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Effectiveness of a Clinically Relevant Educational Program for Improving Medical Communication and Clinical Skills of International Medical Graduates

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Abstract

Background: To assess the efficacy of a 16 week, intensive, full-time medical communication and clinical skills educational program – Medical Communication Assessment Project (M-CAP) – at the Universities of Calgary and Alberta for improving medical communication, clinical skills and professionalism of international medical graduates (IMGs). There is an 8 week didactic course (language instructors, standardized clinical case scenarios) and an 8 week supervised clinical placement.

Method: In Study 1, 39 IMGs (mean age = 35.6) participated in the M-CAP program and were assessed in English language proficiency in a pre- post-test design and on an in training evaluation report (ITER) by practicum physicians. In Study 2, there were 235 IMGs (mean age = 39.2). In addition to the pre- post-test design, there was a comparison group analysis on OSCE data employing multivariate analysis of variance (MANOVA). Pre- post-test data were also collected on ITERs during the practicum as was IMG reported program efficacy data.

Results: The findings show that the participants in the M-CAP program have 1) very large gains in language proficiency (listening and speaking, reading and writing; $p < .001$), and 2) high ratings on scales from the practicum physicians. The between group analyses showed that M-CAP participants outperformed the non M-CAP participants on clinical skills and professionalism ($p < .05$). The IMGs gave very positive ratings to the M-CAP program.

Conclusions IMGs who participated in a clinically relevant educational program improved their English language proficiency, clinical skills and professionalism for medical practice in a host country.

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Introduction

Many physicians from developing countries continue to immigrate to developed nations such as the United States, Canada, United Kingdom, and Australia.[1,2,3] Approximately 25% of the physicians in both the United States and Canada did not attend medical school in those countries[4,5] and are considered international medical graduates (IMGs). Many of these physicians seek postgraduate training positions (e.g., residency).[6]

Most IMGs face difficulties in attaining residency positions, and those that do, face challenges in adapting to the medical culture of the host countries. These challenges may include inadequacy of medical knowledge and skills as well as deficiencies in professionalism and language proficiency. There are currently no standardized or systematic educational programs for improving the clinical skills, interpersonal aspects of patient physician encounter, and professionalism of immigrant physicians that are seeking residency positions in Canada. The major purpose of the present study, therefore, was to assess the efficacy of a clinically relevant educational program to enhance the language proficiency and professionalism of IMGs in a Canadian context.

There have been some attempts to provide educational experiences for IMGs to facilitate integration. In a Canadian study, Majumdar et al[8] focused on the effectiveness of cultural sensitivity training among foreign medical graduates licensed in Ontario. They concluded that cultural sensitivity programs are necessary in order for IMGs in Canada to improve their professionalism and clinical skills.[8] Maudsley[9] described the assessment of international medical graduates and their integration into family practice in Nova Scotia. Although he indicated that there currently is a program of research and evaluation, no empirical evidence of the effectiveness of this program was presented.[9]

Horvath[7] and colleagues described a program for integration of IMGs into American surgical residency training. They found that an 8-week clinical experience provided IMGs (*n* =15) with some experience to enhance integration into a U.S. residency. In another small scale study at Creighton University in the US,[10] IMGs (*n* = 11) were oriented to an internal medicine residency program focused on Accreditation Council for Graduate Medical Education (ACGME) core competencies (e.g., medical knowledge and skills, communication, professionalism, etc.). Notwithstanding some positive self reports by the IMGs, program directors and other stake holders, there was little convincing empirical evidence (e.g., pre and post test scores on knowledge acquisition) of the educational benefits of this program.[10]

Several studies have focused on characteristics, challenges and needs of IMGs. Using a census of family physicians in southwestern Ontario, for example, Thind et al[11] found that IMGs were older (mean age = 56 year versus 48), and where more likely to be in practice longer than Canadian medical graduates (CMGs) (29.3 versus 20.5 years). Additionally, more IMGs compared to CMGs were male, had not completed family medicine residency, and were not involved with teaching. The CMGs were more likely than the IMGs to provide maternity and newborn care and the IMGs were more likely to be serving in small towns, and rural and isolated communities. In an Alberta study,[12] IMGs described two types of learning they needed: 1) preparation for Canadian examinations to remain and practice in Alberta, and 2) learning for success at clinical work in a new setting (learning of regulations and systems, patient expectations, new disease profiles, new medications, new diagnostic procedures, and managing the referral process).

