Addressing Challenges to Providing Health Care in a Short Term Medical Mission: Diabetes Outcomes in Migrant Farmworkers

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Abstract

The Farmworker Family Health Program (FWFHP), a nurse led mobile migrant health clinic, provides health care to Hispanic migrant farmworkers in an annual two week service learning trip. The FWFHP shares many similarities with international programs where care is provided to underserved populations in resource poor areas called short term medical missions (STMMs). Questions have been raised concerning the effectiveness of these venues due to lack of outcome evaluations and failure to address challenges to providing clinically and culturally competent, sustainable and accountable care. Nurses frequently contribute their time and expertise in STMMs but few outcomes studies emanate from the discipline. A mixed methods case study framed by the Quality Health Outcomes Model was employed to describe how the nurse led FWFHP addresses challenges to providing care and to provide an analysis of outcomes of diabetes (DM) care given during the 2012 FWFHP.

The FWFHP was found to have multiple structures in place which promote clinical and cultural competencies, sustainability and accountability resulting in both quantifiable and perceived benefits in the community served. Sixty-four percent (288/447) of adult patients had one or more risks for DM. Seventy-six percent (219/288) of those with risk received risk reduction education. Seventy-seven (77/288, 26.7%) individuals with risk received referral for follow up; 19.5% (15/77) of those sought follow-up after being seen at the FWFHP. Blood glucoses (BG) were significantly lower at follow-up compared to initial levels at the FWFHP (p=0.008, n=8). There were no significant statistical differences in comparisons of initial and follow-up blood pressure, weight or body mass index (BMI).

The nurse led FWFHP effectively targets DM and provides risk information which has been previously proven to increase adoption of healthy behaviors. Reduction of BG levels found at follow-up could be a measure of positive behavioral changes resulting from FWFHP activities. The FWFHP model can be adapted for use by STMM organizers in structuring their programs in a variety of domestic and international settings. Findings concerning the small number of farmworkers who followed up have relevance for all STMMs. Even though follow-up may be facilitated, barriers to follow-up access likely persist after mission providers depart. Factors affecting access to follow-up care such as distance, cost and transportation should be considered when planning all STMM health care. Strategies for removing these barriers as well as ongoing research on whether patients receive appropriate care over time are needed.

Dedication

This capstone is dedicated to my husband, David. In 1978 we promised each other support and understanding in all that we would share in our lifetime. David, you have unfailingly held true to that vow with both extraordinary patience and apt cheerfulness. My journey to DNP could not have been navigated without your encouragement from the start.

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Addressing Challenges to Providing Health Care in a Short Term Medical Mission: Diabetes Outcomes in Migrant Farmworkers

Chapter 1

Introduction

Migrant and seasonal farmworkers (MSFWs) have been recognized as a vulnerable, medically underserved population for many reasons. Contributing factors include the inherent hazards in agricultural work combined with cultural and socioeconomic factors such as lack of English proficiency, poor health literacy, poverty, high cost of medical care, lack of transportation and limited health resources in rural areas where MSFWs reside and work (Schmalzried and Fallon, 2012; Luque & Castañeda, 2012). Threatening political and legal climates related to state immigration laws restrict movement of migrant workers and can create additional access barriers to receiving health care (Galewitz, 2012).

Poor access to health care exacerbates chronic health conditions and further contributes to health disparities known to affect minority populations. For example, diabetes is emerging as a world-wide pandemic disproportionately affecting populations in low and middle income countries and is associated with high morbidity and mortality rates when untreated (WHO | Diabetes, n.d.). The disease is known to disproportionately affect Hispanics who make up the majority of the United States (US) migrant labor workforce (Center for Disease Control, n.d.; Carroll, Georges & Saltz, 2011). A 2011 survey of federally qualified community health centers and other migrant health organizations in Florida, Alabama, Georgia and Mississippi ranked diabetes second in health conditions seen in MSFWs (Sologaistoa, 2012). Diabetes was ranked fourth in a

self-reported health concerns survey administered to MSFWs in a region in southern Georgia (Luque et al., 2012).

Barriers for MSFWs in accessing timely health care can be mitigated or removed by providing low cost health care through mobile migrant clinics located in or nearby migrant farm camps (Luque & Castañeda, 2012; Schmalzried and Fallon, 2012). The Farmworker Family Health Program (FWFHP) is an example of a sustained effort to provide health services to MSFW families via mobile clinics (Connor, Rainer, Simcox & Thomisee, 2007). Since 1993, program participants have traveled to south central Georgia for an annual two week immersion service learning trip (Wilson, Wold & Pittman, 2000). A school of nursing located in the southeastern US is the lead institution and the health care team consists of approximately 90-100 volunteers, faculty and students from regional universities and colleges representing diverse health disciplines including nursing, physical therapy, pharmacy, dental hygiene and psychology (Wold & Rhein, n.d.). Since its inception the FWFHP has collaborated with a local federally funded migrant health clinic (MHC) in provision of health services.

The ultimate goals of the nurse led FWFHP are to increase MSFW families' access to health care and to "promote health and prevent disease as well as identify and prevent disease progression" (Conner, Layne &Thomisee, 2010, p.162). Diabetes is one of the chronic health problems targeted in the program. Additional goals are to provide an immersion service learning experience for nursing and other health professions students in order to increase clinical and cultural competence, to expand their awareness of social responsibility and to enhance their abilities to address global health disparities (Conner et al., 2010).

Providing Care in Underserved Regions in Short Term Time Frames

Although the nurse led two week FWFHP is focused on addressing the health needs of MSFW families in southern Georgia the program shares many similarities with international health initiatives where care is provided to underserved populations in resource poor areas in short term time frames. These programs are sometimes called medical trips, medical brigades or short term medical missions (STMMs). Participation in short term global health programs such as the FWFHP and international STMMs requires acculturation, foreign language proficiency or other provisions for effective communication between visiting health care providers and recipients of care. The FWFHP faces similar challenges to providing health care in rural southern Georgia to those described in literature concerning international STMMs.

STMMs offer nurses and other health care providers opportunities for participating in charitable humanitarian health care programs worldwide. Many nurses from developed regions feel an ethical imperative to support principles of global social justice and to work towards achieving health equity for underserved, vulnerable populations. Participation in the FWFHP and similar international STMMs allows students and providers to travel and share knowledge, skills, treatments and health education with needy people. Most participants return with a deepened awareness of the vast health disparities between wealthy and impoverished people. Other benefits from these immersion experiences include increased knowledge of diverse cultures, foreign language acquisition and improved problem solving skills (Bajkiewicz, 2009; Walsh, 2004; Durning, Massine, & Ender, 2003; Wilson et al., 2000). Heightened consciousness concerning global health inequalities achieved through face to face, direct contact with

those who suffer can be the catalyst for developing strategies for removing barriers to health which stem from poverty, cultural differences and poor health care infrastructure (O'Neil, 2006).

Numerous opportunities exist for participation in STMMs. A brief review of three internet sites which list STMMs (www.volunteerinternational.org, www.missionfinder.org, www.omnimed.org) revealed over a thousand programs recruiting volunteers from diverse health fields including nursing, medicine, dentistry and others. Given that many programs send multiple missions annually, earlier estimates of 6000 annual STMMs emanating from the US (Maki, Qualls, White, Kleefield & Crone, 2008) may be conservative.

Though commendable and in many cases necessary and beneficent, delivery of healthcare in STMMs carries responsibilities which go beyond showing up with manpower, nursing and medical expertise, supplies and good will. Benefits to participating providers and students are widely acknowledged but many challenges to providing health care in these settings have been identified (Langowski & Iltis, 2011; Welling, Ryan, Burris & Rich, 2010). These challenges stem from cultural and language differences which create barriers to effective communication and can result in unsafe practices (Langowski & Iltis, 2011). Insufficient collaboration between STMM organizers and localities can produce differing perceptions concerning local health needs and result in care that lacks relevance and sustainability (DeCamp, 2011; Suchdev, Ahrens, Click, Macklin et al., 2007). If provisions for follow-up are inadequate and no legal contract with local health care agencies exists, STMM team members may not be held accountable for services provided after they depart for their homes (Welling et al.,

2010; Holmgren & Benzian, 2011). High costs associated with transporting STMM personnel and equipment as well as consumption of scarce local resources raises questions concerning cost effectiveness (Martiniuk, Manouchehrian, Negin & ZWI, 2012). STMMs have also been criticized for failure to perform regular evaluations to assess quality and determine if program goals are being achieved (Bourdeaux, Lawry, Bonventre & Burkle, 2010; ; Reaves, Schor, & Burkle, 2008; Drifmeyer, 2003;Maki et al., 2008).

Statement of the Problem

Given the popularity of participating in short term global health initiatives, challenges to providing quality health care in these venues and existing criticisms concerning the paucity of program evaluations, it is important to determine what is known about the relative frequency that program evaluations occur and what methodologies are used. It is also necessary to determine what clinical outcomes are reported and how STMMs and similar mobile migrant health clinics address known challenges to providing health care in these practice settings. These challenges relate to clinical and cultural competence, sustainability and accountability. Since nurses are frequently recruited for participation in STMMs it is crucial to identify the scope of their contributions in practice and research. In addition, since diabetes is emerging as a pandemic problem disproportionately affecting populations in lower and middle income countries (LMIC) where most STMMs provide care, it is essential to identify what strategies are used in prevention and treatment.

For the purposes of this capstone, clinical competence is defined as features that support high quality of care such as appropriate credentialing, licensure and behavior

consistent with ethical underpinnings of the practice discipline. Cultural competence is defined as care that demonstrates respect for local culture, knowledge of cultural contexts of health problems and proficiency in communication with non-English speakers (Nuñez & Robertson, 2006). Sustainability encompasses features that assure program longevity such as commitment to a locality, successful partnerships and capacity building in the locality served (Luque &Castañeda, 2012). Accountability in health care demands assumption of responsibility for consequences of program actions. The domains of accountability are broad and include characteristics described above concerning competencies, ethical practice and sustainability. Accountable care assures access to follow-up care, benefits for the community, a program that is fiscally responsible and incorporates regular outcome evaluations (Emanuel & Emanuel, 1996).

Conceptual Model

The Quality Health Outcomes Model (QHOM) has been used as a framework for health quality and outcomes research (Mitchell & Lang, 2004). The model builds upon Donabedian's linear Structure, Process, Outcome Model by including constructs which promote analysis of dynamic reciprocal relationships between structures or health systems, their processes or interventions, recipients or clients and how these interactions affect functional and clinical outcomes. The four constructs of the QHOM are system, intervention, client and outcome.

In this capstone, system features are conceptualized as the organizational elements of STMMs that promote clinical and cultural competencies such as provider credentialing and knowledge of and respect for local cultures. Organizational elements supporting sustainability such as commitments over time and elements promoting

accountability such as access to follow-up care are also considered in this capstone. Clients are the patients or populations served, their health care needs and descriptive characteristics. Interventions consist of the patient care provided such as preventive services, episodic primary care and surgical procedures. STMM outcomes include measures of program effectiveness such as patient satisfaction, adverse events and program success, and analyses of epidemiologic data which then provide the bases for future practice (Figure1). In this capstone, the four constructs of the QHOM provide a structure for examining the literature on STMMs and also guide the research methodology, presentation of the results and discussion.

Chapter 2

Review of Literature

The literature was reviewed to determine what is known about program evaluations performed in international STMMs and similar mobile migrant health clinics in the US. For the purposes of this review STMMs and short term mobile migrant health clinics are defined as medical trips made by volunteer health care providers and health professions students from upper income developed regions, lasting less than 3 months, where direct health care is provided to vulnerable populations in resource poor settings distant to provider's home regions. Two separate searches were conducted: one for information concerning international STMMs and one for information concerning short term mobile migrant health clinics. The term "STMM" includes both international and short term mobile migrant health clinics in the US for the remainder of this review.

Inclusion criteria for both searches were: English language systematic literature reviews, case studies or empiric program evaluations published in peer reviewed journals between January 1, 2002 and October 1, 2012 for international STMMs and from January 1, 2000 to October 1, 2012 for short term mobile migrant health clinics. Studies reporting clinical outcomes related to services provided and/or describing program structures which assured cultural and clinical competency, accountability and sustainability were included. Commentaries, editorials, articles describing personal experiences and studies focused solely on provider attitudes and experiences were excluded as these topics deviated from the focus of this review. Additionally, studies examining outcomes only as counts of patients seen, prescriptions given or services provided were excluded. Articles not available through The University of Virginia library were also excluded.

CINAHL, Ovid-Medline and Pub-Med databases were searched for studies reporting on short term mobile migrant health clinics using key terms mobile and migrant and clinic, then farmworker and clinic, then farmworker and outreach. A total of 126 articles were identified**.** Abstracts were reviewed and three studies which met inclusion criteria were retained. An ancestry search yielded one study meeting inclusion criteria. A total of four studies concerning short term mobile migrant health clinics were included in this literature review.

CINAHL and Ovid-Medline databases were searched for studies conducted on international STMMs using key terms humanitarian aid, humanitarian missions, medical missions, short term medical missions, medical trips, surgical trips alone and in combination with impact or effectiveness or evaluation. A total of 466 articles were returned. Titles and abstracts were reviewed. Of these thirty- four were retained for initial consideration. After detailed review eighteen not meeting inclusion criteria were excluded. An ancestry search was conducted yielding one additional study. A total of twenty-one studies examining STMM program evaluations are included in this literature review: four concerning short term mobile migrant health clinics and seventeen on international STMMs (Table 1).

The following literature review is organized first by type of study (systematic literature review vs. case study/program evaluation). Case studies/program evaluations are subdivided according to the setting in which the program took place (domestic vs. international). Studies on international programs are further subdivided according to primary type of service offered (non-surgical vs. surgical). Key findings and

characteristics considered important for STMM success are then discussed. The chapter ends with conclusions drawn and identification of persistent literature gaps.

Systematic Literature Reviews

Five systematic literature reviews were included, one concerning domestic programs and four concerning international STMMs. Luque & Castañeda (2012) examined what is known about effective, sustainable mobile migrant health clinics in the US. Their review included studies on programs operating on a regular basis as satellite clinics of established migrant health centers and several which occur as annual short term partnerships with outside institutions. The authors' purposes were to describe partnership models which promote program longevity, to describe challenges in health care delivery in mobile clinic sites and to summarize major health outcomes. Program sustainability was promoted by the presence of committed lead agencies collaborating with diverse but similarly oriented organizations forming community coalitions. Lead academic partners were usually nursing schools followed by medical schools. The most frequent challenges to health care delivery were limited bilingual personnel, cultural differences between providers and patients, low patient health literacy and barriers to follow-up access. The authors concluded that even though mobile migrant health clinics reduce barriers to health care for MSFW families, there are few rigorous evaluations of such programs. Future studies examining longitudinal patient outcome data was recommended to determine if patients receive appropriate treatment and follow-up over time.

Four systematic literature reviews were retrieved which studied international STMM activities. Three examined effectiveness or impact of US Department of Defense (DOD) sponsored missions (Bourdeaux, Lawry, Bonventre & Burkle, 2010; Reaves,

Schor & Burkle, 2008; Drifmeyer, 2003) and one systematic review reported trends in international STMMs from 1985 to 2009 (Martiniuk et al., 2012).

