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Establishing a baseline for multilingual capabilities of medical students at the Michigan State University College of Osteopathic Medicine

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Abstract

Context: The language proficiencies of Michigan State University College of Osteopathic Medicine (MSUCOM) medical students are unknown. As of 2015, approximately 8% (or roughly 25 million) of the US population over the age of five were considered “limited English proficient”. Research indicates, however, that it is valuable to patients to be able to communicate in their primary language with their primary care physician. If medical students’ language proficiencies were known, the medical school curriculum could be adapted to leverage or enhance a student’s language proficiencies, preparing students to serve in communities where their patients language proficiencies align.

Objectives: The aim of this pilot study was to survey MSUCOM medical students in order to assess their language proficiencies with two goals in mind: first, to develop medical school curriculum that would leverage student’s language proficiencies, and second, to encourage student placement within diverse communities throughout the state of Michigan where these physicians-in-training speak or understand the primary language of the local community to better serve patients.

Methods: For this cross-sectional descriptive pilot study, a short, author-created survey was sent to 1,226 osteopathic medical students (OMS-I to OMS-IV) at MSUCOM. Participants were asked questions pertaining to language proficiency,

number of languages spoken, prior exposure to education abroad, and demographic information. All participant data were only reported in grouped, collective, de-identified terms. Descriptive statistical analyses (frequencies, percentages) were calculated utilizing SPSS Version 25 software.

Results: Over the course of several months, 698 (58.7%) current MSUCOM medical students participated in the study. Of those students, 382 (54.7%) responded that they were multilingual. The top three second languages reported spoken were: English 332 (47.6%), Spanish 169 (24.2%), and Arabic 64 (9.2%). In addition, 249 (37.2%) said they had prior exposure to education abroad, and 177 (26.4%) said they had lived in another country for more than 6 months.

Conclusions: The majority, 382 (54.7%), of the MSUCOM students who participated in the survey have some degree of multilingual capabilities. The student population at MSUCOM may benefit from completing primary care rotations in diverse communities within the state of Michigan. Likewise, the communities throughout Michigan may benefit from having bilingual and multilingual medical students serve in their medical facilities. Further research on the efficacy of leveraging language skills in various communities, as well as broadening the population sample, is warranted to refine and validate the observed pilot study results.

Keywords: language proficiencies; medical student; Michigan State University; osteopathic medicine; pilot study; survey.

Primary care providers (PCPs) are often the first to hear a patient’s concerns, collect a pertinent history, perform a physical examination, devise an appropriate diagnosis, discuss healthy behaviors, and recommend treatment options. A PCP is a group term that includes Family Medicine (FM), Internal Medicine (IM), and Pediatrics physicians [1]. In the United States, a shortage of PCPs has been an ongoing issue [2]. Recent (2020) predictions expect this shortage to continue to rise in the coming decades, with an estimated shortage of 54,100–139,000 PCPs by 2033 [2].

According to 2020 Census data, $7.0 \pm 0.1\%$ of the population in Michigan is foreign-born compared to $13.1 \pm 0.1\%$ of

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the population in the United States [3]. In addition, $10.0 \pm 0.2\%$ of the population in Michigan speaks a language other than English at home compared to $22.0 \pm 0.1\%$ of the population in the United States [4].

As such, learning about the multilingual capabilities of healthcare students, graduate trainees, and practitioners will become increasingly important not only in Michigan, but also across the entire United States, because trends in global migration continue to increase and both population trends on a macro (i.e., country) level and micro (i.e., state) level continue to become more diverse [3, 4].

Evidence exists for the value of having PCPs embedded in communities that speak the same primary non-English language [5]. As of 2015, approximately 8% (or around 25 million) of the US population over age five are considered to be “limited English proficient” [5]. The authors consulted leaders within the Michigan State University College of Osteopathic Medicine (MSUCOM) to obtain medical student language proficiency data and discovered that no such data on MSUCOM medical students was available.

Through conducting an assessment at MSUCOM and learning about the prevalence of the proficiency of the languages spoken by its students, the college may have an opportunity to help strengthen the relationship with partnership hospitals within Michigan communities. The authors posited that this could be done by assessing which geographic areas are in need of medical students who speak more common non-English languages to help serve the patient population in a more effective manner. The aim of this pilot study was to survey MSUCOM medical students to assess their language proficiencies with two goals in mind: first, to develop medical school curriculum that could leverage student’s language proficiencies, and second, to encourage student placement within diverse communities throughout the state of Michigan where these physicians-in-training speak or understand the language of the local community to better serve those patients.

