Medicine of the Autonomous University of Nuevo León (A.U.N.L).

**Universe and sample:** the universe was formed of 7 429 students from the Faculty of Medicine of the Autonomous University of Nuevo León (A.U.N.L) enrolled in the medical career divided between the first and twelfth semester. The minimum sample required was calculated to have a confidence level of 95 %, a margin of error of 5 % and heterogeneity of 50 %, resulting in 366 students. Responses submitted after reaching the minimum number were also taken into account, for a total of 423 students.

**Variables and data collection:** The variables sex, semester of study (clinical, basic), age, performance of instructors for teaching, clarity when teaching, interest in learning from novice peers, accessibility of students and how often instructors make themselves understood better than teacherswere studied. Satisfaction with previous instructors, positive impact of previous instructors at a personal or educational level, trust towards previous instructors to request support from other subjects and towards instructors to express doubts was also studied as well as the consideration of instructors as support for teachers' classes, subjects that have most influenced academic life and levels of adaptation of instructors.

The basic semester students were those who are in the first to sixth semester, and the clinical semester students were those that span from the seventh to the twelfth semester.

To carry out the survey (*Available in Complementary Files to the article*), a bibliographic search was carried out on the topic of interest to identify the main points to be evaluated with its development,

sociodemographic variables were included, as well as specific questions about personal experience with instructors (students who teach other students, stated as such in the authors' center).

The survey was distributed among medical students who took courses that have instructors, and who, in addition, teach at least three hours a week throughout the semester.

Seven subjects were selected: embryology, histology, anatomy, physiology, microbiology, pathology, and radiology. The survey was developed on Google Drive, and was approved by the Scientific Council and Ethics Committee of the university. It was sent through the University's Microsoft Teams groups for each semester.

**Statistical processing:** for the statistical analysis, an Excel database was created and the variables were analyzed using the IBM SPSS software version 26.0. The corresponding descriptive indicators were obtained: absolute and relative percentage frequencies.

**Ethical standards:** the paper received the approval of the Ethics and Research Committee of the Faculty of Medicine of the Autonomous University of Nuevo León and the basic principles established in the Declaration of Helsinki were kept. The information collected was only used for research purposes and informed consent was obtained from the participants, ensuring the anonymity and confidentiality of the data obtained.

### RESULTS

61 % of the students identified themselves as women and 57 % belonged to the clinical semesters of the career. The most frequent age group was 20-21 years (38.5 %).

79% considered that the instructors taught in a good or excellent way, and 78.7 % considered that the explanations were clear. Taking into account the interest placed in the classes, 72.6 % of the students classified it as excellent or good, as well as recognizing the accessibility as good and excellent (76.8 %). When asked whether the instructors made themselves understood better than the teachers, 179 (42.3 %) answered "almost always" and 116 (27.4 %) answered "always". (Table 1).

Most of the students are satisfied with the instructors they have had (84.9 %) and 85.8 % of them consider that the instructors had a positive impact on them. 55.3 % and 87.7 % of the students affirmed confidence in the instructors to request support from other subjects and to express doubts respectively. Almost 400 students considered the instructors as supporting elements for the teachers' classes (93.4 %). (Table 2).

27 % of those surveyed stated that the instructors who had the greatest influence on development during the career were those of the anatomy subject.

The change in modality from face-to-face to virtual classes in the midst of the COVID-19 pandemic was better in the radiology and imaging department (positive response in 72.3 %).

Table 1. Student responses about peer teaching. Faculty of Medicine of the Autonomous University of Nuevo León. February 2021		
Performance of instructors for teaching Terrible Bad Regular Good Excellent	N° (%) 5 (1,2) 8 (1,9) 76 (18) 235 (55,6) 99 (23,4)	
Clarity when teaching Terrible Bad Regular Good Excellent	6 (1,4) 12 (2,5) 72 (17) 215 (50,8) 118 (27,9)	
Interest in learning from fellow novices No interest Little interest Some interest Great interest Much interest	7 (1,7) 32 (7,6) 77 (18,2) 149 (35,2) 158 (37,4)	
Instructors accessibility with students Any Little Regular Much Excellent	3 (0,7) 23 (5,4) 72 (17) 130 (30,7) 195 (46,1)	
How often instructors make themselves understood better than teachers Never Sometimes Frequently Usually Always	8 (1,9) 18 (4,3) 102 (24,1) 179 (42,3) 116 (27,4)	
Source: applied survey		

### DISCUSSION

Those students who learn to develop as teachers and researchers during their period as undergraduate students will find these competencies less difficult when they become postgraduate students or physicians attached to a service<sup>10</sup>.

The number of medical schools in the US that have students as instructors is large. In a study consisting of a national survey in which the number of schools using this type of education was evaluated, 100 % of them answered affirmatively, but only 44 % had a formal program, finally it was concluded that it was necessary to formalize these programs<sup>9</sup>.

In the case of the A.U.N.L. programs, the center to which the authors belong, the students do not correspond to a formal program but to a department where they assist the professor and resolve the student's doubts. Of the 7 500 students over the twelve semesters, only students

Table 2. Student responses about peer teaching		
Satisfaction with previous instructors Yes No	No. 359 64	% 84,9 15,2
Positive impact of previous instructor on a per- sonal or educational level		
Yes No	363 60	85,8 14,2
Confidence towards previous instructors to re- quest support from other subjects Yes No	234 189	55,3 44,7
Trust towards previous instructor son a perso- nal or educational level Yes No	371 52	87,7 12,3
Consideration of instructors as support towards teachers' classes Yes No	395 28	93,4 6,6

between the third and tenth semesters can participate in these tutoring programs. About 20 % of the approximately 4 000 students work in a department as instructors, preventing the faculty from achieving the goal of training future doctors as teachers due to lack of space.