The DOD views provision of humanitarian assistance as an integral part of the strategic plan for increasing US security and stabilization in at risk nations (Reaves, Schor, & Burkle, 2008). These operations are considered central to the US military mission and comparable to combat actions in importance (DOD Initiative 6000.16, 2010). Inadequate public health infrastructure and health care are acknowledged as factors leading to governmental instability, thus the DOD has integrated health linked projects into stability operations. The intent is to prevent collapse of government infrastructure in fragile states and improve local attitudes toward the US. Military sponsored STMMs are coordinated by the DOD and frequently partner with non-government organizations (NGOs) for delivery of health care and support of host nation health infrastructure (Reaves, Schor, & Burkle, 2008). As a result, the DOD has emerged as a major worldwide sponsor of STTMs. Three papers describe how military databases were searched for reports on humanitarian assistance programs which include military STMMs (Bourdeaux, Lawry, Bonventre & Burkle,2010; Reaves, Schor &Burkle, 2008; Drifmeyer, 2003). Though methodologies differed in the database searches in each systematic review all authors concluded that meaningful program evaluations were largely absent from project summaries. Given the importance that DOD places on these strategic initiatives, all authors recommended standardized outcomes measures for all projects so that value and effectiveness can be evaluated.

Martiniuk et al. (2012) searched Medline for publications between 1985 and 2009 concerning STMMs to gain understanding of trends including what types of health

services are provided, potential impact on local health systems and common benefits or criticisms described by providers and recipients. Publications included descriptive editorials, commentaries and ethical discussions as well as case studies and program evaluations. The authors excluded studies concerning military sponsored STTMs and missions providing care to vulnerable populations in high income countries such as those serving indigenous peoples living there, migrant workers and those providing disaster relief. A wide range of medical services were delivered though targeted health conditions were generally those amenable by surgery such as cleft lips/palates and other oral and dental conditions. Primary care activities included vaccine distribution, management of infectious diseases, traumatic injury care and maternal/child health care. The review revealed that relative to the number of missions, little is published concerning evaluation of STMMs, ethical issues, policies or standards. The benefits described were largely from provider perspectives. These included opportunities for sharing knowledge and skills with local health practitioners. Mission providers stated their participation allowed for reflection on reasons they had chosen careers in service to others. Recipients of care voiced that the presence of the STMMs showed that outsiders acknowledged and understood their predicaments and that recognition by the outside world imparted sense of renewed hope.

Far more criticisms and potential harms were described in comparison to benefits including lack of sustainability, lack of culturally competent care, questions concerning cost effectiveness, disrespect for local customs and local health care providers and poor provisions for follow-up care. This information formed the basis for the authors' recommendations that mission planners and participants adopt "a more precise approach

to planning, implementation and reporting" (Martiniuk et al., p. 7). Target areas identified for improvement were pre-mission training to enhance cross cultural competencies for volunteers and matching providers' skill sets to local needs. They also recommended supplying information on finances, frequencies of treatments, how follow-up is arranged and challenges to providing optimal care along with how these should be addressed.

Each of these literature reviews noted a scarcity of studies which examine outcomes or effectiveness of STMMs. The studies covered a broad range of mission sponsors, settings and clients served, thus it can be concluded that there is a persistent knowledge gap concerning the short and long term benefits of STMM activities. The following sections will review empiric STMM studies which examined program and patient outcomes from actual missions.

Case Studies/Program Evaluations

STMMs serving MSFWs in the US.

Three studies examined clinical outcomes in programs structured as short term mobile migrant health clinics. The Migrant Clinic Experience (MCE) is a service learning collaboration between a federally qualified community health center and faculty, students and other volunteer staff from health profession programs (Luque et al., 2012). This program provides mobile health care to MSFWs in or near their housing areas in southern Georgia during the Vidalia onion harvest season. During the 2010 program, 100 MSFWs were surveyed to determine their main self-reported health problems. The top five problems were hypertension (25%), eye problems (12%), musculoskeletal problems (11%), diabetes (10%), and depression (7%). The results were similar to top medical

diagnoses recorded in the program's 2009-2011 databases (N=1168 patients). Further study found associations between the presence of musculoskeletal pain and high depression scores (p = .002). The authors stated that results could be used for developing future health interventions to target identified problems. This study was the sole study included in this literature review that discussed diabetes, a health problem reaching epidemic proportions in LMICs and known to disproportionately affect Latino populations. Identification of diabetes as a major health concern of Latino farmworkers themselves is an important finding for planning programs for both farmworker health and international STMMs.

Catholic Mobile Medical Services Clinic volunteers provide medical screenings and follow-up care for remote MSFW communities in rural Florida in partnership with a cancer center (Luque et al., 2011). A retrospective medical records review was performed to determine the effect of the mobile clinic on cervical cancer screening rates in the 222 women served at the clinic between 2003 and 2006. Seventy-nine percent of women aged $\geq$ 18 received cervical cancer screening in the previous 3 years compared to 83% of women aged $\geq$ 18 in the state of Florida. Demographic factors in the study population which improved adherence to recommended screening guidelines were length of time living in the US >5 years (p=.05) and being married (p= .02). The authors concluded that the mobile clinic services improved adherence to guideline based cervical cancer screenings in patients who would otherwise not be served. The screening rate observed in the clinic approached the rate documented in the state of Florida during the same period. The primary outcome was success in achieving the program goal of increased access to cervical cancer screening.

The founding principles and history of the Migrant Family Health Program (MFHP) and the role of evaluation in the program's development are presented in a study by Wilson, Wold, Spencer and Pittman (2000). The study focuses on health care provided for migrant children attending a federally funded migrant health education program. The authors emphasize the role of evaluations and research in guiding how the program advanced from an "innovative teaching and learning opportunity for undergraduate nursing students in community health" in1993 (Wilson et al., 2000, p. 210) to one which included psychological counseling, comprehensive health screenings and targeted health interventions by psychology and nurse practitioner students in 1999. MSFW focus group research conducted by program faculty identified health issues of importance to farmworker families. Findings such as the need for flexible times and locations of services, Spanish language educational materials, counseling services and dental services led to program expansion to accommodate these needs. A separate focus group study with migrant children yielded information on the children's perceptions of health. These findings, together with teachers' feedback resulted in development of age specific teaching modules on basic hygiene, nutrition, smoking and substance abuse risk, career choice and CPR. Educational sessions on these topics were incorporated into the program and delivered by pediatric nurse-practitioner students. Clinical data was examined to determine the most frequent diagnoses encountered in the school health program. Dental caries emerged as the top diagnosis seen from 1997- 1999 which gave additional weight to the inclusion of dental health services in the program. These nurse researchers used clinical data, focus group findings and teachers' feedback to identify client needs, develop targeted approaches in meeting these needs with the outcome of

expanded MSFW health services primarily focused on increased access and prevention. This was the sole study meeting inclusion criteria that was authored by a group of nurses.

These studies provide examples of evaluation methods and evidence of program effectiveness in serving MSFWs via volunteer mobile migrant health missions. Prominent themes include the importance of data collection for tracking trends and using this data in subsequent planning to address identified needs (Wilson et al., 2000; Luque et al., 2012). Studies of this kind are noted to be scarce and a knowledge gap persists concerning whether farmworkers receive appropriate follow-up care over time (Luque and Castañeda, 2012). The following subsection examines STMMs providing nonsurgical care outside of the US.

International non-surgical STMMs.

The Children's Health International Medical Project of Seattle (CHIMPS) is an annual one week STMM serving Los Abilenes in El Salvador since 2002 (Suchdev et al., 2007). The program's guiding principles specifically address the importance of sustainability, provision of culturally and clinically competent health care, capacity building for local providers and evaluation to determine if program goals are being achieved. The authors provide evidence of how these features are addressed in their program. Descriptions of the program's local collaborations and 5 year commitment to one community provide evidence of sustainability. Providers move toward clinical and cultural competency through training which begins long before each trip. Research and community collaborations have led to identification of the top health priorities in the locality and collaborative development of strategies to prevent and treat them.

CHIMPS has established a database where clinical data from annual trips are archived. Analysis of data in 2005 revealed that there were a high percentage of local children with nutritional deficiencies compared to national estimates (44% vs. 18.9%). This data was used to develop nutritional education programs, strategies for improving identification of children at risk for nutritional deficiencies and approaches to preventing and treating these conditions. The authors concluded their model can be used by others in planning STMM activities. Though methodologies for problem identification and strategic planning are clear, no data is provided concerning effectiveness of these initiatives.

Data from three US military sponsored STMMs in Turkman, Aroki and Tangee, Afghanistan in 2003 were reviewed to determine effectiveness of treatments, using rates of probable cure vs. unlikely cure as their measures (Beitler, Junnila & Meyer, 2006). Wellness, preventative visits and palliative care such as acetaminophen or antihistamines for viral syndromes were included in the cure "unlikely" group. Over the three missions, cure was determined to be probable in 46% of the cases ($P<0.001$). The authors concluded that "the effectiveness of medical care during HA missions cannot be assumed and future operations should include assessment of outcomes to optimize their value" (Beitler et al., 2006, p. 889). The conclusion casts doubt on overall effectiveness of the three missions in their study. However, the classification of wellness, preventive visits and palliative treatment of viral illnesses and chronic pain as "cure unlikely" is questionable and disregards the role of palliation and prevention in health. Though the conclusion that cure was probable in only 46% of cases may lack relevance, the recommendation that future mission include outcomes assessment is important.

Researchers from Harvard University performed a three phase study with the purpose of creating and implementing a tool for evaluating the quality of STMMs (Maki, Qualls, White, Kleefield & Crone, 2008). Phase one consisted of surveying organizers of missions in Honduras, Guatemala and Venezuela to identify features important in determining the quality of care in their STMMs. In phase two, an assessment tool was developed based on survey results. The resulting tool assessed cost (total expenditures, cost per patient), efficiency (productivity, number of patients seen, and communication between team members), impact (effectiveness as perceived by patients and providers, complication rates, patient satisfaction), preparedness (team ability to function in site), education (health teaching for patients and training for local providers) and sustainability (long term time commitments capacity building). The tool was field tested in missions in Honduras, Brazil, Ecuador, Zimbabwe and Namibia in phase three.

In the missions where the survey was tested all (100%) stated total costs were less than or equal to planned budgets. Overall, missions scored high on impact assessments. Seventy percent reported complication rates of 0-5% and thirty percent had complication rates of 5-15%. Sixty percent of missions reported patient satisfaction rates between 75% and 100%. Forty percent of missions had patient satisfaction rates between 50% and 75%. Concerning sustainability, 80% had collaborations with local agencies; 100% had the ability to refer patients to a different provider if necessary. Assessment scores were lower overall for parameters in efficiency, preparedness and education. The authors concluded that the evaluation instrument was effective both in identifying strengths and targeting areas for improvement in individual missions.

In the previous three studies various outcomes were described including a successful model for structuring STMMs, a useful evaluation tool, and also clinical outcomes. Clinical outcomes included successful identification of high priority health problems in a community and subsequent initiatives for prevention and treatment (Suchdev et al., 2007), and determination of probable rates of cure (Beitler et al., 2006). Using a newly developed evaluation tool, Maki et al. (2008) quantified the impact of five STMMs in terms of high rates patient satisfaction and low complication rates. The focuses of these studies were diverse and covered a wide range of health problems. Consequently it is difficult to draw any definitive conclusions concerning improvements in health resulting from these STMMs.

Surgical STMMs.

Absence of surgical services in poorer regions of the world results in significant disability and mortality (Farmer & Kim, 2008). Surgeons are rare in developing countries that are largely rural and impoverished. When surgical services are available they are concentrated in urban centers and utilized primarily by those who can pay for services. Short term surgical mission trips have been recognized as offering successful treatments for diseases amenable to surgery especially in missions focusing on single problems (McQueen, Magee, Crabtree, Romano & Burkle, 2009). Despite the indisputable need for surgical treatment, controversy over the role of STMMs in providing these services continues. Specifically questions have been raised concerning cost effectiveness, complication rates and the degree to which follow-up is available in resource poor settings (Marck et al., 2010; Langowski & Ilitis, 2011; Martiniuk et al, 2012).

Ten studies were retrieved that examined surgical STMMs. Primary outcome measures varied among these and included adverse events such as mortality rates (Adams et al., 2012; Davis et al., 2011) and complication rates (Sykes, Le, Sale & Nicklaus, 2012; Leeds et al., 2011; McQueen et al., 2009). Other primary outcomes measures included success rates (Marck et al. 2010; Horlbeck et al., 2008) and host nation capacity building (Merrell et al.,2007; Novick et al., 2008). The majority of studies also described how their programs addressed one or more of the major challenges to delivering health care through STMMs (Table 2). These challenges relate to the ability of STMM personnel to provide clinically and culturally competent, sustainable and accountable health care.

One study reported on trends in a convenience sample of surgical STMMs (McQueen et al, 2010). An internet based survey was sent to 99 surgical NGOs between October and December 2008 to determine practice trends in international surgical STMMs. A 17 item survey with predominantly yes/no response choices was used for collecting information on mission personnel, size, scope, data collection practices concerning complications, mortality, follow up, capacity building and how practices united with local health care systems. Less than half (46/99) of the organizations completed the survey. Surgical services offered were diverse, organizations consistently tracked surgical outcomes. Mortality, complications and infections were tracked by 80% (36/45), 82.6% (38/46) and 64.4% (29/45) of organizations respectively. Eighty-nine percent (41/46) had systems in place for follow-up care, and 56.6% (26/46) had established local partnerships. Evidence was provided that outcomes evaluations are performed by the majority of respondents, but no other details were provided thus no conclusions can be made concerning local impact.

Seven studies tracked adverse events in terms of mortality rate, complication rate and surgical success rate as primary outcomes. Mortality, complication and success rates ranged from to 3.88% to 6.66%, 0-1% and 75.3-84.6% respectively. Of the seven studies examining adverse events, two studies examined mortality. In the first study, medical records were reviewed from 103 cardiac surgeries performed during STMMs in Samoa and Fiji over six years from 2003 to 2009 by a volunteer cardiac team from a New Zealand hospital to determine early (30 day) mortality rate. There were four deaths in the 103 surgeries performed during the study period. This was stated to be consistent with 30 day mortality rates in developed countries for similar procedures (Davis et al., 2011).

In the second study, a Canadian cardiac surgical team reported on cardiac repairs on 15 patients with congenital, rheumatic and ischemic heart disease during two annual missions in Peru 2007- 2008. There were no deaths at one year follow-up in the 2007 mission (0/7). There was one death in a high risk patient with preoperative liver failure in the 2008 cohort. Thus the incidence of mortality was one in fifteen over the two year period (Adams et al., 2012). No comparison was made to rates in developed regions for similar procedures.

Three studies reported complication rates in surgical procedures. Leeds et al. (2011) quantified effectiveness of student's activities in surgical STMMs using a case review of surgeries performed by third year medical students participating in annual three week surgical trips to the central plateau in Haiti in 2008, 2009 and 2010. Medical records from all surgical cases (n=64) performed by the students over the three years were reviewed. Long term complication rates were tracked by local surgical collaborators for one year postoperatively. There were no short or long term

complications during or following any of the missions. The weekly surgical caseload for the hospital hosting the students was greater than the weekly caseload observed in comparable hospitals in the region: thus that the short term surgical mission safely increased access to surgical care in this resource poor setting and fulfilled educational objectives.

