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# Perceptions of Orthopaedic Volunteers and Their Local Hosts in Low- and Middle-Income Countries: Are We on the Same Page?

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**Objective:** Our goal was to compare the perceptions of overseas orthopaedic volunteers and their hosts in low- and middle-income countries (LMICs) regarding the role of international volunteerism. We also sought to determine if differences in perception exist between trainee and fully trained orthopaedic surgeon volunteers.

**Methods:** Surveys with similar multiple-choice and open-ended questions were administered to 163 Health Volunteers Overseas orthopaedic volunteers (response rate 45%) and 53 members of the host orthopaedic staff (response rate 40%). Fifty-four volunteers and 20 hosts also contributed open-ended responses. Quantitative responses were analyzed for significance using Mantel–Haenszel  $\chi^2$  tests. Open-ended responses were coded using thematic analysis.

**Results:** Both the international volunteers and their LMIC hosts agreed that volunteers learned new skills while volunteering. Both groups believed that international volunteerism had a positive overall impact on the local practice, but hosts viewed these benefits more favorably than volunteers did. LMIC staff believed that, besides altruistic reasons, volunteers were also motivated by professional gains, diverging from volunteer responses. In open-ended responses, hosts desired longer term commitments from volunteers and had some concerns regarding volunteers' qualifications. Between volunteer trainees and fully trained surgeons, trainees were more likely to be motivated by personal benefits.

**Conclusion:** Efforts must be made to further align the expectations and goals of volunteers and their hosts in LMICs. Certain measures such as predeparture orientations for volunteers and developing

a more longitudinal and bidirectional experience may enhance the impact of orthopaedic volunteerism in LMICs. Further studies are needed to explore the impact of international orthopaedic volunteerism on the host population.

**Key Words:** low- and middle-income countries, LMICs, volunteerism, orthopaedics, survey

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## INTRODUCTION

The surgical burden of injury is a growing problem worldwide, especially in low- and middle-income countries (LMICs), because of the rapid pace of industrialization coupled with poor infrastructure and road safety.<sup>1</sup> The increasing prevalence of musculoskeletal trauma and other orthopaedic conditions in LMICs is further straining health care networks that are already overwhelmed by conditions such as poverty, malnutrition, and infectious disease. In many of these underserved regions, there are a limited number of health care facilities, a difficulty compounded by inadequate resources and technical ability to handle large patient loads and case complexity.

The population growth in LMICs often outpaces the speed at which their health care networks adapt.<sup>2,3</sup> International orthopaedic volunteers through nongovernmental Organizations often attempt to bridge this gap. In addition to providing direct clinical services, international volunteers may strive to provide sustainable, long-term improvements in health care capacity through the training and education of local providers.<sup>4</sup> The positive personal and professional influences of such an international experience on the volunteer physician are well documented.<sup>5,6</sup> However, physician volunteers also report personal and institutional barriers to international experiences, including inadequate financial resources, lack of institutional support, volunteers' travel and safety, cultural competency, and LMIC capacity for hosting volunteers.<sup>7–11</sup>

To maximize the potential impact of these activities on the local population, it is critical to assess the expectations and perceptions of the international volunteers and their local hosts. Previous studies suggest that medical volunteers perceive that they have a positive impact on the host institution,<sup>12,13</sup> but there is little research documenting the host institution's perceptions, which may not reflect volunteers' perspectives.<sup>14</sup> This may be particularly true in the field

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of orthopaedic trauma.<sup>15</sup> Such information is especially important considering the growing demand among medical trainees and professionals from resource-rich health care systems for opportunities to learn and teach in LMICs.<sup>9,16–18</sup>

The objectives of this study were to evaluate the concordance in the perceptions regarding international volunteerism between international orthopaedic volunteers and their LMIC hosts and to study any divergence of goals and perceptions between volunteer trainees and surgeons.

