Who Wants to Translate? Evaluation of a Novel Medical Mandarin Education Program for and by Pre-Clerkship Medical Students

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Abstract

Purpose: Language discordance between patients and healthcare providers adversely affects health outcomes. Medical students at the University of Toronto (UofT) created a peer-led program for classmates with basic Mandarin skills to learn and practice medical Mandarin. This mixed method study explored participants’ perceptions of program delivery, motivations to participate, and resulting personal and professional development.

Methods: Ten sessions with 25 unique participants were held over an academic year. Eight student-led sessions taught content paralleling pre-clerkship curriculum; two physician-led sessions promoted cultural understanding and practice tips. Focus groups and a post-program survey evaluated the program.

Results: Two focus groups (n=12 participants) and 19 surveys (response rate=76%) were included. Students reported high program satisfaction and improved comfort speaking Mandarin in both casual and professional settings. Students’ motivations to participate in MMEP included witnessing language discordance, recognizing medical Mandarin as an asset, and community expectations. Outcomes included increased comfort with and likelihood of using clinical Mandarin in future patient care, a developing sense of peer linguistic and cultural community, and increased understanding of cultural diversity.

Conclusions: These results provide a framework and lessons learned for students and faculty interested in developing similar language programs, thereby building capacity to bridge provision gaps in healthcare.

Keywords: Undergraduate medical education; language; cultural competency; Medical Students; Chinese; Mandarin
Introduction

Canada is a multicultural country with a linguistically diverse population and rich immigration histories. Unfortunately, significant economic and social inequalities exist for many immigrant populations, resulting in worse health outcomes (Public Health Agency of Canada, 2018). For example, language discordance between patients and healthcare providers contributes to adverse health outcomes. Limited English-proficient (LEP) patients face more emergency room visits, diagnostic tests, and misdiagnoses, longer hospital stays, and decreased rates of preventative screening (Cheung et al., 2004; Masland, Lou and Snowden, 2010; Linsky et al., 2011; Thompson et al., 2014). In Toronto, 4.9% of the population report speaking neither English nor French, and 40% of this subpopulation, approximately 53,000 inhabitants, have Cantonese and Mandarin as their mother tongue (Wilson, Laura and Lau, 2018). More broadly, Mandarin is the mother tongue of 230,000 Toronto residents, who possess varying degrees of English proficiency (Statistics Canada, 2016).

Cost and availability limit existing language solutions such as medical interpreters. Additionally, communication nuances of body language and tone are difficult to convey over translation software. Often, patients’ family members act as communication bridges, but untrained interpreters may not understand medical terminology, omit words, and add their own interpretations (Kumar et al., 2017), leading to accuracy and ethical concerns.

Furthermore, most U.S. and Canadian medical schools lack effective training methods in linguistically and culturally competent care (Zabar et al., 2006; Ahmed et al., 2016). To address this service gap, medical students at the University of Toronto (UofT) created the Medical Mandarin Education Program (MMEP) in August 2018 to work with interested classmates to improve their medical Mandarin skills. As a peer-led educational and support group, MMEP was designed for students already equipped with basic Mandarin fluency. These future physicians are ideally situated to undertake additional training to provide culturally and linguistically appropriate care.

Program Description

During the 2018-2019 academic year, MMEP ran ten 1-hour long meetings designed and implemented by two second year medical students (JZ, RC). Lesson plans adapted from the Asian Pacific American Medical Student Association (APAMSA 2009) and the University of British Columbia Chinese-English Phrasebook (Zhuang and Tran 2016) complemented the formal curriculum. For example, following the psychiatry block, MMEP facilitated a psychiatry vocabulary and practice session. Typical lesson plans included 30 topic vocabulary words (English, Mandarin, Pin-Yin), 5-10 sentence translations, and written patient cases in Mandarin.

Two of the ten MMEP sessions hosted invited speakers: a family doctor and geriatrician. They explored social and cultural nuances of working with Mandarin populations, shared personal experiences about limited language resources throughout training, and discussed end-of-life care, sexual history, and traditional/herbal medicine.

