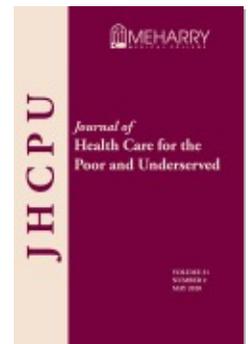




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“Road to Empathy”: A Qualitative Exploratory Study of Trainee Experiences on a Mobile Health Clinic

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Abstract: Introduction. Mobile health clinics often deliver care in medically underserved communities and train student volunteers to support service delivery, but little is known about how these clinics affect trainees. **Methods.** We conducted a qualitative analysis of over 100 trainees’ experiences volunteering with a mobile health clinic, to explore the training experience’s impact on personal and professional development. **Results.** Volunteers’ training experiences involved learning how to deliver compassionate, non-judgmental health care. They developed competencies necessary to deliver effective, understandable, and respectful care. Their understanding of the health care system and patient-provider relationships deepened, and they expressed stronger empathy for people different from themselves. Over time, trainees progressed from initial apprehension towards confidence and competence, mediated by practice and staff expertise. **Discussion.** Mobile clinics should support trainees in understanding community-based services for clients, in addition to cultivating patient-care skills.

Key words: Mobile health clinics, health disparities, medical education.

Academic institutions of medical education currently struggle to equip students with key skills for reducing health disparities.^{1,2} Although primary care physicians are often the first providers to engage with vulnerable populations, tackling the social determinants that underlie disparities requires partnerships beyond the medical setting.³⁻⁵ Community-based undergraduate and postgraduate educational experiences (e.g., clerkships, volunteer experiences) offer a potential solution, evidenced by the

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increased likelihood for students who participate in such experiences to specialize in primary care,^{6,7} and practice in medically-underserved areas.^{8,9}

One community-based training setting that has heretofore received less attention is the mobile clinic. Previous research demonstrates the mobile sector's capacity to provide high-quality,¹⁰⁻¹² accessible,^{11,13,14} and cost-effective¹⁵ care to patients missed by mainstream health care systems, but no studies have assessed its potential for medical education. The population health challenges these clinics directly affect (e.g., logistical barriers, patient mistrust) often align with the system barriers about which academic institutions increasingly educate their students. Further, the majority of nearly 2,000 U.S. mobile clinics represent partnerships between academia and community health centers,¹⁶ so natural collaboration opportunities may already exist. We posit that bringing trainees to the forefront of this service model may represent an untapped opportunity for the health care workforce to develop skills necessary to care for underserved populations.

To explore the feasibility of mobile clinics as a medical education site, we conducted a qualitative study to understand how the mobile clinic experience (1) is perceived by individuals who train aboard the clinic, and (2) influences individuals' personal and professional development.

Methods

The present study focuses on the Family Van (FV), a Harvard Medical School-affiliated mobile clinic that provides free screenings and referrals in underserved Boston communities (described in detail elsewhere^{15,17}). The FV's staff-directed volunteer program trains community members and students from undergraduate and graduate schools (hereafter "trainees") in direct service, community outreach, and research roles.* Trainees complete background readings, video training modules, and two orientation sessions prior to beginning their semester-long role.** For the present study we examined critical reflection papers that were solicited from trainees upon completion of their term of service.

Setting and participants. We used a de-identified total population sample of FV volunteer trainees from 2011–2016 (N=109) who consented to having their critical reflection papers used for program evaluation (Figure 1). Reflection papers are routinely collected by the FV, and ask trainees to write an open-ended essay describing (a) their experience, (b) key takeaways, and (c) if/how the experience influenced professional or personal goals. We used t-tests and chi-square tests to ascertain if those who did not consent to having their reflection paper used (19.7%) differed from those who did on demographic characteristics.

