Author’s response to reviews

Title: Specialty choice determinants among Mexican medical students A cross-sectional study

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Version: 1 Date: 25 Jul 2019

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RESPONSE TO REVIEWERS

Reviewer 1: Ambrose Rukewe

1. The title should be re-worded thus "Specialty choice determinants among Mexican medical students: a cross-sectional study" Language editing could be beneficial in doing justice to this work.

☐ We agree with the reviewer; the title was reworded as suggested and the phrase was modified in the rest of the manuscript. We did a new language review with a person fluent in English to improve the manuscript’s legibility.

2. Introduction section. Page 4 lines 24 - 31: Are the researchers insinuating that similar factors affect 5th year medical students and "young" physicians in choosing a medical specialty?
Thanks for identifying that point, we did not mean “young physicians” but senior medical students. To avoid confusion, we substituted the term “young physicians” with “medical students”.

3. Result section. Page 7 lines 4-9: Why is important to state that 91% of the students' parents are not physicians, 3% are GPs, 5% were in the specialty chosen by the students (which we do not know!) and 1% had a different specialty. This sentence is clumsy.

We agree with the Reviewer, thanks for pointing this out. In the revised version of the manuscript we just stated that 91% of the students’ parents are not physicians, omitting the other less relevant categories.

4. Page 7 lines 41-42: To which group does the 45% interested in rural practice belong? The 80% who plan to specialise or the rest? How does it contribute to the objective of the study?

The students interested in rural practice were distributed in both groups (planning or not to do a specialty) and we did not find an association between the interest in rural practice and planning to specialize. We think it is interesting that a substantial proportion of our students desire to practice in rural areas, since it is one of the most challenging problems of current healthcare.

5. Page 10 lines 4 - 14: Please, move the last 2 sentences to Discussion section.

We agree with the Reviewer. The sentences were integrated in the Discussion.

6. Discussion section. Page 12 lines 31-36: How truly global is the observation stated with only one reference by Kim et al?

Thanks for identifying that discrepancy. We added several references to support this claim.
Reviewer 2. Francisco Javier Bonilla-Escobar

• Thank you for opportunity of reviewing this article. It is well-written and the methodology is sound. The topic is one of high importance for the medical education field and of relevance for postgraduate medical education training.

☐ We appreciate the Reviewer’s comments and agree that the topic is an important one.

• With regards of the whole document:

1. Replace "developing countries" with "low- and middle-income countries"

☐ Thanks for the observation, we replaced the term accordingly in each of its four occurrences.

2. The article will be improved with a proofreading process made by a native english speaker.

☐ We did another review of the manuscript with a person fluent in English.

• Some additional methodological aspects are required like a sedimentation diagram, the validity of the instrument, and relevance of the results and the survey for stakeholders.

☐ These observations were addressed in the appropriate sections of the manuscript, as described below.
Specific comments are mentioned below:

1. Abstract:

1.1. Move the "The instrument Cronbach's alpha was 0.8." towards the beginning of the results description.

☐ The phrase was moved as suggested.

1.2. From the described results it is not clear how the authors get to the conclusion that states: "by the undergraduate experience, the desire to study a subspecialty and other factors."

☐ Thanks for raising this point. We modified the paragraph in the abstract to address and clarify this issue.

• 2. Background:

2.1. Grammar revision required. i.e.: The person used in this sentence is not sound "The trajectory of health professions students is fraught with"

☐ Thanks for the observation, we corrected the sentence and reviewed the rest of the manuscript for grammar issues.

• 3. Methods

3.1. Questionnaire: was face validated? who put the survey together and based on which criteria it was considered that the questionnaire was complete (content validity)?

☐ Thanks for the observation. The instrument was developed following several recommendations of the AMEE Guide for developing questionnaires in educational research (Artino AR et al. Developing questionnaires for educational research: AMEE Guide No. 87. Medical Teacher, 2014; 36:463–474), which involves several steps to accumulate evidence of validity.
For validity framework, we used the validity in educational assessment model of Kane and Messick described by Downing (Downing SM. Validity: on the meaningful interpretation of assessment data, Med Educ, 2003; 37:830-837), and adopted by the AERA-APA-NCME (American Educational Research Association, American Psychological Association, National Council on Measurement in Education, & Joint Committee on Standards for Educational and Psychological Testing. (2014). Standards for educational and psychological testing. Washington, DC: AERA). This model replaced the previous 3C model (content, construct and criterion), and posits that there are no different types of validity. It approaches validity as a unitary holistic concept where all evidence is construct validity, that is obtained from five different sources: content, response process, internal structure, relationship to other variables and consequences.

