The Students' Point of View on the Teaching of Anatomy at the Universidad del Norte, Colombia, Amid the Covid-19 Pandemic

El Punto de Vista de los Estudiantes sobre la Enseñanza de Anatomía en la Universidad del Norte, Colombia, en Medio de la Pandemia de Covid-19

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MARTINEZ, E. G.; PADRÓN, R. R. & VILLALBA, P. J. The students' point of view on the teaching of anatomy at the Universidad del Norte, Colombia, amid the Covid-19 pandemic. *Int. J. Morphol., 40(1)*:46-50, 2022.

SUMMARY: The Covid-19 pandemic has disrupted long-standing educational practices. In Colombia, online learning depends on academic and non-academic factors, and this dependence makes e-learning even more difficult. This paper aimed to study the students' viewpoint of Anatomy teaching at Universidad del Norte, Colombia, during the Covid-19 pandemic. One hundred sixteen students answered a questionnaire about their opinions on several topics related to online learning of Anatomy. The strongest correlation observed showed that the students agree that online anatomy classes make the subject more difficult to learn when compared to face-to-face lectures. Negative attitudes toward motivation, lack of personal contact with classmates, and complaints about being taught without laboratory sessions with cadavers were among the principal negative attitudes in students. After almost one year, motivation to participate in online classes went down; however, students improved their judgment about remote anatomy learning and their views about using authentic anatomy images during online sessions and substituting real anatomy images for apps. Anatomy sessions will have to adapt their learning tools to e-learning as time constraints allow, creating a new environment for students to participate, learn, and take advantage of this change.

KEY WORDS: Covid-19 pandemic; Remote learning; Human Anatomy; Students' opinions.

INTRODUCTION

The Covid-19 pandemic has disrupted long-standing educational practices and has caused an urgent need for many institutions to rapidly implement alternative educational and assessment strategies (Longhurst *et al.*, 2020). Like many other countries (Evans *et al.*, 2020), Colombia went into the lockdown strategy to constrain viral transmission, send students home, and switch face-to-face teaching to remote learning strategies. For years Anatomy curricula have been utilizing an ever-increasing amount of modern technology to create blended learning environments, combining traditional face-to-face teaching experiences with various online activities (Khalil *et al.*, 2018). At Universidad del Norte, Anatomy teaching has been provided in the past eight years using a mixture of face-to-face lectures and laboratory sessions with prosections, online videos, and apps. Therefore, moving from face-to-face physical-based activities as the students

were used to in lecture rooms and the laboratory to use technologies such as Blackboard Collaborate to deliver synchronous and asynchronous online lectures represents a significant challenge. In Colombia and other low-middle-income countries, online learning depends on non-academic factors like energy supply and internet infrastructure, and this dependence makes e-learning even more difficult. The physical limitations challenged students confined to their homes, in infrastructure deprived areas to keep an online connection; thus, synchronous and asynchronous teaching should coexist so that every student fulfills learning outcomes. There are no previous papers published in Colombia about students' engagement in learning Anatomy under these circumstances. This article was aimed to search the students' viewpoint of Anatomy teaching at Universidad del Norte, Colombia, during the Covid-19 pandemic and a year after.

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MATERIAL AND METHOD

Curricular Design at the Universidad del Norte, School of Medicine, has been published before (Martinez & Tuesca, 2014). The module corresponding to the musculoskeletal system during the third semester of the undergraduate medical program has 65 hours of gross human anatomy (lectures 55 %, laboratory 30 %, and clinically oriented case discussion 15 %), representing 35 % of the total hours of the module. The academic period (2020-1) started in January as usual, and by mid-March, the University went into lockdown until the beginning of April; subsequently, academic activities continued with 100 % online sessions.

At the end of the 3rd-semester academic period, the students were invited to answer a thirteen-item questionnaire based on a five-point Likert-type scale (ranging from 1=strongly disagree to 5=strongly agree) and an open short-answer question to assess their opinion about the switch from face-to-face physical-based activities in Anatomy to a 100 % synchronous and asynchronous online lectures and laboratories. The questionnaire was developed by the two faculty of Anatomy (EM and RP) according to their assumptions and previous experience teaching similar contents about how synchronous and asynchronous online lectures and laboratories could influence the students' opinions about Anatomy learning. Spearman Rho's non-parametric test was used to analyze the potential correlation between questions (a=0.05).

At the end of the 4th academic semester and after almost one year of remote teaching and learning activities, a second survey was delivered to the students asking for technical and academic issues during this period they have had experimented.

This study was conducted with the Centre for Teaching Excellence (CEDU) approval at the Universidad del Norte. To respond the survey and participate in the study was entirely voluntary for the students, and it was not considered part of the global evaluation process. Written consent was delivered and signed by the participants.

