

Orthopaedic trauma observerships in North America for international surgeons: the visitors' perspective

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Objective: International observerships are one of many efforts aimed at addressing disparities in orthopaedic trauma care globally. However, their impact on visiting surgeons and their home countries, as well as the challenges faced by participating surgeons, are not well-documented.

Methods: A survey was distributed to overseas surgeons who participated in an orthopaedic trauma observership from 2009 to 2020. Surgeons were identified through North American institutions previously recognized by the authors as having hosted international observerships. Information gathered included participant demographics, details of and perceived impact of the observership, and barriers faced before, during, and after the program. Responses from 148 international surgeons (ISs) from 49 countries were analyzed.

Results: Sixty percent of observerships were at academic programs, 57% lasted 1–3 months, and 60% were self-funded. Participants identified cost and housing as primary barriers. After completing their observership, lack of funding, equipment and support staff, and excessive workload prevented participants from implementing changes at their clinical practice. Most observers believed that they gained relevant clinical (89%) and surgical knowledge (67%) and developed a professional network of North American hosts (63%). The most common suggested changes to the observership were greater hands-on experience in the operating room and structured goal setting relevant to the visiting surgeon.

Conclusions: Visiting surgeons find North American orthopaedic trauma observerships helpful in improving their surgical and clinical skills. However, financial constraints and resource limitations at their clinical practice and limited operative experience during the observership present barriers to maximizing this clinical experience. To enhance the relevance of clinical observerships for ISs and impact global orthopaedic trauma care, the unique needs and challenges facing ISs must be addressed.

Level of Evidence: IV—Cross-Sectional Study.

Keywords: clinical observerships; education; global health; low-middle income countries; orthopaedic trauma

1. Introduction

Musculoskeletal injuries impose a substantial burden globally. The mortality associated with these injuries is greater in low-income countries (LIC) and lower middle-income countries (LMICs), hereafter referred to collectively as LMICs.^[1,2]

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LMICs face several ongoing barriers that contribute to this disparity, including an uneven distribution of the global surgical workforce, inadequate access to surgical care, and absence of opportunities for further training and professional development for local surgeons.^[3,4] The need for improving access to quality surgical care in medically underserved regions globally is well known to the orthopaedic community.^[5–11]

One of the efforts to address these disparities has been the availability of short-term clinical observerships for surgeons from resource-limited environments to visit surgeons and centers in high-income countries (HICs). Currently, many North American (NA) academic centers and professional societies provide such teaching and training opportunities for international surgeons (ISs) from LMICs.^[6–8] A recent web-based search found that orthopaedic trauma was one of the most prevalent subspecialties among orthopaedic observerships available in North America to ISs.^[12] However, the perceived impact of trauma-focused observerships on the visiting LMIC surgeons in the context of their own clinical practice has not been well studied. A recent study found that participation in a NA pediatric orthopaedic observership had a positive perceived impact on most visiting ISs.^[13] Although a few reports have discussed the potential impact of and barriers to observerships in North America available to ISs, this outcome has not been extensively studied in the context of orthopaedic trauma.^[6–8,11,14–19]

Therefore, our primary aim was to assess the characteristics of ISs who participated in North American orthopaedic trauma observerships between the years 2009 and 2020. Furthermore, we

wanted to analyze the ISs' perception of the impact of such visitation on their professional development and clinical practice and determine whether there were any associations between such effects and the income level of the surgeons' country of residence. We also sought to explore any perceived barriers that the visiting surgeons encountered while participating in North American observerships. We believe that the results of this study will provide firsthand information regarding the value of such short-term clinical opportunities for international orthopaedic trauma surgeons and their local peers and patient population. The results of this study can contribute toward formulating best practices for organizing clinical observerships in orthopaedic trauma for ISs and ensure that such programs are designed to be mutually beneficial to all stakeholders.