*For additional information about the Family Van's volunteer role options: <http://www.familyvan.org/volunteers>

**The orientation involves didactic and discussion-based modules on the Family Van's model; demographic and health characteristics of the neighborhoods served; cultural competence; and the consequences, risk factors, and screening procedures for common chronic conditions (e.g., hypertension, diabetes, obesity, glaucoma, depression). Trainees then observe and practice performing health screenings, with feedback and mentorship from experienced staff. These staff provide mentorship to trainees at both this initial orientation and throughout the experience.

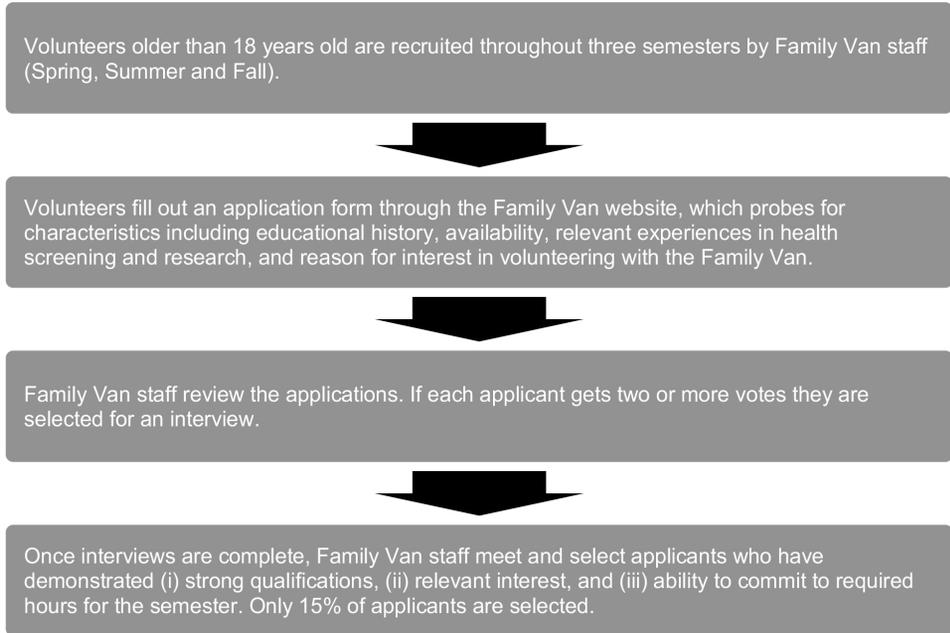


Figure 1. Selection process and desired characteristics for Family Van volunteer trainees.

Data analysis. We used an immersion-crystallization methodology,¹⁸ in which MS and ADC (1) independently, inductively read transcripts without preconception (immersion), then (2) iteratively examined emergent themes and patterns (crystallization).

Initial discussions among the research team served as ongoing reliability checks towards data saturation, and to construct a codebook describing patterns and relationships in the data. The codebook structure and code definitions were created and modified twice to achieve consensus. Data sources were subjected to line-by-line test coding, facilitated by nVivo software,¹⁹ allowing us to ascertain the degree to which our codebook reflected primary data. A randomly selected subsample of 20% of transcripts were also double-coded by an unaffiliated social scientist. The codebook was then refined one more time before application to the data, followed by a final round of thematic data analysis in nVivo (Box 1).^{20,*}

The Harvard Medical School institutional review board exempted the current study's protocol from human subjects review.

Results

Sample characteristics. The majority of trainees were female (72.0%), and the mean age was 24.9 years (SD: 8.7) (Table 1). Three-quarters of trainees were people of color

* As a member check of our findings, we selected a purposeful sample³⁰—stratified by participation year—to share findings with via an anonymous SurveyMonkey questionnaire containing Likert-scale and open-ended questions (available upon request).

Box 1.

FINAL CODEBOOK APPLIED FOR A QUALITATIVE ANALYSIS OF VOLUNTEER TRAINEES' EXPERIENCES ON A MOBILE HEALTH CLINIC IN BOSTON, MASSACHUSETTS.

