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# Effectiveness of virtual peer-led medical Spanish course enhancing healthcare communication skills

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## Abstract

As of July 1st, 2021, the US Hispanic/Latinx community is estimated at 62.6 million, making up 18.9% of the population. Despite federal regulations requiring access to medical interpreters, clinicians often resort to alternative translation methods, increasing the risk of errors. Medical Spanish education lacks standardization in US medical schools, and information on curricula provided by International Medical Schools (IMGs) is limited. We aimed to demonstrate the effectiveness of virtual, peer-led Medical Spanish education for an international medical school cohort. The course consisted of 10 weekly one-hour lectures via Zoom. From 2022 to 2023, three cohorts successfully completed the course. Through realistic clinical scenarios, students practiced and reinforced their clinical knowledge in Spanish. The final exam involved a 20-minute patient encounter on Zoom, with the instructor acting as the patient and the student as the physician. Performance evaluation followed a standardized checklist. Each question was worth 3 points, with a total of 63 potential points. The passing score ratio was set at 2, equivalent to 66.7%, calculated by dividing the score by 21 (the number of questions). Student's self-reported comfort in obtaining a history and physical exam in Spanish, obtained before and after completion of the course post-comfort scores (median, 3), increased significantly compared to pre-course comfort scores (median, 0.5) - increased by an average of 2.5. This Online Spanish Medical Course (OSMC) requires no prior Spanish background or exposure, providing a notable advantage. Most students praised the convenient and effective online format. Despite its short duration, the course yielded significant benefits.

**Keywords** Spanish, Education, Online course, Cultural competency, Videos, Medical students, Communication

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## Introduction

As of July 1st, 2021, the Hispanic/Latinx population in the United States is estimated to be 62.6 million, which makes up 18.9% of the entire population. Of those 62.6 million people, 27.7% reported speaking English less than very well [1]. Although there are federal regulations that require hospitals to allow patients access to medical interpreters in their primary language, due to various factors such as the urgency of communication, time constraints, and difficulty of obtaining a medical interpreter in a timely manner, clinicians often resort to other methods of translation such as their own rudimentary Spanish translation, online translation, and/or using untrained family members or staff as interpreters [2]. This, in turn, leads to inaccurate or incomplete exchange of information, breaches of confidentiality, and unequal care of patients with limited English proficiency compared to their English-speaking counterparts [3].

The percentage of Spanish-speaking physicians lags behind as the population of Spanish speakers in the US grows [4–6]. This gap serves as the inspiration to design an online medical Spanish course to educate the next generation of doctors, so that there are less racial healthcare inequities. Surveys demonstrate more than 60% of US medical schools offer some form of medical Spanish education, yet barriers, such as students' time available to participate and lack of course credit, hinder further success [7, 8]. These limitations were seen in the Vega [9] and Chang [10] study with Vida Medical Spanish Curriculum. To overcome these limitations the authors hypothesized that the first ever online peer-peer Medical Spanish class would (a) increase students' confidence in their use of Spanish in a clinical setting, and (b) a condensed online format would be successful in teaching medical Spanish. Currently, there is no standardization of medical Spanish education in US medical schools, nor is there standardization of assessing the competency of self-identified bilingual medical providers. Our hope is that this course could become the standard for medical Spanish education and lead to certification by an institution. Lesser is known about the existing curricula of medical Spanish education offered by international medical schools, which are large contributors to the US physician workforce. Our study aims are multifold. We sought to demonstrate that virtual, peer-led Medical Spanish education effectively distills standardized material in an international medical school cohort. Further, we aimed to contribute to the existing literature of medical Spanish education as a means of possible framework for similar institutions to ultimately shape a certification curriculum accessible to all healthcare providers.

**Table 1** Session timeline, description of each segment of the 1-hour online class

| Activity | Description |
|---|---|
| *Introduction* (10 min) | Introduce weekly case and discuss any topics from prior lecture that students did not feel comfortable with. |
| *Video lecture* (30 min) | Student roles are assigned.<br>Analysis of video encounter. Video played segment by segment, allowing students opportunity for practice and review. Once all students are comfortable, next segment of video is played.<br>1. Intro/ open ended question<br>2. Establish CC<br>3. Hx/RoS<br>4. Physical exam<br>5. Order/review labs<br>6. Assessment & plan<br>7. "Teach-back"<br>Students are provided ongoing feedback to improve grammar and pronunciation. |
| *Full case practice* (10 min) | Once the case has been discussed, students practice full cases together from start to finish using what they learned in current and previous sessions. |
| *Closing thoughts* (10 min) | Review new topics discussed, address final questions, and preview next week. |

## Methods

### Course structure

The Introduction to Medical Spanish Elective is a 10-lecture online course, offered multiple times a year via Zoom and consists of weekly 1-hour instruction. To date, three cohorts of students have completed the course from 2022 to 2023. The course goal is to create an interactive environment that simulates real-life clinical scenarios allowing the students to learn, practice, and reinforce their clinical knowledge in Spanish.