2. Methods

2.1. Survey Design and Distribution

This study was deemed exempt from institutional review board approval. We modified a survey that was previously used for a similar study among international orthopaedic surgeons who previously participated in a pediatric orthopaedic observership at a North American institution^[13] (Supplementary Fig. 1, <http://links.lww.com/OTAI/A63>). The survey sought information regarding the observer's demographics, with multiple questions inquiring into their perception of the impact of and barriers related to the observership program. A semiquantitative approach was also used with open-ended survey questions pertaining to the surgeon's overall experiences. Survey questions were developed to address the lack of available information regarding the impact of trauma observerships on ISs and were adapted from previously published surveys.^[12,13,20] Members from an academic orthopaedic trauma consortium,^[21] the Consortium of Orthopaedic Academic Traumatologists (COACT), provided further input before the survey was finalized for distribution.

Orthopaedic trauma surgeons at 24 Canadian or US host institutions were contacted through the COACT network and were asked to identify and provide e-mail addresses for ISs who completed a trauma observership at their institution between the years 2009 and 2020. Potential respondents had to reside outside of North America at the time of their observership to be eligible. Seventeen (71%) host sites responded, seven of which directly distributed the survey to their visiting surgeons. We distributed the survey to the remaining list of contacts and collected responses using Google Forms^[22,23] or REDCap electronic data capture tools^[24,25] hosted at the University of California, San Francisco. Responses were collected anonymously from January 2021 to May 2021. Duplicate responses were excluded. Respondents were given the option to provide their contact information if they desired to be acknowledged in the manuscript for their participation. ISs who visited more than one host site were requested to provide an overall impression of their observership experience.

2.2. Statistical Analysis

Descriptive statistics were calculated for data collected on participant demographics, perceived impact, and perceived barriers of the clinical observership. According to World Bank income data,^[26] respondents were categorized into four income groupings based on gross national income per capita^[27]: HIC, upper

middle-income country (UMIC), LMIC, or LIC. Comparisons among groups were performed using the Pearson χ^2 test or two-sample *t* test where appropriate, with significance set at $P < 0.05$. Unless otherwise stated, comparisons were made between surgeons from lower-resource settings (encompassing LICs and LMICs, abbreviated as LMICs for clarity) and from higher-resource settings (encompassing UMICs and HICs, abbreviated as HICs for clarity). All analyses were performed using STATA SE version 16 (StataCorp).

3. Results

3.1. Participant Demographics

Responses from 148 ISs who had participated in observerships were analyzed, after three ineligible NA participants were excluded for not being ISs at the time of their observership. IS respondents were primarily male (89%) and between the ages 35 and 44 years at the time of survey response (66%; Table 1). Respondents practiced in 1 of 49 countries, which represented six World Bank Regions^[26] (Fig. 1), with most (79%) residing in UMICs and HICs (Table 1). Fifty seven (39%) individuals reported that they had participated in >1 North American observership (average 2.09; range 1–11). A significant association was noted between the income classification of the surgeon's country of residence and having participated in >1 NA observership ($P = 0.029$), with LIC surgeons more likely than their counterparts from LMICs, UMICs, and HICs to complete multiple observerships (Fig. 2).

3.2. Observership Details

The respondents completed their observerships, on average, 4.1 years (range 1–11 years) before completing the survey. Of 35 different North American observership sites that respondents reported visiting, most observerships were either self-funded

TABLE 1
Demographics of International Surgeons at the Time of Survey Response

Demographics of International Surgeons	Total (N = 148)
Sex	
Male	132 (89)
Female	16 (11)
Age (at the time of completing survey)	
18–24 years	1 (1)
25–34 years	17 (12)
35–44 years	98 (66)
45–54 years	29 (20)
55–64 years	3 (2)
Country of residence region classification	
East Asia and Pacific	47 (32)
Europe and Central Asia	39 (27)
Latin America and Caribbean	33 (22)
Middle East and North Africa	9 (6)
South Asia	8 (5)
Sub-Saharan Africa	11 (8)
Country of residence income classification	
LICs	8 (5)
LMICs	23 (16)
UMICs	44 (30)
HICs	73 (49)

Values are given as number of respondents, with percentage in parentheses.

