The Medical Mission and Modern Core Competency Training: A 10-Year Follow-Up of Resident Experiences in Global Plastic Surgery

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Background: The emphasis on cultural competency for physicians and surgeons is increasingly important, as communication with both patients and other providers significantly affects individual and system-wide outcomes. International surgical training has been shown to improve leadership skills, cultural competency, and technical proficiency of participants in short-term follow-up. This study explores the long-term impact of international surgical mission experiences on developing participants' core competencies, professional outcomes, and commitment to global health.

Methods: All 208 plastic and reconstructive surgeons who completed the Operation Smile Regan/Stryker fellowship programs between 2006 and 2015 were surveyed electronically.

Results: One hundred sixty-five surveys were returned, for an overall response rate of 79.3 percent. The majority of participants reported that the fellowship positively impacted all six Accreditation Council for Graduate Medical Education core competencies. Most participants who were attending physicians at the time of the survey were practicing general plastic surgery, with 42 percent in an academic/teaching environment, 32 percent in assistant/associate professor positions, and 6 percent in either a program director or department chairman position. The majority currently volunteer on local or international missions, and all respondents would consider volunteering again.

Conclusions: Carefully structured and rigorously proctored programs such as the Regan/Stryker Fellowship offer plastic surgery residents the opportunity to gain valuable professional and personal experiences that benefit them long after their service experience. Programs of this nature can not only effectively improve cultural competency of physicians, but also positively influence their attitudes toward leadership and direct that potential to meet the growing need for surgical care in low- and middle-income countries. (*Plast. Reconstr. Surg.* 138: 531e, 2016.)

Cross-cultural experiences have become an integral part of surgical education, in part because of the increasing diversity of patients in the United States and the growing burden of surgical care in low- and middle-income countries.[1] Strengthening cultural competency and understanding resource allocation and system-based medicine are critical in today's global health landscape, as an estimated 2 billion people worldwide lack access to adequate surgical care.[2]

Surveys report that a significant number of North American residents and medical students are interested in having international educational experiences and select medical education programs based on the availability of these opportunities.[3–6] In response to this interest, there are now more than 50 global health institutes seated within major academic health centers in North America.

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However, less than one-third of these institutions cater to surgical residency programs.[6]

A 2011 study from our group in this *Journal* reported that plastic surgery resident participation in medical missions and short-term international experiences advanced educational growth in Accreditation Council for Graduate Medical Education core competencies.[7] This report builds on our previous work and examines the long-term impact of a global surgical experience on the careers of participants and the populations they serve, and the potential impact on global surgery capacity.

METHODS

The Operation Smile Regan Fellowship and Stryker International Fellows Program are educational initiatives that offer plastic surgeons in training (plastic surgery residents) from both developed countries and low- and middle-income countries surgical experience in the treatment of cleft lip and palate. The programs consist of a 2-week experience that includes a surgical mission with a follow-up debriefing meeting. Each fellow serves as a member of a multidisciplinary cleft care team on an Operation Smile mission—involving 2 days of preoperative screening, 4 to 5 days of surgery, and 1 to 2 days of postoperative—under mentorship of senior attending surgeons. In a rigorously proctored environment, fellows participate in the delivery of multidisciplinary surgical care in resource-limited, multicultural settings and explore the socioeconomic factors that affect local and national surgical capacity. All fellows reconvene at an annual follow-up meeting to debrief with peer and mentor groups in a practice-based learning environment.

In 2015, a cross-sectional survey was conducted of all 208 Operation Smile Regan/Stryker fellows who completed the program between 2006 and 2015. Operation Smile, an international not-for-profit organization that specializes in treatment of patients with cleft lip and/or cleft palate, provides millions of patient evaluations and hundreds of thousands of gratis operations for children in low- and middle-income countries. Online surveys were distributed by means of e-mail; they consisted of 60 simple free response and three-level Likert scale questions designed to maximize clarity. Questions focused on the fellowship's impact on Accreditation Council for Graduate Medical Education core competencies, career motivations and trajectory, populations served, and global health capacity. Certain questions were more subjective, such as questions regarding the degree to which the fellowship affected Accreditation Council for Graduate Medical Education core competencies. Questions were structured to be fact-based and objective whenever possible (e.g., demographics, career status, and quantification of the number of the people the individual had helped on a volunteer basis). Demographics reported were from the time of the survey. There were no financial incentives for completing the survey.