The course curriculum includes grammar, anatomy, cultural competency, and standardized patient case videos with Spanish/English scripts [Table 1]. The lecture videos serve as the main teaching material, covering common chief complaints such as vaginal discharge, back pain, abdominal pain, headache, chest pain, shortness of breath, and a general pediatric encounter. Students were provided with the lecture video link prior to class to familiarize themselves with the content. During the lecture, students play the roles of both the patient and the doctor, watching the video synchronously. They receive live feedback on grammar, pronunciation, and alternative phrases to convey their communication goals. The videos adhere to the standard United States Medical Licensure Examination Clinical Skills (USMLE Step 2 CS) vignette format and are available on YouTube to facilitate accessibility.

### Students' selection

The course was open to any interested medical students (both pre-clinical and clinical years) as well as residents. It was promoted via St. George's University School of Medicine (SGUSOM) "Clinical Students" Facebook Page.

The initial post about the course provided a description and a link to a Google form for prospective students [Supplemental Survey 1]. 126 medical students replied to the initial invitation through a Google survey about availability in the schedule. This information was collected in an excel sheet to propose tentative time for the sessions where instructors and participants were available [Supplemental Copy of IMS Reponses_Cohort1_2022]. The course description explicitly stated that certification was not available at that time and emphasized that participation was entirely voluntary, without monetary or any other form of compensation. Students were asked for their contact information in addition to demographic information that included level of medical education (pre-clinical vs. clinical years). Additionally, students were requested to select their meeting preference: a fixed schedule (e.g., 'every Saturday') vs. a flexible schedule (e.g., a non-fixed day of the week that best suited the majority of students). Students were also able to indicate their preferred days of the week and times of day to meet for class. Student selection criteria included: (1) availability to participate in at least 80% of lectures, (2) commitment to take the final exam, and (3) students who are in their clinical years (with the assumption that this population of students aim to bolster interview skills and patient interaction). Selected students receive an email about their acceptance to the course, a link to the YouTube channel containing lecture videos, and the tentative meeting days/time(s). Cohort size was 15 students (or fewer) to allow for adequate participation to ensure success.

In addition to the Facebook Clinical page announcement, students doing their rotation at Wyckoff Heights Medical Center in Brooklyn were also informed about the course and given the opportunity to apply via a Google form. This medical institution, and several other SGU-SOM clinical affiliate locations, demonstrate a prevalent Spanish-speaking population and offer an appropriate environment for students to practice medical Spanish.

The level of Spanish fluency and college Spanish education were self-reported by the participants and collected through the pre-course survey. It was sent to all the students who initially enrolled in the Online Spanish Medical Course (OSMC) and it was requested to be completed before the first session (Supplemental Material Survey 2).

### Comfort measure

The comfort score level was obtained during the pre-course and post-course survey through a question; *How comfortable do you feel with taking a patient's history and chief concern in Spanish, using appropriate medical terminology?* (Supplemental Survey 2 and 3) The comfort level was measured through a scale from 0 to 5, where 0 equals unable to take the patient's history and 5 very comfortable to take the patient's history.

### Final exam evaluation

Students who achieved an 80% participation attendance were the only ones eligible to take the exam. Those who met the eligibility criteria for the final exam were notified and encouraged to participate voluntarily. The final exam consisted of a 20-minute patient encounter conducted via Zoom, in which the course instructor played the role of the patient, and the student played the role of physician. A standardized checklist [Supplemental Table 2] was used to evaluate participant performance. Questions were divided into subcategories and each question was given a value of 3 points for a total of 63 potential points. This value was then divided by 21 [the total number of questions]. The passing score ratio was 2 [an equivalent passing score of 66.7%].