Wong and Lohfeld[13] described the recertification training experiences of IMGs in Canada in order to help medical training programs understand how to facilitate the integration of IMGs. Twelve IMGs were interviewed and revealed 4 themes that were typical to the IMGs recertification process: training entry barriers, and a 3-phase process of loss, disorientation, and adaptation. It was concluded that IMGs typically complete these 3 phases in order to feel fully integrated into their Canadian professional environments. Similarly, Curran et al[14] found that new IMGs needed to learn about the health care system and the peculiarities of the specific practice context in which they work. For integration of consultant psychiatrist IMGs in an Australian rural setting, Haines and Oakley[15] also found that cross cultural communication and language, with a focus on the individual and the group as part of the community was required.

In other work,[16] it was found that program directors and IMGs sometimes differ on the challenges faced by foreign trained doctors, but both groups agreed that an orientation program is necessary for incoming IMGs

prior to starting their residency program. Program directors typically identify communicating with patients, communicating with team members, and basic clinical skills as the greatest challenges for IMGs[16]. In an interesting twist on the IMG research, Boulet et al[17] found that U.S. citizens trained abroad do not perform as well as other IMGs or U.S. graduates on certifying exams. Moreover, they are more likely than non-U.S. citizens to be engaged in primary care activities.

From the foregoing review we find that several studies have focused on demands and challenges facing the orientation and adaptation of IMGs to their professional work as physicians in Canada, the US and Australia. These challenges include learning of regulations, patient expectations, new disease profiles, new medications, new diagnostic procedures, managing the referral process, cultural expectations, communications with patients and colleagues, basic clinical skills, language requirements and integration into specific communities.

Few studies, however, have employed systematic empirical research to assess the efficacy of the educational programs for IMGs.[7,8,9,10] While laudable as early beginnings, these studies have been small scale, not well-designed, with dependent measures of unclear relevance, of questionable generalizability, and poor internal and external validity.[18] Accordingly, the major purpose of the present paper was to report the results of two systematic empirical investigations of a clinically relevant educational program for improving medical communication and clinical skills of IMGs. Compared to previous research, we wanted to improve the design, measures and analyses of the effectiveness of the educational program. Thus we employed a repeated measures and comparison group design to improve both the internal and external validity of the research.

Methods

Study 1

Participants - IMGs

A total of 39 IMGs who had graduated from a medical school listed in the World Health Organization's (WHO) directory of medical institutions and had a medical degree verified by the Educational Commission for Foreign Medical Graduates International (ECFMGI) Credentials Services participated in the Alberta International Medical Graduate (AIMG) assessment process in 2007, and the educational medical communication assessment project (M-CAP) which included a clinical practicum placement. There were 14 men (36%) and 25 women (64%) ranging in age from 25 to 53 years (mean = 35.6; SD = 6.8). Nearly all the participants were married (89%), and all were landed immigrants or Canadian citizens, and had lived in Canada for a mean of 3.2 years. The participants reported a mean of 7.1 years of clinical experience prior to arrival in Canada. All participants had completed a required medical knowledge exam (the Medical Council of Canada Evaluating Exam and the subsequent MCCQE1 exam), had previous clinical experience, and had demonstrated some English language proficiency.[a] The participants represented 17 countries of origin (South American countries, Pakistan, China, Iran and African countries) and 16 first languages.

This study was approved by the Conjoint Health Research Ethics Board of the University of Calgary and signed consent was obtained by all participants.

Participants – Practicum Physicians

The supervising practicum physicians were family doctors (53%), emergency room doctors (7%), and a mix of other (40% - pediatrics, internal medicine, etc). The practicum physicians had a mean years of clinical practice = 15.53, and mean years of experience with IMGs = 6.2. They perceived their roles as preceptor (40%), examiner/educator (47%), mentor (20%), supervisor (7%), and other (33%).

Design

A repeated measures (pre-test/post-test) study design was utilized to assess the gains in language proficiency and clinical performance of the physicians. All participants were assessed on national standardized language proficiency assessment on three dependent variables (listening and speaking, writing, and reading). Participants were rated on an in training evaluation report (ITER) on general knowledge, professional demeanor, clinical skills, and language and medical communication.