A second study tracked complication rates in 204 tonsillectomies and adenotonsilectomies performed during seven annual STMMs in Antigua, Guatemala between 2004 and 2010 (Sykes et al., 2012). A retrospective medical records review revealed a complication rate of one percent which was within the published range in western literature of 0.8-30%. The authors concluded that procedures performed in this setting had an acceptable complication rate. Finally, complication rates were the main outcome in a retrospective analysis of data from 8,151 cleft lip and palate repairs performed by Operation Smile International (OSI) in developing countries between 2005 and 2006 (McQueen et al., 2009). Researchers determined that complication rates were comparable to rates in the United Kingdom and the Unites States.

Two studies examined surgical success rates. The success rate of facial reconstructive procedures for patients were compared in two consecutive annual STMMs in Ethiopia 2007-2008 (Marck et al., 2010). Surgical success was measured as the degree of improvement of the facial deformity ranging from “worse than before” to “good”. Practice changes in the 2008 mission included the addition of a two week pre-op preparation period during which more detailed patient histories were taken and pre-operative dental care, deworming and nutritional support was given. Post-operative practice changes included routine antibiotic administration, nasogastric feeding tube use

and wound care supervised by a single dedicated nurse. The researchers concluded that, overall, the interventions resulted in improved surgical success rate in 2008 compared to 2007 with the difference reaching statistical significance (P=0.04). However more complex procedures were still more likely to have an unsatisfactory result.

Long term surgical success was evaluated in surgeries for chronic ear disease during three trips in 2003-2006 serving two communities in Paraguay and one in Honduras (Horlbeck et al., 2008). Operative results at 10 to 12 months post op were assessed through medical records reviews. Procedures were classified as successful if grafts were intact and ears were free of disease at follow up. One hundred seventeen patients were included in the study, though follow-up records were only available for 77 patients (64%). The overall success rate was 75.3 % (58/77) which was stated to compare favorably with results published in developed nations for similar types of procedures.

The seven studies above described outcomes in terms of adverse events and success. Where rates of adverse events were compared those resulting from similar procedures in performed upper income regions, authors stated their rates were comparable, thus providing evidence that surgeries performed in austere conditions can be conducted safely and to the benefit of the populations served. However, patients who were sicker or required surgical procedures of higher complexity had higher rates of adverse events. Though these same correlations may be observed in developed regions, it is unknown how lack of health infrastructure in regions served by STMMs factor into their outcomes.

Analysis of host communities' increased capacity to provide health care locally after collaboration with STMMs is another aspect important in outcomes evaluation. The need for educational exchange between providers and host communities with the goal of supporting local health care infrastructure is widely acknowledged (Langowski & Iltis, 2011, Martiniuk et al., 2012) and also provides a measure of sustainability of STMMs.

Capacity building.

Two studies quantifying impact on local ability to perform targeted procedures after collaborating with visiting surgical teams were identified. The purpose of the first study was to determine the effect of a 15 year effort toward the development of a microsurgery program in Vietnam though a retrospective review of records from 11 missions by Operation Smile International (OSI) between 1990 and 2004 (Merrell et al., 2007). While working side by side, visiting surgical teams trained local anesthetists, surgeons and nurses in surgical procedures, and perioperative and postoperative care. During the 15 year period the number of surgeries independently performed by local surgeons (n=474) was greater than the number performed by the volunteer group (n=123). The authors concluded efforts were successful in supporting the establishment and growth of the Vietnamese program.

Novick et al. (2008) reviewed a 14 year pediatric cardiac surgical program sponsored by The International Children's Heart Foundation (ICHF). The surgical teams made 140 short trips to 27 institutions in developing regions in Europe, The Middle East, Africa, and Central and South America. Aside from performing surgeries, a major goal of the program was to provide ongoing educational and professional training for local

health care personnel in order to improve surgical access in host communities. Surveys were sent to host institutions to determine the number and types of surgeries performed before and after training by ICHF personnel. Twelve institutions responded, of which nine reported an increase in the complexity and frequency of pediatric cardiac surgeries. These two studies support a cautious conclusion that education and training for local providers during surgical STMMs have the potential to improve local surgical capacity.

The studies in this review presented various primary outcomes including identification of community health needs and subsequent design of need based expanded services, patient satisfaction, adverse events and capacity building. Authors also provided secondary reports on structures in their programs which addressed clinical and cultural competencies, sustainability and accountability when providing health care in the STMM setting (Table 2). Clinical competency can be addressed by disclosing team member's professional credentials. If students or trainees are team members, supervisory practices can be included in the program description. Overall 83% (14/16) of the studies in this review listed provider's credentials. Fifty-six percent (9/16) of the studies in this review specifically mentioned nurses as team members with one study including an advance practice nurse's role (Adams et al., 2010). One study was authored by nurse researches (Wilson et al., 2000); one additional study was co-authored by a nurse (Adams et al., 2010).

Language and cultural differences between providers and recipients can create communication problems which compromise safety and effectiveness in STMMs**.** Seventy-five % (12/16) of articles addressed challenges to providing culturally competent care and specifically described how communication was enhanced or care delivered

within appropriate cultural contexts. Notably the most detailed descriptions concerning cultural competency came from the nurse led mobile migrant health clinic study (Wilson et al., 2000).

Sustainability can be addressed by detailing STMM program collaborations, including inter-disciplinary team member collaborations and collaborations with host community providers and recipients to ensure shared purposes, common goals and capacity building. Long term commitments to single communities or regions support relationship building and have the highest potential to improve the health of communities served. Of the 16 program evaluations included in this review, 94% (15/16) addressed sustainability by describing collaborations and/or ranges of time commitments to communities and 75% (12/16) described capacity building activities.

Delivery of accountable care requires provision of follow-up that can be easily accessed after STMM teams depart, surveillance for adverse events and wise use of scarce resources. Seventy-five percent (12/16) of the articles described follow-up procedures. Rates of adverse events were discussed in 81% (13/16) of the studies. These were reported as primary outcomes such as complications or mortality or secondarily, without supporting data as a component of feedback obtained in post mission evaluations from collaborating host organizations.

Tracking costs also promotes accountable use of both STMM organization and host nation resources. Forty-three percent (7/16) mentioned costs to the STMM team, usually expressed in generalized statements such as team members being self-funded or equipment and supplies being donated. Thirty-one % (5/16) expressed sensitivity to the financial impact on localities. In summary, when program evaluations exist there is

consensus that clinical and cultural competency, sustainability and accountability should be addressed, though there is variation in the methodologies and frequency that these attributes are described (Table 2).

Conclusions

Three unifying themes have emerged in this literature review. First, relative to the number of existing opportunities for participation in STMMs, publically available program evaluations reporting patient outcomes are scarce. Second, program evaluations are important for examining specific population needs and designing interventions which address these needs within the context of locally available resources. Finally, evaluation is important for determining successes and targeting areas for improvement.

The strongest evidence of positive impact of STMMs has emerged from the literature on surgical missions performing single, less complex procedures. The higher rates of adverse events observed for complex surgical procedures raise questions concerning the role of STMMs in these scenarios. There is some evidence that education and training of local providers has been successful in building local healthcare capacities.

These observations do not mean that health care given in STMMs is ineffective and should be halted. It simply underscores the need for additional well designed studies which report outcomes and examine clinical and cultural competencies, sustainability and accountability of STMM activities. Participation in STMMs will likely remain robust since these activities provide richly rewarding opportunities for students and professionals from diverse healthcare disciplines. Additional research and scholarly discussion on the topic can inspire knowledgeable discourse among mission participants,

enhance quality of services given, and result in improved health of underserved vulnerable populations.

This literature review is unique in its focus on STMM program evaluations, including what methodologies are used, what clinical outcomes are reported and how STMMs address known challenges to providing health care in the resource poor settings they serve. There are several limitations of this review. It is possible that search terms were not broad enough for inclusion of all relevant studies. STMM personnel possibly do conduct evaluations of their activities; however findings are not published because the information is considered private. Seeking publication of results in peer reviewed journals could be perceived as an added burden to organizations with limited funding and personnel.

Gaps in the Literature

This literature review was conducted to determine what is known about STMM program evaluations and outcomes with attention to diabetes care and nurses' contributions. Knowledge gaps persist in each of these areas. The need for additional studies which describe STMM outcomes and structures which assure clinical and cultural competency, sustainability, and accountability has been established. A single study addressed diabetes, but only in terms of recognizing it as a major health concern among migrant workers in Georgia (Luque et al., 2012). Since diabetes is emerging as a world-wide pandemic disproportionately affecting populations in low and middle income countries where most STMM care is given, additional research is needed concerning diabetes outcomes in STMMs serving populations at risk for the disease. Nurses frequently contribute their knowledge and expertise in STMMs, as caring for vulnerable

populations is a core value and directive in the profession. However, few empiric studies emanate from the discipline concerning evaluation of STMM activities. Additional research perspectives from nursing are needed.

Chapter 3
Methodology

Purpose of the Present Study

The purpose of this capstone project is to add to the body of knowledge concerning health care delivered in the setting of a STMM. The capstone describes structures of the nurse led FWFHP which assure clinical and cultural competency, sustainability and accountability in this setting. Since Mexican Hispanics are known to be disproportionately affected by diabetes, a chronic disease associated with high morbidity and mortality when untreated or undertreated, outcomes of diabetes care given at the FWFHP evening clinics were chosen for this analysis.

Research Questions

Research questions are organized using QHOM. This model depicts how the four interrelated QHOM constructs (Health Systems, Clients, Interventions and Outcomes) reciprocally interact and, in turn, affect clinical outcomes and quality in health care (figure 1). The QHOM has been used as a framework in health systems research for quality improvement and outcomes management (Mitchell & Lang, 2004).

System.

1. What structures of the FWFHP assure sustainability, clinical and cultural competence and accountability?

Client.

2. What are the demographics of the population served at the FWFHP mobile evening clinics?

Intervention.

3. What are the processes for screening adult patients in the mobile clinics for diabetes risks and for providing risk reduction education?

Outcome.

4. What diabetes outcomes result from FWFHP interventions?

Design

A retrospective mixed method case study design framed by the constructs of the QHOM was employed which described the FWFHP's systems, clients, interventions and outcomes in 2012. There were four data sources: observations by the author during the 2012 program, existing data from medical records and a de-identified data base and a structured interview (Table 3).

Setting and Sample

The setting for this capstone was the 2012 FWFHP which occurred June 11-22, 2012 in collaboration with a local MHC. The sample was the 2012 FWFHP health care providers (faculty, students, MHC personnel and volunteers) and 447 adult patients seen at the night camp clinics. Pediatric patients (age <18) were excluded since the intent was to evaluate adult diabetes outcomes of outreach services provided during the FWFHP night clinics. The sample for the interview was a senior clinician at the MHC (n=1).

Operational Definitions and Measures

Table 3 in the appendix displays operational definitions with data sources and dates. Operational definitions and measures were organized using the constructs of the QHOM.

System.

Descriptive System characteristics were FWFHP structures which address challenges to providing care in STMMs described in the literature. These challenges include sustainability, clinical and cultural competencies, and accountability. Sustainability is defined as FWFHP system structures that assure program longevity measured by the presence of dedicated leadership, historical commitment to the target community, partnerships with agencies sharing similar goals and planning strategies (Luque & Castañeda, 2012). Clinical competence is defined as FWFHP system structures that assure delivery of an acceptable standard of health care measured by the presence of practice within legislated legal scopes of practice for individual health care providers, the presence of student supervision, adherence to procedures as outlined in the FWFHP procedure manual and practice protocols. Cultural competence is defined as system structures that assure proficiency in delivery of health care within the Hispanic MSFW context measured by the presence of proficient communication with non-English speakers and evidence of training that fosters respect for farmworker health beliefs and awareness of ethical issues unique to farmworker health (Nunez & Robertson, 2006). Accountability is defined as system structures that assure measures of benefit to the community, fiscal responsibility, access to follow-up care and patient outcomes evaluation (Emanuel & Emanuel, 1996).

Client.

Descriptive client characteristics are demographics defined as age, gender, country of origin and ethnicity. Percentages of the population with each characteristic were calculated using the total population adult MSFWs seen at the 2012 FWFHP

(N=447) as the denominator. Mean, median and standard deviation (SD) for age were also calculated. Clinical client characteristics are blood pressures (BP), body mass indexes (BMI) and blood glucoses (BG). Means, medians and SD were calculated.

Intervention.

The intervention is defined as the processes used in screening patients for diabetes risk and providing diabetes care. These are measured by the presence of procedures consistent with American Diabetes Association (ADA) guidelines for identifying individuals at risk for developing DM (ADA, 2012). Diabetes risk is measured as presence of Latino ethnicity plus BMI $\geq$25 or elevated BP (BP$\geq$140/90 or on therapy for HTN), presence of age $\geq$ 45 (ADA, 2012) or abnormal blood glucose level ($\geq$ 140) (Woerle et al., 2006). Diabetes care is measured by the presence of diabetes risk reduction education defined as information on lifestyle changes that promote normalization of weight, BP and/or BG. This information includes portion controlled, low fat, low glycemic index diet and increased physical activity (ADA, 2012).

Outcomes.

The diabetes outcomes explored included the percentage of at risk individuals in the population, the rates at which risk reduction education and referral for follow-up care were given to patients at risk and the actual follow-up rate. The percentage of patients with risk for DM was calculated using the total number patients identified with risk for DM as the numerator and the total number of adult patients seen at the FWFHP night clinics as the denominator. The percentage of patients receiving risk reduction education was calculated using the number of patients receiving this education as the numerator and the total number patients with identified risk for DM as the denominator. For calculating

the percentage of patients with DM risk who received referrals, the numerator was the number of patients with DM risk who received a referral and the denominator was the total number patients at risk for DM. The percentage of patients that came for follow-up was calculated using the number of patients who followed up as the numerator and the number of patients with DM risk who received referrals as the denominator.

Procedures

The descriptions of the FWFHP System structures assuring sustainability, clinical and cultural competencies were based on the author's observations during the 2012 FWFHP. Descriptions concerning System structures assuring accountability were based on both the author's observations and an interview with a MHC senior clinician. The interview took place on May 2, 2013 after informed consent was given by the director. The questions guiding the interview were developed by the author and can be found in appendix G**.** The interview data were shared with the clinician to ensure accurate synopsis and interpretation prior to inclusion in this capstone. The description of FWFHP Interventions was based on observations made during the author's participation in 2012. Data from observations and the interview were extracted summarized in narrative form.

Descriptive Client and clinical diabetes Outcome data were extracted from the de-identified 2012 FWFHP database and organized into a separate database constructed for this capstone project. Data were then summarized as percentages with means and standard deviations when applicable (Table 4).

Data concerning referrals and follow-up were obtained through retrospective review of paper based medical records from the 2012 FWFHP evening camp clinics

available at the MHC. Using the MHC record, patients with diabetes risk who were given referrals for follow-up were identified. The patient's name and date of birth was recorded in a notebook. These patients were assigned a code number starting with "1" according to the order that referrals were found. Using patient's name and date of birth, the MHC's electronic medical record system (EMRS) was searched to see if the patient came for follow up. If found to have a follow-up visit, patient code number, dates of service, weight, BMI, BP and BG were recorded in an excel spreadsheet. The notebook with medical record numbers, patient names and codes remained locked in a closet in the medical records area at the MHC for the duration of the medical record review and was shredded at the clinic when de-identified clinical data had been extracted and recorded. The period for tracking follow-up ended March 31, 2013.