## Materials

The course was developed using different digital platforms. The clinical cases lectures were hosted on the YouTube channel "doctormartinez," (https://www.youtube.com/channel/UCou6AVYEqYyv6CeqeEEnpSA/featured) . The tutorial videos available in this platform were created with different softwares on Adobe Creative Cloud 2021(Adobe. Inc San Jose, CA, US). Zoom (Zoom Video Communications, Inc. San Jose, CA, US) was used as the online meeting platform, enabling interactive sessions regardless of the different geographical areas the students were located. Google Forms and Google Drive were utilized to collect survey data and facilitate information sharing among the instructors.

### Data analysis

Students completed pre- and post-course surveys (https://docs.google.com/forms) collecting demographics, level of Spanish fluency, previous amount of Spanish language education comfort obtaining an H&P, effectiveness of tutorial material, relevance of the topics and objectivity of the online medical encounter test. Participants used a 5-point Likert scale to quantify their comfort with obtaining an H&P in Spanish before and after completing the course. Then, we compared the mean comfort scores from the pre-course survey to those of the post course survey via a Mann Whitney U Test (Wilcoxon Rank Sum Test). (Supplemental Table 6).

The instructors participated as standardized patients and graded students in a 20-minutes Online medical encounter using video conference platform (Zoom Video Communications, Inc. San Jose, California, US). The results of the Online Spanish Medical Encounter test were obtained using a grading rubric from the publication by Vega et al. December 2020. (Supplemental Table

2). The data analysis was complete using Excel Version 2402. Microsoft 365.

## Results

### Participants characteristics

Although most medical students at Wyckoff Heights Medical Center are from Saint George University (SGU), and the course was promoted among SGU medical students through their clinical Facebook page, it was open to all interested students, regardless of background or origin. The Online Spanish Medical Course (OSMC) assisted this cohort of international medical students in enhancing their linguistic skills, considering the unique aspects of their clinical rotations, which were spread across various hospitals in different states with varying schedules. The IMGs who initially enrolled in the course were 18 students (60.0%) in their fourth year, 9 students (30%) in their third year, 2 residents (6.7%) and 1 student (3.3%) in their second year of medical school. (Fig. 1).

Amount of college-level Spanish education was collected for the students who initially enrolled in the OSMC (Supplemental Material Survey 2): 15 participants (50%) did not study Spanish in college, 6 participants (20%) studied Spanish for less than 2 years in college, 3 participants (10%) studied for 4 years in college, 5 participants (16.7%) between 2 and 4 years in college and 1 participant (3.3%) studied 1 year in college. The experience of studying Spanish in a Spanish-speaking country was also collected: only 10% studied Spanish abroad, 90% of the participants never studied Spanish abroad.

Participants were also asked in the survey to determine their perceived level of Spanish fluency, with most students reporting beginner-level Spanish (Fig. 2). When the participants were asked about exposure to different Latino/Hispanic cultures in healthcare, 36.7% had some exposure through coursework and/or clinical experience, 30% had extensive exposure, 23.3% had little exposure, and 10% had no exposure.

### Comfort in obtaining a history and physical in Spanish

Student's self-reported comfort pre and post course from the 14 students that complete at least 80% of participation of the sessions increased in all of them (Supplement Table 1). The comfort scores median increased by 2.5 (Supplemental Tables 3 and Supplemental Table 5). We found statistical significance in the self-reported comfort between the pre course and post course survey ($p<0.05$) (Fig. 3). After the completion of the course, 100% of students reported improvement of their basic and necessary skills to start speaking Spanish with their Spanish-speaking patients.

### Evaluation of students through the online Spanish medical encounter test

From the initial 31 participant students, only 14 met the attendance requirement to be able to participate in the final examination (80% attendance to the tutorial classes). The median score of the participants was 2.38 (range 1.86–2.8) (Supplemental Table 4). Four participants failed the test, the passing score was 2.0 and above that is 66.7% of correct answers, scoring less of 2.0 (equivalent < 66.7%)