1. Features of the Experience
 - a. Service Learning
 - i. Reciprocity and partnership with community
 - ii. Meeting community needs
 - iii. Intensive training
 - iv. Reflective practice
 - v. Non-judgment of clients
 - vi. Mentorship from staff
 - b. Cultural Competency
 - i. Effective, equitable, understandable, and respectful
 - ii. Responsiveness to...
 - a. Culture and how it extends to health beliefs and behaviors
 - b. Preferred languages, health literacy, and communication needs
2. Influences on Volunteer Development
 - a. Professional Development
 - i. Research and Evaluation Skills
 - ii. Patient Care Skills
 - a. Communication and Active Listening
 - b. Language Skill Practice/Development
 - c. Interprofessional Teamwork
 - d. Trust-based Relationship
 - e. Screening Methods
 - iii. Outreach and Education Skills
 - b. Personal Development
 - i. Empathy for those with different life circumstances
 - ii. Awareness of different cultures
 - iii. Newfound understanding for the City itself and its different neighborhoods
 - iv. Challenging preconceptions
 - v. Understanding social determinants firsthand
 - vi. Cultural Humility
 - vii. Reversal of paradigm: serving patients → patients teaching them
 - c. Career Trajectory
 - i. Confirmation of interest in medicine and other health professions
 - ii. Fusion of public health and direct patient care
 - iii. Change in perspective on health care system
 - iv. Long-term influence on philosophy towards future patients

(continued on p. 660)

Box 1. (continued)

3. Programmatic

a. Suggestions for Improvement

- i. Use resources more effectively and efficiently
- ii. Proposition of new programs or initiatives based on experience

b. Valuable dimensions

- i. Training and mentored guidance from FV staff
- ii. Internally consistent modeling of core values by FV staff

c. Outcomes

- i. Would recommend to others
- ii. Positive feedback about the FV experience
- iii. Positive view towards on personal contributions and receptiveness of FV staff to consider/implement

(76.2%), 45% came from racial/ethnic backgrounds under-represented in medicine (URM), and 39.4% reported a non-English primary language (e.g., Spanish, Russian, Haitian Creole). The majority were undergraduates (93.0%) and affiliated with a private university (79.4%). Volunteers who did not consent to having their reflections used vs. those who did consent were not significantly different on any sociodemographic characteristic.

Themes. Four major themes emerged: (i) Features of the trainee experience, (ii) influence on trainee professional development, (iii) influence on trainee personal development, and (iv) perceptions of the FV volunteer training program.

Features of the trainee experience. Many trainees wrote that they volunteered to get more hands-on experience in community-based models of health care. Trainees appreciated being able to observe the delivery of compassionate care, supported by staff mentorship, which fostered the development of both technical and soft skills. One trainee stated, “Every week I am taken aback at how personable the staff is with each of the clients—they truly care about what they do. The amount of compassion I see makes me hopeful for the future of community-centered health care, whether it is by the curbside or at the clinic.” Many mentioned that the interactions modeled by staff helped them understand the core values and service delivery model of the FV. Close staff mentorship helped ease trainees’ fears and doubts:

I worried that I was not going to perform everything as the manual indicated . . . When I got to the Van, [staffperson] welcomed me with huge smiles, and that nervousness began to diminish . . . I faced my fear by asking [staffperson] if I could practice taking blood pressure on her before our patients arrived. That day, I had [staffperson] listening through the stethoscope every time I took a patient’s blood pressure, but by the third visit, I felt like a pro.