This paper reports on the development, implementation, and evaluation of MMEP. It explores three topics from participants’ perspectives:

1. Program structure, content, and delivery, to improve logistical organization.
2. Students’ motivations for participation, to better address student values and needs.
3. Program impact on students’ personal and professional development, to determine intervention value as an extracurricular program.
Methods

Design overview
This mixed-method study occurred in June 2019. Qualitative data was collected from a social constructivist stance that MMEP is socially situated (Sandelowski, 2000) and program outcomes are constructed through interaction with others, both inside and outside the medical curriculum. Focus groups investigated how MMEP students learned and applied knowledge, and why and how they wanted to learn medical Mandarin (Kelly, 2009; Thomas et al., 2014). Quantitative data on these topics was collected via a short anonymous survey.

Ethical considerations
As a quality improvement and program evaluation study, this project was exempted from the UofT Research Ethics Board process. All focus group participants provided signed consent, while survey completion indicated implied study consent.

Data collection
Pre-clerkship medical students attending at least one MMEP session (N= 25) were invited to attend an hour-long focus group and complete a post program evaluation survey. A small incentive was offered to each focus group participant: bubble tea. Paired moderators (JF and YL) monitored body language, and group climate and interactions via field notes. Discussions were audio-recorded, transcribed verbatim, and anonymized. Each participant completed a short, de-identified demographic (e.g. language ability) and 5-point Likert scaled satisfaction survey. For students unable to attend a focus group, the survey was hand delivered for return at their convenience.

Data analyses
Transcript contents were descriptively analyzed line-by-line by two independent researchers (JZ and RC) (Gale et al., 2013). Descriptive codes were grouped into categories and themes. Independent results were compared, discrepancies noted and reconciled, and the resulting coding framework finalized with the broader team and applied to the full dataset. Categorical and quantitative data were summarized with averages, proportions, medians, and interquartile range (IQR).

Results/Analysis
Of 25 participating students, 19 completed the survey (response rate = 76%). Respondents had a median age of 23 years (IQR 22-24 years) and attended a median of 3 sessions (IQR 2-5 sessions). The majority was female (68%) and 2nd year (61%). The two focus groups consisted of 12 students (5 males and 7 females), and six each of 1st and 2nd year medical students.

Participant Mandarin capacity
Most participants reported intermediate or fluent Mandarin speaking ability (78.9%) and aural comprehension (84.2%) (Table 1). However, the majority disagreed or strongly disagreed with feeling comfortable navigating clinical interactions in Mandarin (52.6%) (Table 2). Conversely, most agreed or strongly agreed with feeling comfortable with clinical interactions in English (84.2%) (Table 2).

Table 1. Survey participants’ self-reported Mandarin speaking and listening comprehension ability
Table 2. Survey participants' comfort with clinical interactions in Mandarin and English

|                  | Speaking N (%) | Listening Comprehension N (%) |
|------------------|---------------|-------------------------------|
| None             | 0 (0.0%)      | None                          |
| Basic            | 4 (21.1%)     | Basic                         |
| Intermediate     | 8 (42.1%)     | Intermediate                  |
| Fluent           | 7 (36.8%)     | Fluent                        |

Legend: N, number

"I feel comfortable relaying a medical diagnosis, explaining the basic effects of medication, and taking a history appropriate for my level of medical training…"

|                  | In Mandarin (N [%]) | In English (N [%]) |
|------------------|---------------------|-------------------|
| Strongly disagree| 5 (26.3%)           | 1 (5.3%)          |
| Disagree         | 5 (26.3%)           | 2 (10.5%)         |
| Neutral          | 3 (15.8%)           | 0 (0.0%)          |
| Agree            | 5 (26.3%)           | 7 (36.8%)         |
| Strongly agree   | 1 (5.3%)            | 9 (47.4%)         |

Legend: N, number

Objective 1: To evaluate program structure, content, and delivery

MMEP was well organized and a positive experience to 95% of survey participants. Highest ranked program components included the group setting (100%), content (95%), practice cases (89%), and translation exercises (89%). Similarly, focus group participants were satisfied with session location and timing and enjoyed the small group size. "I really like the smaller group size… it feels a lot less intimidating… you could break off, chat with each other as friends." The proportion of student-led to physician-led sessions (8:2) was perceived as well balanced with complementary content. One student commented: "The speaker sessions were very good at opening up a dialogue on the cultural and context, whereas the student-led sessions were more content [practice]."