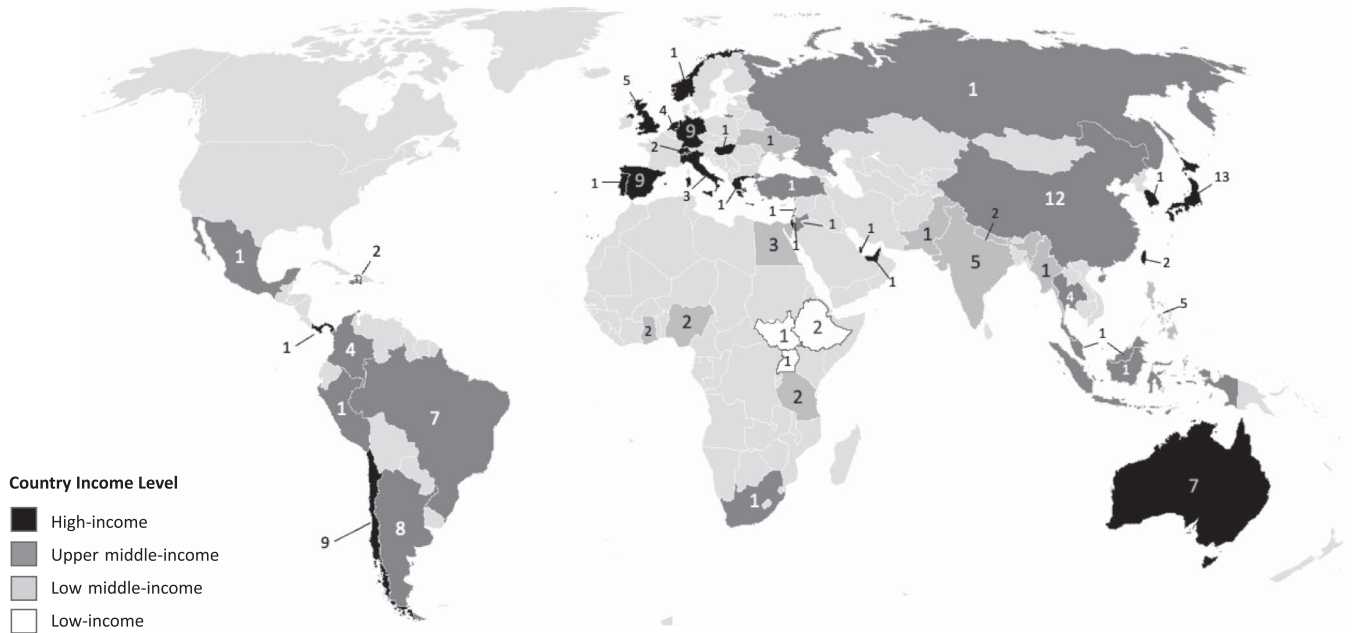


FIGURE 1. Geographic distribution of country of residence and income level.

(60%) or sponsored by a scholarship or professional society (40%; Table 2). The total duration of most observerships was 1–3 months (57%) or <1 month (36%; Supplementary Figs. 2 and 3, <http://links.lww.com/OTAI/A64>, <http://links.lww.com/OTAI/A65>). The most frequent observership activities that respondents participated in included observing in the operating room (OR; 96%) and outpatient clinic (72%) and attending didactic sessions (86%; Table 2).

3.3. Perceived Barriers and (lack of) Support

3.3.1. Barriers and Support Before Observership. The most common predeparture barriers identified by the respondents included high cost (24%) and difficulty finding housing (13%; Table 3). Compared with HIC surgeons, LMIC surgeons were more likely to report high cost as a barrier to participating in an observership ($P = 0.036$). By contrast, HIC surgeons reported language barriers as a more significant constraint ($P = 0.013$).