Human Subjects Protection and Permissions

This study was approved by the collaborating MHC institutional review board (IRB) and the University of Virginia Human Subjects Research IRB (protocol # 16674). Permission to use the de-identified database was obtained. Informed consent was obtained from the MHC clinician prior to the interview (Appendix C).

Data Analysis

Data entry and analysis were conducted using narrative summaries Microsoft Excel 2010 and IBM SPSS Statistics v.20. Descriptive client characteristics were recorded and summarized in an Excel table. Diabetes outcomes were calculated as percentages, means and standard deviations when applicable (Table 5). The paired-sample *t*-test was used to test for changes from baseline (taken at the FWFHP) to a follow-up visit, in systolic and diastolic BP levels, for the fifteen adult patients who

received a referral at the FWFHP and sought additional services through the MHC. Baseline and follow-up values were recorded for subsets of these fifteen patients for: weight (n=6), BMI (n=6), and blood glucose (n=8). The nonparametric Related Samples Sign Test was used to test for pre-post changes in those variables. A significance level of less than 0.05 was used for all tests.

The original analysis plan called for the Wilcoxon Signed Rank Test to be used for all of the pre-post changes. However, one of the guidelines for use of the test is that the number of nonzero differences should be at least 16 (Rosner, 1995). For systolic and diastolic BP, weight, BMI and blood glucose, the numbers of non-zero differences were 15, 14, 5, 6, and 8, respectively, so alternative tests were needed. For the two BP levels, there were 15 differences, and the distributions were without outliers and not skewed, so t-tests could be used. The small sample sizes and non-normal distributions of the other three differences required the use of non-parametric tests with no distribution or sample size requirements, so the Related Samples Sign Test was used.

Chapter 4

Results

Chapter four provides answers to the research questions posed in chapter three. As in the previous chapters, the constructs of the QHOM provide the organizational framework for this chapter.

System

1. What structures of the FWFHP assure sustainability, clinical and cultural competence and accountability?

Sustainability.

As of 2012, the FWFHP has provided services to the farmworker community in SW Georgia over an annual two week period for 19 consecutive years. There are multiple long term collaborations in place which support this longevity. Collaborative efforts are coordinated by the lead institution, a school of nursing located in north western Georgia. The 2012 FWFHP was comprised of faculty, students and volunteers from five health disciplines (nursing, pharmacy, dental hygiene, public health and physical therapy) from five educational institutions. Local partners include the MHC and its umbrella agency, the district department of health, the Southwest Georgia Area Health Education Center (SOWEGA-AHEC), municipal agencies, churches and farm managers. Pre-program collaborative planning takes place via conference calls, correspondence and some face to face meetings.

Longstanding partnerships with the local municipal government and school system promote FWFHP sustainability. In 2012 the mayor of the local municipality personally welcomed the FWFHP at a reception hosted by the local arts council. The

local school system expresses endorsement of FWFHP by continuing to provide space where FWFHP participants provide annual comprehensive health screenings for farmworker's children attending a migrant summer education program.

Local church and business support promotes FWFHP sustainability. Daily luncheons are hosted for FWFHP participants by many area churches representing multiple denominations. These meals are preceded by a blessing and acknowledgement of the importance of the work done by FWFHP participants. Farm and property owners give permission to the MHC allowing the FWFHP to set up mobile clinics on private property, thus giving tacit support for the program's mission.

Clinical competency.

Though physical therapy, dental, pharmacy and undergraduate RN students are not yet eligible for licensure, all faculty members, volunteer professionals and nurse practitioner students are licensed in the state of Georgia by their respective disciplines. Each health care provider signs a statement of intent to comply with health department rules and HIPAA requirements. In 2012, average faculty to student ratio was 1: 6 over the 2 week period allowing for constant clinical supervision of all student activities. Throughout the program a procedure manual and practice protocols for common farmworker health problems are available to participating healthcare providers on site. Nurse practitioner faculty and students provide care according to a practice agreement overseen by the health district's medical director which is consistent with Georgia rules and regulations governing advanced nursing practice.

Cultural competency.

In preparation for participation in the FWFHP, graduate and under-graduate nursing students engage in educational activities concerning Hispanic farmworker culture and health. These pursuits are aimed at improving participant's knowledge of common health beliefs and health seeking behaviors of Hispanic farmworker families as well as therapeutic approaches in treating common farmworker health problems. Discussion of multiple barriers to health care experienced by MSFWs is a component of the pre-program curriculum. One common healthcare access barrier is lack of English language proficiency in MSFW adults. During the 2 week program medical interpretation is provided by volunteer certified medical interpreters and bilingual community health workers employed by the MHC. Students with Spanish language skills are preferentially selected for participation in the FWFHP. While many program participants have medical and conversational Spanish fluency, training in communicating with non-English speakers through medical interpreters is given. Proficiency in this skill is tested.

Additional educational activities aimed at fostering increased sensitivity to Hispanic farmworker culture and health continue throughout the 2 week program. These involve farm tours, community health assessments and seminars regarding unique ethical considerations in MSFW health. Examples of discussion topics in seminars include questions concerning obligations to treat undocumented workers in view of personal beliefs, national policy concerning an individual's right to health, and health disparities among MSFW. Daily faculty guided multidisciplinary reflection groups provide a forum where students discuss their clinical experiences and strategize for improved healthcare delivery for this population.

Accountability.

Accountability was measured by evidence of benefit to the community served, fiscal responsibility, access to follow-up care and regular evaluations. FWFHP benefit to the farmworker community and the MHC is seen in several aspects. In addition to providing thorough health screenings for children attending a federally funded preschool and migrant summer school, the FWFHP targets many top chronic and acute farmworker health concerns including DM, HTN, obesity, cervical cancer, dental caries, infections, occupational problems and others. The FWFHP increases the number of patients the MHC can reach for preventive screening and treatment of many of these conditions. For example, all patients seen by FWFHP providers are entered into the MHC records system. During the two week 2012 program 847 patient encounters were entered compared to 104 patient encounters during the two weeks prior to the FWFHP and 171 patient encounters during the two weeks following the program (Figure 2). The interview with the MHC clinician revealed that, despite the documented overall increased access to care, female MSFWs possibly remain underserved since many of the women work evening shifts in packing sheds which prevented them from receiving services at the FWFHP mobile clinics.

There are costs realized by the MHC related to the presence of the FWFHP. These include personnel time, additional equipment, supplies and medications needed for planning and implementing the program. However, the clinic operates as a federally qualified MHC and as such is funded via federal grants. In order to receive continued funding the MHC must log 3,000 unduplicated patients during a calendar year. In many years the number of patients seen during the FWFHP equals approximately one third of

that requirement making a significant contribution to the clinic's ability to secure ongoing funding. MHC costs related to the FWFHP are considered part of the normal operating budget because of the overall benefit to the clinic. Additional benefits are greater local understanding of farmworker health issues and awareness of services available at the MHC both of which are fostered by FWFHP interactions with farm managers and other community members.

Access to follow-up care is facilitated by MHC staff present at the evening clinics throughout the 2 week program. They provide on-site coordination of appointments and transportation for farmworkers who are referred for follow-up. Information is also provided concerning additional MHC outreach services available during the peak agricultural season.

Historically, one possible adverse event was noted by the MHC clinician. The FWFHP is highly visible and brings additional public attention to migrant health issues in the community. In 2011, Georgia enacted restrictive immigration codes. Law enforcement officials, aware of the remote FWFHP outreach clinics, set up nearby road blocks/check points which intimidated farmworkers from seeking health services both at FWFHP clinics and the MHC. So, paradoxically, in 2011 the high visibility of the FWFHP may have created additional barriers to farmworker health services. At the same time, the high visibility of the FWFHP is seen as a benefit. The presence of the FWFHP and their partnerships with multiple community agencies allows for a strong public statement of solidarity and support for the farmworkers.

An additional element in the domain of accountability as defined in this capstone is outcome evaluation. Student evaluations concerning their educational experiences are

performed. Post program collaborative debriefing meetings to document successes and identify additional needs are regularly conducted.

Client

2. What are the demographics of the population served at the FWFHP mobile evening clinics?

Ethnicity was listed as "Latino" in 99.6% (445/447) of the adult population seen at the evening FWFHP clinics. Two individuals did not have ethnicity recorded. Male gender was recorded in 94.2 % (421/447) of the population. Mean age was 31.3 (SD= 9.33). Mexico was listed as country of origin by 97.5% (436/447) (Table 4).

Intervention

3. What were the processes for screening adult patients in the mobile clinics for diabetes risks and for providing diabetes education?

Each evening FWFHP participants set up eight clinical stations in the designated farmworker housing area. The eight stations covered admitting, BP and BMI, hemoglobin and blood glucose (BG), pharmacy, dental hygiene, physical therapy, foot care and nurse-practitioner (NP) care. Screening for diabetes risk is initiated at admission where patient demographic information, past medical history (PMH) and medication history is recorded. Patients are then directed to stations where height and weight are measured, BMI's calculated, BP measured manually and random BG measured with a glucometer. Some patients may wish to visit single stations such as foot care or dental and opt out of initial screenings. Since all clinics are in the evening, it is likely that most BGs are not fasting. Clinical data is recorded in the patient chart. The information gathered at the outset (demographics, medical histories, vital signs and laboratory values)

provides a basis for determining patients' risk profiles. Patients are advised of results and directed to a NP student for further care for abnormal findings and any patient concerns. NP students then perform problem oriented histories and physical examinations related to risks and patient concerns, formulate plans, present findings and plans for faculty approval before implementation. Education for patients with DM risk consists of nutritional counseling aimed at reducing consumption of high fat, sodium, and glycemic index foods and beverages and suggestions on how to increase physical activity. Spanish language educational handout materials to support verbal instructions are provided. Referrals to the migrant health clinic for further care are given based on patient histories, physical assessments and laboratory values.

Outcome

4. What diabetes outcomes result from FWFHP interventions?

There were missing data possibly related to patients self-selecting screening stations. Specifically, 22.8% (102/447) had no entry for BMI; 17% (76/447 had no entry for BG and 4.9% (22/447) had no entry for BP. Therefore percentages were calculated twice for these variables (BMI, BG and BP) using both the total with data and the total population (447) as denominators. One hundred percent of the population had age recorded.

BMI was elevated in 58.3% (201/345) of the population with reported BMIs and 45% (201/447) of the total population. BG was elevated in 28.6% (106/371) of the population with reported BG and 23.7% (106/447) of the total population. BP was elevated in 20.2% (86/425) of the population with BP reported and 19.2% (86/447) of the total population. Age $\geq$ 45 was observed in 9.8% (44/447) of the population. A total of

64.4% (288/447) had identifiable risk for diabetes though this value could be under reported due to the missing data.

Of the 288 farmworkers who had identifiable risks for diabetes 76% (219/288) received diabetes risk reduction education at the FWFHP evening camps and 26.7% (77/288) received referrals for follow-up care at the MHC (Table 4). Fifteen of the 77 (19.5 %) farmworkers identified with DM risks who were given referrals were seen for follow-up care by MHC personnel prior to March 1, 2103 (Table 4). Follow-up care occurred in two locations: in home visits and at the MHC. The MHC community health workers regularly return to farmworker housing areas during the agricultural season. These home visits involve additional screenings and health educational sessions. Nine of the 15 patients seen for follow-up care were seen at home visits by community health workers while six were seen at MHC.

All 15 farmworkers who had follow-up care had BP taken both at the FWFHP and at the follow-up visit at home or at the MHC. Six patients had pre/post weights and BMIs, eight had BGs. There were no significant statistical differences in camp and follow-up comparisons of BP, weight and BMI. Follow-up BG levels were significantly lower than those recorded at the FWFHP (p=.008) (Table 5). In fact, the BG level dropped from baseline to follow up for all 8 migrant workers for whom there were pre/post BG levels.

Chapter 5

Discussion

The purpose of this capstone was to add to the body of knowledge concerning health care delivered in STMMs. Specifically, this case study described how the nurse led two week FWFHP addressed known challenges to the provision of health care as a STMM. A summary and analysis of outcomes related to diabetes care given at the June 11-22, 2012 FWFHP was also provided. The QHOM provided the organizational framework for the research questions, study design and presentation of the results. The model is used again in organizing the subsequent interpretation of the findings. Each research question is discussed separately incorporating a summary of key findings, comparison with what was found in the literature and practice implications specific to the FWFHP and other mobile migrant health clinics. Broader implications concerning STMM practice and policy are also integrated. The chapter closes with limitations and final conclusions.

System

1. What structures of the FWFHP assure sustainability, clinical and cultural competence and accountability?

Many criticisms have been voiced concerning STMM failure to consider sustainability, clinical and cultural competencies and accountability (DeCamp, 2011; Langowski & Ilitis, 2011; Martiniuk et al., 2012, Welling et al., 2010). The literature review in this capstone confirmed that, relative to the number of functioning STMM programs, there is a paucity of studies examining these features. The FWFHP had

multiple system structures in place which promoted sustainability, clinical and cultural competencies and accountability in its scope of practice.

FWFHP features assuring sustainability include a two decade commitment to the target community. This is considerably longer than the time commitments described by other STMMs which ranged from three months to 14 years (Table 1). A key element assuring FWFHP sustainability is the presence of a coalition of multidisciplinary partnering agencies all of whom share planning and implementation strategies under the direction of a dedicated lead institution. All FWFHP partnering agencies have intersecting organizational goals of community service which enable each agency to achieve mutual objectives, strengthen inter-organizational ties and in turn further the sustainability of the FWFHP system. These characteristics are exemplars of sustainable partnerships as described in the literature (Luque and Castañeda, 2012). Though the majority of STMM program evaluations described some elements of their partnerships (Table 2), only one, notably authored by nursing faculty, outlined a functioning coalition involving both sending and receiving agencies and communities (Wilson et al, 2000).

FWFHP clinical competency is assured by the presence of credentialed personnel licensed to practice in the locality, practice parameters that are plainly defined in approved procedure manuals and protocols, and an average 1:6 faculty to student ratio. Provision of high quality care within defined scopes of practice is unequivocally a FWFHP priority. The majority of studies included in the literature review reported on the providers credentialing in home regions, but legal authority to practice in the locality served was rarely mentioned (Table 2).

Several key FWFHP structures are in place which promote delivery of culturally competent care. Preferential selection of students with Spanish proficiency, training in communicating through qualified medical interpreters and Spanish language patient education materials are examples of FWFHP structures which address language differences. One area for improvement can be identified. The Spanish patient education materials, photocopies brought by undergraduate nursing students, were from numerous sources and of varied literacy levels. A more standardized approach should be considered such as requesting that students bring risk reduction handouts specifically targeting MSFWs.

Other related ethical and cultural issues regarding student cultural competence are addressed through various ongoing educational platforms including reading assignments, seminars and discussions. It is possible that other programs place as much emphasis on acculturation as does the FWFHP, but other than descriptions of language interpretation services, the literature is lacking in descriptions on how STMM providers are trained to fully function within local contexts.

