

THE ORTHOPAEDIC FORUM

Sustainability Assessment of a Short-Term International Medical Mission

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Background: Few studies have analyzed the tangible impact of global, philanthropic medical missions. We used qualitative methods to analyze the work of one such mission, Operation Walk Boston, which has made yearly trips to a Dominican Republic hospital since 2008.

Methods: We interviewed twenty-one American and Dominican participants of the Operation Walk Boston team to investigate how the program led to changes at the host Dominican hospital and how the experience caused both mission protocols and U.S. practices to change. Transcripts were analyzed with the use of content analysis.

Results: Participants noted that Operation Walk Boston's technical knowledge transfer and managerial examples led to sustainable changes at the Dominican hospital. Additionally, participants observed an evolution in nursing culture, as the program inspired greater independence in decision-making. Participants also identified barriers such as language and organizational hierarchy that may limit bidirectional knowledge transfer. U.S. participants noted that their practices at home changed as a result of better appreciation for different providers' roles and for managing cost in a resource-constrained environment.

Conclusions: Operation Walk Boston catalyzed sustainable changes in the Dominican hospital. Cultural norms and organizational structure are important determinants of program sustainability.

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The number of global, philanthropic medical missions has steadily increased, with over 6000 annual U.S.-sponsored trips^{1,2}. These missions expend ~\$250 million annually¹. The high cost of these efforts

and the lack of evidence that they yield sustainable improvements in care have stirred debate about medical missions. Proponents focus on the social responsibility of health-care professionals to address

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TABLE I Staff Roles of Subjects Interviewed

Position	No. of Staff
U.S.	
Orthopaedic surgeon	5
Anesthesiologist	1
Nurse	1
Physical therapist	1
Operating room coordinator	1
Sterilization and cargo coordinator	2
Dominican Republic	
Orthopaedic surgeon	2
Nurse	4
Medical student	3
Administrator	1
Total	21

unmet needs²⁻⁶, whereas critics question the cost-effectiveness and sustainability of these missions^{1,7-14}.

Few studies have analyzed the tangible impact of global medical mission trips. Martiniuk et al. found that most articles about mission trips are descriptive, with only 5% providing theoretical or conceptual analysis¹⁵. Those with analytical components have focused on the educational value for U.S. residents¹⁶, sustainability of missions¹, and changes in the procedure volume of the international partner¹⁷. We are not aware of any studies assessing the impact of a mission on the care provided by the international entity or the reciprocal impact on the care provided by those conducting the mission.

In this investigation, we used qualitative methods to analyze the work of one short-term mission, Operation Walk Boston, which has made one trip to the Dominican Republic each year since 2008. This program has partnered with a local hospital (Hos-

pital General de la Plaza de la Salud [Hospital HGPS]) to provide pro-bono total joint arthroplasty to economically disadvantaged patients. We have documented positive patient outcomes¹⁸ and high-quality care¹⁹ in association with the Operation Walk Boston program. The specific goals of this investigation were to determine (1) what changes have occurred at Hospital HGPS as a result of the knowledge and skills imparted by Operation Walk Boston and (2) whether the volunteer experience influenced how the participants provide care in the U.S.

Methods

Setting

Briefly, Operation Walk Boston and Hospital HGPS have provided total hip and knee replacements to financially needy Dominicans on annual mission trips since 2008. See the Appendix for a more complete description of Operation Walk Boston and Hospital HGPS.

Sample

Investigators identified twenty-one previous participants of the Operation Walk Boston mission to be interviewed; all agreed to participate. Eleven were American staff who had traveled with Operation Walk Boston for at least one trip. The other ten were staff or students at Hospital HGPS. These individuals represented a broad range of roles (Table I). Study activities were approved by the institutional review board at Brigham and Women's Hospital.

Data Collection

A moderator's guide (Table II) was developed by a multidisciplinary team that included previous Operation Walk Boston participants from the U.S. and Dominican Republic. A bilingual member translated the moderator's guide into Spanish. Interviews focused on two questions: (1) What changes occurred at Hospital HGPS as a result of Operation Walk? (2) Did the Operation Walk experience influence how U.S. staff delivered care in their home institutions?