RESULTS

One hundred sixty-five surveys were returned, for an overall response rate of 79.3 percent. Fellows were from 42 different countries; 47 percent were from North America and 44 percent were from low- and middle-income countries. Fellows participated in missions in 34 different countries in Africa, Asia, South America, Central America, and the Middle East. Table 1 lists demographics of past fellowship participants and current career pursuits. Mean and median age of respondents was 34 years, with a range of 26 to 45 years. Respondents were an average of 3 years out from the fellowship experience (range, 1 to 14 years). The majority of participants are currently living in North America, between 30 and 40 years of age, and in their fellowship or attending years.

Thirty-eight percent of fellowship participants pursued a fellowship in craniofacial surgery. Of respondents who were attending physicians at the time of the survey, a majority were practicing general plastic surgery, with 42 percent in an academic/teaching environment, 32 percent in assistant/associate professor positions, and 6 percent in a program director or department chairman position.

Figure 1 shows the reported impact of the Reagan/Stryker Fellowship on participants' Accreditation Council for Graduate Medical Education core competencies, leadership, and career development. Table 2 defines and exemplifies the type of survey question used for each of the categories for growth and development presented in Figure 1. The vast majority of participants reported that the fellowship positively impacted their core competencies in patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and systems-based practice. Participants reported being able to develop their technical skills through intensive training in the operating room and diverse mentorship from leading surgeons in the field. A significant

Table 1. Respondent Demographics and Attending Leadership Positions

Characteristic	No. (%)
Age	
<30 yr	24 (15)
31–35 yr	72 (46)
36–40 yr	51 (33)
>40 yr	8 (5)
Career status	
Resident	56 (34)
Fellow	34 (21)
Attending physician	74 (45)
Fellow's region of origin	
Africa	13 (8)
Asia	24 (15)
Australia	1 (1)
Central America	14 (9)
Europe	14 (9)
North America	76 (47)
South America	20 (12)
Medical mission region on Regan/Stryker mission	
Africa	14 (12)
Asia	69 (61)
Central America	20 (18)
South America	10 (9)
No. of procedures performed on Regan/Stryker mission	
<25	66 (46)
25–100	69 (48)
>100	9 (6)
No. of mentors on Regan/Stryker mission	
1–3	45 (30)
3–5	68 (46)
5–10	27 (18)
>10	9 (6)
No. of cultures exposed to on Regan/Stryker mission	
1–3	68 (45)
3–5	51 (34)
5–10	23 (15)
>10	9 (6)
Fellowship(s) done	
Pediatric/craniofacial	41 (38)
Hand	12 (11)
Microsurgery	22 (20)
Cosmetic	19 (18)
Burns	13 (12)
Other	23 (21)
Type of practice	
Academic/teaching	31 (42)
Solo/private practice	11 (15)
Group practice	13 (18)
Community	19 (26)
Primary specialty	
General plastic surgery	28 (58)
Pediatric/craniofacial	10 (21)
Hand	1 (2)
Burn	1 (2)
Microsurgery	7 (15)
Cosmetic	1 (2)
Leadership positions	
Assistant/associate professor	24 (32)
Program director	2 (3)
Department chairman	2 (3)
Surgical society leadership	1 (1)
Journal board member	1 (1)
Small business owner	7 (9)
Other	7 (9)
None	30 (41)
Volunteerism	
Would volunteer again	164 (100)
Currently volunteer on medical missions	91 (55)
Currently perform nonmedical volunteerism	45 (27)
Currently an active mentor	75 (46)
Gave money to a nonprofit in the last year	86 (52)

(*Continued*)

Table 1. *Continued*

proportion (48 percent) of respondents participated in performing more than 25 procedures on their international mission, and most received mentorship from three to five different senior attending physicans. In addition, exposure to an international cadre of plastic surgery faculty further built practice-based learning skills on medical mission trips.

For the vast majority of participants, this impact translated into a lasting commitment to underserved populations. At the time of the survey, 55 percent actively participated on medical missions. Over 70 percent of participants reported seeing clinic patients on a regular basis in a volunteerism setting, and over 50 percent currently performed surgery on a regular basis in a volunteerism setting. Since finishing the program, a majority of participants had seen over 25 patients in a volunteer clinic setting, performed over 25 operations in a volunteer setting, and actively mentored at least 10 to 20 students. The majority of respondents believed the experience enhanced their sense of self-confidence, ability to lead, and desire to contribute on a volunteer basis throughout their career.