The domains of accountability considered in this capstone were benefit to the community, fiscal responsibility, provision of follow-up and outcome evaluation (Emanuel & Emanuel, 1999). The literature describing challenges to providing accountable care in STMMs is generally focused on responsibilities to the receiving community that persist after mission personnel depart. These responsibilities include provisions for follow up, sensitivity to use of scarce local resources and regular outcome evaluations (Langowski & Ilitis, 2010; Holmgren & Benzian, 2011). Evidence has been provided that the FWFHP activities clearly benefit community without straining local

resources. Access to follow-up is facilitated by arranging appointments and transportation to the MHC on site at the FWFHP clinics. Community benefit is demonstrated by the increased access to preventive care, and treatment of acute and chronic health problems. Additional benefits were increased knowledge in the community of MHC services available after the FWFHP and heightened awareness concerning MSFW health issues. These benefits were achieved without straining the resources of the collaborating MHC. Conversely, FWFHP activities help the MHC secure funding so that continuous year round services can be offered to the MSFW community.

The final accountability domain is outcome evaluations that focus on community impact rather than provider's perceptions (DeCamp, 2011; Drifmeyer, 2003; Langowski & Ilitis, 2010, Martiniuk et al., 2012). The FWFHP regularly solicits student evaluations concerning their educational experiences and conducts post program collaborative debriefing meetings to document successes and identify additional needs. Also, the fact that program leaders welcomed this author, an outsider, to perform this project is evidence that the need for program evaluation is recognized. Additional perspectives should be considered such as patient satisfaction surveys.

As interest in global health increases and educational institutions respond by providing short term domestic and international student clinical placements in resource poor areas, additional outcomes evaluation from these global health initiatives are needed. Similar to FWFHP practices, educators often require student evaluations concerning effectiveness of teaching methods and personal learning but additional

evaluations of outcomes of health care delivered by students should be designed, implemented and publically shared.

It has been established that there is an overall scarcity of outcomes evaluation of STMM activities. However, where STMM program evaluations are provided, various structures that promote sustainability, clinical and cultural competencies and accountability are described. This indicates that there is agreement among STMM planners that these four features are important for overall mission success (Table 2). Though there is consensus there are no international standardized evaluation guidelines. This may be due to the diverse types and locations of organizations sponsoring STMMs and numerous international sites served. Nurses and other healthcare providers in global health leadership roles should advocate for a unified international approach in the design and adoption of standardized outcomes measures. Until standardized evaluation criteria are developed and widely adopted, it remains incumbent upon program organizers and providers to seek empiric findings from similar programs and report their own outcomes.

Nurses frequently contribute their knowledge and expertise in STMMs, as caring for vulnerable populations is a core value and directive in the profession. However there is a notable paucity of clinical evaluative research on STTMs emanating from the discipline. Nurses who participate in STMMs should have increased awareness of common criticisms and known challenges to providing care in these scenarios and be encouraged to contribute to the literature concerning their experiences in addressing them. The evidence presented here adds to the body of knowledge concerning characteristics which should be incorporated into STMMs as well as methods for evaluation. The FWFHP system structures assuring sustainability, clinical and cultural

competencies, and accountability could be modified and implemented in a variety of STMM settings.

Client

2. What are the demographics of the population served at the FWFHP mobile evening clinics?

There were differences in demographics of the FWFHP adults and MSFWs in the southeast United States (SE USA). Ninety-four percent of the FWFHP adults were male compared to 80% male in the SE USA (Sologaistoa, 2012). Additional demographic differences between FWFHP adults and MSFWs in the SE USA included country of origin (98% Mexican vs. 60% respectively) and ethnicity (99.5% Latino vs. 68%) (Sologaistoa,2012). The differences observed in the FWFHP adult population compared to SE USA may simply reflect different regional demographics in the area served by the FWFHP or possible access barriers for non-Mexican MSFWs. Also, the discrepancy in the gender demographic observed in the FWFHP population may reflect a critical access problem for female workers in the area served. The latter issue emerged in the interview with the MHC clinician where it was revealed that many of the female MSFWs in the region are employed in packing sheds and rigid evening work schedules interfere with their ability to attend the night camp clinics. One suggested approach in mitigating this barrier was to schedule dedicated women's health outreach clinics early in the day when women are likely to be in their housing areas. Additional investigation into actual area farmworker demographics is needed. If indicated, development of strategies for removing barriers for women and non-Mexican MSFWs in accessing care is imperative.

Intervention

3. What are the processes for screening adult patients in the mobile clinics for diabetes risks and for providing risk reduction education?

The initial screening process at the FWFHP night clinics included collecting patient information (demographics, medical histories) and clinical measurements (BMI, BP, BG). This provided a basis for determining DM risk profiles. Patients with abnormal clinical measurements were advised of findings and referred to NP students for additional evaluation and therapies. Treatments available at the FWFHP night clinics for DM risk reduction consisted of therapeutic nutritional and physical activity counseling and referral to the MHC for further care if indicated. These actions are consistent with ADA standards for identifying DM risks and for initial healthy lifestyle therapies in reducing risk for or treating DM (ADA, 2012). Obtaining additional initial information such as family history of DM, personal history of HTN and physical activity habits could help in stratifying an individual's risk level. This would enable providers to individualize education and recommendations for further care according to the severity of risk present.

Outcome

1. What diabetes outcomes result from FWFHP interventions?

Risks for DM (presence of BMI $\geq$ 25, BP $\geq$ 140/90, BG $\geq$ 140 or age $\geq$ 45) were identified in 64.4 % (288/447) of the FWFHP adults. This is consistent with findings in the literature regarding high rate of farmworker health care visits related to DM (Sologaistoa, 2012) and high rate of concern for DM expressed by farmworkers themselves (Luque et al, 2012). Elevated BMI was the most frequent risk factor in the population (58.3%) followed by elevated BG (28.6%), elevated BP (20.2%) and age $\geq$ 45

(9.8%) respectively. In view of the hard physical work the farmworkers perform for long hours most days of the week, the high frequency of elevated BMI is a surprising finding. There is a clear need for additional research on factors contributing to excess weight in MSFWs as well as community and workplace interventions directed at improved farmworker nutrition. Low food security has been associated with elevated BMI and obesity in low income Latinos (Leung, Williams & Villamor, 2012). Lifestyle education concerning weight loss must incorporate individual nutritional assessments which include food availability and sources. Many farmworker's meals are restricted to what is available at the cantinas in their housing areas. These dietary limitations must be factored into nutritional education strategies. The effect of farmworker lifestyle factors on BP and BG levels also merits future study.

Providing appropriate health information can be seen as the first step in promoting positive behavioral changes. Individuals who are made aware of their risks for DM through consultation with doctors and other health care providers are more likely to make healthy lifestyle changes compared to those who are not told of their risks (Okosun, Davis-Smith & Seale, 2012). In Okosun et al. (2012) 10.9% of a nationally representative sample (n= 5073) reported having been informed of their diabetes risks by healthcare providers. While no data is available for calculating the rate that farmworkers were explicitly told of their risks, provision of risk reduction education implies being told. Seventy-six percent (219/288) of farmworkers with DM risk received risk reduction education. Compared to rates reported by Okosun et al. (2012) the nurse led FWFHP performance is exemplary (10.9% vs 76%). However, a 100% risk reduction education rate for those at risk should be the goal. Many farmworkers presenting for care during

the FWFHP, though found to have risks for DM, have acute problems as chief concerns. These competing priorities likely affect the risk reduction education rate. FWFHP providers should maintain awareness of the population's overall high risk for DM and give healthy lifestyle education whenever clinically feasible.

Referrals for follow-up care were given to 26.7% (77/288) of the farmworkers identified with DM risk. It is important to recognize that not all individuals found to be at risk necessarily needed referral. For example, overweight farmworkers aged < 45 with normal BPs and BGs could be managed reasonably by informing them of their risk and providing health education aimed at weight loss with additional recommendations for annual surveillance. Fifteen farmworkers (15/77, 19.5%) who received referrals sought additional healthcare from MHC personnel during the nine month follow-up period after the 2012 FWFHP. The follow-up rate is important for recognizing that services received at the FWFHP may be the only health care that farmworkers receive while in the USA. A key finding is also the pattern where follow-up care was received. Of those that followed up, 60% (9/15) were seen by MHC outreach workers in their housing areas and 40% (6/15) were seen at the MHC.

Fear, language differences, lack of transportation and finances are the most frequently listed barriers to health care reported by MSFWs in the southeast USA (SE USA) (Sologaistoa, 2012). Because approximately 50% of the SE USA farmworker population is working in the US without legal authorization (Sologaistoa, 2012), fear of harassment, arrest and deportation likely discourages them from travelling to clinics as it requires using roads where law enforcement officials have been known to set up road blocks. Though all MHC personnel attending the FWFHP clinics are either bilingual or

fluent in Spanish and transportation to the clinic is arranged, farmworkers do have to pay modest fees for office visits when seeking care at the MHC while outreach services are free of charge. Consequently the higher follow-up rate observed at outreach home visits compared to MHC visits could be associated with fear resulting from recently enacted immigration laws and/or financial concerns. Trends reported here are important in recognizing that barriers to health care persist after the FWFHP departs and continued outreach services are critical for farmworker access to health care. Continued investigation into viable solutions to removing these barriers is needed.

FWFHP clinic and follow-up BG measurements were recorded in 53.3% (8/15) of the farmworkers who sought additional care. All BG levels were lower at follow-up and differences reached statistical significance (p=.008). It is possible that observed reductions in BG may have been secondary to behavioral changes which resulted from information provided at the FWFHP. It is also possible that differences were related the timing of the tests. All baseline BG's were measured after 6:30 pm thus it was more likely that these were postprandial. Follow-up BGs at the MHC are more likely to be fasting, as patients are instructed to fast for 8 hrs prior to having blood tests there. Outreach home visits occur at varying times during the day and evening.

The feasibility of expanding the scope of diabetes services offered in mobile clinics should also be examined. Additional services might include point of care diagnostic testing such as hemoglobin A1Cs for high risk individuals. This would allow definitive stratification of risk status such as diagnosis of DM, pre-diabetes or risk present but no evidence of disease. With this knowledge, providers might identify those needing referrals for follow-up with greater precision and give more individualized education.

Patients would have more information concerning their health and perhaps be better equipped to make decisions concerning risk reduction and the necessity of follow-up care. The combination of expanded outreach clinical services and education could result in improved follow-up rates.

It is clear that a large percentage of the FWFHP patient population is at risk for DM and that program providers give appropriate risk reduction education to 76% of those at risk. Achieving an education rate of 100% for those at risk may be problematic due to patient's competing health priorities. Steady improvements in the rate could be attained though continued provider education and awareness concerning the population's high risk for having or developing DM.

Tracking clinical data at follow-up provides an indicator of the effect of initial therapies. Examining follow-up rates is important for exploring persistent barriers to healthcare. The information resulting from this research narrows the knowledge gap concerning how farmworkers access care. The overall conclusion is that the FWFHP successfully identifies conditions associated with increased DM risk and provides appropriate initial therapies including referrals for follow up. When patients do follow-up there is some evidence that risk reduction education resulted in behavioral changes as reflected in the significantly lower blood glucose levels found on return. Findings concerning follow-up rate and location are critical for acknowledging that barriers persist even when access to follow-up is facilitated. These findings substantiate the need for continued outreach services with consideration of expanded services. Additional longitudinal research is needed to determine if farmworkers receive appropriate care over time for DM and DM risk reduction.

Diabetes is now emerging as a world-wide pandemic disproportionately affecting populations in low and middle income countries where most STMMs offer health care. Reports on diabetes care are absent in the literature on international STMMs. Clinical services aimed at identifying individuals with DM risk and providing them with information should be considered in STMM programs in areas where the disease is seen as a health priority. These activities have been proven to promote behavioral change which can result in improved population health. Factors affecting access to follow-up care for patients served in STMMs should be considered when planning all STMM health care.

Limitations

There were several limitations in this project. Missing data in the health records may limit conclusions concerning the number of farmworkers found to be at risk for DM. Also, the small number of pre/post clinical data sets in the subset of farmworkers who followed up limits the strength and generalizability of conclusions concerning the effect of risk reduction education on clinical outcomes.

It is possible that some farmworkers who went for follow-up were not detected using the procedures described in this capstone and therefore not included in this study. Despite the availability of medical interpreters at the FWFHP, farmworker names and dates of birth could have been misspelled or otherwise incorrectly recorded. Also, since an estimated 50% of the farmworkers in the SE USA are undocumented it is conceivable that farmworkers use aliases to prevent tracking. When farmworkers return for follow-up they may register using a different name or birth date than that documented at the FWFHP clinic. Cross referencing FWFHP clinic medical records with the MHC EMR

would not be possible in these cases. Additionally workers may have returned home or migrated to other agricultural areas shortly after the FWFHP and sought care after relocating. As a result the actual follow-up rate may have been greater than the rate observed.

Conclusion

The nurse led FWFHP has multiple structures in place that assure sustainability, clinical and cultural competencies and accountability. Program providers successfully identify conditions associated with increased DM risk and provide appropriate initial therapies. The significantly lower BG levels found at follow-up may reflect positive behavior changes that resulted from education received at FWFHP clinics. A relatively small number of farmworkers who received referrals followed up. This finding coupled with the higher frequency of follow-up occurring via home visits substantiates the importance of outreach services in farmworker health. Since health care received in outreach clinics held during the peak agricultural season may be the only health care accessible to some MSFWs, expanded services meeting identified needs should be considered. Findings concerning the follow-up rate have relevance for all STMMs in facilitation of follow-up care for their patients. Ongoing outcomes research is needed to determine if MSFWs and patients served by other STMMs receive appropriate care for chronic conditions over time.

Nurses and other healthcare providers in global health leadership roles should advocate for a unified approach in the design and adoption of standardized outcomes measures for STMMs. Until standardized evaluation criteria are developed and widely adopted, it remains incumbent upon program organizers and providers to seek empiric

findings from similar programs and report their own outcomes. The FWFHP model for health care delivery and the methodology used in this capstone can be adapted and used by STMM organizations in planning and evaluating their activities in a variety of international and domestic scenarios.

Participation in STMMs will likely remain robust since these activities provide accessible and richly rewarding opportunities for volunteers from diverse healthcare disciplines. It is hoped that findings in this capstone will inspire nurses to reflect upon their work in STMMs, empirically examine how their programs address common challenges to providing health care in these scenarios and publically share results.

Epilog

In May 2013, preliminary results of this capstone were shared with FWFHP partners during a planning meeting for the 2013 program. The program director and other partners showed interest in findings and immediately discussed approaches for improving screening and educating farmworkers as well as improving access for female farmworkers. A report of proposed practice changes is beyond the scope of this project, but the enthusiasm for evidence based practice is noteworthy and provides additional proof of the FWFHP's ongoing commitment to providing high quality health care to the MSFW families of Southwest Georgia.