Trainees observed and participated in a non-judgmental, informal health care environment for clients, which facilitated open, candid sharing during client counseling, as described by one volunteer:

Table 1.**DEMOGRAPHIC CHARACTERISTICS OF VOLUNTEER
TRAINEES ON A MOBILE HEALTH CLINIC IN BOSTON,
MASSACHUSETTS, 2011–2016 (N=109)**

	<i>N</i>	%
Gender	100	
Male	28	28.0
Female	72	72.0
Age	77	
18–22	38	49.4
23–28	27	35.1
29–34	6	7.8
35+	6	7.8
Primary Role Type	101	
Direct Service	61	60.4
Research and Evaluation	15	14.9
Outreach and Education	25	24.8
Race/Ethnicity	105	
White	25	23.8
Black	33	31.4
Asian	26	24.8
American Indian/Alaska Native	1	1.0
Hispanic	6	5.7
Other ^a	14	13.3
Primary Language	109	
English	22	20.2
Non-English	43	39.4
Not Reported	44	40.4
Languages Spoken	109	
One Only	49	50.5
Two or More	54	49.5
Under-represented in Medicine (URM) ^b	109	
Yes	49	45.0
No	60	55.0
Educational Status	71	
Undergraduate	66	93.0
Graduate (MPH, MD, PhD)	5	7.0
Institutional Affiliation	68	
Public University	12	17.6
Private University	54	79.4
Other (e.g., Community Volunteer)	2	2.9

Notes:^aIncludes students who identified as multiracial or chose not to disclose race/ethnicity.^bURM Status based on American Association of Medical Colleges Definition (2004).

[The client] expressed some relief in what she felt when she was on the Van— namely, that there were people there who actually cared about her. We, of course, talked together about all the details about what constitutes healthy living —right blood pressure numbers, good versus bad cholesterol, etc. . . . but what stuck with me was her emphasis on trust.

Influence on trainee professional development. The most common trainee role was Direct Service volunteer.* The majority of these participants remarked on learning skills needed to care for clients. Namely, this involved both improvements in clinical assessment/screening skills and preparation to communicate with and provide care for diverse clients. One trainee described their experience of becoming more self-assured following a first client visit that was stressful: “That encounter helped me put things into perspective. I was mentally prepared to deal with the wide variety of people I would be seeing thereafter.”

Trainees who worked in Outreach participated in social media efforts, community events, and health education workshops. Many noted improved communication skills, and several observed that community outreach is vital to ensure services reach communities most in-need (e.g., “This work simply cannot happen if patients don’t know about services available to them”).

Research trainees described learning about the mobile health sector, specifically with respect to funding models, policy issues (e.g., reimbursement), communication skills, and “the true impact mobile clinics make.” These volunteers often mentioned the untapped potential mobile clinics have in the health sector, frequently citing the Van’s return on investment estimate (see Song et al.¹⁵). Volunteers appreciated the experience despite having spent little time physically on the Van.

Trainees also described learning experiences consistent with several well-known dimensions of culturally competent care:²¹ effective care, understandable care, and respectful care. With regard to *effective care*, volunteers described their accomplishments (e.g., screening for chronic disease, making referrals, providing emotional support), as well as recognition of how systemic barriers limited their clients’ ability to achieve optimal health: “However, HIV testing was only half the battle, the other half was to get her health insurance so she could access the primary care she needed.” Trainees also shared experiences encompassed by the concept of *understandable care*, in which they were able to bridge communication barriers by using tailored engagement strategies, accommodations (e.g., written instructions), or using the client’s language “so that it would make sense in their lives.” Finally, trainees reported on experiences of *respectful care*, where clients felt respected “like human beings on an equal level with the health care provider” through positive interactions with the staff; terms such “make them feel at home” were regularly used to illustrate this comfortable relationship.

Influence on trainee personal development. Trainees’ experiences shaped their personal beliefs and perceptions of illness and health care (see Box 2 for sub-themes and

* Although trainees were assigned specific roles based on interest and needs, many volunteers ended up taking on duties spanning multiple role types. Most volunteers served as a Direct Service volunteer at least once.

Box 2.