Procedures

The M-CAP program took place at the Faculty of Medicine, University of Calgary employing a Med Skills Centre for videotaped case rehearsals and provided

[a] Canadian Language Benchmark Assessment (CLBA) benchmarks on listening and speaking, reading, and writing of CLB 8

access to other services related to medical education. The program consisted of two major components: an intensive 8-week instructional component, and an instructionally supported 8-week clinical work placement. The eight week instructional component consisted of discussion of weekly articles, videotaped comparison cases, coached role plays, controlled rehearsal, rehearsed case work, critical reflection, related written tasks, unrehearsed case work, clinical feedback and differential diagnosis, and weekly review.

Practicum Placements

After the 8-week instructional component, participants were placed in clinical settings with a practicing physician for an 8-week professional work experience. This practicum experience provided M-CAP participants with first-hand observation and supervised practice in medical settings. Courtesy licenses were obtained to allow participants to engage directly in the practice of medicine, under the supervision of a licensed physician. Participating physicians were responsible for providing daily feedback and leading formative and summative IMG evaluation of the clinical, communication, and language proficiency of the IMG candidate in clinical settings.

Results & Discussion (Study 1)

Repeated measures multivariate analyses of variance (rep-MANOVA) showed differences between the pre-test and post-test on all the three language proficiency dependent variables (Wilks' Lambda = .089; F = 116.14, p < .001). For a more fine grained analysis, the differences were analyzed with analysis of variance (ANOVA) and for effect sizes (Cohen's d[a]). For listening and speaking (F = 122.40, p < 0.001, d = 2.23), reading (F = 347.04, p < 0.001, d = 4.34), and writing (F = 41.34, p < 0.001, d = 1.48). These are all very large effects, particularly for reading, indicating that there were very large language proficiency gains over the M-CAP program.

[a] The following values indicate the interpretation of Cohen's d [Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd Ed), Hillsdale, NJ: Lawrence Earlbaum Associates]: 0.2 = small effect; 0.5 = medium effect; 0.8 = large effect; > 1.0 very large.

$$d = \frac{\text{mean}_1 - \text{mean}_2}{\sqrt{(\text{SD}_1^2 + \text{SD}_2^2)/2}}$$

The practicum physicians also rated the IMGs on an ITER (internal consistency reliability: Cronbach's α = 0.94) on general knowledge and professional demeanor, clinical skills, and language and medical communication. The practicum physicians' assessment of the M-CAP participants was based on an average of 20 hours a week of direct contact with the IMGs. The results of these assessments are summarized in Table 1.

A close inspection of Table 1 reveals that for General Knowledge and Professional Demeanour, all of the items are in the very good range, as for Clinical Skills with the possible exception of Procedural Skills which ranges from satisfactory to very good. All Language and Medical Communication skills are in the very good range. Finally, the overall mean rating is in the very good range. The ratings on the ITERs, therefore, indicate that the practicum physicians generally rate the IMGs in the very good range on all knowledge, skills and communication.

The findings from Study 1 show that the participants in the M-CAP program 1) have large gains in language proficiency (listening and speaking, reading and writing) as objectively measured by the language proficiency test, and 2) received high ratings on the ITER scales from the practicum physicians on general knowledge, professional demeanor, clinical skills, and language and medical communication.

These results notwithstanding, it is unclear how the M-CAP participants might compare to a comparison group (e.g., IMGs who did participate in a formal educational program) on language proficiency, objective measure of clinical skills, medical communication and overall professionalism. Accordingly, a second study was conducted to address this limitation. The major purpose of the second study, therefore, was to both replicate and extend study one by employing both a repeated measures design as well as a comparison group. Moreover, we wished to employ a larger sample to improve both the stability and generalizability of the results.[18]

Study 2

Participants - IMGs

A total of 235 IMGS who had graduated from a medical school listed in the WHO directory of medical institutions and had a medical degree verified by the ECFMG Credentials Services participated. As in Study 1,

all participants had completed a required medical knowledge exam (the Medical Council of Canada Evaluating Exam and the subsequent MCCQE1 exam), had previous clinical experience (mean = 7.4 years), and had demonstrated adequate English language proficiency. These IMGs participated in the 2008 M-CAP and AIMG programs in the Faculties of Medicine at the University of Calgary and the University of Alberta. The 135 women (57%) and 100 men (43%) represented 22 countries of origin (primarily China, India, Pakistan, Iran, Eastern Europe and African countries) and 19 first languages. All were Alberta residents with either permanent resident or Canadian citizenship status and all were undergoing assessment in Canada to gain residency positions.