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Appendix A

Table 1

Studies

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
Adams et al., 2012	2 surgical trips to Arequipa, Peru	15 patients	Cardiac repairs: Valvular repairs or replacement, Excision of atrial myxoma, CABG ASD repair, aortic coarctation repair	Complications, Mortality	2009 1 TIA 2 pts. returned to OR for bleeding , no source identified 1 readmitted for late wound infection. All well at 1 year, New York Heart Association class 1 2010 1 death, 7 days post op (patient had multiple pre-op comorbidities). All other patients were reported "doing well" at 30 days.
Beitler et al., 2006	Aroki, Tangee and Turkman, Afghanistan	1743 patients	Delivery of primary care services during DOD sponsored missions in 3 locales in Afghanistan during 2003	Determination of likeliness of cure resulting from services given.	All 3 mission combined: Cure probable: 798/1743 (45.8%) Cure unlikely (included supportive care): 480/1743 (27.5%) Wellness only: 465/1743 (26.7%) Majority of patients- unlikely cure ($p<0.001$)
Bourdeaux et al., 2010	Retrospective systematic review of all approved project reports in the Overseas Humanitarian Disaster and Civic Aid (OHDACA) database since 2001.	2097 project reports were reviewed	To provide the DOD a quantitative description of HA projects funded since 2001.	Calculations concerning: number of programs/year, where they occurred, under which combatant command, types of services provided. Presence of : stated goals, implementation strategies,	Projects took place in 90 countries. The number of projects increased by 50%-80% between 2004 and 2007 varying by region. Projects occur in civilian health care, public health, education and disaster preparedness sectors. Summary: The value of the DOD missions "remains unclear given the lack of project goals, implementation strategies or measures of effectiveness."(p.66)

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
				coordination with partners, impact or outcome measures.	
Davis et al.,2011	Pacific Islands (Fiji and Samoa) between 2003 and 2009	103 Patients	Valvular replacements and ASD repairs	Comparison of 30 day mortality rate to rate observed for similar procedures in Victoria, AU	Mission Mortality Rate: 3.88% Victoria, Australia Rate: 3.1%
Drifmeyer et al., 2003	Retrospective review of reports written by DOD project leaders during HA projects. Survey of US military members who were involved in DOD projects.	"Over 100" after action reports (AARs). 215 military personnel	To determine the extent to which DOD sponsored HA projects are evaluated for effectiveness.	Presence of measures of effectiveness.	AARs do not report on project outcomes; reports are process based and include counts of patients screened but no measures of health effects on recipients. In cases of donated equipment, shipment weights are documented but not whether equipment was wanted or used.
Horlbeck et al.,2008	Asuncion, Paraguay, 3 missions 2003-2006 Tegucigalpa, Honduras, 1 mission 2003-2006	121 patients	Surgical procedures for chronic ear disease: tympanoplasty, canal wall up (CWU), canal wall down(CWD)	Success rate for all procedures and for the 3 types of procedures Comparison of success rate to published rates in developing nations Complications	117 patients included in the study. Follow-up was only available for 77 patients. All procedures: Success: 58/77 (75.3%) (P=0.055) Overall success rate (developed regions 85-91%) Rates of success for surgeries: Tympanoplasty: 14/22 (63.6%) (developed region: 92%) CWU: 21/30 (70.0%) CWD: 23/25 (92.0%) No complications
Leeds et al., 2011	Hinche, Haiti	64 surgical cases in which third	To increase access to surgery in a resource	Complication rates	There were no short or long term complications during the study period

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
	Authors associated with Emory University	year medical students participated between 2008 and 2010	poor and to expand surgical educational opportunities for third year medical students.	Achievement of educational objectives Increased surgical access	Educational objectives were achieved Access to surgery was improved.
Luque et al., 2011	Hispanic migrant farmworker community in Florida, US 2003-2006	222 women	Cancer screening	Cervical cancer screening rates for women aged ≥18	79% of women presenting to the clinic had cancer screening within the previous 3 years compared to 83% in the state of Florida.
Luque et al., 2012	Hispanic farmworker camps in Georgia, US, 2009-2011	100 farmworkers surveyed in 2010. 1161 patient encounters 2009-2011	Provision of primary health care and health screenings for MSFWs. Study purpose- conduct an occupational health needs assessment	Health survey administered to 100 MSFWs in 2010 to compare self- reported health needs to diagnoses in medical records review 2009-2011	Top 5 self-reported health concerns: HTN 25% Eye problems 12 % M/S problems 11% DM 10% Depression 7% Ranking of diagnoses in medical records were similar to the survey. M/S and Eye problems were the major occupational health problems
Luque et al., 2012	Literature Review	Literature Review of publications on Mobile Migrant Health Clinics from 1990-2012. 18 articles met inclusion criteria	To study barriers to health access that migrant families face, evaluate services provided at mobile clinics, describe practice models employed	Effectiveness of services provided Effective partnership approaches promoting sustainability	Based on descriptions, mobile clinics increase access to health care. There is little data concerning evaluation of services delivered. Sustainable partnerships between different health disciplines and community partners described.
Maki et al., 2008	Harvard University Phase 1- 6 STMM sites in Honduras, Guatemala, Venezuela,	Phase I- Needs assessment: determine the most important factors in evaluation the quality of STMMs	To develop and test a standardized evaluation tool for examining strengths and weaknesses of STMM programs	Phase 1 determination of the most important factors in evaluation the quality of STMMs	**Phase 1** 6 major common factors relevant to quality of STMMs were identified: Cost, Efficiency, Impact, Preparedness, Education, Sustainability. **Phase 2** Surveys were developed for: Mission Director,

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
	Phase 3- Honduras Brazil, Ecuador, Zimbabwe and Namibia Authors associated with Harvard University	Phase 2- survey tools developed based on Phase 1 findings Phase 3- Field test of the survey		Phase 2 Surveys developed Phase 3 Surveys tested in 5 mission sites	Host/Local provider, Patient, Personnel and Mission Administrator addressing factors listed above **Phase 3** **Cost**: 100% reported cost less than budget, average cost =$3/patient in medical missions. Surgical cost per patient =$700. **Patient Satisfaction:** 40 % of missions reported pt. satisfaction rates of 50-75%. 40 % reported satisfaction rates of 75-90%. 20% reported satisfaction rates of >90%. **Complication rates:** 70% reported complication rates 0-5%. 30 % reported complication rates of 5-15%. **Sustainability:** 80 % reported collaboration with local health services. **Preparedness:** 80% reported credentialing for personnel. 40% did not have system in place for reporting morbidity and mortality. **Efficiency:** 60% reported a triage system, 40% reported having easy access to outside referrals, 40 % reported efficient communication between team members **Education:** 60% provided some education for local providers and patients.
Marck et al., 2010	Addis Ababa, Ethiopia 2007, 2008	77 patients	Facial reconstructive procedures.	Intervention: Changes in practice	Overall surgical outcome improved in 2008 compared to 2007 (P=0.04).

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
			Pathology included Noma, Trauma, Tumors	implemented in the 2008 after analyzing data from 2007. Outcome Measure: Comparison of results from the 2007 and 2008 mission: Successful vs Unsuccessful.	92% (24/26) of the simple cases had successful outcomes. Complex case outcomes remained unsatisfactory: 50% (8/16) of the complex cases had successful outcomes.
Martiniuk et al., 2012	Literature Review	Systematic Literature Review included 230 articles available at the Library of the University of Sydney.	Purpose was to review available literature on STMMs over the 25 year period to gain understanding of trends in STTMs and potential impact.	Identification of common benefits and critiques of STMMs.	**Common Benefits of STMMs:** Providers felt enriched. Local communities felt a sense of solidarity with the outside world. Educational transfer. **Common critiques of STMMs:** Lack of: -sustainability. -relation with local health system. -follow up data -alignment with local needs and resources -cultural sensitivity -lack of community preventive services Others: -expectations to give care beyond scope of practice. -limited impact. -questions concerning cost effectiveness. -missions tied to political goals. 5 % of articles utilized theoretical or analytic methodology.
McQueen et al., 2009	Retrospective analysis of data sets from surgeries performed by Operation Smile International (OSI) in	8,151 surgical cases	Cleft lip and cleft palate repairs	Complication rates and comparison to those reported in developed regions.	Complication rates were 1.2 % of cases in 2005 and 1.0% of cases in 2006 Rates were comparable to complication rates in medical institutions in developed regions.

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
	developing countries between 2006 and 2007.				
McQueen et al., 2010	Internet based questionnaire sent between Oct. 2008 and Dec. 2008.	99 surgical HA organizations.	Purpose: to determine size, scope, data collection practices and how well these organizations united with local health care systems	17 item internet based questionnaire was the evaluation instrument. Response choices were primarily yes/no.	46/99 (46.5%) organizations completed the survey. 42/46 (91.3%) reported they track annual surgical volume 80% (36/45) tracked mortality. 82.6% (38/46) tracked complications. 64.4% (29/45) tracked infections. 89.1% (41/46) had follow up available. 56.5% (26/46) had local partnerships. 89.1% (41/46) had educational exchange.
Merrell et al., 2005	Hanoi, Vietnam	597 micro-surgical procedures performed between 1990 and 2004.	Micro-surgical procedures for soft tissue, bone and peripheral nerve problems.	Measure of increase of local surgical capacity resulting from surgical education provided by OSI surgical teams over 15 years. Failure rate of surgeries performed by local surgeons.	n=474 (micro-surgeries by local surgeons) n= 108 (micro-surgeries by volunteer surgeons) Local overall failure rate reported to be 6.4% The authors stated this is within ranges reported in the literature.
Novick et al., 2007	Developing nations in Europe, Asia, Africa and South America over	2138 pediatric cardiac surgeries performed in the year prior to the program by local teams. 2,708 surgeries performed by the visiting team during the program.	Pediatric cardiac surgical program providing surgery as well as education and program development over 14 years. (1993-2007)	The increase in the number and complexity of pediatric cardiac surgeries performed by local surgical teams after involvement with a visiting cardiac surgical team. Numbers of cardiovascular surgical	9/12 institutions included in the study were performing an increased # of pediatric surgeries and /or increased complexity compared to # and complexity prior to the program. 2138 surgeries were performed in the year prior to the program. 3904 surgeries were performed in the year after the program. 338 professionals from host countries received educational training. Survival rates improved from the start of the program in 1993 to 2007:

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
		3,904 surgeries performed after the program by local teams.		personnel trained. Survival rates pre-program and post-program	Pediatric Cardiac Care Consortium Categories PCCC 1- no statistical difference PCCC 2- $p<0.01$ PCCC 3- $p<0.0001$ PCCC 4- $p= 0.05$ PCCC 6 - insufficient numbers
Reaves et al., 2008	Retrospective review of DOD database for AARs and Lessons Learned from DOD humanitarian missions between 1996 and 2007	1000 reports 12 Subject Matter Expert (SME) interviews	To determine the extent to which data is collected and analyzed concerning impact of DOD HA programs and compare with internationally accepted standards.	Presence of impact assessments or measures of effectiveness	7/1000 (0.7%) reports mentioned effectiveness, but did not discuss this beyond general summary statements such as "The HA program was a success." Qualitative analysis of SME responses mirrored the data base findings: there were no measures of health outcome.
Suchdev et al., 2007	Los Abilenes, El Salvador 2003-2007	Patients presenting to an annual 1 week STMM clinic in a rural El Salvadoran community	"To ethically address underlying health issues and to provide sustainable public health interventions and medical assistance for underserved com-munities in developing nations" (p. 318)	Percentage of children with nutritional deficiencies	44% of children had nutritional deficiencies. Data supported development of strategies to prevent and treat nutritional deficiencies. A description of program structures which supported sustainability, safety, cultural competency, accountability and effectiveness was provided.
Sykes at al., 2012	Antigua, Guatemala 2004-2010	204 patients	Tonsillectomies and adeno-tonsillectomies performed from 2004-2010 using a specific safety protocol requiring patients to stay within 1 hr. of the hospital for 10 days following surgery.	Complication rate	197/204 charts were available for review. 3/197 had documented complications: All complications were treated and resolved without sequelae Complication rate was 1%. This was reported to be within ranges reported by institutions in developed regions (0.8-30%).
Wilson et al., 2000	Migrant Family Health Program	Migrant children in a migrant	Improvement of primary care health	Evaluations from stakeholders	Children's teachers identified health educational needs

Author	Locale/ Setting	Patients or Documents	Program Purpose	Measures of outcomes	Results
	1994-1999	health education program in southern Georgia	services to migrant children though a community academic partnership	Focus group research including farmworkers and Farmworker children Database review for most frequent diagnoses	Identified needs for health care at more convenient times and locations, Spanish language educational materials, counseling services and dental services Dental caries was the leading health problem Findings were used to develop additional teaching and clinical interventions

Table 2

STMM Characteristics

Legend for STMM characteristics included in program evaluations

Clinical and Cultural competency

1. Team includes nurses
2. Description of team members professional designations, supervisory practices when students are involved
3. Description of how language and cultural differences provided

Sustainability

1. Local partnerships described
2. Time commitment with locality
3. Capacity building, how program augments local capacity for health care
4. STMM Team funding described

Accountability

1. Follow up
2. Adverse reactions
3. Clinical outcomes
4. Costs to host communities tracked

STMM Characteristics X = information provided, O = information not provided

Table 2

	Clinical and Cultural Competency			**Sustainability**				**Accountability**			
Author	Team includes nurses	Professional designations described	Cultural differences addressed	Local partners described	Time commitment with locality	Capacity building	Team Funding described	Follow up described	Adverse events reported	Clinical outcomes provided	Local costs
Adams et al., 2012	X	X	X	X	X	X	X	X	X	X	O
Beitler et al., 2006	O	O	X	O	O	O	O	O	O	X	O
Davis et al., 2011	X	X	O	X	X	X	O	X	X	X	O
Horlbeck et al., 2008	X	X	O	X	X	X	O	X	X	X	X
Leeds et al., 2011	X	X	X	X	X	X	X	X	X	X	X
Luque et al., 2011	O	O	X	X	X	X	O	X	O	X	O
Luque et al, 2012	X	X	X	X	X	X	O	X	O	X	O
Maki et al., 2008	X	X	X	X	X	X	X	X	X	X	X
Marck et al., 2010	X	X	O	O	X	O	X	O	X	X	O
McQueen et al., 2009	O	X	O	O	O	X	O	X	X	X	O
McQueen et al., 2010	O	X	X	O	X	O	O	X	X	X	O
Merrell et al. 2005	X	X	X	X	X	X	O	O	X	X	O
Novick et al., 2008	X	X	X	X	X	O	X	O	X	X	O
Suchdev et al., 2007	X	X	X	X	X	X	X	X	X	X	X
Sykes et al., 2012	X	X	X	X	X	X	O	X	X	X	X
Wilson et al., 2000	X	X	X	X	X	X	X	X	X	X	O

Table 3

Operational Definitions of Study Terms, Data Sources, Dates of Data

AQHOM Construct and Capstone Study Terms	**Operational Definition**	**Data Source:** 1.Database 2. Medical records 3. Personal observation 4. Interview	**Dates of Data**
System Characteristics: FWFHP structures which address challenges to delivery of health care in STMMs	FWFHP structures which:		
• Sustainability	Assure program longevity. Measured by presence of: Leadership Commitment Partnerships	3	2012
• Clinical Competence	Assure standards of care. Measured by presence of: Practice within legal scope Student supervision Adherence to approved protocols	3	2012
• Cultural Competence	Assure proficiency of health care delivery within the context of Hispanic MSFW culture. Measured by presence of: Effective communication between provider and patient Respect for MSFW health beliefs Awareness of MSFW ethical issues	3	2012
• Accountability	Assure answerability Measured by presence of: Access follow up Fiscal responsibility Benefit to community	3,4	2012, 2013

Client Characteristics: Patient Demographics Clinical characteristics	 Age, gender, ethnicity, country of origin BMI, BP, BG, Age	 1 1	 2012 2012
Intervention: Processes used in screening for DM and DM care	Measured by the presence of procedures consistent with ADA guidelines for identifying and treating DM. Risk =Latino ethnicity plus: BMI > 25, BP > 140/90 or on therapy for HTN. Age ≥45 BG ≥140	3	2012
Outcome: Diabetes outcomes	Percentage of patients with risks for diabetes calculated by: # at risk/total population Percentage of patients with DM risk who receive: • Risk education, calculated by # receiving education /# at risk • Referral, calculated by #receiving referral/# at risk Percentage of patients receiving referrals who follow up, calculated by #receiving referral/ #who followed up Weight, BP, BG and BMI at follow up	1 1 1 2 2 2	2012 2012 2012 2012 2012, 2013 2012, 2013

Table 4

Summary FWFHP Demographic and Diabetes Outcome Statistics

Variable	n/total	percent
Male	421/447	94.2%
Female	26/447	5.8%
Latino Ethnicity	445/447	99.6%
Country of Origin Mexico	436/447	97.5%
Other Country of Origin (Guatemala, USA, Puerto Rico, Honduras)	11/447	2.5%
Age $\geq$ 45	44/447	9.8%
Mean age: 31.3*		
Median age: 29*		
Standard Deviation: 9.33*		
Elevated BMI	201/345 201/447	58.3% 45%
Mean BMI 26.3*		
Median BMI: 25.7*		
Standard Deviation: 4.1*		
Elevated BP	86/425 86/447	20.2% 19.2%
Mean BP 125/78*		
Median BP: 122/80*		
Standard Deviation: 11.7/10.5*		
Elevated BG	106/371 106/447	28.6% 23.7%
Mean BG: 127*		
Median BG: 121*		
Standard Deviation: 42.8*		
1 or more risks for DM	288/447	64.4%
At risk receiving DM preventive education	219/288	76.0%
At risk receiving referral to clinic	77/288	26.7%
At risk receiving referral who came for f/u	15/77	19.5%

*The statistic is for the full sample of N=447.

