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Addressing the Health of Hispanic Migrant Farmworkers in Rural East Tennessee Through Interprofessional Education, Experiential Learning, and a University/Community Partnership

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East Tennessee is a mostly rural, traditionally non-Hispanic region situated within south central Appalachia. Historically, this area (and the entire state of Tennessee) has not had a large Hispanic presence until recently, where there has been exponential growth in this population. Tennessee now ranks 3rd among states in the United States with the fastest growth rate of this population (US Census Bureau, 2011). While the Hispanic immigrant population is under-researched in rural traditionally non-Hispanic regions such as east Tennessee, what is known in general about this population is that many Hispanic immigrants experience a number of health-related risk factors such as the immigration experience that includes, language barriers, low literacy and stressors such as disruption of social networks and support and may lead to a number of preventable conditions such as health risk behaviors, depression, and physiological problems (Arbona et al, 2010; Finch & Vega, 2003; Hiott, Grzywacz, Davis, Quandt, & Acury, 2008; Hovey, 2001; Interian et al, 2011; Loury & Kulbok, 2007; Loury & Nelson, 2009). Language barriers are an especially significant issue impacting the Hispanic immigrant who resides in a rural traditionally non-Hispanic setting, where the Spanish language is not freely spoken or understood (Loury & Nelson, 2012; Padgett & Barrus, 1992). Traditionally non-Hispanic regions such as east Tennessee are not always culturally compatible or receptive; the Hispanic culture is not clearly understood, nor is the Spanish language freely spoken. These rural southeastern communities have had limited exposure to or understanding of recently immigrated ethnic groups. Most social service and health care providers are minimally prepared to understand the Hispanic culture or issues that impact this population now residing in this region. Cultural and language barriers exist causing many immigrants in these rural communities to remain isolated from the mainstream community (Villalba, 2011), and may result in cultural or language-related misunderstandings.

Predominantly an agricultural region, rural east Tennessee is also host to a large number of Hispanic migrant farmworkers. In addition to the issues that impact the Hispanic immigrant population as a whole, the Hispanic migrant farmworker also experiences additional factors such as the stress of frequent mobility, isolation, and occupational risk factors and injury due to the nature of the work they perform (Calvert et al, 2007; 2008; Cecchini, Colanti, Mussantini & Monavca, 2010; Palmer, 1996). Farmworkers in east Tennessee and the surrounding region also experience the same occupational risks of migrant farmworkers in general, including pesticide exposure, repetitive movements, heat stress, and poor sanitation which can also lead to infectious diseases, respiratory, musculoskeletal, and dermatological problems (Anthony et al, 2010; Kelly et al, 2012; Spears et al, 2012). In addition, low literacy, language and cultural barriers, long working hours, lack of transportation, and limited access to primary care create additional risks related to development, identification, or exacerbation of chronic disease (Larson, 2002; NCFH, 2012).

Research has shown that an outreach approach and use of mobile clinics for migrant farmworkers helps improve access to care however, studies focused on interventions to reduce incidence or exacerbation of the conditions experienced by these farmworkers are extremely limited (Luque & Castaeda (2013)

Providing effective health care services that address the multiple concerns in this population not only requires an outreach approach, but a collaborative practice approach where the community is in partnership with the health professionals and each discipline brings specific training, knowledge, and expertise to the interprofessional collaboration in order to address the multiple

needs of the migrant farmworker population and meet the goal of quality health care (Reeves, Lewin, Espin, & Zwarenstein, 2010; WHO, 2010).

Interprofessional Education and the University

A collaborative practice approach to health care requires a shift in the current education of future health care professionals where the concept of Interprofessional Education has been introduced as a way to address the educational needs of the students (IOM, 2013). According to the World Health Organization (WHO), interprofessional education (IPE) “occurs 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.13). The goal is to improve the health, safety, and quality of care to the patients, families, and communities without replacing the education that is specific and unique to each discipline, but augment the educational experience by exposing students to interprofessional collaboration as a method of practice in order to meet the goal of quality health care.

For a number of years, as a regional research university with strong health programs across five colleges in the Academic Health Sciences Center (Clinical and Rehabilitative Health Sciences, Medicine, Nursing, Pharmacy, and Public Health), Psychology, and Social Work, a two-semester interprofessional course in community assessment, research, and service, referred to as the “Rural Track” has been offered. The purpose of this course is to create interprofessional working relationships by teaming students and faculty across disciplines and partner with rural communities to prioritize health needs, develop plans, and work effectively as an interprofessional team to address identified health care needs of that community.

Students from Nursing, Medicine, Public/Environmental Health, Psychology, Social Work, and Clinical and Rehabilitative Health Sciences work in partnership with communities and their target populations. Goals of this rural Interprofessional Education Program are to develop an understanding of working as a team in addressing identified problems of a population in the community setting, gain experience in partnering with a community, and use community based principles in planning and evaluating health promotion and disease prevention strategies.