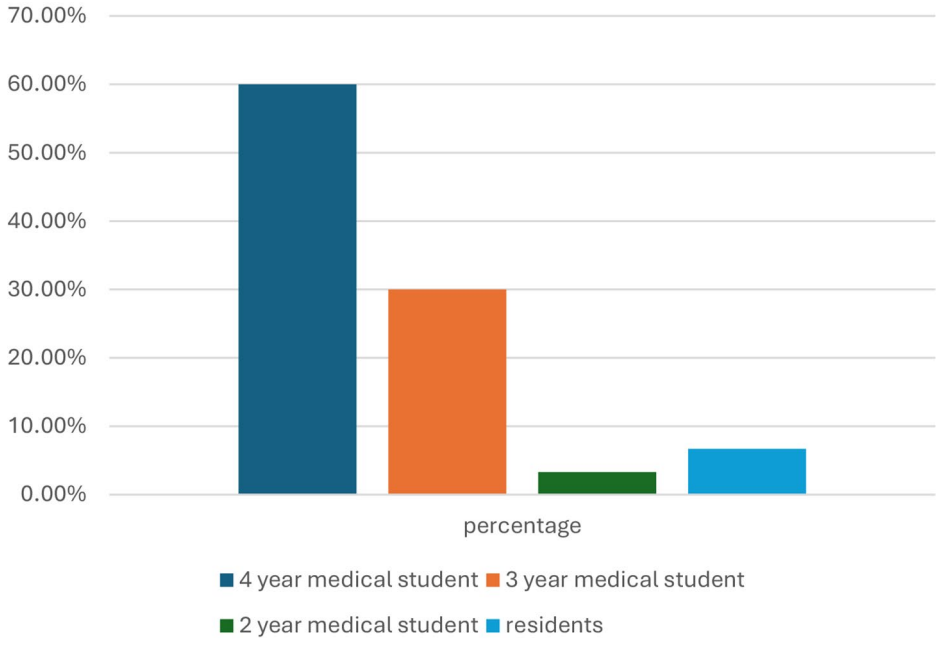


**Fig. 1** Characteristics distributed by percentage of students enrolled for the Online Spanish Medical Course (OSMC)

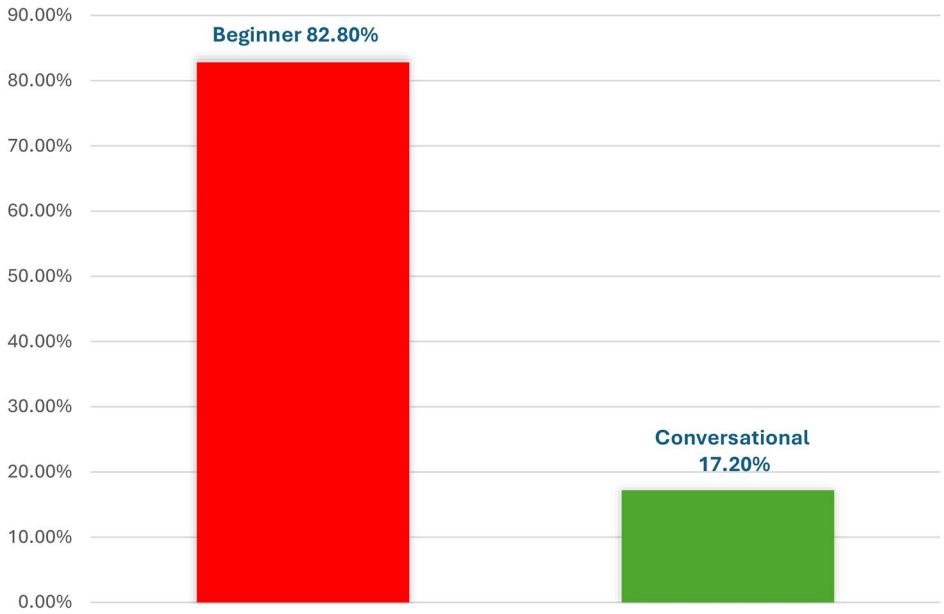


**Fig. 2** Self-Report Spanish fluency of the students in the pre-course survey. Red bar: beginner level, green bar: conversational level distributes by percentage