A bilingual investigator conducted the interviews in person during and prior to the 2014 mission. Thirteen participants were interviewed one-to-one; four, in a group interview; and four, via e-mail because they no longer resided in the study area.

The interviews were conducted in the participant's preferred language and lasted approximately twenty minutes. They were digitally recorded and

TABLE II Moderator's Guide*

Change at Hospital HGPS due to Operation Walk Boston

1. What knowledge or skills have you tried to share with the staff at Hospital HGPS?
2. How have you tried to impart this knowledge or these skills?
3. How successful do you feel you have been at transferring the knowledge? Have the changes been long-lived?
4. Can you give one example of a change you have observed in the way care is delivered at Hospital HGPS that has resulted, at least in part, from the knowledge or skills you have shared? Any others?
5. On a scale of -10 to 10 (with -10 indicating an extremely negative impact; 0, no impact; and 10, an extremely positive impact), how much impact overall would you say Operation Walk Boston has had on the way care is delivered at Hospital HGPS since the collaboration began?

Influence of Hospital HGPS on care in the U.S.

6. How do you think our work together has influenced the way care is delivered on the Operation Walk Boston trips? Are there examples of changes we have made over the years as a result of things we've learned by collaborating with our colleagues in the Dominican Republic?
7. Are there any lessons that you have taken away from the experience that have influenced the way you or others deliver care at Brigham and Women's Hospital?

*Spanish interviews were conducted with a translated version of this guide with reformatted questions addressing the efforts of Operation Walk Boston.

transcribed verbatim. The interviews conducted in Spanish were translated into English by the bilingual investigator.

Analysis

Transcripts were analyzed in English with content analysis²⁰. Initially, four investigators held an open reading session of four randomly selected transcripts to identify concepts and recurring themes²¹. One investigator (J.B.) compiled the notes into a preliminary set of ten content area codes. Content area codes were hypothesis-free designations, such as “technical skills.” After reaching a consensus on content area codes, the same four investigators held a second open reading session using four new randomly selected transcripts. The reviewers developed a list of thematic codes, which were directional statements reflecting the aims to document the sustainability of programmatic change. An example is “positive transfer of skills from Operation Walk to Hospital HGPS.”

J.B. produced ten content area codes and six thematic codes based on the reviewers’ notes from the eight transcripts. J.B. read the remaining thirteen transcripts, and no new codes emerged. Once the investigation team reviewed the final coding scheme, J.B. coded all twenty-one interviews using the approved structure. The Results section of this paper is structured to address the thematic codes. The investigators used the Dedoose mixed methods online research platform (version 4.5.98) to code for content and themes and extract and export relevant quotations. The interrater reliability of coding for themes and content was assessed by having two investigators, J.B. and D.A.D., code 10% of the text excerpts. The Cohen kappa coefficient for interrater agreement was 0.69, reflecting substantial²² or fair-to-good²³ agreement. J.B. and D.A.D. resolved all discrepancies.

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Results

We grouped responses into two categories. The first describes knowledge transfer from Operation Walk Boston to Hospital HGPS. The second is the extent that exposure to Dominican culture and Hospital HGPS influenced the delivery of care during the trip and back at the participants’ U.S. institutions.

Hospital HGPS Changes Attributed to Operation Walk Boston

Orthopaedic Knowledge Transfer

All participants attributed changes in Hospital HGPS procedures to knowledge and skills shared by Operation Walk Boston. One Dominican surgeon described how this knowledge was acquired: “Interacting, discussing difficult cases which we don’t have the ability to resolve. We have learned how to resolve some of them from these professors.” Other participants attributed the growth of the Hospital HGPS orthopaedic service (from fewer than twenty total joint arthroplasties in 2008 to 110 in 2013) to Operation Walk Boston: “The joint arthroplasty service has grown considerably because the hospital has become better known with Op Walk” (Dominican administrator).