Groups of 8 to 10 students are led by faculty from two or more disciplines in designated sections of communities where they conduct a health related needs assessment of their target community during spring semester. In the fall, they carry out an evidence based intervention addressing at least one of the problems identified. Using this model of inquiry-based learning, topics addressed in partnership with the community, regional health, and non-profit organizations have included health issues ranging from smoking cessation to suicide prevention. Faculty members in each small group stay together within their designated community sections, maintaining a consistent presence and ongoing trust in the community. Throughout both semesters, all students receive the same didactic course content per semester through a series of online modules that include community assessment, health related theory, community based participatory research, leadership, health promotion planning and epidemiology.

Hispanic Migrant Farmworkers in East Tennessee and Experiential Learning

Each section in the course has a specific community or target population focus. This particular section is focused on the needs of the Hispanic migrant farmworker community in rural east Tennessee, where a collaborative partnership has been developed with a local health care clinic serving the migrant population, local farmowners, the migrant farmworkers, and agricultural extension agents in the area. The Hispanic migrant farmworker section in the Interprofessional Rural Health Program is led by three core faculty from environmental health, medicine, and nursing who have expertise with this population and have worked together in an interprofessional partnership with the same community since 2009. In this east Tennessee community, the Hispanic farmworker population is comprised of tomato workers, mostly young men in their twenties and thirties who work in the fields either planting or harvesting tomatoes. The packing houses are mostly staffed with Hispanic females who also follow the migrant stream. Agricultural farmworkers generally fall within three main categories, migrant, seasonal, and H2A workers:

- Migrant farmworker: A worker, whose principal employment is seasonal agricultural work, resides in temporary housing and moves from place to place to seek farm work.
- Seasonal farmworker: A worker whose principal employment is agricultural work but does not move into temporary housing-- remains a permanent resident of the community.
- H2A worker: A H2A work permit for non-United States (US) residents (guest workers) to work in the US for a specified period of time. These workers return to their homeland at the end of that time period.

Historically in this east Tennessee community, the majority of farmworkers are those who follow the migrant stream (Florida, Georgia, Tennessee, and sometimes Ohio). In addition, there are a number of seasonal farmworkers who at one time may have been part of the migrant stream, but have “settled out” and become permanent residents of the area. More recently, there has been an increase in the number of H2A workers being recruited for work. While they are paid differently than the migrant farmworker and cost the grower more in direct costs, farmowners view them as being work-oriented and more productive than the migrant worker. The beginning of the season usually starts in April when a small number of migrant workers arrive in Tennessee for planting. The majority arrive in early July and leave at the end of the growing season (September or October).

For migrant workers, growers generally enter into agreements with contractors (owners of trucks who, in turn, hire crews for harvesting and packing). These contractors are also part of the migrant stream, with their workers often traveling on to the next tomato farm or state where a contract is in place to harvest and pack. Depending on the size of the farm, housing may or may not be provided. Seasonal farmworkers are paid as migrant workers but do not move on to another state, nor are they provided with housing. H2A workers are hired through a federal process and paid for their labor through an hourly rate. Housing is supplied by the farmowner.

The migrant and seasonal field harvest worker usually earns a piece rate of 50 cents per 35-pound bucket of tomatoes that equates to approximately \$10 per hour for the efficient worker by

filling a 35 pound bucket every three minutes. Buckets are loaded onto a truck where the worker receives in return, a wooden payment token. Inclement weather, such as heavy rain delays, may halt the work. At a piece rate, the farmworkers may work for 14 hours or more to maximize their pay or make up for lost time and wages.

Packing house workers are paid a lower hourly rate, however the environment is less taxing than for those who work in the fields under more adverse conditions. The packing house workers select tomatoes of the correct size and color from a rolling conveyor for hand-packing into cardboard boxes. Although well-lit and protected from direct sun, the packing house is associated with long hours of repetitive movements and standing on concrete floors.

Most of the faculty and students in this region do not speak Spanish and have limited access to the Hispanic community. In order for students to be able to address the needs of the Hispanic migrant farmworker population, partnerships with organizations and the community, where trust and respect have been established, have become critical for access to this at-risk population and for student learning.

Community/University Partnership/Interprofessional Collaboration

Key to access and establishing trust within the Hispanic migrant farmworker community is a collaborative partnership between the university, the migrant health clinic, growers, and farmworkers. The migrant health clinic administration and staff are actively involved with the students in their assessments and projects. Faculty and students work in partnership with the migrant health clinic staff to address the health needs of migrant farmworkers in that community. Through the clinic migrant outreach coordinator, students are provided access to the local farms in the area. During the summer months, students who are able, attend evening health screenings provided by the health clinic on the farm sites. Farmowners have become familiar with student involvement with the Hispanic farmworker population at the farms. They have welcomed faculty and students to tour and explore their farms while sharing their own concerns, needs, and ideas. Credibility, respect, and trust have been established within the community due to this ongoing continuity and presence of the university in the community. The farmowners understand that the main goal is to provide expertise and support for optimal outcomes in the Hispanic farmworker population through an equal partnership rather than imposed directives.