Supplementary Table A (<http://links.lww.com/OTAI/A66>) presents predeparture information that respondents reported receiving from their host institution and information that they did not receive but would have preferred to receive. Most programs provided at least some information regarding the host institution (74%) and health screening requirements (62%), but the most common information that respondents would have preferred but was not provided included a program schedule (45%), housing information (38%), and a web-based orientation (31%).

3.3.2. Barriers and Support During Observership. During the observership, ISs reported that the most common types of support provided by the host institution included administrative support staff (53%), academic resources such as library access (45%), and career advice and mentorship (41%; Supplementary Table B, <http://links.lww.com/OTAI/A67>). An association was identified between IS from LMICs and receiving support including

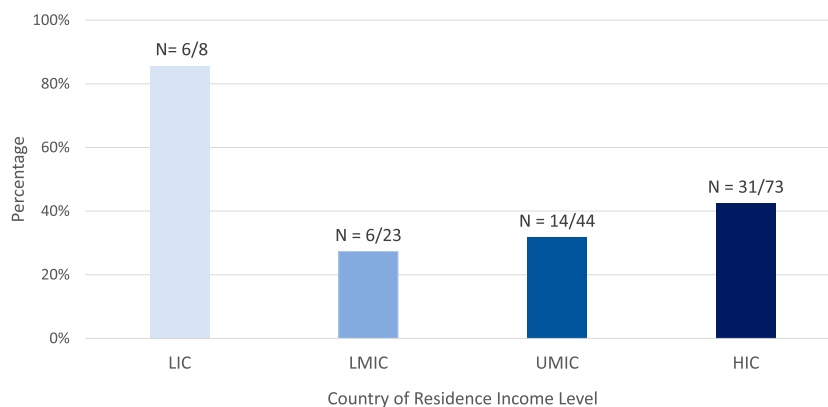


FIGURE 2. World Bank Class distribution of surgeons who attended >1 observership.

TABLE 2
Characteristics of Observership Programs

Characteristics of Observership Programs	Total (N = 148)
Observership type*	
Academic institution	88 (60)
Professional society	49 (33)
Private practice	14 (10)
Other/no response	5 (3)
Duration of observership	
Less than 4 weeks	53 (36)
4–12 weeks	84 (57)
More than 12 weeks	11 (7)
Observership activities participated in*	
Observe in the OR	142 (96)
Attend grand rounds, conferences, seminars, journal club, and other didactic lectures	128 (86)
Observe in the outpatient clinic	106 (72)
Participate in inpatient rounds	83 (56)
Attend a professional society meeting	48 (32)
Participate in surgical skills laboratory activities	46 (31)
Give a formal presentation on an orthopaedic topic	34 (23)
Research	29 (20)
Observe administration operations to enhance leadership abilities	23 (16)
Sponsoring institution/professional society†	
Mayo Clinic (Rochester, MN)	40
University of California San Francisco (San Francisco, CA)	20
Harborview Medical Center (Seattle, WA)	18
AO Trauma Fellowship	16
Denver Health (Denver, CO)	9
Massachusetts General (Boston, MA)	8
University of Missouri, Columbia/Missouri Orthopaedic Institute (Columbia, MO)	8
Memorial Hermann/University of Texas McGovern (Houston, TX)	7
Hospital for Special Surgery, (New York, NY)	4
Parkland Hospital/University of Texas Southwestern (Dallas, TX)	3
Shock Trauma (Baltimore, MD)	3
Rothman Institute/Jefferson Health (Philadelphia, PA)	2
Children's Hospital of Philadelphia (Philadelphia, PA)	2
Orthopaedic Trauma Association	2
University of South Florida (Tampa, FL)	2
McGill University Health Centre (Montreal, QC)	2
McMaster University (Hamilton, ON)	2
Vanderbilt University Medical Center (Nashville, TN)	1
Johns Hopkins University (Baltimore, MD)	1
MetroHealth Cleveland (Cleveland, OH)	1
Pikeville Medical Center/University of Pikeville (Pikeville, KY)	1
Steadman Philippon Research Institute (Vail, CO)	1
Banner Medical Center (Phoenix, AZ)	1
Temple University Hospital (Philadelphia, PA)	1
Brown University (Providence, RI)	1
Regions Hospital/University of Minnesota (St. Paul, MN)	1
University of Miami/Jackson Memorial Hospital (Miami, FL)	1
Mayo Clinic Jacksonville (Jacksonville, FL)	1
Medical College of Wisconsin (Milwaukee, WI)	1
Rush University (Chicago, IL)	1
Beth Israel Medical Center Orthopaedics (Boston, MA)	1
SIGN Fracture Care International	1
American Society for Surgery of the Hand	1