Program content was of appropriate difficulty, relevant to the medical curriculum, and applicable clinically: "I thought the content that we covered was accessible; it was basic enough for people to grasp, and it was also applicable enough that we could foreseeably use it [clinically]". Another student noted: "Very helpful to hear demonstrations of conversations. Because not having heard examples before, it's hard to come up with your own." Participants also enjoyed discussing cultural and practical elements of Mandarin-based practice during physician-led sessions and appreciated the developing sense of community within the group: "Having a sense of community, of people who speak Mandarin … I think a lot of us are from similar backgrounds."

Participation barriers included inconsistent scheduling and participants' differing Mandarin fluency. Respondents suggested establishing "a regular routine… one suggestion being, first Wednesday evening of every month we will have a meeting." One person asked, "If there's a way to kind of help the beginners learn a bit more without impeding how the more advanced people learn the more sophisticated medical terms, that could be an
improvement.” Other suggestions for improvement included group social events and circulating post-session newsletters.

**Objective 2: To understand why participants were interested in Medical Mandarin**

*Theme 2.1: Students witness language discordance in clinical settings.*

Every participant reported witnessing language discordance between Mandarin speaking patients and healthcare professionals. Many also experienced family members’ difficulties communicating with healthcare providers: "My grandparents, who only speak Mandarin … seeing how difficult it was even for my mom to try and translate [during clinical visits]."

While many MMEP attendees were fluent Mandarin speakers, they struggled with medical vocabulary. One noted, "When I was shadowing, my preceptor said, ‘Ask what the patient’s understanding of COPD, pneumonia and heart failure is.’ I didn’t know how to say any of those words in Mandarin.” Another commented, "Even though I think I’m very comfortable with conversational Mandarin, it’s very difficult to talk about medical vocabulary [and] convey emotions … like showing empathy." Similarly, other students discussed difficulty delivering supportive messages in clinical situations – specifically phrasing and tone; "Emotion really doesn’t carry over when you’re having so much difficulty just talking."

Students remarked on patients’ comfort and expressiveness in Mandarin. "I encountered a Chinese-speaking patient who was unable to communicate effectively in English. After speaking in Mandarin, it was clear that he was a lot more articulate." Generally, students appeared unaware of current translation services or found them inconvenient (e.g. phone interpreters): "It's really awkward because they use an iPad kind of thing, and it's like a broken telephone."

*Theme 2.2 Mandarin is a personal and career asset*

Participants had variable prior exposure to Mandarin. Some were Canadian born; others had secondary schooling in China. Participants cited their personal backgrounds as reasons to learn medical Mandarin. "I grew up going to Chinese school, but I've basically forgotten a lot … [MMEP] was a good way to reorient myself with Chinese." Another student observed: "When I’m talking to my grandparents over WeChat … [and I want to] let them know what my life is like as a medical student … it's really hard to explain to them [because of language barriers]."

In addition, some students expressed a sense of duty towards Mandarin-speaking patient populations. "We are in the best position to do this, and if we’re not doing it, who else is going to?" Most felt that medical Mandarin would support their clinical practice and cited the necessity of early practice to build linguistic and cultural competencies: "Being able to speak another language that’s not English is an asset, both to the community [and] to myself." Others noted medical Mandarin’s current utility, "during clerkship, I can offer a unique skill to be able to translate for [patients]", and future utility, "I definitely wanted to be more familiar with medical terms in Mandarin, because in the future that's probably a lot of the population I'll see."