In reflective narratives from the survey, common sentiments highlighted the value of accessing diverse experts in the field of cleft care, forming relationships with professionals interested in international service, and developing a more comprehensive understanding of patient-centered care. Participants reported that the fellowship positively impacted their choice of plastic surgery specialty, prepared them for their current career, and increased their likelihood of participating in volunteerism to underserved populations. Long-term patient follow-up was universally recognized as a marked shortcoming within the service mission system, and respondents agreed that it was an important point of exposure to the challenges that arise in the delivery of care in resource-limited settings. Exposure to only a single country and medical system was also cited as a shortcoming, given the need for broader based

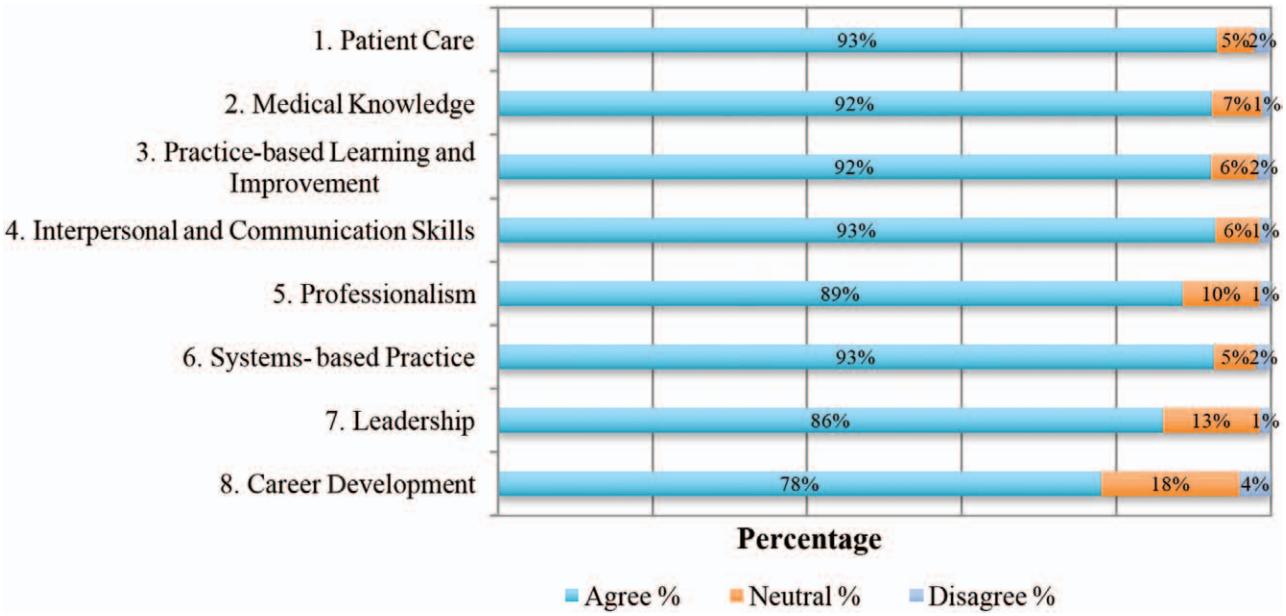

Fig. 1. Impact of Reagan/Stryker Fellowship on Accreditation Council for Graduate Medical Education core competencies and surgical leadership. See Table 2 for definition of each category.

Table 2. Accreditation Council for Graduate Medical Education Core Competencies, Leadership, and Career Development Definitions and Subclassification in Survey Questions

Patient care
Appreciation for the impact of a person's culture on their health
Confidence in dealing with other cultures
Emphasized accountability to patients by encompassing confidentiality, respect, and autonomy
Reflected a model of patient care that emphasizes compassion, integrity, and respect for others
Medical knowledge
Ability to evaluate cleft lip and cleft palate patients
Technical surgery skills
Practice-based learning and improvement
Ability to adapt surgically
Ability to adapt professionally
Interpersonal and communication skills
Worked with diverse interprofessional teams to enhance patient safety and quality care
Effective for practicing effective communication with physicians, health professionals, and staff from different socioeconomic and cultural backgrounds
Was an opportunity to learn how to more effectively communicate with patients from different socioeconomic and cultural backgrounds
Provided experience in effective resource allocation to benefit the most possible patients
Professionalism
Ability to form partnerships
Had numerous clinical faculty from diverse backgrounds and facilitated exchange of ideas, intensive resident education
Systems-based practice
Awareness of health care disparities
Ability to quickly adapt to a new health care setting; was beneficial for work within a health care system in an underdeveloped nation with severely limited resources
Leadership
Desire to become a leader
Ability to become a leader
Choice to mentor
Self-confidence
Personal sense of social responsibility
Likelihood to participate in volunteerism to underserved populations
Career development
Choice of plastic surgery specialty
Preparation for current career

cultural competency training in today's diverse communities. Similarly, each medical mission is unique, with specific faculty/mentorship, operative volume, operative autonomy, volunteer diversity, and team dynamics; the high variability in individual mission experiences was cited by many participants as a shortcoming.