RESULTS

Approximately 82 % of the total eligible students completed and returned the questionnaire. Table I have shown average responses to the student satisfaction survey after the remote Musculoskeletal System Module. Results showed that two broad strands of responses could be considered, which positively value the change from face-to-face to online classes and those against it. Considered as positive were: (a) the students felt that online sessions made access to lectures and learning outcomes more accessible and understandable; (b) the online sessions (synchronous and asynchronous) allowed more time to study and (c) the review and feedback provided by faculties were adequate. On the other hand, considered as unfavorable were: (a) the connectivity was a significant concern, mainly in regions far away from Barranquilla (rural areas); (b) the students considered that online learning is not better than face-to-face classes regarding understanding and comprehension and (c) the students considered that the available apps were not enough to substitute face-to-face laboratory sessions, which are essential in their medical training.

Table I. Average students´ responses to the satisfaction survey after remote teaching and learning of Musculoskeletal System Module during Covid-19 pandemic.

	Questionnaire element	ASR*
A.	Remote mode makes access to anatomy lectures easier	3.6
B.	Technical issues have been the main difficulty in remote lectures.	4.0
C.	Timetable have been the main difficulty in remote lectures.	2.3
D.	Motivation have been the main difficulty in remote lectures	3.4
E.	Online learning activities has allowed a better understanding of the topics than face-to-face lectures.	1.9
F.	Learning outcomes in online modality have been formulated properly.	3.3
G.	Online learning of Anatomy is easier than face-to-face.	1.7
H.	Learning anatomy face-to-face allows a better understanding	4.4
I.	Using the cadavers in the laboratory is essential in training as a doctor.	4.5
J.	With the apps available, face-to-face activities in the laboratory is not needed.	1.9
K.	Online lessons allow more time to study.	4.0
L.	The review and feedback provided on each subject have been laboratory is not needed.	4.1
M.	In online assessments, spotter test enhances learning.	3.6

*ASR (average students' response). Students' responses were gauged a 5-point Likert-type scale (ranging from 1=strongly disagree to 5=strongly agree) and data are an average representation from 116 respondents.

Regarding answers to the open short-answer question, the more relevant were:

1. Lack of motivation;
2. Medicine, particularly Anatomy, is a hands-on subject, and for that reason, students were not comfortable having online classes;
3. Lectures delivered asynchronous, and a tremendous amount of readings delivered by faculties reduced the possibility for them to ask questions during the lecture;

4. To many students, the lack of personal contact with their classmates was a significant issue.

After almost one year, the second survey (Table II) showed, among others, that motivation to participate in online classes went down. However, on the other hand, students improved their judgment about remote anatomy learning and their views about using authentic anatomy images during online sessions and substituting real anatomy images for apps.

Table II. Average students´ responses to the survey related to technical issues and academic satisfaction after a year of remote Musculoskeletal System Module teaching and learning.

Question	ASR*
1. Technical issues to remote learning are:	3.9
2. Motivation to participate in online lectures:	2.7
3. Time and facilities to study are:	3.1
4. Curricular design and timetable are:	2.9
5. Anatomy remote learning is:	3.0
6. Presentation of authentic anatomy images based on human bodies during remote lectures and laboratories makes learning:	4.0
7. Replacing authentic anatomy images based on human bodies with apps (Essential Anatomy or Acland´s Videos of Human Anatomy), makes lectures learning:	3.7

*ASR (average students´ response). Questions 1-4 were gauged on a 5-point Likert-type scale (ranging from 1= worst to 5=very good), and data are an average representation. Questions 5-7 were gauged on a 5-point Likert-type scale (ranging from 1= more challenging to 5= not challenging at all), and data are an average representation.

DISCUSSION

The Covid-19 pandemic has affected all industry sectors worldwide, including education (Ayittey *et al.*, 2020). Few medical and health science education disciplines have seen a more significant shift in delivery approaches than gross anatomy due to Covid-19-related stay-at-home orders and physical distancing restrictions (Evans *et al.*).

By March 18th, Universidad del Norte closed the campus in response to national government regulations and banned any face-to-face learning sessions offered to students, and all teaching activities were moved online. Although anatomists have been crucial in promoting computer-based educational innovations (Trelease, 2016), Anatomy is one of the most challenging subjects to be delivered online (Evans *et al.*), mainly in a country with significant inequalities in technological and communications facilities, Internet included. Online anatomy education will need to balance the amount of content delivered against the learning materials' quality to keep students motivated to be in that environment with us (Wilson, 2015). Numerous courses have been described that integrate online material as a central learning tool to deliver the required learning objectives

(Wright, 2012; Green & Whitburn, 2016; Attardi *et al.*, 2018). However, these courses were mainly blended learning in nature, while in Colombia, traditional face-to-face teaching methods are still the most widely used forms of medical education.