Methods

This descriptive, exploratory pilot study was approved as an exempt (category 2i) project after review by the Michigan State University Institutional Review Board (IRB# 0004540). After reviewing the literature and not finding a survey instrument available that fit this study team’s desired aims, the authors developed a pilot survey. The survey (Appendix A) was distributed to all current (as of June 2020) MSUCOM medical students, i.e., osteopathic medical students (OMS) years I–IV. The Qualtrics platform was utilized for this project to build, distribute, and collect data for the survey [6]. Prospective participants were informed both in the invitation email and at the beginning of the survey

that they were being asked to participate in a study designed to ascertain information relating to medical students’ ability to speak multiple languages. In both the email and at the beginning of the survey, prospective participants were informed via computer-generated written text of the following: participation was voluntary, they would be able to skip any question and or withdraw from the study at any time, and there was no cost to participate. The final statement reads, “You indicate that you voluntarily agreed to participate in this research study by submitting the survey.”

Demographic information regarding age category, self-identified gender, and current medical student training level, i.e., the current medical school year (I–IV) they were enrolled in, was also collected.

Self-reported language and language fluency was identified by providing a list of the more common languages identified in the 2017 Doximity report regarding language barriers in US healthcare [7]. These languages consisted of English, Spanish, Hindi, French, Persian/Farsi, Chinese, Arabic, German, Russian, Italian, and Hebrew. An “other” option was included for respondents to write in any additional languages beyond those “common languages” identified from the Doximity report [7]. For each language specified, further questions (please see Appendix A survey instrument item #9) were asked to assess self-reported proficiency levels. Selection options derived from the “core scale” from the American Council on the Teaching of Foreign Languages (ACTFL) consisting of the following options were utilized: Novice (“Communicate minimally with formulaic and rote utterances, lists, and phrases”), Intermediate (“Create with language, initiate, maintain, and bring to a close simple conversation by asking and responding to simple questions”), Advanced (“Narrate and describe in the past, present, and future. Deal effectively with an unanticipated complication”), Superior (“Discuss topics extensively, support opinions, hypothesize. Deal with linguistically unfamiliar situations”), and Distinguished (“Ability to tailor language to a specific audience, persuade, negotiate. Deal with nuance and subtlety”) [8].

Surveys were sent out to all 1,226 medical students currently (as of 2020–2021) enrolled at the MSUCOM. The survey was first sent out on July 15, 2020, with reminders sent out at the beginning of both August and September of 2020. The survey was closed for further responses on October 1, 2020.

In addition to the Qualtrics software [6], which automatically supplies survey participant responses in a de-identified form, summary descriptive data are only presented in grouped, de-identified terms, and compiled/stratified by training level (year of medical school enrollment). The survey was distributed via email by the last author, KR, who is the MSUCOM Associate Dean of Admissions and Student Life. Those who chose to participate were offered the chance to win a \$50 Amazon gift card. Winners were determined utilizing an online random number generator. Descriptive frequencies and percentages were calculated. Author SJW performed all statistical analyses utilizing SPSS Version 25 software [9].

Results

Of those 1,226 MSUCOM medical students asked to participate, $n=698$ responded, a 56.9% response rate (Table 1). Although data on age and gender were collected, this data was not utilized for the premise of this pilot study.

Table 1: The multilingual capabilities self-reported by students by year of training. Do you speak more than one language?

		Yes	No	Total
What year are you in your medical student training?	First-year medical student	119 (31.2%)	88 (27.8%)	207
	Second-year medical student	115 (30.1%)	93 (29.4%)	208
	Third-year medical student	84 (21.9%)	84 (26.6%)	168
	Fourth-year medical student	60 (15.7%)	49 (15.5%)	109
	Other	4 (1.0%)	2 (0.6%)	6
	Total	382 (54.7%)	316 (45.3%)	698

The total number of languages that the participants self-reported as being able to speak was 866, which is larger than the sample size because it includes participants who indicated that they spoke more than one language. This meant that on average, among those who spoke more than one language, the average number of languages spoken was the total number of languages (866) divided by the total number who reported that they spoke more than one language (382), thus $866/382=2.3$ (Table 2).

Overall, the top three self-reported languages spoken were English with 322 (47.6%), Spanish with 169 (24.2%), and Arabic with 64 (9.2%) (Table 2).

In the “other” category, the top five languages that participants reported knowing included: Telugu (n=12), American Sign Language (ASL, n=11), Korean (n=11), Punjabi (n=11), and Urdu (n=11) (Table 3).

Finally, out of the n=670 (95.9% of total 698 respondents) individuals who answered further questions regarding their

exposure to languages/cultures other than their own, 249 (37.2%) said that they had studied abroad (Table 4), 177 (26.4%) said they had lived in another country for more than six months (Table 5), and 228 (34.1%) responded “yes” to the question regarding whether they had been immersed in another culture for at least three months (Appendix B-18).