Participants had a mean age of 39.2 years (SD = 7.3), and had lived in Canada for a mean of 5.8 years. The mean years since graduation from medical school was 13.4 (SD = 7.4; Range 0 – 32 years). Of the total 235 IMGs, 57 (24.3%) participated in the M-CAP program while the remainder (*n* = 178; 75.7%) did not.

This study was approved by the Conjoint Health Research Ethics Board of the University of Calgary and signed consent was obtained by all participants.

Participants – Practicum Physicians

Practicum physicians supervised and mentored the M-CAP IMGs for an average of 25 hours a week. They assessed the IMGs at the beginning and end of their practicum on their medical knowledge, professionalism, clinical skills and professional communication and language proficiency employing the ITERs. The supervising practicum physicians were family doctors (72%), surgeons (2%), and a mix of other (26% - pediatrics, internal medicine, etc). The practicum physicians had a mean years of clinical practice = 25.12, and mean years of experience with IMGs = 5.2. They perceived their roles as preceptor (13%), examiner/educator (33%), mentor (21%), supervisor (4%), and other (30%).

Design

As in Study 1, a repeated measures (pre-test/post-test) study design was utilized to assess the gains in language proficiency and clinical performance of the physicians for the M-CAP group. To further improve the internal validity of the design,[18] a non M-CAP group was employed as a comparison group in a MANOVA and ANOVA comparison between the two groups, with Cohen's *d* effect size calculation.

Procedures

All participants (*n* =235) were assessed on standardized language proficiency assessment. As in Study 1, three dependent language proficiency variables (listening and speaking, writing, and reading) were derived. Additionally, all participants undertook a ten station OSCE. The stations were conventional OSCE type assessments designed to measure a number of clinical skills such as history taking, physical examination, lab data interpretation, diagnoses, case management, counseling, breaking bad news, etc. One trained physician assessor scored each candidate on a standard checklist where each skill was dichotomously scored as either correct or incorrect. Practicum physicians completed an ITER on the IMG at the beginning and completion of the practicum rotation. The IMG participants completed a questionnaire about the program effectiveness at the completion of the program.

Results & Discussion (Study 2)

Gains in Language Proficiency

Repeated measures MANOVA showed differences between the pre-test and post-test on all the three language proficiency dependent variables (Wilks' Lambda = .179; $F = 86.97$, $p < .001$). For a fine-grained analysis, repeated measures ANOVAs were run for each of the dependent variables. There were significant differences for each of the three measures. For listening and speaking ($F = 157.89$, $p < .001$), reading ($F = 165.57$, $p < .001$), and writing ($F = 138.80$, $p < .001$). To determine the magnitude of change between times 1 and 2, Cohen's *d* effects size coefficients were computed. Cohen's *d* for listening and speaking = 1.92, reading = 2.74, and writing = 2.22. All of these effects are very large, especially for reading.

Growth on ITER Items

The 59 IMGs that were in the M-CAP program participated in a supervised clinical placement were they were assessed using a 14-item ITER early in the practicum (Time 1) and at the conclusion of it (Time 2). The growth of the scores on the ITERs on the two assessment times are reported in Table 2. The ITER had high internal consistency reliability (Cronbach's $\alpha = .94$).

To determine the magnitude of the change between times 1 and 2 of the practicum, repeated measures MANOVA were computed with the 14 items from the ITERs as the dependent variables. As well, Cohen's *d* effect size coefficients were computed.

The results of these analyses are summarized in Table 2 showing the mean values for each item (and Overall) at both time one and time two, Cohen's *d* effect size, the *F* statistic and its significance. It is evident from Table 2 that significant growth occurred on all 14 items ($p < .01$) with Cohen's *d* medium to large. The largest growth was in Basic Science and Clinical Knowledge with Cohen's $d = 0.86$ (a large effect) and the smallest growth was in Fluency with Cohen's $d = 0.28$ (a small effect). Notable improvements can also be observed for Sense of Responsibility & Work Ethic (#3), Clinical Judgment (#8), Communication Skills (#10), and Interaction (#11). These results indicate that there is considerable improvement on all ITER items during the practicum with a large improvement for knowledge, judgment, communication and interactions. The ratings showed that preceptors rated the IMGs very positively.