CODES, DESCRIPTIONS OF CODES, AND ILLUSTRATIVE QUOTES WITHIN THE THEME OF INFLUENCES ON TRAINEE PERSONAL DEVELOPMENT, WITHIN A QUALITATIVE ANALYSIS OF VOLUNTEER TRAINEES' EXPERIENCES ON A MOBILE HEALTH CLINIC IN BOSTON, MASSACHUSETTS

Code	Description	Illustrative quote
Empathy for people with different life circumstances ^a	Descriptions of the Van experience as a window into the lives of people with very different cultural, socioeconomic, and life circumstances than their own.	“I would have to say that starting off on the Van, I thought that I knew my community pretty well; given the fact that I was born and raised in Boston, but had no idea of what people in my community were going through. Seeing people regularly come on the Van to get something as simple as their blood pressure checked, put things into perspective for me, as to why having access to health care really is important within the community.”
Responsiveness to culture, and the influence of culture on health beliefs ^a	Statements reflecting newfound awareness for specific cultures they may not have had much interaction with; and how belief systems, values, and norms may influence how patients view care and how they might approach delivering medical recommendations.	“I have not worked extensively with Muslim patients, and so some of the cultural sensitivity aspects were new to me, e.g. gender-matched health care providers, not providing educational materials with faces, not making direct eye contact. Observance of customs and norms is critical in being able to effectively reach and serve populations.” <i>(continued on p. 664)</i>

Box 2. (continued)

Code	Description	Illustrative quote
Cultural humility ^a	Experiences in which cultural humility was an important lesson; this encompasses an awareness of and appreciation for unique cultural and linguistic factors that might influence the patient-provider interaction. The humility component connotes a willingness to continuously learn from these experiences.	“My first day on the Van, I thought I was completely prepared, when in reality I knew close to nothing about what these people really needed. I was stationed at the [Boston neighborhood] location because of my Spanish and Portuguese speaking skills. Spanish became my first lesson—humility. I realized that I could not speak as well as I thought under pressure, and especially when using medical terms. I learned to be upfront with the patients, and to lose all sense of embarrassment.”
Importance of language in patient care ^a	Statements acknowledging how crucial it was to connect with clients in their own language; this seemed to communicate a respect for individuality and helped establish comfort and relief. Also included instances in which volunteers struggled with limited or basic knowledge of a language.	“Many of the people I have seen speak Portuguese Creole, and because I do not speak this language I relied on my trusty friend Google to help me learn some key words such as ‘Bon dia’ for Good morning or ‘Obrigado’ for You are welcome. I have been able to apply some of the words on the Van, and I enjoy seeing the clients light up—whether in laughter or in appreciation that I am trying—when I relay some of these words to them.”
Newfound understanding for city and different neighborhoods	Reports about how trainees learned new facets about a neighborhood/area of Boston with which they’ve had less experience, or had held preconceptions based on the media/word of mouth. This involved awareness of the area’s demographics, history, and unique health issues.	“While volunteering in [Boston neighborhood], it became evident that there is a sense of mistrust and anger towards health care. A few of the patients I screened discussed decades of neglect, long waiting periods, bad experiences with health care professionals, and high costs of medical services as factors that have contributed to this mistrust. These opinions prevent them from routinely accessing medical services when medical attention is required.”

(continued on p. 665)

Box 2. (continued)

Code	Description	Illustrative quote
Challenging one's preconceptions	Notes about trainees' concept or perspective they had prior to volunteering on the Van regarding the medical/social needs of local communities, and how it changed through their experience. Includes realizations of patient needs which were often not visibly apparent.	<p>"After the screenings, I sat down with the mother and proceeded to complete the general questions we ask everyone. Towards the middle of the survey, the mother answered "yes" to the "Are you homeless?" question. To this day, two months after, I still remember pausing, immediately looking up at the kids, and seeing the youngest who was still joking with her dad. I remember the surprise. I would have never imagined that this family was struggling with homelessness."</p>
Understanding social determinants firsthand	Experiences trainees found surprising, interesting, or novel in which non-clinical drivers of health were observed firsthand. Involved recognition that medical challenges could not be fully addressed without also understanding these factors.	<p>"I was lucky enough to have [Family Van Staff] give me a tour of the [grocery store] . . . When I stepped inside the store, I was surprised to see that there was very little in terms of fresh fruits and vegetables, and fresh produce in general . . . There was also a huge selection of one-dollar, single-serving frozen foods: convenience meals that upon looking at nutrition labels I discovered were high in calories and saturated fat, and low in protein and vitamins and nutrients."</p>