Patient Safety and Quality Improvement

In addition to orthopaedic knowledge transfer, Operation Walk Boston shared general surgical and medical management skills. Examples include the adoption of disposable kits and contamination management protocols in the operating room, use of

proper sterilization procedures, and greater emphasis on hand hygiene. Other best-practices tactics learned from Operation Walk Boston have been incorporated into Hospital HGPS procedures, notably the use of the surgical time-out and World Health Organization (WHO) Surgical Safety Checklist^{24,25}, enhancement of a post-anesthesia care unit, and more detailed documentation pre-operatively and in the post-anesthesia care unit. As a Dominican nurse described, these changes progressed outside of the orthopaedic surgical service: “We also have the [preoperative] checklist for surgical patients that used to not be implemented. We implemented it and it is working successfully... Now if we don’t send it [process innovations derived from Operation Walk] to the OR, we get a call asking why we didn’t do it—in all departments, in all the nursing areas.”

Nursing Professional Development and Empowerment

U.S. and Dominican nurses have different roles in their respective hospital hierarchies, with U.S. nurses enjoying more autonomy. Nearly all Dominican staff discussed how the exposure to this new team structure inspired Dominican nurses to challenge their traditional roles and seek more independence, gaining a sense of empowerment. A Dominican nurse noted: “Due to the protocol that U.S. nurses have, the doctors and nurses have a better interaction around how to act. The nurse is more independent about making decisions since they already have that protocol and the doctor and nurse are unified on what should be done. We see that as something we need to gain.” The Dominican physicians also commented on this theme: “The nurses have gotten to the point of demanding continuing education when Op Walk leaves. It has created a thirst for knowledge.”

Catalysts for Change

Participants provided insight into factors that enabled knowledge to spread to other departments besides Orthopaedics. One such catalyst for change was the Operation Walk Boston research program, which assesses the quality and outcomes of care provided by the mission^{18,19}. The research was seen as a motivating force for change. “We have even demonstrated in the paper... that we can be a center of excellence for joint replacements of the knee and hip. Seeing that it can be achieved here... motivated us to understand that it can be achieved...” (Dominican administrator).

Participants suggested that dissemination of expertise occurred because the nurses involved in the mission come from different hospital departments and thus spread the information of Operation Walk Boston. Another factor enhancing dissemination may be that the Dominican leader of Operation Walk Boston is in charge of the hospital’s surgical services: “I was appointed the vice-director of surgical services 2.5 years ago and that has brought all the heads of the departments of surgery to have one place where they have to go through their protocols... Whatever happens, not only to Orthopaedics but to any surgical department... gets replicated in every surgical department.”

Barriers to Knowledge Transfer

This study helped the team uncover several opportunities for programmatic improvement. For example, the lack of Spanish-speaking

American volunteers posed a barrier, despite the availability of interpreters: “Language is a barrier. The most integral part of being able to speak more and for there to be more interactions between the U.S. and D.R. nurses is language. They can’t express themselves with each other. We communicate with an interpreter but only about things for the program” (Dominican nurse).

Additionally, factors such as the hierarchal structure of the local organization may impede changes. For example, participants noted that it might be difficult for nurses to change physician behaviors, as the Dominican health-care system has been historically physician-centric. Finally, U.S. staff noted the importance of knowing the local staff’s practice styles and learning preferences: “The first year we were teaching them about hand washing, infection control, very basic things that they knew quite well. The following year we sought their advice and asked them what they wanted to learn” (U.S. nurse).

Operation Walk Boston and U.S. Practice Changes

Changes in Operation Walk Boston Practices Due to Collaboration
Participants described how the mission’s protocols have evolved as a result of shared experiences. Participants noted that an advantage of returning yearly is the increased cultural exposure that allows both groups to understand each other better: “Every year it gets better because we have become family. We feel comfortable. Each party understands each other’s culture” (Dominican student). Others noted that it was particularly important for the Americans to get acquainted with the Dominican staff’s working abilities in order to better divide assignments: “We have learned too. We are more sensitive. I think at the beginning...there was so much work to do and we just needed to get it done. So they got pushed to the side. Now we really are collaborative” (U.S. nurse).

Participants highlighted pain management as an example of a change that arose from discussions between the U.S. and Dominican staff. During the initial years of Operation Walk Boston, U.S. physicians prescribed a narcotic regimen similar to that used in the U.S. However, U.S. staff noted that the Dominican patients had more adverse effects and required less narcotic for pain control: “We’ve learned from our D.R. doctors, PTs, and nurses that we were probably overmedicating our patients. The patients in the D.R. don’t seem to require nearly as much opioids as in the States. They also have more nausea and probably some of their anxieties are different because many of these people have not been in hospitals” (U.S. physician). The U.S. staff attributed their willingness to change the pain management regimen to a growing respect for the Dominican culture: “For me it’s respecting somebody else’s culture and their beliefs and their way of doing things” (U.S. physical therapist).