Medical Knowledge, Skills, Communication and Language Performance

Analyses of variance (ANOVA) were employed to determine any between group differences in IMGs that had attended the M-CAP program versus those that had not. The internal consistency reliability (Cronbach's alpha) of the stations ranged from .56 to .82. Generalizability coefficients (Ep^2) employing a single facet nested design G-study ranged from 0.51 to 0.78.

The results of these analyses are summarized in Table 3. From these results it can be seen that the M-CAP physicians outperformed the other IMGs overall on several dependent variables: 1) they passed more OSCE stations: mean = 6.53 versus 5.98, $p < .05$, 2) they had higher Total Clinical Score: mean = 68.89 versus 66.36, $p < .01$, as well as 3) higher scores on Stations: 5 mean = 86.43 versus 81.50, $p < .05$; 9: mean = 71.66 versus 67.76, $p < .05$; and 10: mean = 68.59 versus 64.17, $p < .05$ (Table 3).

IMGs Perception of the M-CAP Program

The 59 IMGs responded to a questionnaire at the end of the M-CAP program and assessment process. The questionnaire focused on program and instructor effectiveness and personal development. The results of these analyses are summarized in Table 4.

A close inspection of Table 4 shows that the IMGs endorsed all aspects of the M-CAP program very positively. Both the overall program and individual instructor effectiveness were regarded as excellent or good (mean = 4.80/5.0 and 4.81/5.0 respectively). The respondents indicated that feedback from language assessors (from the OSCE training cases and test scores), physicians (during the clinical practicum), and standardized patients (from the OSCE training cases) was very useful. The mean rating of perceived English language comprehension growth as a consequence of the M-CAP program was 3.71/4.0.

The main results of Study 2 are: 1) The pre-post test analyses of the standardized test of language proficiency showed the M-CAP program is very educationally effective in improving participants' listening and speaking, reading, and writing English proficiency skills, 2) The pre-post test analyses of the ITERs as assessed by preceptors showed considerable growth in a variety of areas including clinical knowledge and judgment, professionalism, and communication skills, 3) Between group analyses of the M-CAP and non M-CAP groups indicated that the former outperformed the latter on several variables including clinical skills, and 4) The IMGs themselves rated the M-CAP very positively.

General Discussion

The findings from both Study 1 and Study 2 show that the participants in the M-CAP program 1) have very large gains in language proficiency (listening and speaking, reading, and writing) as objectively measured by the language proficiency test , and 2) received very high ratings on the ITER scales from the practicum physicians. In Study 2 we increased the sample size of the M-CAP group and added a comparison group of physicians who did not participate in the M-CAP program but both groups underwent the same assessments. The pre-post test analyses of ITERs in Study 2 showed that there was uniform improvement – as assessed by the preceptors – over the course of the practicum on several dimensions including communication, clinical skills and judgment, and professionalism. The between group analyses in Study 2 showed that the M-CAP participants outperformed the non M-CAP participants on several dimensions. Finally,

the data on the IMG evaluation of the program showed very positive ratings.

The major result of the present studies is that the M-CAP is an educationally effective program. Specifically, it is effective in improving English language proficiency, medical communication, clinical knowledge and judgment, and professionalism. Previous studies of programs for IMG orientation, education, and adaptation have been small scale, not well-designed, with ambiguous dependent measures, of questionable generalizability and poor internal and external validity.[7,8,9,10] By contrast, the present research was well designed with careful attention to both internal and external validity.

In Study 1, we employed a pre-test/post-test analysis of a standardized language proficiency test to measure gains in English language proficiency. Moreover, we were able to determine the magnitude of the gains by employing Cohen's *d* effect size analyses. Additionally, these indicators of language improvements were corroborated by the ratings of the practicum physicians on the ITERs. The corresponding results from different sources of data, therefore, provide evidence of convergent validity.

In an attempt to further improve both internal and external validity, we replicated and extended the research in Study 2 by employing a larger sample and adding a comparison group for the analyses of rigorous psychometric data (e.g., OSCE scores). The ten OSCE stations all showed high internal consistency reliability as well as Ep^2 coefficients across the stations. The MANOVA results followed by ANOVA results showed that the M-CAP group performed better than the non-M-CAP group on several OSCE stations as well as on the overall clinical scores and the number of stations passed. These results leave little doubt that the M-CAP group outperformed the comparison group on clinical skills. The IMGs improvement in knowledge, professionalism and communication skills during the clinical placement was confirmed by the repeated measures analyses of the ITER data from beginning of the practicum placement to the end allowed us to measure the growth (as assessed by the preceptors) of the IMGs'.