The values are given as the number of respondents, with the percentage in parentheses.

* Some respondents responded to >1 category.

† Host institution was determined through a free-text response question; some respondents attended observerships at >1 institution, some did not respond to the question, and some listed the sponsoring society and did not specify a host site, and therefore, this is not an exhaustive list of host sites.

interpreter services ($P = 0.020$), financial support (0.005), and lodging ($P < 0.001$).

During their observership, the primary barrier reported by ISs included high cost (20%), followed by difficulty adapting to a new health care system (5%), difficulty integrating into the host surgeons' daily routines (5%), and language barriers (5%; Table 3). Additional barriers reported through free-text response included limited patient interaction and ability to scrub in for surgical cases and limited duration of observership. Participants were asked to identify the most significant barrier experienced during their observership. Examples of their free-text responses are presented in Supplementary Table C (<http://links.lww.com/OTAI/A68>); the most prevalent theme identified was the limited ability to participate in the OR.

3.3.3. Barriers After Observership. After completion of their observerships, IS continued to face barriers with implementing changes to their clinical practice, including equipment availability (41%, $P < 0.001$), excessive workload (38%, $P = 0.002$), lack of hospital funding (36%, $P = 0.007$), lack of appropriately trained support staff (32%, $P = 0.02$), and inability of patients to afford treatment (28%, $P < 0.001$; Table 3). All these barriers, with the addition of patient reluctance to accept treatment ($P < 0.001$), were significantly associated with IS from LMICs.

3.3.4. Perceived Impact After Observership. After completing their observership, most respondents reported being able to incorporate new skills into their practice, particularly in clinical decision making and diagnosis (Table 4). Overall, most surgeons reported gaining relevant orthopaedic knowledge (89%), in addition to forming professional relationships (63%) and gaining relevant surgical skills (67%). No trends were observed between income level of the respondent's country of residence and the perceived impact of the observership. Participants were asked to identify the most significant impact of participating in the observership. Examples of their free-text responses are presented in Supplementary Table D (<http://links.lww.com/OTAI/A69>); the most prevalent themes were development of a professional network with NA hosts and meaningful cross-cultural sharing of perspectives.

After returning from their observership, nearly all respondents reported sharing the knowledge they had gained with their peers and trainees (98%) and encouraging others to apply for an observership (96%), and 80% continue to maintain contact with their North American hosts (Supplementary Table E, <http://links.lww.com/OTAI/A70>). Of the 148 surgeons surveyed, 142 (96%) continued to live and work in the country they resided in at the time of their observership. Of the six surgeons who did relocate, three (50%) moved from an LMIC to an HIC, one (17%) moved from a UMIC to an HIC, and two (33%) moved from an HIC to another HIC.