Table 5

Summary Statistical Analyses of Comparisons of FWFHP Clinical Measures and Follow-up Measures
Abbreviations: NE- No entry

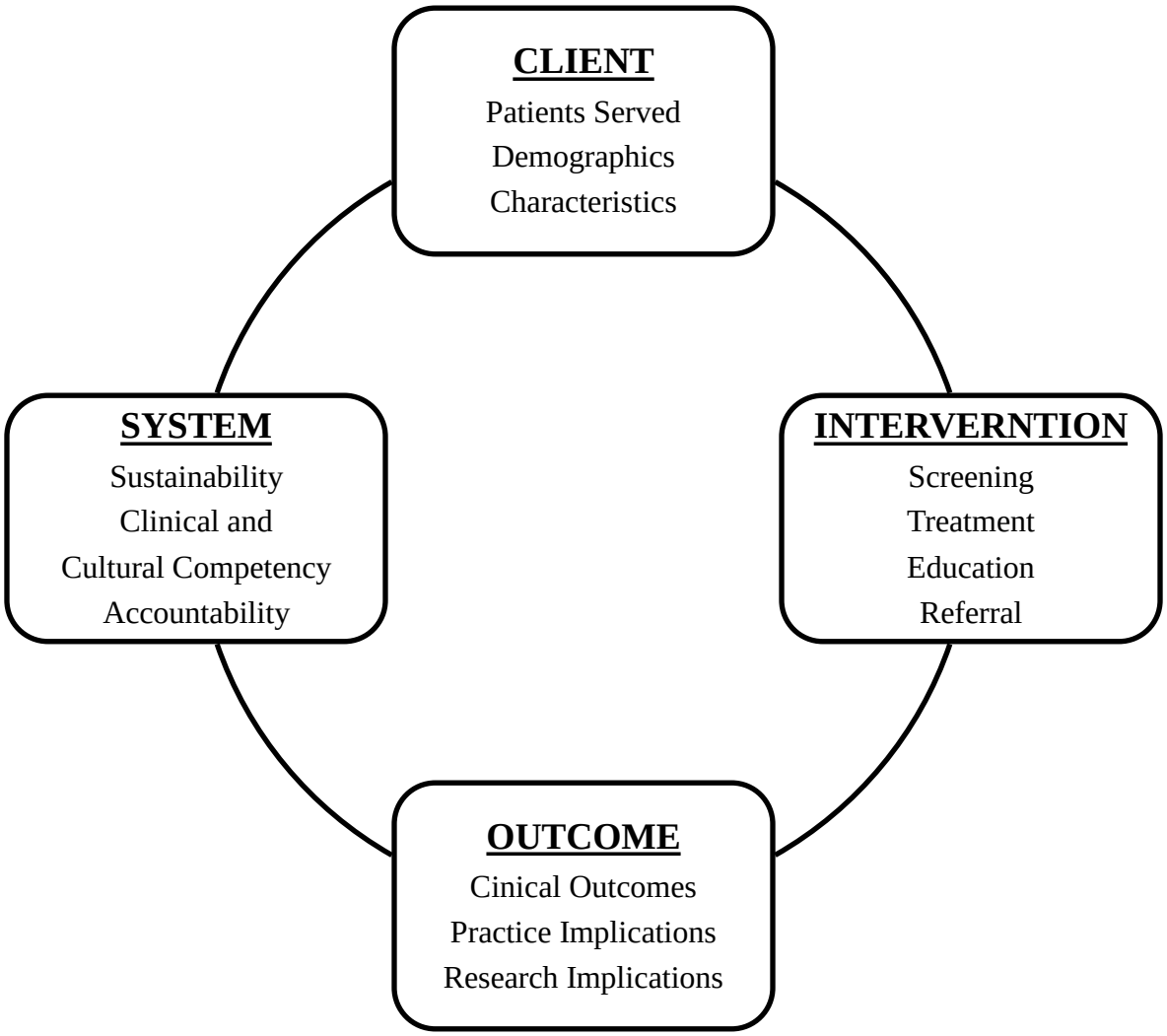
Code	Systolic Blood Pressure		Diastolic Blood Pressure		Body Mass Index		Blood Glucose		Weight	
	Date_1	Date_2	Date_1	Date_2	Date _1	Date_2	Date _1	Date_2	Date _1	Date_2
8	138	134	84	78	26.6	27.1	232	103	165	166
10	162	142	110	90	38.2	36	159	126	244	232
12	140	141	88	86	NE	NE	165	104	180	NE
24	135	139	84	84	27.2	28.2	156	NE	180	180
30	138	136	90	70	28	27.6	83	NE	158	156
36	122	133	85	79	27.3	NE	80	NE	162	NE
48	118	133	88	81	28.8	NE	159	NE	162	NE
52	140	163	90	102	NE	28.3	176	88	NE	160
53	130	151	86	77	31.8	NE	312	174	194	NE
54	130	148	82	103	26.2	NE	135	NE	132	NE
58	118	123	80	72	27.9	NE	195	109	171	NE
67	102	95	62	48	25.2	25	124	100	112	120
68	150	175	102	106	30	NE	120	NE	198	NE
72	146	120	74	80	33.2	NE	129	NE	198	NE
75	146	126	82	83	30	29.4	283	141	180	177

Variable	n	Mean difference (Baseline - Follow up)	95% Confidence Interval	Test (*p* value)
Systolic Blood Pressure	15	-2.933	-11.964, 6.097	Paired Samples *t* Test (*p*=.497)
Diastolic Blood Pressure	15	3.200	-2.992, 9.392	Paired Samples *t* Test (*p*=.286)
Body Mass Index	6	.317	-.838, 1.471	Related Samples Sign Test (*p*=.688)
Blood Glucose	8	87.625	48.989-126.261	Related Samples Sign Test (*p*=.008)
Weight	6	1.333	-5.489, 8.156	Related Samples Sign Test (*p*=1.00)

Appendix B

Figure 1

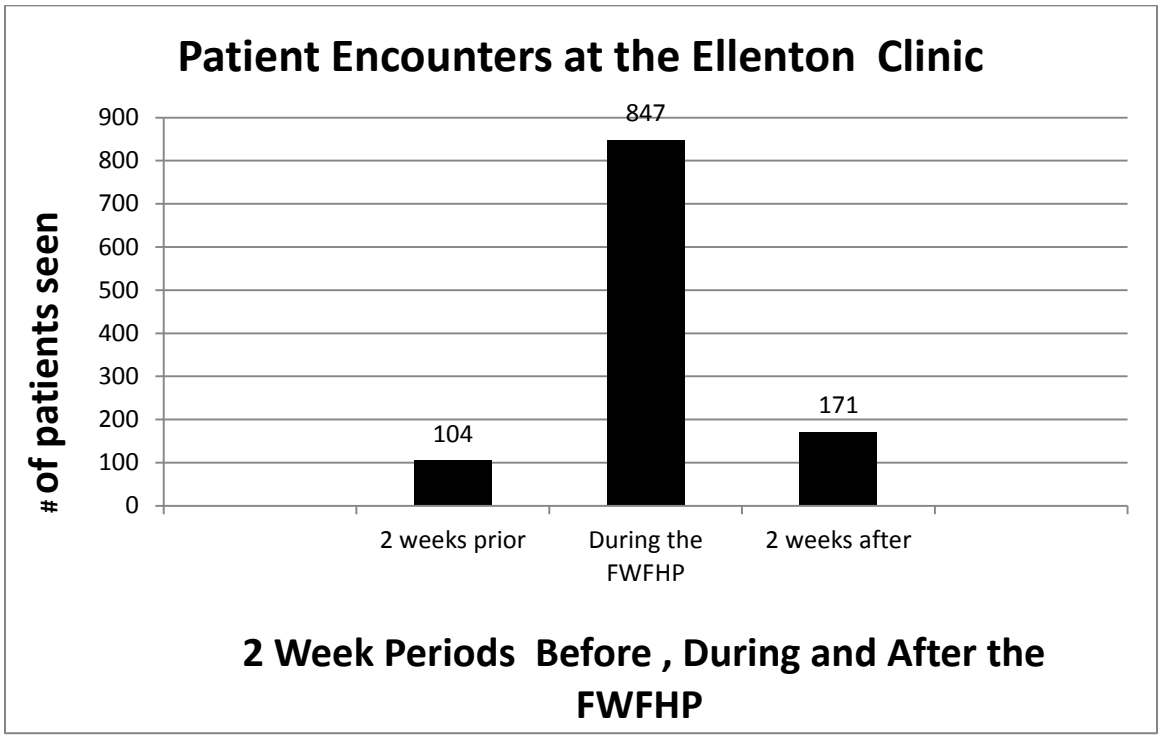
Conceptual Model



Adapted from the Quality Health Outcomes Model (Mitchell, P., & Lang, N., 2004)

Figure 2

Total Patient Encounters at the MHC 2 Weeks Prior, During and 2 Weeks Following the 2012 FWFHP



Appendix C

Questionnaire

Interview Questions for Migrant Health Clinic Director for Determining Costs Associated with the FWFHP.

Introductory statement: Your thoughts are valuable in helping to determine how the Farmworker Family Health Program (FWFHP) affects the health of farm worker families and also how the program helps your clinic in its goal of improving the health of the farmworker community. We would like to determine any extra costs realized by your clinic in preparation, during and after the FWFHP. We also wish to determine what benefits result from the FWFHP which offset some of these costs.

1. Have you participated in the FWFHP before?

2. If yes, how many times?

3. How do you feel the FWFHP helps your clinic serve the migrant worker families in this region?

4. Do you think the FWFHP addresses health issues and problems which you feel are important for the migrant workers and their families?

5. Do you think the presence of the FWFHP brings additional public attention to migrant health issues in your community? If yes, in what ways? Do you think this attention is beneficial to your clinic? To the migrant worker community?

6. What activities require personnel time outside of their usual daily job descriptions?
   a. Before
   b. During
   c. After

7. How many hours are required from clinical staff?
   a. Before
   b. During
   c. After

8. How many hours are required from administrative staff?
   a. Before
   b. During
   c. After

9. What extra supplies are required? (for example: medications, laboratory supplies, office
   supplies) Can you estimate the cost of these?

10. What are the costs related to the mobile clinic van getting to and from the FWFHP
    camps?

11. In the past, The FWFHP has seen from 700-1000 patients during the 2 week period. These patients are seen free of charge. How does this affect your clinic financially?

12. Is there any loss of patient revenue related to the FWFHP?

13. Can you describe how any extra costs associated with the FWFHP are offset by beneficial activities that might not otherwise occur?

14. Is there a specific health issue you think the FWFHP should address in more detail?

15. If yes, why is this important to your clinic or to your community?

16. Are there any activities the FWFHP should add in order to increase the reach of health
    services to the migrant families in this community?

Appendix D

Consent form for the Structured Interview

Consent of an Adult to Be in a Research Study

In this form "you" means a person 18 years of age or older who is being asked to volunteer to participate in this study.

In this form “we” means the researchers and staff involved in running this study at the University of Virginia.

Participant’s Name_____

Principal Investigator:
Marianne Baernholdt RN PhD
University of Virginia School of Nursing
202 Jeanette Lancaster Way
Charlottesville, VA 22903-3388
(434) 924-2254

Sponsor: UVa Center for Global Health

What is the purpose of this form?

This form will help you decide if you want to be in the research study. You need to be informed about the study, before you can decide if you want to be in it. You do not have to be in the study if you do not want to. You should have all your questions answered before you give your permission or consent to be in the study.

Please read this form carefully. If you want to be in the study, you will need to sign this form. You will get a copy of this signed form.

Who is funding this study?

This study is supported financially by a grant from the University of Virginia Center for Global Health.

Why is this research being done?

The purpose of this study is to evaluate how the Farmworker Family Health Program (FWFHP) achieves its goals of increasing access to care, identification of chronic diseases and prevention of progression of disease.

Up to 681 people will be included in this study. For the interview portion of this study, only one person will be in this study.

We would also like to determine an estimate of costs realized by your clinic related to the presence of the FWFHP and possible benefits.

How long will this study take?

Your participation will require 1 study visit, which will take approximately 45-60 minutes.

What will happen if you are in the study?

If you agree to participate, you will sign this consent form before any study related procedures take place.

During this study, you will participate in a structured interview with the study coordinator, Mary Winston. Questions will be asked concerning costs associated with the presence of the FWFHP. These costs include additional supplies, equipment use and staff time. You will also be asked about perceived benefits of the FWFHP.

This interview will take about 45-60 minute minutes.

What are the risks of being in this study?

There is only a very small risk that someone might see your private information.

If you want to know about the results before the study is done:

The final results of the research will not be known until all of the information is reviewed. At that time you can ask for more information about the study results.

Could you be helped by being in this study?

You will not benefit from being in this study. However the information researchers get from this study may help others in the future.

What are your other choices if you do not join this study?

You do not have to participate. You may read the questions prior to making your decision and decline to participate if you chose. You may also choose to participate but decline to answer one or more of the questions posed. You may choose to withdraw at any time during the interview by asking the interviewer to stop. All written notes form the interview will be destroyed and not reported if you choose to withdraw. There will be no penalties if you chose to withdraw.

