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Community-Based Education in Global Low-Resource Settings: A Unique Interprofessional Collaborative Experience in Primary Care Delivery

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Abstract

The complex nature of global health issues requires multidisciplinary efforts, namely, interprofessional education (IPE) and collaborative practice. For American students to develop skills and competencies that contribute to global primary care workforces, they must receive community-based education in various environments around the world. This article presents a global health education program that offers community-based, health-related IPE that is centered on primary care, collaborative practice, and a unique three-way partnership. Using a "classroom in the field" hybrid model, this program placed graduate and undergraduate students from different majors into experienced multidisciplinary health care teams and gave them hands-on, firsthand public health experiences in eight low-resource settings in Guatemala. The curricular design was informed by the Consortium of Universities for Global Health's global health education competencies. At the completion of the program, all partners, participants, and local communities involved saw significant positive outcomes. Notably, students were able to articulate the essentials of primary care in a global context and demonstrate knowledge and skills in global health competencies. Such community-based approaches promote student understanding of disease prevention and health promotion as key elements of primary care that could improve health outcomes for underserved global populations.

Keywords

community-based learning, global health education and workforce development, interprofessional education, service-learning pedagogy

Primary health care is a whole-of-society approach that aims to ensure the highest level of community's health and well-being, as well as equitable distribution of care, by focusing on patient needs and preferences on individual, familial, and communal levels. Primary care should be incorporated early on and support patients at every stage, from health promotion and disease prevention to treatment, rehabilitation, and palliative care (World Health Organization [WHO] & United Nations Children's Fund [UNICEF], 2018a).

The WHO's Astana Declaration states that primary health care and services should be high quality, safe, comprehensive, integrated, accessible, and affordable for all peoples and be provided by health professionals who are skilled and committed (WHO & UNICEF, 2018b). Primary care teams are multidisciplinary and may include physicians, physician assistants, nurses, rehabilitation workers, nutritionists, care managers, social workers, pharmacists, dentists, laboratorians, policy analysts, engineers, statisticians, health educators, communication experts, and traditional healers (Koo & Miner, 2010; WHO & UNICEF, 2018a). Such public health workers must be purposefully trained through dedicated pre-service and in-service programs that combine evidence-based knowledge with locally relevant expertise (WHO & UNICEF, 2018a).

Considering the wide range of health-related disciplines that exist and the diversity among health professionals, Koo and Miner (2010) recommend a rigorous outcome-based education and workforce development. To this end, WHO promotes interprofessional education

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(IPE), which is defined as "when students from two or more professions learn about, from and with each other to enable effective collaboration and improve health outcomes" (WHO, 2010, p. 7). This team-based approach creates shared accountability for outcomes relevant to prevention and health care (Interprofessional Education Collaborative [IPEC], 2016).

This article describes an interprofessional pedagogical approach to delivering primary health care to low-resource global communities. Through a partnership between University of Washington (UW) Bothell and community-based organizations (CBOs), graduate and undergraduate students from different academic majors participated in a global health education program that allowed them to work with, and learn from, experienced multidisciplinary teams in eight remote mountain and river-lined villages in rural Guatemala. As a "classroom in the field" hybrid model of education, this ongoing interdisciplinary course provides students with unique, firsthand experiences in public health care outside of the United States and also fills a curricular gap in global service-learning at UW Bothell. Note that this article's methods, results, and discussions focus on programs held in 2016 and 2018.

Background

Competency-based education, including service-learning and community-based learning, teaches students lessons through practice. McKinnon, Smedley, and Evert (2016) describe these courses as not just regular courses with community service for homework but rather as courses that unite service and classroom, and enforce a rigorous, service-based pedagogy that maximizes student development and community priorities. Thus, Kuh (2008) asserts that service-learning and community-based learning are high-impact educational practices that encourage students to apply their courses' curriculum to real-world settings. McKinnon et al. (2016) further explain that global service-learning is a specialty field that focuses on practice and education in international settings, community development, and cross-cultural engagement.

Evidence shows that students who engage with CBOs expand the scope of their learning, develop practical skills, and deepen their appreciation for community-based work (Gardner, Ronzio, & Snelling, 2018). Furthermore, they learn to quickly apply their knowledge to solve unique local problems, thus stimulating their critical thinking (Ezeonwu, Berkowitz, & Vlasses, 2014).

An undeniable reality of living in the digital age is the emergence and establishment of innovative hybrid approaches to teaching and learning. Technology promotes higher-order competencies and provides learners with the skills and capacities for 21st-century citizenship such as global awareness, creativity, collaborative problem solving, and self-directed learning (Groff, 2013). Hybrid courses not only enhance different modalities of content delivery but also support a myriad of learning styles and diverse collaborative methods. This sort of "blended" learning creates variety and excitement in educational experiences, especially for students with broader learning goals who cannot be served just by traditional forms of education (Ezeonwu et al., 2014, p. 277).