## METHODS AND MATERIALS

Surveys were constructed to assess how international volunteers and host medical staff in LMICs viewed the educational, clinical, and cultural contributions of volunteer orthopaedic surgeons and trainees. Surveys included general questions about the host practices and more direct questions about specific experiences in an LMIC orthopaedic volunteer program (see **Appendices, Supplemental Digital Content 1 and 2**, <http://links.lww.com/JOT/A465>, <http://links.lww.com/JOT/A466>). All survey participants were identified through their participation with the orthopaedic program of the nonprofit organization, Health Volunteers Overseas (HVO).

HVO's mission is to build health care capacity in low-resource environments through teaching, training, and professional development of health care providers in those settings. Orthopaedics is one of HVO's 18 program areas; the organization has been recruiting orthopaedic volunteers to provide training in LMICs for over 30 years.<sup>19</sup> On average, HVO orthopaedic volunteers complete assignments of 2–4 weeks in length. In preparation for their assignment, volunteers receive structured orientation from HVO staff, the HVO project director (typically US-based orthopaedic surgeons with extensive international experience), and the onsite coordinator (orthopaedic provider at the host institution). Orientation includes background information about the host institution, the orthopaedics department, the training level and education of orthopaedic staff, the primary patient population, the goals and objectives of the project, and the specific teaching and training activities they will provide. HVOs' partner institutions are typically universities or larger referral hospitals with trainees including medical students, orthopaedic residents, orthopaedic fellows or those enrolled in other subspecialty training, or orthopaedic technicians. Volunteers may provide teaching and training through bedside/clinical teaching, continuing education courses, didactic instruction in formal degree programs, and professional mentorship, which may include academic writing and research.

The survey was administered to HVOs' orthopaedic volunteers and orthopaedic surgeons and trainees of LMICs who participated in HVO's orthopaedic program from 2014 to 2017, using the online platforms SurveyGizmo<sup>20</sup> and Constant Contact.<sup>21</sup> All HVO volunteers who completed an assignment during this time frame were eligible to participate. All current on-site coordinators from partner institutions in LMICs and any orthopaedic staff or trainees who had participated in the HVO program were also eligible to participate. Surveys sent to each group had similar questions to address

the same topics from the perspective of either a volunteer or host. Survey recipients were given 6 weeks to complete their responses, and 2 reminders to complete the survey were sent at 2 weeks and 3 days before closing the survey.

Quantitative results were transferred to SAS (version 9.4) for analysis.<sup>22</sup> Mantel–Haenzel  $\chi^2$  tests were used to assess agreement among the hosts and volunteers, as well as between volunteer surgeons and trainees. Statistical significance was set at  $P < 0.05$ . Responses to open-ended questions were input into the qualitative analysis software package ATLAS.ti (version 8.1.3).<sup>23</sup> Responses were inductively coded by a single author (J.T.H.) using thematic analysis. Key themes in participant responses were identified from the codes and categorized by informant type (Fig. 1).

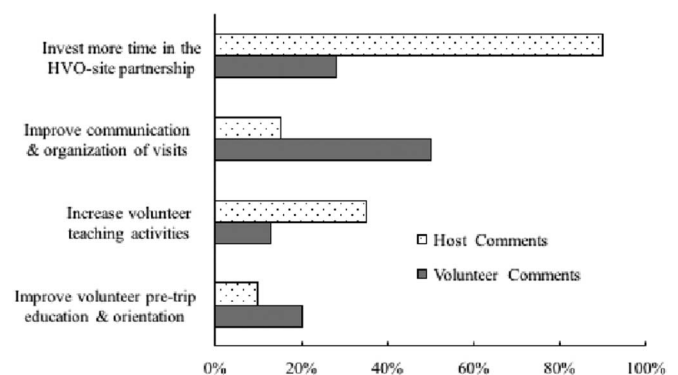
## RESULTS

### Participants

Surveys were sent to a total of 163 volunteers and 53 providers from the host institutions. When available, we did include orthopaedic providers at the host institution who were still in training, although none responded to the survey. The number of volunteers and hosts who completed the survey were 73 (45%) and 21 (40%), respectively (Table 1). Of these, 54 volunteers and 20 local hosts also answered open-ended questions for qualitative analysis (Table 2).