Discussion

This is a novel study examining the language proficiencies of medical students at the MSUCOM. Assessing language proficiencies of medical students may become more important as improving access to healthcare and the overall quality of healthcare are a priority [10]. The doctor–patient relationship has long been fundamental to quality care, and verbal communication is one of the keys to that relationship [11].

From census data, we know that areas relevant to the MSUCOM, such as southeast Michigan, have large Spanish- and Arabic-speaking populations [12]. The results of this study show that MSUCOM is currently educating medical students who have such language skills. More specifically, the authors observed that 169 (19.5%) of our respondents stated that they speak Spanish and 64 (7.4%) noted that they speak Arabic. Among the Spanish speakers, the majority, 110/184 (59.8%), noted novice or intermediate proficiency, which suggests that there is room for improving those skills to be effective communicators, particularly if aiming to engage with patients in local communities. Although not investigated, this could improve if students become engaged in medical electives within Spanish-speaking countries offered by the college. Conversely, the majority of the Arabic speakers, 49/68 (72.1%), self-identified as being advanced, superior, or distinguished in proficiency. As such, these

Table 2: Total number of self-reported languages spoken by medical students by year of training.

What languages do you speak?	First year	Second year	Third year	Fourth year	Other	Total
Arabic	17 (6.6%)	22 (8.6%)	13 (6.7%)	10 (6.8%)	N/A	n=64 (7.4%)
Chinese	4 (1.5%)	8 (3.1%)	3 (1.5%)	3 (2.0%)	1 (10.0%)	n=19 (2.2%)
English	99 (38.2%)	100 (39.2%)	75 (38.7%)	54 (36.5%)	4 (40.0%)	n=332 (38.3%)
French	12 (4.6%)	14 (5.5%)	10 (5.2%)	6 (4.1%)	1 (10.0%)	n=43 (4.9%)
German	11 (4.2%)	4 (1.6%)	1 (0.5%)	4 (2.7%)	N/A	n=20 (2.3%)
Hebrew	1 (0.4%)	N/A	1 (0.5%)	1 (0.7%)	N/A	n=3 (0.4%)
Hindi	10 (3.9%)	7 (2.7%)	9 (4.6%)	7 (4.7%)	N/A	n=33 (3.8%)
Italian	3 (1.2%)	5 (1.9%)	3 (1.6%)	2 (1.4%)	N/A	n=15 (1.7%)
Persian/Farsi	3 (1.2%)	3 (1.2%)	N/A	2 (1.4%)	N/A	n=8 (0.9%)
Russian	2 (0.8%)	2 (0.8%)	3 (1.6%)	N/A	N/A	n=7 (0.8%)
Spanish	46 (17.8%)	50 (19.6%)	40 (20.6%)	31 (21.0%)	2 (20.0%)	n=169 (19.5%)
Other	51 (%)	40 (15.7%)	36 (18.6%)	28 (18.9%)	2 (20.0%)	n=157 (18.1%)
Total	259	255	194	148	10	866

Table 3: Additional languages spoken (beyond selections given).

Which additional languages do you speak?	No. of respondents
Albanian	3
American Sign Language (ASL) ^a	11
Aramaic	1
Bengali	5
Chaldean (Aramaic and Neo-Aramaic)	9
Dutch	2
Fante	1
Filipino	2
Greek (and Greek little)	5
Gujarati	6
Gurung	1
Haitian Creole	1
Igbo	2
Japanese	6
Kannada	3
Korean ^a	11
Krio/Pidgin	1
Luxemburgish	1
Macedonian	1
Malayalam	6
Marathi	4
Navayathi	1
Nepali	1
Polish	5
Portuguese	5
Punjabi ^a	11
Rajasthani	1
Romanian	7
Serbian	1
Sindhi	1
Swedish	1
Syriac	1
Tagalog	8
Taiwanese	1
Tamil	5
Telugu ^a	12
Thai	1
Turkish	1
Ukrainian	3
Urdu ^a	11
Vietnamese	8
Yoruba	1

^aTop five in total number of “other” write-in languages self-reported.

MSUCOM students’ language proficiency could allow them to work more fluidly within communities with large Arabic-speaking populations. Several cities including Sterling Heights, located in Macomb County, as well as Dearborn, located in Wayne County, have significant numbers of the population speaking Arabic, and the statewide Arab population is roughly 277,534 [13].

In this study, the authors also evaluated whether or not the students studied abroad and if they had lived in another

Table 4: Responses to the question, “Have you studied abroad?” (medical students by year of training).