Horvath et al[7] in their study of surgical residents similarly concluded that their educational program enhanced the knowledge and clinical skills of the IMGs. They were able to therefore improve the chances that the IMG residents would be successful in their residency programs. No other studies have focused on educational programs designed specifically to improve knowledge and clinical skills of IMGs.

The data reported from the IMG questionnaire also indicated very positive responses to the program as a whole. The IMGs endorsed both the effectiveness of the overall program as well as the individual instructors. They felt that the feedback that they received from several sources (language assessors, standardized patients, physicians) was very useful and their language proficiency improved due to the M-CAP program.

Notwithstanding the strengths of the current research, there are several limitations of the present studies. We have not yet followed the IMGs that gained residency position and compared the M-CAP graduates with the comparison group on their success during residency. Future longitudinal studies should be conducted to determine the long term benefits of the M-CAP program. Most of the successful candidates have gone into family medicine residency and hence we are not able to generalize to other specialists (e.g., surgeons, internal medicine). Finally, we were not able to analyze differences within IMGs based on their country of origin and cultural differences because of the small numbers representing cultural differences.

Summary and Conclusions

In two separate studies employing a pre- post-test design, a comparison group and several other data sources, we were able to show that IMGs who participated in a clinically relevant educational program improved their English language proficiency, outperformed the comparison group on OSCE data, were highly rated on ITER data by preceptors, and themselves rated the program very highly for its effectiveness. The findings of the present studies are stable (over 2 studies) and compelling, producing large effects. Nonetheless, future work is required to replicate and extend our research, apply it to other medical specialties, and investigate country of origin differences as well as cultural differences. Meanwhile, the M-CAP is an effective clinically based educational program that enhances English language proficiency and clinical knowledge and skills of IMGs.

Table 1: Descriptive Statistics of the in Training Evaluation Reports (ITERs; *n* = 39)

Variable	Min	Max	Mean	SD
General Knowledge and Professional Demeanour (1-5)[¶]				
Basic Science/ Clinical Knowledge	2	5	3.9	.56
Professional Rapport	2	5	4.1	.50
Sense of Responsibility & General Work Ethic	1	5	4.0	.48
Self-Awareness	2	5	4.0	.52
Clinical Skills (1-5)[¶]				
Data Gathering	2	5	3.8	.47
Physical Exam	3	5	4.0	.59
Synthesis & DDx	2	5	3.8	.58
Clinical Judgement	2	5	3.7	.49
Procedural Skills	2	5	3.5	.56
Language and Medical Communication (1-10)[¶¶]				
Communication Skills	7	10	9.0	.64
Interaction	7	10	8.8	.55
Providing Information	7	10	8.8	.61
Fluency	7	10	8.8	.71
Overall (1-5)[¶]				
Overall	2	5	3.9	.51

[¶] 1= unsatisfactory; 2 = remediable; 3 = satisfactory; 4 = very good; 5 = excellent

[¶¶] 1= poor to 10 = excellent

Table 2: Growth on Items for In Training Evaluation Reports* (ITERs; *n* = 57)

Item[¶]	Mean Time 1 Max = 4	Mean Time 2 Max = 4	Cohen's *d*	*F*	Sig.
1. Basic Science/ Clinical Knowledge	2.90	3.33	0.86	40.01	.000
2. Professional Rapport	3.26	3.53	0.54	16.18	.000
3. Sense of Responsibility & Work Ethic	3.37	3.72	0.70	22.24	.000
4. Self-Awareness	3.22	3.49	0.53	15.89	.000
5. Data Gathering	2.98	3.27	0.51	15.28	.000
6. Physical Exam	2.97	3.24	0.54	7.49	.010
7. Synthesis & DDx	2.96	3.25	0.53	7.87	.009
8. Clinical Judgment	2.94	3.29	0.70	7.32	.011
9. Procedural Skills	3.00	3.21	0.42	9.26	.005
10. Communication Skills	2.93	3.29	0.72	19.12	.000
11. Interaction	3.06	3.42	0.72	13.64	.001
12. Providing Information	2.94	3.20	0.52	12.24	.001
13. Fluency	2.90	3.04	0.28	10.44	.002
14. Overall Assessment	3.26	3.37	0.22	20.92	.000