Medical students have played an important role in teaching preventive medicine concepts such as chronic degenerative diseases or infectious diseases in local communities, using basic language to make the message clearer to people <sup>11,12,13</sup>. Therefore, this peer education system also makes it possible to benefit the general population.

The data obtained in this study are consistent with what was previously reported, where the use of classmates as tutors has served to a better explanation of biomedical concepts to lower-grade students, improve learning, and strengthen students' confidence when participating during the course class<sup>13,14,15</sup>. The importance of these programs has been reported in medical and non-medical careers.

On the other hand, it was found that students are satisfied with the performance of the instructors, and even that they can make themselves understood better than the teachers<sup>14,15</sup>. This is believed to be attributable to the relationship between instructors and students, which tends to be friendlier and closer.

In Mexico, studies that address the role of medical students as teachers are limited, and probably non-existent. In other countries of the region, such as Peru, the problem has been addressed, but not in a comprehensive manner<sup>16</sup>. Many studies have highlighted the need to implement this teaching model, arguing that it enables leadership development, can be easy for both instructor and student to follow, and helps reduce the workload for teachers.

Many university programs focus on the development of clinical skills, research and teaching of all students, however, it is apparent that teaching is the least developed of them<sup>17,18</sup>, and that this knowledge is prioritized over the theoretical one<sup>19</sup>.

The benefits of peer teaching have been mostly positive for the teaching of clinical skills<sup>20</sup>; on the other hand, authors such as Pasquinelli et al<sup>21</sup> have obtained mixed or inconclusive results.

A systematic review carried out by Yu et al<sup>22</sup> concluded that the model of students who teach students in undergraduate medicine programs is comparable to the teaching of professors, and that it could benefit the professional development of students. It is remarkable for the lack of primary studies carried out in Latin America, only counting on one that was carried out in Brazil by Sobral<sup>23</sup>.

Undoubtedly, the current COVID-19 pandemic has changed the way medical education is taught around the world, affecting both medical teachers and students <sup>24,25,26</sup>.

In the present investigation, most of the departments were valued positively for their adaptation efforts to the pandemic. The diagnostic imaging department was the best valued, while those of microbiology and physiology were the worst. This can be explained by the fact that it is easier to adapt the online classes to the digital images used for the radiology class, than to adapt the practices carried out in the microbiology and physiology laboratories, which were mostly canceled.

Indeed, the COVID-19 pandemic may be a new opportunity to strengthen matching and teaching among medical students. Various online platforms, such as Zoom or Microsoft Teams, allow students to create sessions to encourage teaching and discussion to solve a clinical problem<sup>27</sup>.

There the instructor can pair up with some students to guide them in solving the problem. Communication, listening and evaluation can also be improved using these platforms<sup>28</sup>.

A notable example is that of the Bristol School of Medicine, where fourth graders taught third graders about surgery, while third graders taught pathology to second graders through a videoconferencing platform<sup>28</sup>.

Finally, the need to develop undergraduate students with teaching skills should be emphasized as part of their integral development<sup>29</sup>.

The strengths of this research lie in the fact that this is the first study that evaluates peer teaching in Mexico and that it consisted of a significant sample, however, as a limitation, its descriptive methodology stands out. It is expected that this study will stimulate future research on the matter.

#### CONCLUSIONS

Through the present, it was possible to describe the experiences and perceptions of the Mexican medical students, it was visualized that the perception of the students to the peer teaching model is positive and that it can be found as a feasible strategy to complement the teaching by the assigned professors, in addition it is a great supportive option for the current contingent situation.

#### **AUTORÍA**

PGE: conceptualization, formal analysis, research, methodology, validation-verification, writing-original draft, writing-review and editing.

EBH: formal analysis, project management, research, resources, writing-original draft, writing - review and editing.

JPRP y RAS: monitoring, visualization, research, writing-original draft, writing-review and editing.

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# Percepción de los estudiantes de Medicina hacia la enseñanza entre pares en una universidad de México

### RESUMEN

Introducción: la enseñanza entre pares es común en universidades y permite a los estudiantes enseñar a sus compañeros desde los primeros años académicos. Durante la pandemia de COVID-19 los estudiantes de Medicina han tenido que aprender mediante clases online, pero la enseñanza entre iguales les ha ayudado a superar estos retos educativos. Objetivo: describir las experiencias y percepciones del alumnado de Medicina sobre el modelo de enseñanza entre pares. Método: se realizó un estudio observacional, descriptivo y transversal. Se aplicó una encuesta de realización propia integrando variables sociodemo-gráficas y experiencias personales. Se compartió entre los estudiantes de Medicina y se evaluó el modelo, se encontró como muestra mínima necesaria la cantidad de 366 estudiantes entre 1-12 semestre de la Universidad Autónoma de Nuevo León. Resultados: se identificaron 258 (61 %) mujeres, se consideró por 334 (79 %) que los instructores enseñaban de una manera buena o excelente, se refirió por 333 (78,7%) que se tenía una claridad buena o excelente de las explicaciones. Además, 295 (69,7 %) nombró que los instructores explicaban mejor que los profesores casi siempre o siempre y 359 (84,9 %) explicó sentir-se satisfechos con los instructores. Los departamentos mejor valorados fueron radiología (72,3 %) calificándola como buena, patología (69 %) y embriología (68,7%). Conclusiones: se encontró que la percepción de los estudiantes al modelo de enseñanza de pares es positiva, que puede servir para complementar la enseñanza de profesores y ser de gran utilidad ante la situación actual de pandemia.

Palabras clave: COVID-19; Educación de Pregrado en Medicina; Estudiantes; Enseñanza.



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