Have you studied abroad?	First year	Second year	Third year	Fourth year	Other	Total
Yes	78 (39.4%)	71 (35.7%)	54 (33.3%)	43 (40.9%)	3 (50.0%)	249 (37.2%)
No	120 (60.6%)	128 (64.3%)	108 (66.7%)	62 (59.1%)	3 (50.0%)	421 (62.8%)
Total	198	199	162	105	6	670

country outside the United States for more than six months. The authors posited that these questions might help assess cultural experiences rather than just language acquisition [14]. Among those asked, 177 (26.4%) students noted that they had lived outside the United States for more than six months, and 249 (37.2%) of MSUCOM medical students had studied abroad at some point in their education. In future studies, to assess beyond descriptive statistics, it may be beneficial to assess similar “cultural experiences” on a more granular level. For example, studies with a significantly larger sample size may have the statistical power to examine those who have studied abroad and or lived outside of the United States by self-reported, or better, a more objective measure, of second language proficiency.

The survey included 10 languages that respondents could select, and/or they could write in another language that may not have been included in the original 10. In the “other” category, students noted 42 different languages that they speak (Table 3). The top five of the “other” languages included two languages primarily from the Indian subcontinent, Telegu and Punjabi, with 12 and 11 student speakers, respectively. There were 11 speakers of Urdu, a language spoken in both Pakistan and India [15]. Eleven students self-reported that they speak Korean, and 11 students noted that they speak American Sign Language (ASL).

This is the first study that the authors are aware of that examined the language proficiencies of medical students. It is the authors hope that MSUCOM medical students’ experiences could be enhanced with curriculum changes based on language proficiency and placement within diverse communities. Curriculum changes that could be revised within the college include the primary care intensive preceptorships that second-year preclerkship students are required to complete as part of curriculum requirements [16]. By being placed in ambulatory settings in which medical students have similar language capabilities and proficiency to the local population, they may improve their ability to provide quality care.

Table 5: Responses to the question, “Have you lived in another country other than the United States for more than six months?” (medical students by year of training).

Have you lived in another country other than US for more than six months?	First year	Second year	Third year	Fourth year	Other	Total
Yes	55 (27.8%)	51 (25.6%)	41 (25.3%)	27 (25.7%)	3 (50.0%)	177 (26.4%)
No	143 (72.2%)	148 (74.4%)	121 (74.7%)	78 (72.3%)	3 (50.0%)	493 (73.6%)
Total	198	199	162	105	6	670

The goal of the authors is to have the survey instrument utilized validated. In addition, the authors hope that the data obtained during this study could be replicated on a larger scale at other health professional schools not only within the state of Michigan, but also across the United States. This could help to build baseline knowledge on multilingual capabilities of individuals providing care.

Limitations

This study has limitations. One limitation is that the questionnaire utilized was a nonvalidated questionnaire. These study data are limited because they were collected from only survey participants from one medical school, and this may not reflect the language proficiencies of students at other medical schools in Michigan or across the United States. Ideally, further studies could utilize a version of our survey to produce a validated study instrument.

In addition, there were likely limitations imposed by a lack of clarity for the “English” language option. All of the medical students we surveyed speak English; however, some of them identify as nonnative English speakers. The way the questionnaire was worded, with English as an option, may have been interpreted by participants as asking whether English was a participant’s first language. This is highlighted by the discrepancy between the total number of respondents to the questionnaire, at $n=698$, with 382 responding that they do speak more than one language and 332 reporting that they speak English only.

Conclusions

Although this descriptive exploratory study has limitations, the authors hope that this information could pave the way for further studies that could become a valuable tool for medical school curriculum planning and for the enhancement of patient care. More specifically, the authors would suggest similar studies replicating/expanding upon

examining the language skills of the physicians in graduate medical education.

Although the data for this pilot study were collected solely from students enrolled at MSUCOM, the methods utilized here could be replicated and expanded upon in future studies. For example, similar studies could be conducted through additional graduate medical education consortiums (statewide or otherwise), or at organized health professional schools including physician assistant schools and nursing schools. Such data could be beneficial in determining the placement of healthcare professional students and trainees with multilingual capabilities in improving health outcomes for local communities.

The authors plan to complete studies examining language skills of all of the medical students in a state or region. Osteopathic medical schools across the United States may be contacted by utilizing affiliate organization contact information listed on the American Association of Colleges of Osteopathic Medicine (AACOM) website to try to replicate such studies in diverse student populations across the country [17].

Additionally, the collection of larger study samples going forward could allow for more robust data on additional language proficiencies to be collected, for example, to determine whether the “limited” data for the remaining languages collected in this study would change with a much larger sample (see Appendix Tables B-9–B-17). To that end, the authors are considering conducting a larger study that would include participants from additional US medical schools.

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Competing interests: None reported.

Informed consent: All prospective participants were informed both in the invitation email and at the beginning of the survey that they were being asked to participate in a study. All participants in this study provided digital consent by submitting the survey.

Ethical approval: This study was approved as an exempt (category 2i) project after review by the Michigan State University Institutional Review Board (IRB# 0004540).

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