Students and a Typical Semester

The first day of the Interprofessional course involves orientation for all of the students who then meet with their individual sections to further discuss the semester plans. In the Hispanic migrant farmworker section initial introductions are made and students are provided with an overview of the Hispanic farmworker population in east Tennessee, the community in which they will be working, community leaders with whom they will be engaging, and previous work of the other groups. Usually a group member from the previous year attends that first day orientation to talk to the new cohort of students and provide them with an overview of his or her own experience, what to expect, what had been accomplished in the preceding semesters, as well as how that group developed a working relationship and established roles and responsibilities. The first day concludes with time set aside for the students to get to know one another as well as discuss and organize the group's work. Since one of the main goals of this course is for the students to work

as a collaborative team bringing perspective and expertise as a discipline to the team, they decide how their team will work best and establish the group's groundwork and roles and responsibilities of each member.

With an initial grounding in the population and community in which the students will be working, plans are then made for the group's first visit to the community. In the second class of the semester, students are introduced to the community, community agencies, and individuals with whom they will be involved. The day starts out with meeting the administration and staff at the local migrant health clinic, a tour, and an overview of previous needs as well as those that have emerged. Sometimes if local seasonal workers are in the area and available, students, faculty, clinic staff, and the key informant farmworkers will all have lunch together at a local Mexican restaurant and engage in an informal conversation. The students conclude their day conducting a windshield survey of the community and surrounding area and when possible, interviewing key informants in the community.

For the past several years, each cohort of students has continued on with previous groups' work while also conducting their own needs assessment. Toward the end of the first semester, in consultation with the community partners and assessment results, they identify new issues that may have arisen and determine priority needs upon which to develop their project

Student Activities and Past Projects

Since one of the course objectives is to use community-based participatory research principles in addressing the needs of a target community, the students integrate input from the farmworkers, the farmowners, and health clinic staff in developing their projects. The health clinic staff facilitates and advises on the needs of the clinic and the target population, the farmowners become partners with input and support, and the farmworkers provide input on development of potential interventions, feedback, and evaluation. Each student cohort learns something new from their assessment, while building on previous assessments. Issues such as working conditions, the environment, weather, and language have been identified by the farmworkers, and were confirmed through observations. Past assessments indicated issues were mostly related to musculoskeletal, dermatological, and potential pesticide problems, but in more recent semesters, issues such as psychological stress, heat stress, and risk for development of chronic disease have emerged from these assessments, and reflect problems of migrant farmworkers in regions similar to east Tennessee, such as North Carolina and Virginia (Anthony et al, 2010; Kelly et al, 2012; Spears et al, 2012)

One of the ongoing projects the students have been working on is revision of the clinic's encounter forms that are used at the outreach screening to identify specific occupational health problems and conditions experienced by the migrant farmworker population in that area. Each year the students enter data from these forms into a database and analyze the findings to identify additional factors that impact this population. In addition, students conduct an ongoing analysis to determine the trends and patterns over time in the identified health issues. On several occasions, groups have met with the owners of a large farm, as well as the farmworkers themselves. The farmowners provided the students with the perspective of hiring and retaining productive workers to perform the labor needed to harvest and package the tomatoes. One group of students also had the opportunity to conduct an informal focus group with 14 H2A workers in

a trailer on the farm. The outreach worker from the clinic served as interpreter while the students asked questions of the farmworkers and learned that as H2A workers, their concerns varied somewhat from seasonal workers who had wives and children in the area. The concerns of the H2A workers focused specifically on the availability of work, weather problems, as well as lack of available immediate transportation if they need to purchase something outside of the weekly shopping trip or wash their clothes.

Student Assessment Findings and Interventions

Throughout the years 2009-2013, several significant issues similar to findings in previous studies (Anthony et al, 2010; Kelly et al, 2012; Spears et al, 2012), have been identified through ongoing assessments conducted by the students and summer health screenings:

- **Language barriers:** While not a health problem, the ability to communicate is problematic when the farmworker cannot speak English and the health care provider does not speak Spanish. This often translates into misunderstanding and potential errors and considered a significant problem throughout the area since east Tennessee is a traditionally non-Hispanic region and Spanish is not freely spoken within the dominant population. The health clinic however has addressed that need locally by staffing bilingual outreach workers who are native speakers and can interpret for those health care providers not fluent in Spanish.
- **Musculoskeletal issues:** Occupational-related and chronic health issues range from musculoskeletal injuries and pesticide-related symptoms to issues related to heat stress and blood glucose levels. Across several seasons, workers in the packing house complained of neck and shoulder pain, most likely linked to hours of repetitive movements and postures and leg pain due to standing on concrete floors. A pilot ergonomic intervention using anti-fatigue mats, adjustable height stools, and stackable risers was implemented and evaluated in the packing house. At the end of the season, the students found through self-reported responses from the workers that the equipment was useful and decreased some of their discomfort. **Pesticides/dermatological problems:** Skin rashes were also identified as a problem. Whether this resulted from pesticides or irritation from the plant materials has not been determined and requires further assessment due to concern about the chemicals and pesticides used in the fields that place the farmworker at risk from exposure. In addition, accidental take home pesticide exposure to family members is another area that has not been fully explored with suggestions for further assessment.
- **Risk for chronic disease:** High blood glucose levels were identified among a number of farmworkers during the summer 2012 screenings. None of these individuals had been previously diagnosed with diabetes, but since the tests were not fasting, it is unclear how definitive the results were and warrants further assessment. In addition, a number of individuals were also found to have high blood pressure, requiring the need for follow-up and referred to the migrant clinic.

Another activity conducted with the population during the summer of 2012, was a public health student's study on heat stress among farmworkers in the fields. He and a medical student

conducted field observations on a local tomato farm to assess eighteen farmworkers for self pacing and hydration practices. This was implemented over a two week period during the summer where the students distinguished between the migrant and H2A farmworkers. They concluded in their observations that the H2A workers were more likely to self pace, take breaks, and drink water on a routine basis compared to the migrant farmworkers, suggesting that those workers on a piece rate pay focus on maximizing their pay by compensating with fewer breaks. The need for further research in this area has been suggested.

Overall, a number of needs have been identified through the student assessments. However, the ability to carry out a project to address a specific need may be limited due to feasibility, access to the population, and emerging priorities within the partner agency. The student groups prioritize their activities based on those factors.

With the interprofessional education approach, students also have the benefit of collaboration with faculty in research and scholarly presentations as well as the opportunity to evaluate their overall experiences across the semesters.

Student Scholarship

Faculty and students have been collaboratively engaged in a number of ongoing research studies and scholarly activities. In addition, students have been included as authors in a number of articles under development on topics ranging from ergonomic issues to pesticide exposure. Students have co- presented papers and posters with faculty at international and national conferences that include the American Public Health Association (APHA), National Rural Health Association (NRHA), and Rural Nurse Organization (RNO). One of the posters received an award at a recent NRHA conference in 2012.

Student Evaluations of the Interprofessional Education Experience Over the two semesters, each cohort of students has developed and articulated appreciation for interprofessional collaboration, having become actively involved with their group community activities. In the Hispanic migrant farmworker group, students have worked together and interacted with the migrant community to meet the goal of addressing the priority needs identified in their first semester together. In spite of occasional conflict or philosophical differences, they manage to work together as a team in order to accomplish their common goal. Group members are consistently and actively engaged in their group activities and project through the end of semester paper and presentation. Their anecdotal comments focus on the ability to become actively involved in the community, their target population and learning to work together. While students provide an overall evaluation of their course, they are also given the opportunity to comment on their experiences. At the end of the Spring 2013 semester, written comments by the students also addressed the benefit of the course from an interprofessional/community perspective:

- “Working with the other professions to be able to see a single situation from a multitude of views.”
- “The point of views and ideas expressed by the members of my group opened my eyes to different ways of doing things.”

- “Learning how to work directly with a community in assessing their needs.”
- “That by working together, you can accomplish a greater good for the community.”
- “Talking with stakeholders on the ground and seeing the issues in their community through their eyes.”
- “... about the migrant population. I did not have any idea about the problems they faced. I learned that we can actually make a difference.”
- “Having to do a hands-on assessment (working in the field) and not just listening to what has been done from previous research.”
- “Learning how to develop community-based relationships.”

Conclusion

A number of challenges to assessing and developing interventions to address the needs of Hispanic farmworkers include language, cultural differences, and access to the population. Forming a partnership between the university, students, community members, and organizations with a common goal have helped address those barriers through the integration of education, community partnership, and practice. The local migrant health clinic has provided resources to address the health of the Hispanic migrant population and outreach workers for access and liaison to the farms; the university brings a background of education, research, faculty expertise, consistent presence, support and student talent; community organizations bring resources and services; and the community members openly share the issues they face; and together, the groups identify effective ways to address those issues. The students have networked with the community and developed relationships that go beyond academics as each semester the students are embraced by the community, and are valued and applauded for the work that they do. As a collaborative team, students, faculty, and community partners all share the common goal of safe, effective quality health care for the Hispanic migrant farmworkers.

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