*Theme 2.3: Students are influenced by community expectations*

Some participants cited MMEP as an opportunity to expand their existing Mandarin knowledge, while others felt an obligation to learn the language. One explained, "[My parents] are expecting me to know some of these medical terms." Another said, "Sometimes my [older relatives], they'd be like ‘This young Chinese doctor, they don't even know how to speak Chinese,’ and they kind of just look down on you a bit for that."

**Objective 3: To understand program impacts on participants**

*Theme 3.1 Increased comfort with Mandarin use*
Students attributed their initial discomfort speaking Mandarin to each other and patients to lack of experience and fear of verbal missteps. "One of the biggest things … at first was just even being comfortable speaking Mandarin… that's a really important thing to get over [self-consciousness]." Their confidence increased with practice. "I think the comfort is more psychological… just the process of talking in Mandarin [helped]."

Students cited increased confidence following the session led by a family doctor, who shared his personal journey of acquiring competent Mandarin communication skills. One student commented, "He had very basic level of Mandarin … and has built this vocabulary himself". Another noted, "If he can do it … I'm confident that I can as well. If I didn't have this experience, I would still be like, 'Yeah, there is no way.'"

**Theme 3.2 Building a sense of peer support and community**

All students praised the social support provided by MMEP. "I think it is still nice to be able to connect to people from a similar background and be able to build a stronger sense of cultural identity." Further, MMEP helped these students establish a new community of support at school. "Understanding this community of people … learning Mandarin similar to me … it's helpful to know that there's support."

**Theme 3.3 Increased cultural understanding**

Physician-led sessions helped students appreciate the interplay between cultural understandings and healthcare expectations in patient communication. One student said, "I learned that the healthcare system and the specialty distribution are very different in China versus North America. I think that opened my eyes to the different ways we can practice." Another observed, "People from different parts of China have different cultural values and expectations… you can't really generalize for everyone coming from a certain country."

Students also benefited from exposure to sentence phrasing by more fluent peers. With sensitive topics like sexual health or palliative care, how something is said is as important as what is said: "There are certain linguistic differences or terms and phrases that people who are more fluent with Chinese use. For example, when describing or asking questions about sexual history." Finally, through MMEP, some students developed an appreciation for difficulties faced by English as Second Language patients. "[I]n the future when dealing with any second language English speakers, we will put that in the mind that things are lost in translation."

**Discussion**

MMEP attracted 25 pre-clerkship students. We adopted a summative, mixed methods program evaluation approach. A survey characterized participants' demographics, including self-reported language fluency, and focus groups explored respondents' program experiences, motivations, and impacts. We had an excellent response rate; 19 (76%) students completed end-of-program surveys and 12 (48%) participated in a focus group, suggesting that our triangulated results represent the majority of participant experiences and outcomes (Guest, Namey and McKenna, 2017). We achieved data saturation.

Our findings demonstrate MMEP increased participants' level of comfort with Mandarin communication in both daily and clinical settings. Student-led sessions alleviated self-consciousness through practice. Physician-led sessions increased confidence through modelling a realistic longer-term goal. Similarly, a 2018 UBC workshop evaluation found 82% of medical student participants improved confidence in communicating with patients in Mandarin (Zhuang, Tran and Ho, 2018).

MMEP provided a sense of "shared background" among participants, who were both "looking for" such community and "surprised by" the amount of mutual interest in MMEP. Our program leverages students' pre-existing linguistic
skills, cultural awareness, and medical knowledge to build a sustainable community. Our efforts explicitly align with our Faculty of Medicine's commitment to equity, diversity, and inclusion, especially in support of minoritized and underrepresented groups. Our goal is that MMEP will empower future practitioners with the confidence and skills to meet the "needs of the diverse communities they will serve in their careers" (UofT Faculty of Medicine 2020).