3.3.5. Suggested Changes to Observership. The most common suggested changes recommended by IS included a more comprehensive OR experience (69%), longer duration of observership (54%), more engagement in research activities (49%), additional financial support (41%), and more involvement in social activities (41%; Table 5). Participants were asked to identify the most important change they would like to see

TABLE 3
Barriers Experienced Before, During, and After Observership

Barriers Experienced by International Surgeons	Total (N = 148)	IS from LICs (N = 8)	IS from LMICs (N = 23)	IS from UMICs (N = 44)	IS from HICs (N = 73)
Before starting observership					
High cost*	36 (24)	2 (25)	12 (52)	9 (20)	13 (18)
Difficulty finding housing	19 (13)	2 (25)	3 (13)	6 (14)	8 (11)
Difficulty finding a faculty member sponsor	13 (9)	1 (13)	4 (17)	5 (11)	3 (4)
Difficulty finding an observership program	11 (7)	0	3 (13)	3 (7)	5 (5)
Difficulty passing health screening/other health issues	6 (4)	0	1 (4)	2 (5)	3 (4)
Language barrier*	6 (4)	0	0	3 (7)	3 (4)
During observership					
High cost	30 (20)	2 (25)	7 (30)	7 (16)	14 (19)
Difficulty adapting to a new health care system	8 (5)	1 (13)	2 (9)	3 (7)	2 (3)
Surgeons were unable to fit me into their daily routines	7 (5)	0	2 (9)	3 (7)	2 (3)
Language barriers*	7 (5)	0	0	2 (4)	5 (7)
After returning from observership					
Lack of equipment*	61 (41)	7 (88)	15 (65)	20 (45)	19 (26)
Excessive work load*	56 (38)	7 (88)	10 (43)	19 (43)	20 (27)
Government/hospital lack of funding*	53 (36)	5 (63)	11 (48)	18 (41)	19 (26)
Lack of appropriately trained support staff*	48 (32)	4 (50)	11 (48)	15 (34)	18 (25)
Patient/family's inability to afford treatment*	42 (28)	7 (88)	14 (61)	15 (34)	6 (8)
Discouragement from supervisors	15 (10)	0	4 (17)	6 (14)	5 (7)
Patient/family's reluctance to accept suggested treatment*	11 (7)	2 (25)	4 (17)	2 (5)	3 (4)

Values are given as the number of respondents who responded with "Considerably" (4 points) or "A great deal" (5 points) on a 5-point Likert scale, with the percentage in parentheses.

* Denotes categories for which the responses were significantly different between LIC/LMICs versus UMIC/HICs (P value < 0.05 for two-sample t test).

implemented in their observership experience. Examples of their free-text responses are presented in Supplementary Tables C and D (<http://links.lww.com/OTAI/A68>, <http://links.lww.com/OTAI/A69>); prevalent themes included more hands-on experience in the OR, explicit goal setting and scheduling before starting the observership, and greater integration into the clinical team at the host site.

5. Discussion

Our study aimed to assess the barriers to participation and perceived impact of North American orthopaedic trauma observerships for ISs. The barriers reported spanned multiple domains, including high cost, short duration, difficulty finding programs, and limited hands-on experience. Compared with HIC surgeons, surgeons from LICs perceived greater financial barriers to participation and decreased ability to implement changes in their home practices after participating. Despite these barriers, most surgeons, regardless of background or country of origin, reported a positive impact on patient care, surgeon professional and socioeconomic advancement, and research experience. Most visiting surgeons reported gaining relevant orthopaedic knowledge and formed meaningful professional networks with their host surgeons and would recommend the experience to other surgeons. Taken together, these findings suggest that both North American hosts and the countries in which the ISs practice should seek to expand, refine, and provide more funding for these experiences, particularly for surgeons from LICs.