(continued on p. 666)

Box 2. (continued)

Code	Description	Illustrative quote
Extending view on patient-provider relationship	Moments in which trainees recognized that important aspects of patient care were in conversations, active listening, and encouragement. In conjunction with health screenings, these aspects of clinical interactions were often linked to an appreciation for models in which patients are meaningfully engaged in care, as well as understanding health care “value” beyond disease averted, (i.e., thriving and hope).	“When a client comes on the Van, there is a required form and procedure that must be followed. However, beyond these steps is where the healing happens. It is in the conversations discussing healthier options for lifestyle changes, or referrals for further health services, I worked in partnership with the client to figure out a solution that fit his or her individual abilities or choices.”
Considering health beyond the biomedical model	Statements reporting noticing the less biomedical dimensions of health—spanning emotional, social, and spiritual aspects. Often included that these aspects of patient care need to be considered just as important as physical health needs.	“Many times on the Van I celebrated with people, and cried in their suffering. This made me realize that health is physical but also mental, emotional and spiritual...health is beyond just the physical realms of the body”

Notes:

^aIn the member-check process, the majority (>9 of 17) of former volunteers agreed or strongly agreed that this code accurately reflected their experience, providing an indication of relative salience.

representative quotations). The most salient theme was the development of empathy for people with different life circumstances. Trainees described experiences on the Van through which they gained insights into—and understanding for—the challenges experienced by people with axes of identity (e.g., race/ethnicity) different from their own. Another consistent theme was developing a better understanding of how beliefs and attitudes rooted in cultural norms could affect health-related behaviors. For example, a few trainees expressed surprise that some clients struggled with healthy eating practices for cultural reasons, beyond access-related barriers such as cost:

[Client name] knew that healthier food often cost more . . . she confided that the food she cooks, which could at times be unhealthy, matters so much for her family. It meant more than just nutrition—it was a practice of expressing love, passed down across generations to keep the family bound together.

Relatedly, trainees also described the advancement of *cultural humility*,⁴ a trait that encompasses both growing in understanding culturally diverse perspectives as well as a commitment to lifelong learning. Finally, language as a specific factor within culture that influences the patient-provider relationship was often discussed.

These shifts were often linked to trainees' professional aspirations. The majority felt that the experience re-affirmed or deepened their interest in pursuing a career path "practicing in underserved urban environments," as a "clinician-leader" or "clinician-advocate." Several volunteers described that the Van prompted a paradigm shift in their view on health care systems and delivery (e.g., "Our system was set up to remove pathology and illness, not to create meaningful relationships with communities"). This seemed to hold even for those who felt they had a grasp on clients' experiences from previous volunteering or from growing up in Boston. Many highlighted the value of a trusting, accessible, and relationship-based model of care they had not previously witnessed. One trainee said that "on the Family Van, the relationship between service providers and clients is dramatically altered."

Perceptions of the Family Van volunteer training program. Overwhelmingly, the FV trainee experience was praised, and most volunteers would recommend the experience to others. Nonetheless, some volunteers did suggest the Van extend their services to additional populations (e.g., adolescents, specific immigrant subgroups). These ideas included improving outreach strategies (e.g., audience tailoring, social media), research efforts to understand barriers to care, altering the Van's sites, and onboard resources to better support clients with language barriers.