Physician-led sessions helped students appreciate the interplay between cultural understandings and healthcare expectations in patient communication. Furthermore, students developed an appreciation for difficulties faced by English as Second Language patients beyond Mandarin speakers. Likewise, the Pennsylvania State College of Medicine found medical students – representing 21 languages – felt more confident interpreting and more empathetic towards LEP following completion of a condensed, certified interpreter training program (Vargas Pelaez et al., 2018).

To our knowledge, this is the first language program for pre-clerkship medical students to utilize focus groups to understand participants' underlying motivations. While similar language programs exist, their evaluations utilized quantitative surveys. Our study led to a deeper understanding of participants' motivations and program outcomes, illustrates why and how the program was successful, and is proving useful for iterative program improvement.

Our findings suggest participant motivations are multi-factorial and interconnected. Participants explained that witnessing language disparity in healthcare, recognizing Mandarin as a personal and career asset, and feeling pressure from their home communities, motivated them to participate. While students valued each domain differently, most seemed to identify with all three, likely due to their shared histories as first and second generation Canadians.

MMEP was well organized and a positive experience for 95% of survey participants. Highest ranked program components included the group setting and content. Similarly, the aforementioned UBC group (Zhuang, Tran and Ho, 2018) found their phrasebook and peer coaching were the most useful resources. In addition, our physician-led sessions had better attendance, even attracting non-Mandarin speaking students with interests in language, culture, and healthcare.

Interestingly, most participants reported intermediate or high comfort in conversational Mandarin (Table 1), but only a minority felt comfortable using it in clinical settings (Table 2). This confirmed our initial observation and motivation to develop the course; conversational fluency in Mandarin does not equate to communication comfort or translational effectiveness in clinical contexts.

Future directions
Moving forward, MMEP will continue to offer a safe environment for trainees to practice medical Mandarin and gain insight into cultural competencies. While additional funding is being sought from local community groups to enhance program offerings, MMEP is already cost-effective and sustainable.

MMEP aims to increase participant opportunities to practice translation in clinical environments. We are also investigating ways to better support attendees with varied Mandarin fluency by creating beginner training sessions and pairing beginners with more advanced student mentors. Lastly, we plan on advertising physician-led sessions conducted in English to non-Mandarin speaking students, thereby expanding our target audience. Virtual meetings with local and national experts on this topic are being explored. We believe linguistic training programs like ours can have an early and positive impact on future practice. Further research could usefully explore MMEP's impact on participants during clerkship, residency, and beyond, and investigate how our program offerings may be expanded in the context of clerkship training and virtually, given ongoing physical distancing requirements necessitated by
COVID-19.

Conclusion

In conclusion, MMEP fills a linguistic training gap between healthcare providers and Mandarin speaking patients. The program encouraged pre-clerkship medical students to refine their clinical Mandarin skills. The language and cultural workshops helped enhance their perceived linguistic confidence and proficiency. The program's small group setting created a sense of community, peer, and cultural support, ultimately increasing the participants' stated likelihood of Mandarin use in future clinical practice. Our study insights are informative for the development of similar minority language programs in diverse healthcare training environments such as dentistry and nursing. Our future directions include iterative program improvements to reduce participation barriers, assess longer-term program impacts, and shift to virtual platforms given the circumstances of COVID-19.

Take Home Messages

- Medical students' conversational fluency in Mandarin does not translate to clinical effectiveness.
- Peer practice and engagement increased students' medical Mandarin comfort and ability.
- Students gained appreciation for the interplay between cultural understandings and healthcare expectations through listening to physicians speak on working with Mandarin-speaking populations.
- The Medical Mandarin Educational Program created a sense of community among participants.

Notes On Contributors

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**Appendices**

None.

**Declarations**

The author has declared that there are no conflicts of interest.

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**Ethics Statement**

As a quality improvement and program evaluation study, this project was exempted from the UofT Research Ethics
Board process. All focus group participants provided signed consent, while survey completion indicated implied study consent. Please find the relevant article in the TCPS, article 2.5:
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