### Concordance

In general, both groups agreed that volunteers learned applicable skills while volunteering (68% of volunteers, 100% of hosts,  $P = 0.216$ ). They also agreed that volunteers typically had the skills necessary to benefit the local patient population (75% of volunteers, 71% of hosts,  $P = 0.747$ ) and ultimately provided contributions that were beneficial to LMIC practices (96% of volunteers, 100% of hosts,  $P = 0.385$ ). When asked about volunteer motivations, hosts recognized that volunteers were largely motivated to improve orthopaedic care (100% of volunteers, 95% of hosts,  $P = 0.079$ ) and the skills of orthopaedic staff at the host practice (100% of volunteers, 95% of hosts,  $P = 0.076$ ). Hosts typically viewed the contributions of trainees and fully trained



**FIGURE 1.** Major response themes for concerns regarding HVO volunteer experiences based on open-ended question survey responses.

**TABLE 1.** Demographic Information About Survey Respondents

| Volunteer Surgeons                                  | Volunteer Trainees                                  | Host Orthopaedic Staff                     |
|---|---|--|
| Declared interests within orthopaedics*, %          | Declared interests within orthopaedics*, %          | Declared interests within orthopaedics*, % |
| General orthopaedics: 36                            | Adult reconstruction: 50                            | General orthopaedics: 89                   |
| Trauma: 28  | Trauma: 50  | Trauma: 83                                 |
| Adult reconstruction: 24                            | General orthopaedics: 38                            | Adult reconstruction: 61                   |
| Hand and upper extremity: 24                        | Pediatric orthopaedics: 11                          | Sports: 33                                 |
| Sports: 22  | Other: 25   | Spine: 28                                  |
| Pediatric orthopaedics: 16                          | Undecided: 13                                       | Other: 55                                  |
| Other: 37   |   |  |
| Primary practice setting*, %                        | Primary practice setting                            | Primary practice setting*, %               |
| Private practice: 42                                | Not applicable                                      | Private practice: 27                       |
| Academic: 24  |   | Academic: 60                               |
| Hospital employed: 24                               |   | Hospital employed: 80                      |
| Retired: 15   |   | Other: 7                                   |
| Other: 7  |   |  |
| No. of volunteer experiences in the past 5 years, % | No. of volunteer experiences in the past 5 years, % | Years experience with HVO volunteers, %    |
| 0–3: 62   | 0: 13   | ≤1: 6                                      |
| 4–6: 22   | 1: 50   | 1–2: 6                                     |
| 7–9: 10   | 2: 25   | 3–4: 17                                    |
| ≥10: 6  | 3: 13   | ≥5: 72                                     |
| Average duration of volunteer experience, %         | Average duration of volunteer experience, %         | Country of practice, %                     |
| ≤1 wk: 17   | 2–3 wk: 50  | Bhutan: 29                                 |
| 2–3 wk: 50  | 4–5 wk: 38  | Nicaragua: 29                              |
| 4–5 wk: 23  | 6–8 wk: 13  | Tanzania: 24                               |
| 6–8 wk: 5   |   | Myanmar: 12                                |
| Other duration: 5                                   |   | Uganda: 6                                  |

\*Respondents could choose multiple options.

orthopaedic surgeons similarly (see **Table, Supplemental Digital Content 3**, <http://links.lww.com/JOT/A467>).

When asked, in open-ended questions, how the experience of having volunteer orthopaedic surgeons could be improved, both hosts (20%) and volunteers (19%) expressed similar degrees of concern regarding cultural barriers. However, hosts (15%) were more likely than volunteers to identify a lack of cultural competency and sensitivity (7%). Similarly, although both hosts (20%) and volunteers (24%) agreed on the impact of resource barriers in general, volunteers (20%) were slightly more likely than hosts (10%) to comment on the lack of local medical infrastructure and supplies as a resource barrier (Table 2).