DISCUSSION

The Accreditation Council for Graduate Medical Education defines six core competencies for surgical resident education,[8] but there is no consensus regarding the most effective way for residents to develop these aptitudes. A 2014 study of 48 surgical residents at Baylor University reported that residents had a low level of confidence in core competencies that were difficult to structure within a traditional residency (i.e., practice-based learning, interpersonal and communication skills, systems-based practice, and professionalism). Despite efforts to form a curriculum around these skills, dedicated didactics for these topics showed mixed program evaluation results.[9]

Also, scrutiny of cultural competency has heightened in recent years. A nationwide survey of 2047 residents across a range of specialties (e.g., internal medicine, surgery, pediatrics, obstetrics/gynecology, emergency medicine, psychiatry, and family medicine) showed that surgical and emergency medicine residents were less likely to deem cultural issues as "very important" (43 and 47 percent, respectively), compared with all other specialties (67 to 94 percent).[10] Similar findings were presented in a qualitative study of 68 residents across the United States who reported little formal training in cultural competency despite being told that such training was important.[11] These residents reported that their cultural competency skills were gained largely through ad hoc personal experiences, rather than institutionally supported initiatives. Chun et al. reported that surgical residents and faculty both view culture as a challenge in clinical practice and that both groups desire more training on cultural issues.[12,13]

Previous studies on similar plastic surgery resident populations reported that short-term international experiences advanced educational growth in all competencies, especially those tied to culture and communication.[7,14,15] In recent years, several small-scale cohort studies in general surgery, internal medicine, and pediatrics showed that short-term international electives led to resident growth in all six Accreditation Council for Graduate Medical Education core competencies.[16,17]

We expand on previous evaluations of short-term international experiences in the context of core competencies. In our study, fellows improved their skills in patient care by becoming immersed in a culturally diverse setting that would otherwise have been difficult to reach, and participating in high-intensity clinical screening and operative planning. They significantly increased their medical knowledge by completing large volumes of patient screenings and procedures under direct mentorship. The majority of fellows performed between 25 and 100 operations on a single mission, and over 90 percent felt they improved their surgical skills and ability to adapt in the operating room. Reciprocal knowledge sharing in a close-knit team fostered practice-based learning and improvement, with 96 percent of fellows reporting that the mission improved their ability to grow in interprofessional teams. Participants improved interpersonal and communication skills by working with new, multidisciplinary teams on a daily basis. Professionalism was richly fostered as fellows assumed leadership positions, offered mentorship to students and peers, and networked with a culturally diverse group of professionals. Learning how to adapt to new medical systems and team dynamics helped each participant manage challenges in systems-based practice.

Certain important and lasting impacts of short-term international experiences are not quantified by the Accreditation Council for Graduate Medical Education core competencies, such as future leadership potential, lifelong lessons, awareness in resource management, an appreciation of international partnerships, and support for surgical capacity in resource-poor settings. To this end, our data show a high level of volunteerism, mentorship, and leadership in Regan/Stryker fellows, a trend that is consistent with previous findings. A 21-year follow-up study conducted by the University of Virginia found that of graduates who participated in international missions as residents, 60 percent participated in missions when in practice, versus 5.9 percent among graduates who did not participate in missions during residency.[18] Similarly, Disston et al. found that 19 percent of orthopedic surgery residents who participated in a month-long international rotation chose to volunteer on international surgical missions after residency; only 6 percent of residents who did not participate in the international elective went on to volunteer on international missions after residency.[19] These findings suggest that the commitment to working with underserved populations cultivated during a short-term international

experience during residency can translate into continued dedication.

Critics of traditional short-term international resident experiences point out that more reciprocal feedback is necessary to build global health capacity.[20] Newer programs such as the Regan/Stryker fellowships emphasize the importance of cross-cultural exchange. As such, our fellows overwhelmingly cited operating with local surgeons, educational exchanges with local staff, and collaborations with foreign institutions on clinical research as the most rewarding aspects of their experience. In open-ended responses, fellows also reported an increased motivation to seek out research collaborations and maintain ties with international medical colleagues. As fellows in this study traveled to 34 different countries on three continents over a 10-year period, each individual likely had varied experiences in terms of particular cultural, professional, and personal interactions. We show that despite country-specific attributes of each mission, fellows were able to consistently derive benefits in terms of Accreditation Council for Graduate Medical Education core competency training and leadership potential.