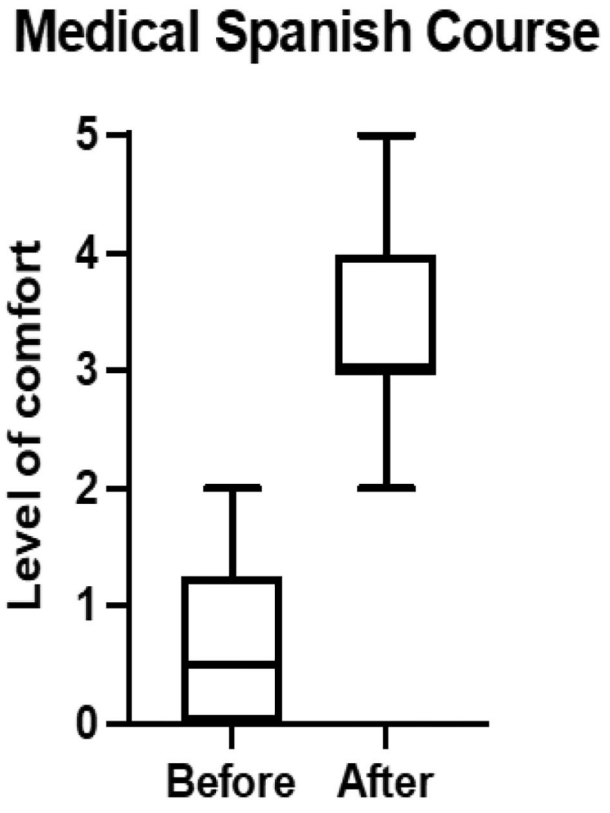


**Fig. 3** Boxplot of self-reported level of comfort to take medical history in Spanish before and after the completion of the Online Spanish Medical Course (OMSC). 0 equals unable to take a medical history and 5 very comfortable to take it. There is statistic significant different comfort before and after the OMSC

and 10 participants scored 2 or above (>66.7%). There were not outliers between the participants. (Fig. 4). The standard deviation of the results of test was 10.0% with class mean score of 76.7%.

### Assessment of the OSMC by the participants who completed the sessions

The students who completed the course were asked if the tutorial videos created for the OSMC were important in their process of learning: 88.9% considered them very important, 11.1% important, and no students considered the videos not important. When they were asked; *Do you agree that this course will help you enough to work with Spanish speakers regardless your current proficiency in Spanish?* 66.7% of the participants answered "Yes, it would" and 33.3% answered "maybe". Finally, participants were asked if they thought the online format was just as effective as an in-person version of the course: 77.8% answered "yes, it would", 11.1% answered "maybe", and 11.1% answered "no".

## Discussion

In summary, the creation of this Online Spanish Medical Course (OSMC) has helped international medical graduates, who complete the course and were evaluated, improving their linguistic skills in a healthcare setting while they are enrolled in clinical rotations all over the U.S.

After the course was completed, students self-reported an increase in confidence in obtaining a history and performed physical exam. This is a major accomplishment

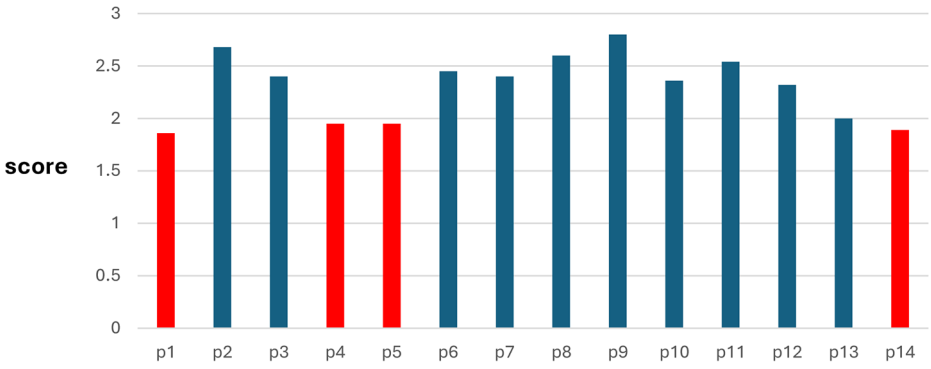


**Fig. 4** Results of the 20-min online evaluation for the Online Spanish Medical Course (OSMC). Each bar represents the results of one participant (p1-p14). Blue bars: passed the test, red bars failed to pass the test. The passing score was 2.0 and above (equivalent of 66.7% of correct answers). The lowest score is 1.86 (p1), the highest score is 2.8 (p9)

because obtaining a more thorough H&P in a patient's native language leads to better diagnosis and patient outcome. Furthermore, to be able to provide better patient-centered care just by taking a short course is a worthwhile effort for any medical student. We were confident that participants that passed the course improved their medical Spanish proficiency because the post course evaluation meets the recommendations suggested by Ortega [2]. It was a face-to-face communication skills and comprehension test conducted by Zoom videoconference that allowed us to evaluate the listening, pronunciation and comprehension of medical Spanish of our participants.