Hybrid models have found success in community-based health programs. In baccalaureate nursing programs, content for health promotion and disease prevention in low-income communities (e.g., community health needs assessments and health education workshops) have been taught using hybrid modalities (Ezeonwu et al., 2014). Family and internal medicine residency programs have also used hybrid models to teach primary care contents (Bodenheimer, Knox, & Kong, 2019).

IPE presents an innovative form of hybrid learning. In fact, WHO (2010) has deemed IPE a necessary step in preparing a team-centered, practice-ready health workforce that is better prepared to respond to a community's health needs. For global health, this is done by bringing a diverse group of students, CBOs, and local community members together in a global space. Given the wide variety of disciplines and individuals that make up the global health workforce, IPE is reflective of the teamwork that students will ultimately experience in their careers. After all, the IPEC's expanded competency model for population health demands that clinicians, public health practitioners, and professionals from other fields collaborate effectively and creatively across disciplines to optimize care and advance population health (IPEC, 2016).

Primary Care in Low-Resource Global Communities

Health systems of most developing countries are poorly designed and struggle to address both communicable and noncommunicable diseases. For example, a multi-country study of community perceptions of African health systems revealed a high burden of communicable and noncommunicable diseases, the most commonly reported issues being malaria, hypertension, and diabetes (WHO, 2012). The study also identified obstacles that prevented patients from accessing health care such as cost, long distances to facilities, inadequate and unaffordable transportation systems, poor quality of care, and the poor attitude of health service providers. Furthermore, evidence shows that Caribbean countries and territories face high burdens of noncommunicable diseases among developing nations in the Americas (Razzaghi et al.,

2019) due in part to substantial gaps in primary care (Macinko, Guanais, Mullachery, & Jimenez, 2016).

Guatemala, Central America's most populous country with more than 16 million people (WHO, 2019), has an equally weak and underresourced health system and presents a fertile ground for global public health education. Communities suffer from lack of access to health care, the remoteness of villages, and the prevalence of chronic and infectious diseases, which have profound global effects due to their transmissibility and adaptability (Fauci & Morens, 2012). Guatemala also has a high burden of noncommunicable diseases such as diabetes, hypertension, and cancer (Maher, Harries, Zachariah, & Enarson, 2009). In addition, complications of malnutrition such as fetal growth restriction, stunting, wasting, and deficiencies of vital vitamins remain persistent in poverty-stricken areas (Voth-Gaeddert, Stoker, Cornell, & Oerther, 2018).

These extensive public health issues require coordinated and collaborative intervention efforts. Disease prevention and health promotion that target common diseases are especially central to primary health care in Guatemala, which underscores the need to train an experienced interprofessional primary care workforce.

Curricular Framework

The global health education program was informed by the Consortium of Universities for Global Health's (CUGH) global health education competency toolkit (CUGH, 2018), which was developed to promote workforce training at different levels and support diverse groups of students in becoming global citizens and health practitioners (Jogerst et al., 2015).

This toolkit identifies two levels of global health competencies: global citizen level and basic operational program-oriented level. These competencies are comprehensive, relevant across disciplines, and support interprofessional programs tailored to meet the varied educational and professional goals of participants from different academic backgrounds (Jogerst et al., 2015; Wilson et al., 2014). The two levels of competencies have a combined total of 11 domains with 38 discrete competencies that measure students' knowledge, attitudes, and skills in each of the domains. The domains include the following:

- Global burden of disease
- Globalization of health and health care
- Social and environmental determinants of health
- Capacity strengthening
- Collaboration, partnering, and communication
- Ethics
- Professional practice
- Health equity and social justice
- Program management
- Sociocultural and political awareness
- Strategic analysis (CUGH, 2018; Jogerst et al., 2015)

Method

Partnership and Team Development

This study's author contacted several U.S.-based CBOs that engage in global development in low-resource countries. After extensive communication, vetting, and confirmation that individual and organizational values and priorities aligned, UW Bothell established a partnership with Guatemala Village Health (GVH) in 2015. GVH is a Seattle-based organization whose mission is to improve community and individual health in rural Guatemalan villages by educating villagers, empowering local leaders, and training local health providers (GVH, n.d.). The partnership also extended to Aldeas Sanas Guatemala, a Guatemala-based nonprofit organization. GVH also partners with the Guatemalan Ministry of Health and works directly with Centro de Atencion Integral Materno Infantil or Integrated Health Center for Mothers and Infants, secondary-level government health care centers that offer a wide array of primary care services in the town of El Estor. GVH built a training center within this El Estor facility to help train health workers.