Barriers to Change

Dominican staff speculated that the hesitancy of the U.S.-based staff to accept Dominican medication protocols might stem from over-reliance on official guidelines: “In the U.S. everything is by protocol and is supposed to be backed by analysis and references. If it came out in JBJS or at the AAOS then that’s what we are going to utilize. Incredibly, we were able to modify the analgesic pro-

tol to the point where the U.S. staff accepts it” (Dominican physician). In addition, participants noted that the implied teaching role may make the U.S. group less open to learning and compromising: “It’s easier for us to change because we feel that we are learning than it is for the U.S. to accept that they can actually learn from a small practice” (Dominican physician).

U.S. Practice Changes Attributed to Volunteer Experience

All U.S.-based participants were able to point out ways in which they had changed their practice in the U.S. as a result of their experience with Operation Walk Boston. Most participants noted that the mission’s smaller team environment allowed them to better appreciate the unique contributions of individual staff and develop a greater sense of mutual respect and congeniality: “My time with Operation Walk opened my eyes to all the different people who help us do what we do. For example, I never even knew what an anesthesia tech was before my trips!” (U.S. physician). Participants also noted gaining a greater appreciation for teamwork: “My time on the Op-Walk Boston trips has shown me how well a care team can work together when all are united towards a similar goal. Unfortunately...in the U.S. the roles between health-care providers can become adversarial. It’s refreshing to be involved with a group that works so well together and reminds you of the reasons we all started in this field in the first place” (U.S. physician).

U.S.-based participants also noted that working in a low-resource environment prompted them to practice in a more cost-conscious manner: “One thing I’ve taken back is being more cost effective. We count everything in the D.R...We also know what everything costs. If somebody drops something on the ground or opened the wrong thing, you say, ‘you know that’s 100 bucks.’ I do it all the time” (U.S. operating room coordinator).

Discussion

To our knowledge, this is the first published qualitative assessment of the sustainable impact of a short-term international medical mission. We interviewed twenty-one participants of the Operation Walk Boston mission to investigate how the program led to changes at Hospital HGPS and how the experience caused both mission protocols and U.S. practices to change. We found that participants attributed change to technical knowledge transfer as well as to exposure to a distinct managerial style. Participants also identified barriers such as language and power dynamics that may limit bidirectional knowledge transfer. U.S. participants noted that their practices at home changed as a result of their greater appreciation for different care providers’ roles and for the importance of managing costs in resource-constrained environments.

Previous researchers have also attributed an increase in the volume of surgical procedures performed by the international partner hospital to the technical knowledge and recognition imparted by the mission organization¹⁷. However, as far as we know, no one has previously assessed whether changes occurred outside of their target department. Our investigation demonstrated that medical management skills, such as infection control and improved documentation, were adapted in other hospital

departments. Additionally, this study elucidated structural factors that can aid in the dissemination of information. Selecting staff from different departments and establishing relationships with those in charge of clinical departments are strategies that other mission trips might consider in order to have a more pervasive impact throughout the hospital. Furthermore, this study demonstrated the impact of a long-term regular commitment to one international institution. Operation Walk Boston's multiple trips and yearlong communication with Hospital HGPS have resulted in a wealth of knowledge transfer and strengthened the relationship between the organizations.

One of the most frequently emphasized and lasting changes at Hospital HGPS that was attributed to Operation Walk Boston is the evolution in nursing culture. Dominican nurses have historically not enjoyed the same high hierarchical status in their hospitals as their American counterparts. Dominican nurses who participated in the Operation Walk Boston mission witnessed a different doctor-nurse relationship, which inspired a desire for continued education and greater independence in decision-making.

Our research identified barriers that impeded optimal knowledge transfer. We found that language is an important barrier, despite translator services. This offers an opportunity for improvement; incorporating more Spanish-speaking staff could increase the possibility of deeper dialogue, which would be particularly helpful for sharing "sticky knowledge"²⁶—e.g., about teamwork. Additionally, we noted that power dynamics within Hospital HGPS as well as between Operation Walk Boston and Hospital HGPS could inhibit change. It is important for mission organizations to understand hierarchical relationships in host hospitals in order to support substantive discourse about change and foster cross-cultural relationships.