The skills reportedly gained during the observership were more often in clinical decision making and diagnosis rather than operative skills, likely in part because of institutional restrictions imposed on the visiting surgeon from gaining hands-on exposure in the OR. Frustration at not being able to scrub in for surgical cases was expressed by surgeons of all backgrounds. IS believed that this limited access to the OR minimized the educational

benefit of observing their host surgeons and that their time may have been better spent discussing cases or even using other educational resources such as videos and books. In contrast to HIC-to-LMIC international rotations, where US surgeons and trainees have the opportunity to operate alongside LMIC surgeons and often participate to a greater extent with hands-on experience than they would at their home institutions,^[28–30] fully trained ISs coming to the US have limited opportunities to participate in patient care. The American Medical Association (AMA) guidelines for observerships specifically state that clinical observerships are intended for foreign physicians to learn about the practice of health care in US systems and not to further develop their clinical skills.^[31] Currently, despite recommendations by the ECFMG working group in 2014, there is no existing licensing category that allows for international physicians to enter a short-term clinical program that allows for patient contact, even as a scrubbed observer in the OR.^[16] However, institutions in other HICs^[32,33] use a graded responsibility approach for visiting trainees and surgeons, and several US state medical boards have licensure categories specifically designed for non-US physicians to interact directly with patients under US physician supervision.^[16] We recommend that such short-term licensures be adopted by state legislatures across the United States and echo the recommendation by Hudspeth et al that a new J-1 visa category be established by the Department of State to allow non-US physicians to participate in short-term clinical training without compromising patient safety or confidentiality. In addition, the host surgeons should work with their institutions' leadership to enhance visiting surgeons' abilities to more closely observe clinical encounters, especially in the OR.

Eighty percent of the respondents to our survey continued to stay in touch with their host surgeon after the observership, suggesting that such observerships provide an opportunity for visiting surgeons to develop networks that can enhance both professional and social relationships. To further improve the

TABLE 4

Perceived Impact of Observerships

Perceived Impact of Observerships	Total (N = 148)	IS from LICs (N = 8)	IS from LMICs (N = 23)	IS from UMICs (N = 44)	IS from HICs (N = 73)
New skills acquired					
Clinical decision making	108 (73)	7 (88)	14 (61)	36 (82)	51 (70)
Diagnostic skills	94 (64)	6 (75)	15 (65)	30 (68)	43 (59)
Teaching skills	85 (57)	4 (50)	8 (35)	25 (57)	34 (47)
Operative skills	83 (56)	6 (75)	12 (52)	27 (61)	38 (52)
Patient education/communication	69 (47)	6 (75)	9 (39)	24 (55)	30 (41)
Cultural competency	67 (45)	3 (38)	8 (35)	22 (50)	34 (47)
Presentation skills	65 (44)	6 (75)	9 (39)	23 (53)	27 (37)
Conducting research	55 (37)	6 (75)	7 (30)	17 (39)	25 (34)
Perceived benefits					
Gained relevant orthopaedic knowledge	132 (89)	8 (100)	18 (78)	42 (95)	64 (88)
Gained relevant surgical skills	99 (67)	5 (63)	16 (70)	32 (73)	46 (63)
Formed relationship with NA hosts that will be beneficial professionally	93 (63)	8 (100)	10 (43)	29 (66)	46 (63)

Values are given as the number of respondents who responded with "Considerably" (4 points) or "A great deal" (5 points) on a 5-point Likert scale, with the percentage in parentheses.

longitudinal impact of observerships, allowing visiting surgeons remote access to educational materials such as electronic books and journals through the host institution can be another way of promoting up-to-date access to the surgeon in their home country.^[34] Some respondents suggested including exposure to simulation and cadaver laboratory results to allow for instruction of surgical skills without involving live patients at the NA host institution.

We found wide variability both in the structure of observerships and in solicitation of feedback from visiting surgeons. A standardized evaluation system at the conclusion of the observership may help with addressing shortcomings and missed opportunities for future observerships.^[35] Many visiting surgeons believed that a more robust prearrival orientation package, including more detailed information regarding local accommodation, food, and navigating health care screening and travel procedures, and providing a more inclusive environment such as hosting social events with members of the clinical team would have been helpful. In addition, collectively establishing learning objectives and goals that are relevant and achievable at the start of the observership would help set realistic expectations for both the visiting surgeon and their NA host.