In comparison to the Vega study, the design of our course was tailored to clinical IMG students, did not require in person attendance, and is not supplemental learning to an existing course. The Online Spanish Medical Course was for clinical students so that they can practice what they're learning and apply it in a real clinical scenario. Furthermore, the course is robust and does not require any other outside resources to be successful. The study was designed with every type of learner in mind since there was no requirement for a background or prior exposure to Spanish.

The greatest features of an online course are its convenience and accessibility. The participants consisted of third and fourth year international medical students who were spread out all over the U.S. in different time zones. The accessibility of the course also meets a national need in medical education. A national survey in 2019 was done to assess Spanish Medical Education in US medical schools. Across all primary survey respondents, 96% (112/117) agreed that medical Spanish education is wanted or needed at their institution. In addition, 84% (105/125) of all respondents and 91% (42/46) of schools who did not already have formal curricula agreed that a faculty development course to train faculty to teach medical Spanish would be desirable [8]. Our OSMC could relieve the burden of US medical schools from having to develop a course, and with our peer-peer model would relieve a financial burden of having to train and hire faculty. If we compare online learning to a formal classroom setting, 88.9% of participants thought the online format was just as effective as an in-person format. However, the online platform does have limitations when it comes to learning a language because of the lack of human interaction, but we did our best to simulate that in our videos.

The biggest limitation for the participants was time. Due to the time constraints and considering the general requirements of medical school, the course was limited to 8 one-hour online lessons. The major success and efficacy of this study is that even though the course was brief, 100% of students reported improvement of their basic and necessary skills to start speaking Spanish with their patients. The brevity of our course is truly a strength because it makes it more desirable for medical students to enroll. The study was designed to be manageable for medical students with an already full workload versus the Chang study that consisted of an 18-month on-site instruction. While the brevity of our course is a strength, it can also be a limitation. However, the course can serve as a launching point for students who decide to further their medical Spanish knowledge.

Going forward, the goal is course accreditation either through a medical school or national hospital system. Having an accredited curriculum allows medical students to have it as part of their medical school transcript to set them apart in their career in medicine. Other goals include expanding the design of the course to address cultural differences within the Hispanic population to promote cultural competency in healthcare and improve patient outcomes.

## Conclusion

In conclusion, the Online Spanish Medical Course (OSMC) has proven to be a valuable tool in improving the linguistic skills of international medical graduates (IMGs) enrolled in clinical rotations. The course successfully increased participants' comfort in obtaining a history and physical in Spanish, as evidenced by significant improvements in self-reported comfort scores. The course prepared the participants for a face-to-face communication skills and comprehension test conducted by Zoom videoconference that allow us to evaluate the listening, pronunciation and comprehension of medical Spanish.

The students also reported improvement in their basic and necessary skills to communicate with Spanish-speaking patients. The online format of the course was well-received by the majority of students, highlighting its convenience and effectiveness. While the course was limited in duration, it demonstrated significant benefits within the given timeframe. Future plans involve seeking course accreditation and expanding the curriculum to address cultural competency and improve patient outcomes.

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12909-024-05918-w.

Supplementary Material 1

Supplementary Material 2

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**Author contributions**

Juan Carlos Martinez MS, MD; creator of the online material for the Spanish course, writing the manuscript, promoting and teaching the course. Amado Estrada Fernandez, MD; writing the manuscript, promoting and teaching the course. Christine Bieber, MD; writing the manuscript and teaching the course. Priscilla Orellana, MD; writing the manuscript and teaching the course. EmiliAnne Wheeler, MS, MS3; writing the manuscript and teaching the course. Juan Carlos Fuentes-Rosales, MD, JD, MPH, data analysis of the results.

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**Data availability**

The data that support the findings of this study are available on request from the corresponding author, Juan Carlos Martinez. The data are not publicly available due to containing information that could compromise the privacy of research participants.

## Declarations

**Ethics approval and consent to participate**

Not applicable

**Consent for publication**

I declare that the participants in this study have consented to publish the results of their participation also allow to analyze and discuss those results in this manuscript

**Competing interests**

The authors declare no competing interests.

**Experiment on humans**

We didn't perform any experiments on humans and/or we use human tissue samples.

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## Publisher's note