Although GVH has ongoing health programs throughout the year in Guatemala, they also conduct joint public health mission trips with UW Bothell's team, which occur every other year. In 2016 and 2018, UW Bothell's participants consisted of graduate students and undergraduate seniors from different majors including policy studies, environmental studies, societal ethics and human behavior, health studies and public health, biology, and nursing. Nursing students were from three programs: Master of Nursing, Registered Nurse-to-Bachelor of Science in Nursing (RN-to-BSN), and First-Year Entry BSN.

Meanwhile, GVH's team consisted of family physicians, nurse practitioners, a pharmacist, registered nurses, and public health practitioners. The Aldeas Sana Guatemala team consisted of a country program director, village health workers, nurses, laboratory technicians, interpreters for Q'eqchi and Spanish, and numerous field staff. Finally, the Guatemalan Ministry of Health was represented by a physician and a nurse.

Course Development

The development of the interdisciplinary elective titled "Global Health Promotion: Health Services Delivery in Resource-Poor Settings" was informed by the CUGH's

interprofessional global health competency framework. The 12-credit course features a three-way hybrid design that includes online asynchronous sessions, face-to-face seminars, and hands-on service-learning. The subsections of the course were global health promotion (5 credits), interdisciplinary collaborations and primary care (5 credits), and independent and group research (2 credits). The course has continued to evolve based on student and community partner feedback.

Although the course was designed for delivery in a single quarter (10 weeks), activities such as student recruitment, logistical arrangements, planning, and predeparture orientations were done at least one to two quarters before the actual course delivery. Online and classroom activities preceded fieldwork. The course's individual and group assignments prepared students in primary care, health education, and research as well as provide opportunities for reflections through syntheses of field experiences, research activities, and course readings. The recommended text was Werner, Thurman, and Maxwell's (2017) *Where There Is No Doctor: A Village Health Care Handbook* in addition to select articles and films.

Major content areas were epidemiology, determinants of health, the Center for Disease Control and Prevention's (CDC) 10 essentials of public health and principles of community engagement, health promotion, and risk-reduction strategies. Other content included health systems, project planning, implementation and evaluation, essentials of primary care, and community health needs assessments. A case study methodology involving evidence-based theoretical investigations and analyses was also covered.

The course's learning objectives stated that, upon completion, students should be able to complete the following:

1. Describe pre-trip learning goals and how they were met or unmet through the global experience
2. Articulate skills needed to collaborate effectively with interdisciplinary teams in low-resource communities
3. Analyze the essentials of primary care and health promotion in resource-poor countries
4. Develop skills to conduct health needs assessments of communities in a developing country and describe ongoing policy strategies to address identified needs
5. Demonstrate the ability to learn and participate in primary care activities including health education and screenings
6. Analyze local and global determinants of health of communities in developing countries
7. Research, document, and present specific health issues of a given population
8. Articulate the roles of health professionals, local and global CBOs, charitable foundations, and other nongovernmental organizations and agencies in global development efforts
9. Evaluate approaches to working with diverse teams and communities and articulate the importance of cross-cultural dialogue and understanding

Fieldwork

Each of the two global experiences were set up in eight clinics in eight Guatemalan villages, and resulted in more than 500 patient encounters per trip. The "clinic" here refers to mobile primary health care clinics set up in rural village spaces such as churches, schools, and community centers. Aldeas Sanas Guatemala coordinated in-country team activities and necessities including clinic set-up, transportation, meals, and accommodations. On arrival at each village, intensive on-site orientation and briefing were conducted, followed by hands-on clinic activities, beginning with community and environmental assessments.

To ensure that every student had opportunities to experience different areas of primary care delivery, clinic flow was structured by roles and work stations. Work stations were set up for basic assessments, screening and vital signs, triage, provider, laboratory, pharmacy, and health education for common chronic health issues. Meanwhile, commonly assigned roles included the scribe, who documented care, and the runner or troubleshooter, who ensured that the clinic ran smoothly and delivered needed items or messages to different stations. Students rotated roles and stations according to their skill levels, language abilities, learning needs, and areas of interest.

Results

Student Outcomes

Formative and summative assessments were used to evaluate student learning throughout the course. Students developed knowledge and skills in all content areas and demonstrated understandings of interprofessional collaborations, cross-cultural communication, and the logistics and challenges of health care delivery in global underresourced communities.

Through written assignments, active engagement in fieldwork, and reflections, students articulated the essentials of primary care (WHO, 2008), particularly in areas of (a) community health education (i.e., emphasis on how to

promote overall health and prevent diseases and illnesses); (b) proper nutrition (i.e., education and demonstrations on how to prepare balanced and nutrient-rich meals using local ingredients); (c) clean water, hygiene, and sanitation (i.e., education on links between illnesses and hygienic regimens and demonstrations on safe water use and handwashing); (d) maternal–child health and family planning (i.e., education on immunizations, contraception and child spacing, and sexually transmitted infections); and (e) access to health care in rural villages (i.e., primary care delivery and training of health promoters [*promotoras*] and lay midwives [*comadronas*] on basic health knowledge and assessment skills).