Briefly re instrument development: we did a broad literature review about instruments related to the construct of interest (specialty choice factors in medicine), synthesized the identified questionnaires and evaluated them with an expert-group of medical educators (clinicians with experience and Master and Doctorate degrees in the field); we selected the items relevant to the construct, obtained feedback about the items from a group of scholars from the Dept. Of Medical Education at UNAM Faculty of Medicine (psychologists, educationalists, clinicians), and via group consensus aimed to achieve content validity. We also obtained validity evidence from the internal structure source (reliability, factor analysis).

The current validity model excludes “face validity” as a reasonable evidence-based source of validity, so we did not document face validity in our study (Downing SM. Face validity of assessments: faith-based interpretations or evidence-based science? Med Educ. 2006;40(1):7-8).

We modified the pertinent areas of the manuscript adding information about the questionnaire’s sources of validity evidence. We are aware that any new instrument is a work in progress, and we are currently involved in a longitudinal project that will help refine the questionnaire, with several cohorts of medical students.

• 3.2. Factorial analysis is clearly described. However, was there any subgroup analysis of the population with regards of their preference towards a specialty (any) or comparing those with and without intentions of going through a residency training?

Thanks for the interesting question. We did not perform these subgroup analyses, since the main goal of this study was to find the most relevant factors considered by the students while
choosing a troncal specialty. We are currently initiating a larger study that will address these considerations, but for purposes of this paper, we believe the results presented are sufficient.

3.3. Please add the ethical approval code or ID of the document.

We do not have a specific ethical ID approval number for the study. Review and approval were provided by the Medical Education Department of the medical school as a non-invasive minimal risk study. The need for IRB ethical approval was deemed not necessary since this is an educational quality improvement study with no control group.

In Mexico there are no national guidelines for educational research, and no formal recommendations for educational research are available in our universities or healthcare institutions. The Research and Ethics Committees in our Faculty of Medicine have clear guidelines for informed consent in clinical research, but when educational quality improvement activities are implemented and there is no risk to the participants (experimental or invasive procedures, extreme stress, risk of adverse effects, biological sample collection, invasion of privacy), no IRB formal approval is required.

Data were managed anonymously in a confidential manner, the study was in compliance with the Declaration of Helsinki for research involving human subjects, and formal written informed consent was not required since this was a “research without risk” study, according to Article 17 of the Mexican Federal Law of Health Research, published in 1984 (http://www.salud.gob.mx/unidades/cdi/nom/compi/rlgsmis.html), and to Article 11.3 of the Mexican National Norm on Biomedical Research in Human Beings, published in 2013 by the Mexican Federal Government (http://dof.gob.mx/nota_detalle.php?codigo=5284148&fecha=04/01/2013). Participants were informed of the purpose of the study, and verbal informed consent was obtained. Verbal consent was preferred due to the nature of the study, and the limited time window available during participation.

In our Institution we are currently in the development phase of a section of the IRB that specifically reviews non-invasive, low-risk, educational and social science studies.

4. Results
4.1. Please do not begin a sentence with numbers or percentages.

☐ Thanks for the observation, we avoided this practice in the revised version of the manuscript.

- 4.2. Move this to the discussion: "These dimensions resemble the Bland-Meurer classification: personal values that develop and change during the undergraduate training (F1), career needs to satisfy (F2), and perception of specialty characteristics (F3). This confirms the suggestion that students choose a specialty based on a "package" or "cluster" of characteristics, rather than single features or interest in the specialty (Weiss et al., 2017)."

☐ Thanks for the recommendation, we have addressed this in the revised version of the document

- 4.3. Please add a sedimentation graph to show the potential number of groups of variables.

☐ Thanks for the suggestion. We added a scree plot figure to the results section.

- 5. Conclusion

5.1. This conclusion "The specialty choice decision is made usually during the last years of undergraduate training." is not coming from the results of study.

☐ We have rephrased the sentence to better reflect our results as follows: “The majority of medical students reached a final decision regarding specialty choice after they underwent clinical training, particularly during the last clinical immersion year”.

- 5.2. A statement describing how the factorial analysis results can be used by stakeholders in order to improve medical training is required.
Thanks for the recommendation. We added a few sentences to aid decision-makers and stakeholders in the use of the results.