**Discordance**

Hosts viewed volunteer contributions regarding improving surgical techniques ( $P = 0.005$ ), general practice efficiency ( $P < 0.001$ ), and documentation procedures ( $P < 0.001$ ) more favorably than the volunteers did (90%, 86%, and 71% of hosts vs. 52%, 15%, and 10% of volunteers, respectively). Hosts believed that volunteers were strongly motivated by their need to enhance their own clinical skills (67% of hosts, 29% of volunteers,  $P < 0.001$ ) and professional career (90% of hosts, 23% of volunteers,  $P < 0.001$ ). Volunteers were also less likely than hosts to cite cultural

barriers as impediments to interpersonal interactions during the volunteer experience (19% of volunteers, 43% of hosts,  $P = 0.018$ ). Hosts were more likely to say that volunteer visits are too short (62% of hosts, 32% of volunteers,  $P = 0.01$ ). Volunteers were less likely than hosts to believe that orthopaedic capacity building was improved as a result of their volunteer efforts (47% of volunteers, 90% of hosts,  $P < 0.001$ ).

Volunteer trainees were more likely than fully trained orthopaedic surgeons to report being motivated by the technical (75% trainees vs. 29% surgeons,  $P = 0.011$ ) and career benefits of volunteerism (75% trainees and 23% of fully trained surgeons,  $P = 0.02$ ). Volunteer trainees were also more likely to cite lack of long-term case follow-up as a challenge to the international experience (100% of trainees vs. 62% of fully trained surgeons,  $P = 0.032$ ) (see **Table, Supplemental Digital Content 4**, <http://links.lww.com/JOT/A468>).

In responses to open-ended questions, hosts (90%) were more likely than volunteers (28%) to report the desire for long-term commitments from HVOs. Specifically, hosts were more likely to report the desire for longer volunteer visits (45% vs. 7%), longitudinal relationships with volunteers (25% vs. 15%), and strengthened partnership and collaborations between HVOs and the local sites (20% vs. 6%). Hosts (35%) were also more likely than volunteers (13%) to

**TABLE 2.** Selected Quotes From Open-Ended Question Responses Organized by Theme

| Theme   | Coded Subtheme                                  | Selected Quote   |
|---|---|--|
| Bidirectional learning and reverse innovation | Desire for long-term commitments                | “For a program to be successful some consistency is required in terms of number and frequency of volunteers throughout the year.”—Host   |
| Standards for improvement                     | Improve previsit communication and organization | “There needs to be better communication, particularly on a personal level, between the recently departed volunteer, the program director (MD and administrative staff) and the new volunteer... we need to engage the locals in an ongoing dialogue regarding realistic goals and expectations of our presence.”—Volunteer   |
| Challenges                                    | Importance of volunteer teaching activity       | “The volunteer surgeons should have either of this: (1) good surgical skills so that they could help us and teach us or (2) good in teaching in order to help teach the orthopedic staff here.”—Host   |
|   | Improve volunteer pretrip activity              | “[There is a need for] more preparation ahead of time—orientation, etc. It would allow me to better “hit the ground running” than to take the usual week to adjust.”—Volunteer   |
|   | Desire for more well-qualified volunteers       | “[Visits would be improved] by having those who are towards the completion of the training and not the beginners. Many volunteers are very experienced surgeons. But they are also towards the retirement age and many seem not to be an active practitioner back home.”—Host  |
| Capacity building                             | Cultural barriers                               | “[Volunteers] need prior training before coming to our tropical countries. Must be flexible to change attitude depending on where they are.”—Host  |
|   | Resource barriers                               | “The experience and impact would be improved if it included a way to provide access to low cost, high quality orthopedic implants such as the SIGN nail, simple external fixators, and stainless steel, standardized plates, screws, and instruments... I noticed a growing and real need for low-cost, reliable, arthroplasty implants and instrumentation as well as arthroscopy equipment.”—Volunteer |

comment on volunteer teaching activity as an area of improvement. In addition, 25% of hosts expressed concerns with the qualifications and capabilities of young trainees and/or retired volunteers. Volunteers' remarks (35%) focused largely on the need for better communication between HVOs, volunteers, and the local sites, as well as the need for better organization of visits (15%) and pretrip education (20%) (Table 2).