Our survey study had several limitations. Because of the methodology used to identify eligible participants and the anonymization of the responses, we could not determine the number of nonresponders and establish a survey response rate.

We requested that respondents only complete the survey a single time, and duplicate e-mail addresses were manually removed before contacting eligible participants. We limited responses to surgeons who participated in an observership from 2009 to 2020, but there still remains a possibility of recall bias given the potentially long period between observership participation and survey completion. It is also possible that there was a selection bias because participants who had a particularly positive or negative experience with their observership may have had a greater likelihood to respond. There may have been an acquiescence bias where respondents tended to respond positively to general quantitative questions because the overall perceived impact of observerships was exceedingly positive despite a substantial number of comments expressing frustration at the limited hands-on experience. However, on more specific, open-ended questioning, respondents provided more direct feedback that explored this limitation more comprehensively. In addition, our study did not account for annual changes in World Bank Income Classification that may have occurred during the study period.^[26] Furthermore, we did not survey all ISs who participated in an orthopaedic trauma observership during the study period, and surgeons who were hosted by other institutions may have had entirely different experiences. Only a minority of respondents were from LMICs; this distribution could also indicate a selection bias, or it could reflect the financial burden associated with participating in an observership, which disproportionately reduces access for

TABLE 5

Suggested Changes to Observership Programs

Suggested Changes to Observership Programs	Total (N = 148)	IS from LICs (N = 8)	IS from LMICs (N = 23)	IS from UMICs (N = 44)	IS from HICs (N = 73)
More OR experience (eg, better video observation or being allowed to scrub in as second/third assist)*	102 (69)	7 (88)	20 (87)	30 (68)	45 (62)
Longer duration of observership	80 (54)	6 (75)	15 (65)	28 (64)	31 (42)
More involvement in research	72 (49)	5 (63)	14 (61)	26 (59)	27 (37)
More financial support*	60 (41)	8 (100)	13 (57)	17 (39)	22 (30)
More involvement in social activities	61 (41)	4 (40)	9 (39)	20 (45)	28 (38)
More communication about goals of observership	56 (38)	5 (63)	10 (43)	18 (41)	23 (32)
More support with paperwork/accommodation before/ during the observership	55 (37)	3 (38)	11 (48)	20 (45)	21 (29)
More involvement in teaching*	47 (32)	3 (38)	13 (57)	17 (39)	14 (19)

Values are given as the number of respondents, with the percentage in parentheses. Some respondents filled out more than 1 category.

* Denotes categories for which the responses were significantly different between LIC/LMICs and UMIC/HICs (P-value <0.05 for two-sample t-test).

surgeons from lower-resource settings. Finally, we did not include the perspective of the host institutions, which limits our ability to make inferences about the feasibility of some of the proposed solutions that were discussed. To gain additional insight, we plan to survey the partner host institutions to explore the challenges and positive impacts they experience in hosting international observers and do a follow-up qualitative study to get more in-depth information on some of the responses.

This study elicited information on the perceived impact and barriers experienced by surgeons participating in orthopaedic trauma clinical observerships in North America, a perspective that is unfortunately not often reported in peer-reviewed literature. Overall, such observerships had a meaningful impact on the visiting surgeons, particularly in domains of clinical decision making, diagnosis, patient care, and developing a professional network. However, some important barriers that remain include associated high cost, difficulty integrating into the host institution work environment, gaining hands-on experience in the OR, and difficulty implementing changes to their home practice on returning. Although we have identified some suggestions for further improving clinical observerships, including greater access to the OR, additional studies are needed to identify the most effective and sustainable strategies to improve the bidirectionality of these programs, especially in the face of travel and institutional restrictions because of the recent COVID-19 pandemic.

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APPENDIX 1. COACT Study Group (Corporate Authors)

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