An initial lack of confidence in their ability to perform health screenings was recognized as an issue; however, this uncertainty waned as confidence improved. Trainees recommended that the Van inform volunteers that the orientation would be followed by extensive hands-on training and support. Several trainees recommended improving the materials the Van provided regarding local community resources for clients to access basic and social needs, as trainees consistently remarked on seeing the impact of social determinants firsthand. As one trainee said, "I knew that [the client] would benefit from hearing about legal assistance, but I essentially had to Google what organizations could help address that need, their hours and requirements, etc."

With regard to outcomes, many respondents were pleased when their suggestions to improve the Van's operations were welcomed and implemented. These experiences were fundamental in reinforcing trainees' confidence in and commitment to the role they could play in a community health organization: "To my surprise, the potential change was added to a grant proposal the Family Van was working on . . . it really helped to enforce to me that my ideas mattered and merits attention." Some trainees noted the critical role mobile health clinics play in the broader health care system, longitudinal patient care, and addressing health disparities. This was often characterized as a health care resource that "addressed the many chasms in our current health care system." Examples of stated gaps included community distrust of institutions, lack of coordinated care, and geographic and transportation barriers.

Discussion

In this qualitative assessment of volunteers training on a mobile health clinic, we found that participants witnessed a model of compassionate, non-judgmental health care. Trainees progressed from apprehension towards confidence and competence, mediated by practice and staff expertise. Trainees' role type appeared to influence how their participation shaped professional goals, and the acquisition of culturally-competent care principles was consistently noted by direct service volunteers. Most salient within trainees' reflections was a marked transformation about their understanding of the health care system and the patient-provider relationship (Box 2).

The opportunity to advance health care access while training providers to participate in similar models may be attractive to educators and mobile clinics, particularly in light of limited resources. This is notable, as our findings align with studies on undergraduate medical education in other community settings.^{22,23} Since many mobile clinics rely on volunteers and students,¹⁶ there may already be mechanisms in place that can be formalized to train, supervise, and assess these individuals. For mobile clinics considering engaging with educational efforts, we underscore our final theme that clinics should focus on supporting trainees to understand the landscape of local resources for referrals. Clinics currently in operation likely have a bank or institutional memory of such organizations²⁴ that could be incorporated into volunteer training procedures.

Limitations and future directions. First, we studied competitively-selected volunteers from one mobile clinic affiliated with a private medical school which likely limits generalizability. Second, social desirability bias is a concern as reflection papers were submitted directly to staff at the close of volunteers' term of service. Third, we had limited ability to probe in-depth as this was a secondary analysis of existing data. Although we employed techniques to ameliorate these threats (e.g., audit trail, triangulation, member-checking), future studies may consider direct observations of trainee clinical skills. Fourth, FV trainees largely indicated a predisposition towards community health and were nearly half URM, so we cannot disentangle whether insights gained on the Van would not have occurred otherwise (as acknowledged in similar studies²⁵).

Given respondents' markedly positive experiences, along with sub-themes detailing challenged preconceptions and reinforced commitment to community-based health care, we recognize this study constitutes a necessary yet insufficient step in building the

case for mobile clinics as a medical education partner. Key themes such as the importance of mentorship from the FV's inter-professional staff represent valuable targets for future research. Further, evidence consistently shows that supporting student interest in underserved practice has an independently observable effect on workforce outcomes (e.g., primary care residency match),^{7,26,27} but we do not yet know whether this would hold for mobile clinic traineeships. To our knowledge this is the first study to illuminate the influence of mobile clinic experiences on trainees. Our ethnically-diverse sample and robust qualitative analysis represent noteworthy strengths, building upon building upon previous work characterizing patient experiences on these clinics.^{10,28} Future research using more rigorous study designs (e.g., with control groups) and validated competencies is merited.²⁹

Conclusion. Mobile clinics have potential to serve as key sites for both health care delivery and feasible community-based medical education, addressing topics not captured by traditional curricula. This study adds exploratory qualitative data to illustrate how training in this setting shapes students' knowledge and perceptions, setting the stage for future work.

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