## DISCUSSION

To our knowledge, this is the first study that assesses and directly compares attitudes of both volunteers and their LMIC hosts in the field of orthopaedics. Survey responses revealed various themes of concordance and discordance surrounding hosts' and volunteers' perceptions.

### Bidirectional Learning and Reverse Innovation

As with previous studies of orthopaedic volunteers,<sup>24</sup> most hosts and volunteers in our study agreed that volunteers were able to gain skills through volunteering that they could apply at their home practices, indicating a bidirectional transfer of skills and knowledge between the host and volunteer. Previous authors have noted that international experiences often allow volunteers to expand their medical knowledge and improve their physical examination skills<sup>9</sup> because

volunteers are often used to relying on technology that may be limited when practicing abroad. Another aspect of bidirectional learning comes in the form of sending trainees from LMICs to learn in more resource-rich health care systems. The desire for this exchange is documented in our data and in the existing literature on volunteer experiences.<sup>9,25</sup> Exchanges such as this would contribute to establishing the more permanent long-term relationships desired by hosts that may be beneficial for creating sustainable and effective health care networks in LMICs.<sup>26</sup>

### Standards for Improvement

Hosts and volunteers were typically in agreement that volunteers were skilled enough to positively impact the local health care during their time volunteering, but disagreed strongly about long-term improvements such as efficiency and documentation procedures, where hosts were more likely than the volunteers to cite improvements. One way to standardize improvement aside from hosts' and volunteers' perceptions would be to use objective, quantifiable metrics such as morbidity and mortality, wait times, and growth in number and size of medical practices; this method has shown to be useful in other specialties.<sup>27</sup>

The desire for better communication and improved orientation and preparation was expressed by both hosts and volunteers and has been previously suggested to better prepare the volunteers for their roles during their volunteer

experiences.<sup>28</sup> Working with the host staff in clearly establishing goals and expectations would help align the efforts of volunteers and hosts, making them more successful at working toward a common defined objective and ultimately improving the experience for all stakeholders.<sup>29</sup>

### Motivations

Although volunteers and hosts typically believed that the volunteers were strongly motivated by the altruistic aspects of volunteering, host responses suggested that they perceived that volunteers were also motivated by their desire to practice and learn new techniques and enhance their professional careers. Addressing these issues in an open discussion may help foster a stronger and more trusting relationship between volunteers and local hosts, thus leading to a more effective delivery of care.

Discrepancies in perceptions of volunteer motivations could be due to a paternalistic attitude of the volunteers, who may have preconceived notions that they come from a superior medical system and that their primary role was to teach rather than participate in a bidirectional relationship.<sup>30</sup> Although it is true that the LMICs are limited in resources, their health care professionals often have novel approaches to health care with potential for implementation in other health care systems. This is evident given that many volunteers ultimately agreed that they learned applicable skills during their volunteer experience, despite not being initially motivated by learning during their stay in an LMIC. Effective orientation before volunteer experiences can address volunteer paternalism and foster a more mutually beneficial experience.<sup>17,31,32</sup>

### Challenges

Both volunteers and hosts agreed that the lack of long-term patient care and follow-up is a challenge for the volunteers. This is likely related to the brief duration of international volunteer visits. Longer or multiple visits to the same location would potentially allow the volunteers and hosts to spend more time collaborating on the entire episode of care for individual patients, strengthen their relationships, and improve patient follow-up. However, the duration of volunteers' visits are often restricted by personal and professional considerations, making it difficult for most volunteers to commit to long-term assignments. One related barrier often cited by volunteers is a lack of organizational support from their home institutions or practices to participate in overseas volunteerism.<sup>7,8</sup> With more willing support from organizations from advanced health care systems, it is possible that volunteers would be able to increase the length of their stay abroad and alleviate some host concerns regarding volunteer duration.