Meanwhile, graduate students honed numerous research skills including preparation for institutional review board application and approval, data collection and analysis, manuscript preparation, and conference presentations. For example, graduate students, as well as some undergraduates, researched the prevalence of sexually transmitted infections and contraceptive use in rural villages. In addition, they led day-long clinical skills training workshops on best practices for basic health screenings and interpretation of results. Twenty-four health promoters and six lay midwives from rural villages participated in the workshops.

Student deliverables for individual and group projects included goal statements, certificates of completion of select epidemiology modules from the Northwest Center for Public Health Practice (2019), PowerPoint presentations on the country's historical background, summative reflection papers, and case study projects on each of the primary care areas. Group-narrated PowerPoint and iMovie presentations of the projects were given to the campus community and community partners. Students also participated in end-of-course debriefings and evaluated the program and its partners. Many students indicated a strong desire to pursue careers in global health and/or to return to the same Guatemalan villages on graduation. These reflections underscore the significance of global service-learning and the impact of cultural relativism on efforts to improve public health outcomes.

Community Outcomes

Rural communities that served as this program's teaching-learning platforms benefitted from its curricular model. One notable benefit was the training of local health promoters and lay midwives. GVH and the Guatemalan Ministry of Health and Public Welfare have developed training programs aimed to enhance these community health workers' basic health care skills, given that they are highly respected volunteers who reside in the communities they serve and support the health system by monitoring health at the community level (United States Agency for International Development, 2015).

Through this course, local health promoters and lay midwives received training in health assessment and screening skills (e.g., blood pressure and temperature measurements) and learned how to interpret values and parameters for appropriate intervention and referral. After they received one-on-one training and their assessment techniques were confirmed, they received sphygmomanometers, stethoscopes, and thermometers. The lay midwives also received specific training on reportable warning signs during pregnancy and delivery, critical pregnancy timelines, and physiologic changes during pregnancy. Participants were also given fetoscopes, antenatal cards, and notebooks for record-keeping along with instructions on how to use these items.

Community-Based Organization Outcomes

As a result of this partnership, the CBOs gained greater credibility and visibility as important contributors to training global public health professionals and leaders in advancing access to health care in rural areas. The program enhanced their clinic operations and increased the number of clients seen at each location. Furthermore, the students' collaborative research projects provided the evidence needed to support the CBOs' global engagement efforts, which may boost these organizations' status and eligibility for future funding.

Faculty Outcomes

The multilevel benefits of this educational model affirmed the faculty's effectiveness in delivering a complex interprofessional education program that has far-reaching implications for global health workforce development and health care access. The faculty's ongoing partnerships with community partners exemplify both leadership and collaboration in innovative global health program, while the students' learning outcomes demonstrate that pedagogical goals were met. Furthermore, by addressing the learning needs of diverse groups of students and the primary care needs of underserved communities, the program enriched faculty member's scholarship agenda.

Discussion

Health care systems in developing nations like Guatemala are compromised by persistent public health issues such as poverty, war and violence, displacement and homelessness, malnutrition, chronic and infectious diseases, and dismal access to health care services. The expansive health needs of people in remote villages call for a targeted approach to educating and training future public health workers.

Teaching global health practice requires innovation and creativity. The multidimensional nature of global

health issues requires a pedagogy that is interprofessional and recruits students who are willing to share their perspectives and expertise as well as understand their roles in a team. An effective model must also employ a hybrid approach to meet students' learning needs, collaborate with multiple partners and stakeholders, and be community based. These philosophical conclusions align with Gardner et al. (2018) who noted that a transformational model in public health education must engage students, faculty, and community partners and create opportunities for improvement through each party's assessment.

Furthermore, evidence shows that learning by doing is the best way to acquire requisite skills (Greece, DeJong, Schonfeld, Sun, & McGrath, 2019). The teaching-learning model described in this article provides students with ample opportunities to do the work and practice primary care in environments that need it the most. As proven through the program's many successful outcomes, the hands-on service-learning approach instills skills, builds competence in practice and global citizenship, and can be adapted to various country contexts.

Conclusion

Public health educators are tasked with training the next generation of interprofessional teams that can effectively tackle complex global health issues. When students engage in IPE and practice primary health care in communities alongside experienced multidisciplinary teams, they acquire global health competencies, observe specific global health issues first hand, and learn about the politics of care delivery in developing countries. Carefully designed IPE that is grounded in collaborative practice and supported by strong academic and community partnerships can ultimately strengthen health systems and improve outcomes.

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