In our study, the students reported positive attitudes toward the easiness to access anytime-anywhere to the lectures (whether synchronous or asynchronous) offered by online teaching activities, albeit connectivity. Although previous reports show that students watching lecture recordings can also become distracted by other activities (Zureick *et al.*, 2018), no information about this subject was registered. Previously published mixed reports note the degree to which students are inherently predisposed to high levels of competency with Technology-Enhanced Learning Resources (TEL) (Selwyn, 2016; Kirschner & De Bruyckere, 2017); nonetheless, our results have shown no reports related to TEL difficulties expressed by the students. Correlation analysis showed a strong negative correlation between coded questions D and E in Table I, indicating that the low score for understanding in online learning could be related to lack

of motivation (p value= 0.006, Rho= -0.253). The strongest correlation observed among all comparisons correspond to coded questions E and G, showing that the students agree that online anatomy classes make the subject more difficult to learn when compared to face-to-face lectures (p-value = 2.058e-14, Rho= 0.634).

Students in face-to-face learning environments process social information differently from online learning environments (Slagter van Tryon & Bishop, 2009). In online learning environments, feelings of social disconnectedness, missing teacher interaction, and missing interpersonal interactions and social cues have been reported (Haefner, 2000; Menchaca & Bekele, 2008), consistent with our findings.

In this paper, the students reported negative attitudes toward motivation, lack of personal contact with their classmates, and complaints about being taught without laboratory sessions with cadavers. In the survey made a year after the beginning of the pandemic, lack of motivation persisted (Table II). However, using authentic anatomy images based on human bodies during the online labs made the students feel much better about their anatomy knowledge.

With the availability of numerous adjuncts or alternatives to learning anatomy other than cadavers (medical imaging, models, body painting, interactive media, virtual reality), the costs of maintaining cadaver laboratories and the advances in TEL that allow for online distance learning, acquiring anatomical knowledge in the laboratory with cadavers is often a matter of controversy (Ghosh, 2017), particularly in Colombia. A few years ago, anatomy teachers, surgeons, students, and others discussed the importance of human bodies in Anatomy in a symposium, and the result was published in Medical Teacher (McMenamin *et al.*, 2018). Although most of the audience thought it was necessary exposure to cadaver material as an experience for undergraduate medical students, they were not convinced that actual dissection was needed in an undergraduate medical course.

After a year of remote learning, the present report showed that the students in this cohort favorably view replacing authentic anatomy images based on human bodies with apps or videos, which denotes an essential change concerning the survey carried out initially, and perhaps it may be related to the use in a different way than usual of the technological resources available for learning the subject.

The authors would like to suggest, to take advantage of the new reality where new ways of teaching are opening up and in which all educators must adapt their learning tools

to e-learning as much as time constraints allow it, creating a new environment for students to participate, learn, and take advantage of this change because everything seems to indicate that this new reality is here to stay.

Finally, the authors also wish to encourage other teachers to transform how they teach and students learn.

MARTINEZ, E. G.; PADRÓN, R. R. & VILLALBA, P. J. El punto de vista de los estudiantes sobre la enseñanza de anatomía en la Universidad del Norte, Colombia, en medio de la pandemia de Covid-19. *Int. J. Morphol., 40(1)*:46-50, 2022.

RESUMEN: La pandemia de Covid-19 ha interrumpido las prácticas educativas de larga data. En Colombia, el aprendizaje en línea depende de factores académicos y no académicos, y esta dependencia dificulta aún más el e-learning. Este trabajo tuvo como objetivo estudiar el punto de vista de los estudiantes sobre la enseñanza de Anatomía en la Universidad del Norte, Colombia, durante la pandemia Covid-19. Ciento dieciséis estudiantes respondieron un cuestionario sobre sus opiniones sobre varios temas relacionados con el aprendizaje en línea de Anatomía. La correlación más fuerte observada mostró que los estudiantes están de acuerdo en que las clases de anatomía en línea hacen que la asignatura sea más difícil de aprender en comparación con las clases presenciales. Las actitudes negativas hacia la motivación, la falta de contacto personal con los compañeros y las quejas de que se les enseñe sin sesiones de laboratorio con cadáveres fueron algunas de las principales actitudes negativas de los estudiantes. Después de casi un año, la motivación para participar en clases en línea disminuyó; sin embargo, los estudiantes mejoraron su juicio sobre el aprendizaje remoto de anatomía y sus puntos de vista sobre el uso de imágenes de anatomía auténticas durante las sesiones en línea y la sustitución de aplicaciones por imágenes de anatomía real. Las sesiones de anatomía deberán adaptar sus herramientas de aprendizaje al e-learning según lo permitan las limitaciones de tiempo, creando un nuevo entorno para que los estudiantes participen, aprendan y aprovechen este cambio.

PALABRAS CLAVE: Pandemia de Covid-19; Aprendizaje a distancia; Anatomía humana; Opiniones de los estudiantes.

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