Hosts also perceived cultural barriers among volunteers as a greater challenge than the volunteers themselves did, as is reflected in the literature regarding global volunteerism in other fields.<sup>33</sup> The difficulties in treatment and patient advocacy posed by cultural barriers may be alleviated by effective predeparture orientation.<sup>3</sup> Overcoming cultural barriers may lead to improved patient education, which can contribute to the sustainability of the medical practice.<sup>34</sup>

### Capacity Building

In general, volunteers were less likely to believe that they improved the orthopaedic capacity of the LMIC institution where they volunteered. We found that most volunteers believed that they did not enhance the abilities of the host staff to train their own trainees effectively, whereas hosts believed that volunteers contributed significantly to their skills as a trainer. For orthopaedic capacity to be improved sustainably, LMIC practices must be able to teach their own trainees how to practice effectively so that there can be cascading improvement of orthopaedic care long after the volunteers leave.

A study of outcomes of acquired immunodeficiency syndrome epidemic in South Africa and Malawi showed that long-term patients fared better mentally and emotionally when they were treated by paid local staff rather than unpaid volunteers.<sup>35</sup> This documented advantage for the patient population to be treated by local providers highlights how task shifting and capacity building may be in the best interest of not only the local staff, but also the patients that they treat. Capacity building involves not only transmission of clinical skills and knowledge but also training in health care management and administration to improve the effectiveness of the practice as a whole. Steps should be taken to improve documentation, patient safety, and overall practice efficiency in order for orthopaedic practices in LMICs to be able to sustain themselves.

### Practicing Surgeons Versus Trainees

In our study, hosts showed a preference in open-ended responses for senior residents or young attending physicians as compared to other subgroups, such as junior-level residents or retired surgeons. The reasons for this finding needs to be explored further, but may be related to these preferred groups having a combination of both, clinical experience and knowledge of the current clinical practice guidelines for orthopaedics. Volunteer trainees were also more likely than practicing surgeons to be motivated to volunteer by the personal benefits to their career; it is notable that this motivation was in addition to, rather than instead of, the more generous goals of improving LMIC orthopaedic capacity. Trainees were also more likely to report lack of long-term follow-up of patients as a challenge to volunteering. Over half of fully trained volunteer surgeons surveyed have had 3 or more international experiences in their career; repeat visits have likely provided the long-term follow-up of cases that trainees, early in their careers and having completed fewer international trips, often lacked.

### Limitations

This study has several limitations. Our sample size was small, especially when responses are broken down into different cohorts. The responses of volunteers were also not directly compared with the responses of the hosts that they worked with. In addition, we did not have any responses from local trainees at LMIC sites. Furthermore, our survey was only distributed to volunteer and host participants in HVO orthopaedic programs. Whether our findings are generalizable

to other types of orthopaedic volunteers and hosts needs further study. In several instances, hosts viewed improvements where volunteers did not or viewed contributions as more substantial than the volunteers did. Hosts might have answered the survey more favorably because the survey was administered through HVOs, the organization that sends volunteers, so as to seem appreciative of the volunteer efforts. There is also the possibility of selection bias, where hosts from practices where HVO intervention has been more successful felt more inclined to respond to the survey.

## CONCLUSION

Our findings suggest that LMIC hosts and orthopaedic volunteers generally agree that international volunteerism has a role in improving local clinical practices and leads to a generally positive experience for all stakeholders. Survey responses also demonstrated discrepancy in the magnitude of the perceived benefits and challenges of international volunteerism. To further improve the experience for volunteers and hosts and accelerate orthopaedic capacity building in LMICs, efforts must be made to explicitly outline goals and expectations for the volunteer experience and further align perceptions among hosts and volunteers. This includes taking steps to quantify improvements objectively and to reduce language and cultural barriers. Efforts must also be made to identify and clearly outline specific areas of need within individual practices to ensure that both parties are fully prepared for the collaboration before the arrival of the volunteers. Future studies should include surveying broader groups to see if these results are generalizable to volunteer experiences among orthopaedic surgeons who volunteer individually or with multiple groups.

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