We noted that benefits flow in both directions. Previous studies have shown that global volunteerism helped U.S. surgical residents attain greater cultural sensitivity and a deeper understanding of global health issues¹⁶. Similarly, participants in this study reported attaining a better understanding of the work of team members and greater cost-consciousness. These results highlight the importance of assembling a diverse team and of exposure to low-resource environments.

Although Operation Walk Boston has influenced the daily proceedings at Hospital HGPS, it is important to consider limiting factors. Despite the increase in the number of joint replacements performed, the annual volume remains modest in relation to national needs. This is due in part to the limited number of surgeons at Hospital HGPS who were trained to perform total joint arthroplasty (three) and, most importantly, to the fact that the national health insurance available to Dominicans does not cover total joint arthroplasties, or many other elective procedures. Furthermore, several factors may pose threats to Operation Walk Boston's ability to conduct future mission trips. One is that increased financial pressure on device manufacturers may make the provision of implants more difficult. Another is that the mission trip requires annual fundraising, which is always a challenge. To date, these factors have not compromised its capacity to conduct the mission but it is important to anticipate future threats such as these.

Several study limitations should be noted. We did not sample staff randomly and acknowledge that the sample and their experiences may not be representative of all staff. Additionally, participants may underreport challenges and focus on the positive. Our qualitative approach precludes claims of causality. Finally, our investigation was carried out in an established hospital in a low-resource country with a stable government and may not be generalizable to all international mission efforts.

In conclusion, Operation Walk Boston catalyzed sustainable changes in the daily workings of Hospital HGPS. Establishing a long-term trusting relationship with one international institution may be the best strategy for creating lasting changes. Mission groups should incorporate cultural norms and organizational structure in their plans and include native-language speakers whenever practical. Furthermore, global short-term medical missions should periodically assess the extent to which they have influenced the practice and culture of their international partners, as sustainable change is generally central to mission goals and strategy.

Appendix

Mission Setting

The Dominican Republic is located within the Caribbean island of Hispaniola, and 40.9% of its approximately 10.4 million citizens live below the international poverty line²⁷. The public health-care system of the Dominican Republic provides basic health-care coverage eligibility to all citizens; however, most of the population is currently uninsured²⁸. Additionally, basic insurance does not cover some advanced treatments such as total joint arthroplasty. Therefore, only those with additional insurance are able to receive these elective surgical procedures. Citizens who live in the nation's capital, Santo Domingo, can seek care at many hospitals, including Hospital HGPS. A private hospital with over 2200 staff members, Hospital HGPS has twelve operating rooms and three orthopaedic surgeons with total joint arthroplasty as the focus of their practices. However, prior to Operation Walk Boston's arrival, they collectively performed fewer than twenty total joint arthroplasties annually.

Operation Walk Boston is a branch of the national Operation Walk not-for-profit organization. Its mission is to provide free total joint replacements in the Dominican Republic to patients who cannot otherwise afford the surgery. Unlike Operation Walk branches that travel to different countries annually, Operation Walk Boston has organized annual one-week medical missions to Hospital HGPS since 2008. These trips are funded through donations of financial and surgical resources. Hospital HGPS was originally chosen because of its affiliation with a Dominican medical school and because it had the infrastructure, such as radiology systems, needed for surgery as well as committed orthopaedic surgeons who could take care of patients postoperatively.

The Operation Walk Boston team consists of approximately fifty health-care workers, including orthopaedic surgeons, anesthesiologists, internists, a pharmacist, physical therapists, physician assistants, surgical and medical nurses, operating room personnel, medical students, and other staff. The staff works in several different U.S. hospitals, the great majority of which are in Boston. The majority of the staff returns each year. This dynamic team works

with over 200 Dominican colleagues at Hospital HGPS, including orthopaedic surgeons, nurses, medical students, and administrative and housekeeping staff. Administrative staff in each country communicate with each other throughout the year to address logistics, and during the annual trip the Operation Walk Boston team operates on approximately forty-five to fifty patients. ■

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