*The internal consistency reliability of the ITERs (Cronbach's alpha) was 0.94.
[¶] 1= unsatisfactory; 2 = remediable; 3 = satisfactory; 4 = very good; 5 = excellent

Table 3: Comparison on OSCE Performance by M-CAP and Non-M-CAP IMGs

OSCE Station	M-CAP	*n*	Mean	SD[†]	95% CI for Mean[††]	
Station 1	NOT M-CAP	178	56.83	11.99	55.05	58.60
	M-CAP	57	59.72	10.56	56.91	62.52
	Total	235	57.53	11.71	56.02	59.03
Station 2	NOT M-CAP	178	66.77	9.53	65.36	68.18
	M-CAP	57	67.20	9.20	64.76	69.64
	Total	235	66.87	9.44	65.66	68.09
Station 3	NOT M-CAP	178	68.14	14.50	65.99	70.28
	M-CAP	57	71.43	11.66	68.33	74.52
	Total	235	68.94	13.92	67.15	70.72
Station 4	NOT M-CAP	178	60.09	13.23	58.14	62.05
	M-CAP	57	61.79	11.14	58.84	64.75
	Total	235	60.50	12.75	58.87	62.14
Station 5*	NOT M-CAP	178	81.50	13.04	79.57	83.43
	M-CAP	57	86.43	11.61	83.35	89.51
	Total	235	82.70	12.86	81.04	84.35
Station 6	NOT M-CAP	178	62.47	14.53	60.32	64.62
	M-CAP	57	63.09	12.77	59.70	66.48
	Total	235	62.62	14.10	60.81	64.43
Station 7	NOT M-CAP	178	66.48	12.44	64.64	68.32
	M-CAP	57	67.69	10.28	64.96	70.42
	Total	235	66.77	11.94	65.24	68.31

Station 8	NOT M-CAP	178	69.40	14.73	67.22	71.58
	M-CAP	57	71.29	11.85	68.14	74.43
	Total	235	69.86	14.08	68.05	71.67
Station 9*	NOT M-CAP	178	67.76	13.89	65.71	69.82
	M-CAP	57	71.66	13.97	67.95	75.37
	Total	235	68.71	13.98	66.91	70.50
Station 10*	NOT M-CAP	178	64.17	12.17	62.37	65.97
	M-CAP	57	68.59	11.08	65.65	71.53
	Total	235	65.24	12.04	63.70	66.79
# OSCE Stations Passed*	NOT M-CAP	178	5.98	2.12	5.66	6.29
	M-CAP	57	6.53	1.77	6.06	7.00
	Total	235	6.11	2.05	5.85	6.37
Total Clinical Score**	NOT M-CAP	178	66.36	7.37	65.27	67.45
	M-CAP	57	68.89	5.60	67.40	70.38
	Total	235	66.97	7.06	66.07	67.88

[†]SD = standard deviation; [††]95% CI = 95% confidence interval

* $p < 0.05$ for a one-tailed test (as the M-CAP group was theoretically expected to outperform the other IMGs (i.e. they received formal specialized instruction for clinical and language performance), the ANOVA analyses were conducted for a one-sided test); ** $p < 0.01$ for a two-tailed test

Table 4: IMGs Perceptions of Effectiveness, Feedback and Growth of English Language Understanding (*n*=59)

IMG Perception	Rating					Mean
Effectiveness of Experience	5 Excellent	4 Good	3 Average	2 Below Average	1 Poor	
Program Effectiveness	47 (80%)	12 (20%)	-	-	-	4.80
Instructor Effectiveness	48 (81%)	11 (19%)	-	-	-	4.81
Usefulness of Feedback	4 Great Extent	3 Some Extent	2 Small Extent	1 Not at All		
From Language Assessor	51 (86%)	8 (14%)	-	-		3.86
From Standardized Patient	33 (56%)	24 (41%)	2 (3%)	-		3.53
From Physician	51 (86%)	7 (12%)	1 (2%)	-		3.85
Growth of English Understanding	42 (71%)	17 (39%)	-	-		3.71

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