On a practical level, institutional and financial support for short-term international experiences for residents is essential, as lack of Accreditation Council for Graduate Medical Education approval, time constraints, and funding are the most commonly cited barriers to participation.[6] Half of short-term international programs are funded by individual hospitals, and a quarter are sponsored by nongovernmental organizations. Thirty-three percent of residency programs offer some type of international opportunity, but of the majority of these are for nonsurgical specialties[21]; to date, only 12 percent of surgical programs have formal international electives.[22] Even when such programs are available to surgical residents, it is difficult for them to participate because they generally must use vacation time.

Academic plastic surgery has played a prominent role in recognizing that global medicine is relevant and valuable in training the next generation of surgeons.[23–25] In 2015, the Plastic Surgery Residency Review Committee and Accreditation Council for Graduate Medical Education provided guidelines for formal approval of international rotations for residents. This included an approved process for recognizing international rotations, addressing issues of patient and resident safety, the nature of the site, and the educational structure of the rotation.[26,27] Under this formalized structure, residents receive credit for their cases in Accreditation Council for Graduate Medical Education case logs and do not have to use extended vacation time to work internationally. Increasing numbers of plastic surgery programs now sponsor international rotations, and application templates for international rotations to comply with Accreditation Council for Graduate Medical Education/Plastic Surgery Residency Review Committee requirements have been created to facilitate the participation of interested programs.[28–30]

As international plastic surgeon volunteerism has evolved over the past 50 years, there has been an increasing and rightful emphasis on training surgeons; building local capacity; and ensuring patient safety, care continuity, and good outcomes.[31–33] Different surgical organizations have developed their programs in different ways to balance these objectives.[34] For instance, Interplast (now ReSurge International), in the late 1990s, launched incubator and medical scholar programs to facilitate local surgeon training, in addition to direct surgical provision through medical missions.[35] On surgical missions, Interplast has periodically included plastic surgery residents and Webster Fellows (recent residency graduates), recognizing their importance to missions, the need for international volunteerism in resident development, and also the controversy of trainees learning on vulnerable populations and potentially displacing the training of local doctors.[34,35] Both ReSurge and Operation Smile have developed a combination of overlapping programs to facilitate surgical training and treatment: surgical care through team trips and outreach programs, and training through visiting educators (ReSurge), international and local mission trips, educational outreach programs, and local comprehensive cleft care centers (Operation Smile).[36,37] Twenty-six of the surveyed fellows in this study completed their mission at a comprehensive cleft care center, where sustainability in both local surgeon education and service provision was prioritized. Local resident training is also an important component of Operation Smile mission trips; care was taken to integrate Regan and Stryker fellows into the training of local residents rather than displacing them.

Limitations of this study include possible selection bias within the sampled cohort. Residents who choose to participate in an international surgical mission are a self-selected group who are more likely to value the experience, grow from the mission, and have their positive attitudes toward international work reaffirmed. Similarly,

this resident cohort is likely self-selected regarding their interest in craniofacial surgery and pursuing such a fellowship to this effect. Our reported high rate of residents pursuing craniofacial surgery is partially attributable to this bias. This study was survey-based, which carries inherent limitations regarding self-reported outcomes, but it did have a very high response rate, which suggests that the study sample is generalizable across Regan and Stryker fellows.

More than ever, the surgical profession needs leaders in global surgery, education, and systems-based care. The recent Lancet Commission report "Global Surgery 2030," stresses the importance of cross-cultural exchanges and the success of surgical nongovernmental organization programs in teaching both medical and systems-based skills in resource-poor settings.[38] This claim is supported by numerous previous studies that have reported the immediate educational effects of international humanitarian missions. Our study presents the lasting impact and value of such experiences on not only core competencies, but also career trajectory, propensity toward leadership, desire to work in multicultural populations, and potential to increase global surgical capacity. Carefully structured and rigorously proctored programs such as the Regan and Stryker fellowships offer plastic surgery residents the opportunity to gain valuable professional and personal experiences that benefit them throughout their careers. Programs of this nature can not only effectively improve cultural competency of future physicians, but also positively influence their attitudes toward leadership and direct that potential to meet the growing need for surgical care in low- and middle-income countries.

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