If you are an employee of UVa your job will not be affected if you decide not to participate in this study.

If you are a student at UVa, your grades will not be affected if you decide not to participate in this study.

Will you be paid for being in this study?

You will not get any money for being in this study.

Will being in this study cost you any money?

Being in this study will not cost you any money. You will be responsible for the cost of travel to come to any study visit and for any parking costs.

What if you are hurt in this study?

If you are hurt as a result of being in this study, there are no plans to pay you for medical expenses, lost wages, disability, or discomfort. The charges for any medical treatment you receive will be billed to your insurance. You will be responsible for any amount your insurance does not cover. You do not give up any legal rights, such as seeking compensation for injury, by signing this form.

What happens if you leave the study early?

You can change your mind about being in the study any time. You can agree to be in the study now and change your mind later. If you decide to stop, please tell us right away.

Even if you do not change your mind, the study leader can take you out of the study. Some of the reasons for doing so may include

a) You do not follow instructions
b) The study sponsor closes the study for safety, administrative or other reasons

How will your personal information be shared?

The UVa researchers are asking for your permission to gather, use and share information about you for this study. If you decide not to give your permission, you cannot be in this study.

If you sign this form, we may collect any or all of the following information about you:

No personal information will be collected for the study. Your name and signature will be on the consent form, but will not be noted anywhere in the data collection or report.

Who will see your private information?

- The researchers to make sure they can conduct the study appropriately, observe the effects of the study and understand its results
- People or committees that oversee the study to make sure it is conducted correctly
- People who evaluate study results

The information collected from you might be published in a medical journal. This would be done in a way that protects your privacy. Because of the nature of the data your identity may be possible to construe. However, your data will be reported in a way that will not identify you or your organization. The information you give will be handled confidentially.

What if you sign the form but then decide you don't want your private information shared?

You can change your mind at any time. Your permission does not end unless you cancel it. To cancel it, please send a letter to the researchers listed on this form. Then you will no longer be in the study. UVa researchers will do everything possible to protect your privacy.

However, they will need to share your information with people outside of UVa who may not have to follow the federal Privacy Rule. Some of those people may be allowed to share/release your information without your permission.

The information collected about you will be kept confidential by UVa as required by the federal Privacy Rule. Your information will not be released outside of UVa unless it is permitted by law.

Please contact the researchers listed below to:

- Obtain more information about the study
- Ask a question about the study procedures or treatments
- Report an illness, injury, or other problem (you may also need to tell your regular doctors)
- Leave the study before it is finished
- Express a concern about the study

Principal Investigator:
Marianne Baernholdt RN PhD
University of Virginia School of Nursing
202 Jeanette Lancaster Way
Charlottesville, VA 22903-3388
(434) 924-2254

Study Coordinator:
Mary Winston RN MSN DNP Student
University of Virginia School of Nursing
202 Jeanette Lancaster Way
Charlottesville, VA 22903-3388
(540) 230-4044

What if you have a concern about a study?

You may also report a concern about a study or ask questions about your rights as a research subject by contacting the Institutional Review Board listed below.

University of Virginia Institutional Review Board for Health Sciences Research
PO Box 800483
Charlottesville, Virginia 22908

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When you call or write about a concern, please give as much information as you can. Include the name of the study leader, the IRB-HSR Number (at the top of this form), and details about the problem. This will help officials look into your concern. When reporting a concern, you do not have to give your name.

Signatures

What does your signature mean?
Before you sign this form, please ask questions about any part of this study that is not clear to you. Your signature below means that you have received this information and all your questions have been answered. If you sign the form it means that you agree to join the study. You will receive a copy of this document after you have signed it.

Consent From Adult

_____	_____	_____
PARTICIPANT (SIGNATURE)	PARTICIPANT (PRINT)	DATE

Person Obtaining Consent

By signing below you confirm that you have fully explained this study to the potential subject, allowed them time to read the consent or have the consent read to them, and have answered all their questions.

_____	_____	_____
PERSON OBTAINING CONSENT (SIGNATURE)	PERSON OBTAINING CONSENT (PRINT)	DATE

Appendix E

Capstone Manuscript for Journal Publication

Addressing Challenges to Providing Health Care in a Short Term Medical Mission: Diabetes Outcomes in Migrant Farmworkers

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Abstract

Purpose:

The purpose of this study was to perform a program evaluation of the Farmworker Family Health Program (FWFHP), an annual 2 week service learning trip serving migrant and seasonal farmworkers (MSFWs). An additional objective was to add to the body of knowledge concerning health care delivered in the setting of a short term medical mission (STMM).

Design:

A mixed methods case study design using was employed to describe how the FWFHP assures clinical and cultural competencies, sustainability and accountability, and to analyze diabetes outcomes. The setting was the 2012 FWFHP. The sample included the FWFHP system and 447 adult MSFWs.

Results:

Multiple structures were in place in place which promoted clinical and cultural competencies, sustainability and accountability. Sixty-four percent (288/447) of adult patients were at risk for diabetes (DM). Seventy-six percent (219/288) of those with risk received preventive education. Fifteen of the 77 MSFWs who received referrals (19.5%; 15/77) returned for follow up. Follow up occurred more frequently in outreach venues. Blood glucoses were significantly lower at follow up compared to initial levels at the FWFHP (p=0.008, n=8).

Conclusions/Implications for Practice:

The FWFHP model can be adapted for use by STMM organizers in structuring their programs. Findings concerning the small number of farmworkers who followed up

have relevance for all STMMs. Factors affecting access to follow up care such as distance, cost and transportation should be considered when planning all STMM health care. Strategies for removing these barriers as well as ongoing research on whether patients receive appropriate care over time are needed.

Key words: migrant, mobile clinic, outreach, Latino, short term medical mission, medical brigade, diabetes risk, outcomes

Addressing Challenges to Providing Health Care in a Short Term Medical Mission: Diabetes Outcomes in Migrant Farmworkers

Introduction

Migrant and seasonal farmworkers (MSFWs) have been recognized as a vulnerable, medically underserved population for many reasons. Contributing factors include the inherent hazards in agricultural work combined with cultural and socioeconomic factors such as lack of English proficiency, poverty and limited health resources in rural areas where MSFWs reside and work (Schmalzried and Fallon, 2012; Luque & Castañeda, 2012). Threatening political and legal climates related to immigration laws restrict movement of migrant workers and can create additional access barriers to receiving health care (Galewitz, 2012).

Poor access to health care exacerbates chronic health conditions and further contributes to health disparities known to affect minority populations. For example, diabetes is emerging as a world-wide pandemic disproportionately affecting populations in low and middle income countries and is associated with high morbidity and mortality rates when untreated (WHO | Diabetes, n.d.). The disease is known to disproportionately affect Latinos who make up the majority of the United States (US) migrant labor workforce (Center for Disease Control, n.d.; Carroll, Georges & Saltz, 2011). A 2011 survey of federally qualified community health centers and other migrant health organizations in Florida, Alabama, Georgia and Mississippi ranked diabetes second in health conditions seen in MSFWs (Sologaistoa, 2012). Diabetes was ranked fourth in a self-reported health concerns survey administered to MSFWs in a region in southern Georgia (Luque et al., 2012).

Barriers for MSFWs in accessing timely health care can be assuaged by providing low cost health care through mobile migrant clinics located in or nearby migrant farm camps (Luque & Castañeda, 2012; Schmalzried and Fallon, 2012). The Farmworker Family Health Program (FWFHP) provides health services to MSFW families via mobile clinics during an annual two week service learning trip (Conner, Layne &Thomisee, 2010; Connor, Rainer, Simcox & Thomisee, 2007; Wilson, Wold & Pittman, 2000). A school of nursing located in the southeastern US is the lead institution and the health care team consists of volunteers, faculty and students from regional universities and colleges representing diverse health disciplines (Wold & Rhein, n.d.). Diabetes is one of the chronic health problems targeted in the program (Conner et al., 2010).

Although the nurse led 2 week FWFHP is focused on addressing the health needs of MSFW families in the south eastern US, the program shares similarities with international health initiatives where care is provided to underserved populations in short term time frames. These programs are sometimes called medical trips or short term medical missions (STMMs). Though intent is commendable and in many cases action is necessary and beneficent, delivery of healthcare in STMMs carries responsibilities which go beyond showing up with manpower, supplies and good will. Benefits to participating providers and students are widely acknowledged but many challenges to providing health care in these settings have been identified (Langowski & Iltis, 2011; Welling, Ryan, Burris & Rich, 2010). These challenges stem from sustainability issues such as insufficient collaboration between STMM organizers and localities that can produce differing perceptions concerning local health needs and result in care that lacks relevance

(DeCamp, 2011; Suchdev, Ahrens, Click, Macklin et al., 2007). Cultural and language differences between providers and communities served can create barriers to effective communication and result in unsafe practices (Langowski & Iltis, 2011). If provisions for follow up are inadequate and no legal contract with local health care agencies exists, STMM team members may not be held accountable for their actions after they depart for their homes (Welling et al., 2010; Holmgren & Benzian, 2011).

STMMs have also been criticized for failure to perform regular evaluations to assess quality and determine if program goals are being achieved (Bourdeaux, Lawry, Bonventre & Burkle, 2010; Reaves, Schor, & Burkle, 2008; Drifmeyer, 2003; Maki, Qualls, White, Kleefield & Crone, 2008; Martiniuk, Manouchehrian, Negin & ZWI, 2012). Luque and Castañeda (2012) have described a paucity of rigorous evaluations of mobile migrant health clinics including those structured as STMMs. Reports on diabetes care given in STMMs are absent in the literature despite the fact that the disease disproportionately affects populations in regions where most STMMs operate. Nurses frequently contribute their knowledge and expertise in STMMs as caring for vulnerable populations is a core value in the profession but few empiric studies emanate from the profession concerning patient outcomes related to their STMM activities.

Methodology

The purpose of this study was to address persistent knowledge gaps concerning health care given in STMMs. A mixed methods case study was employed to describe structures of the nurse led FWFHP which assure clinical and cultural competency, sustainability and accountability in this setting. Since Latinos are known to be disproportionately affected by diabetes, a chronic disease associated with high morbidity

and mortality when untreated or undertreated, outcomes of diabetes care given at the FWFHP evening clinics were chosen for this analysis. There were four data sources: observations by the author during the 2012 program, existing data from medical records and a de-identified data base, and a structured interview. The setting was the 2012 FWFHP. The sample was the 2012 FWFHP health care providers (faculty, students, MHC personnel and volunteers) and 447 adult patients seen at the night camp clinics. The sample for the interview was a senior clinician at the local collaborating MHC (n=1).

The Quality Health Outcomes Model (QHOM) was used to frame and organize this study. The model builds upon Donabedian's linear Structure, Process, Outcome Model by including constructs which promote analysis of dynamic reciprocal relationships between health systems, their interventions and clients, and how these interactions affect outcomes. The four constructs of the QHOM are System, Intervention, Client and Outcome (Mitchell & Lang, 2004). Four research questions were considered in this study organized by the constructs of the QHOM.

System

5. What structures of the FWFHP assure sustainability, clinical and cultural competence and accountability?

Sustainability was defined as FWFHP system structures that assure program longevity measured by the presence of leadership, commitment to the target community, partnerships with agencies sharing similar goals (Luque & Castañeda, 2012). Clinical competence was defined as FWFHP system structures that assure delivery of standard of health care measured by the presence of practice within legislated legal scopes for individual health care providers, the presence of student supervision, adherence to

procedures as outlined in the FWFHP procedure manual and practice protocols. Cultural competence was defined as system structures that assure proficiency in delivery of health care within the Latino MSFW context measured by the presence of proficient communication with non-English speakers and evidence of training that fosters respect for farmworker health beliefs and awareness of ethical issues unique to farmworker health (Nunez & Robertson, 2006). Accountability was defined as system structures that assure answerability to the community measured by the presence of community benefit, fiscal responsibility, access to follow up care and patient outcomes evaluation (Emanuel & Emanuel, 1996). Data sources were the author's observations during the 2012 and FWFHP an interview with a senior MHC clinician. Data were extracted from the author's notes taken while observing and summarized in narrative form.

Client

6. What are the demographics of the population served at the FWFHP mobile evening clinics?

Descriptive client characteristics were demographics defined as age, gender, country of origin and ethnicity. Data were extracted from the FWFHP de-identified database and percentages, means, medians and standard deviations (SD) were calculated.

Intervention

7. What are the processes for screening adult patients in the mobile clinics for diabetes risks and for providing risk reduction education?

The intervention was defined as the processes used in screening patients for diabetes risk and providing diabetes care. Processes were measured by the presence of procedures consistent with American Diabetes Association (ADA) guidelines for identifying

individuals at risk for DM and providing initial lifestyle education (ADA, 2012). The author's observations during the 2012 FWFHP served as the data source. Data were extracted and summarized in a narrative.

Outcome

8. What diabetes outcomes result from FWFHP interventions?

The diabetes outcomes explored included the percentage of at risk individuals in the population, the rates at which risk reduction education and referral for follow up care were given to patients at risk, and the actual follow up rate. Diabetes risk was measured as presence of Latino ethnicity plus body mass index (BM)I $\geq$25 or elevated blood pressure (BP) (BP$\geq$140/90 or on therapy for HTN), presence of age $\geq$ 45 (ADA, 2012) or abnormal blood glucose (BG) level ($\geq$ 140) (Woerle et al., 2006). Diabetes care was measured by the presence of diabetes risk reduction education. Data concerning population at risk and population at risk receiving education were extracted from the de-identified database; percentages were then calculated. Data concerning patients at risk receiving referrals were obtained through retrospective review of paper based medical records from the 2012 FWFHP. Percentage at risk receiving referral was calculated. Data concerning follow up rate after the FWFHP was extracted from medical records at the collaborating MHC. Follow up was tracked for 9 months after the 2012 FWFHP. A comparison of baseline and follow up BP BG, weight and BMI differences was conducted.

Data Analysis

Data entry and analysis were conducted using narrative summaries Microsoft Excel 2010 and IBM SPSS Statistics v.20. The paired-sample *t*-test was used to test for

changes in baseline and follow-up BP (n=15). The nonparametric Related Samples Sign Test was used to test for pre-post changes in weight (n=6), BMI (n=6), and blood glucose (n=8). A significance level of less than 0.05 was used for all tests.

Results

System

2. What structures of the FWFHP assure sustainability, clinical and cultural competence and accountability?

Sustainability.

As of 2012, the FWFHP has provided services to the farmworker community in SW Georgia over an annual two week period for 19 consecutive years with a school of nursing in the southeast US as the lead institution. There are multiple long term collaborations with agencies sharing intersecting goals of community service supporting this longevity. The 2012 FWFHP was comprised of faculty, students and volunteers from five health disciplines (nursing, pharmacy, dental hygiene, public health and physical therapy) from five educational institutions. Local partners include the MHC and its umbrella agency, the district department of health, an area health education center (AHEC), municipal agencies, churches and farm managers.

Clinical competency.

All faculty members, volunteer professionals and nurse practitioner students are licensed in the region to practice in their respective disciplines. In 2012, average faculty to student ratio was 1: 6 over the 2 week period allowing for constant supervision of all student activities. A procedure manual and practice protocols for common farmworker health problems are available to participating healthcare providers on site. Nurse

practitioner faculty and students provide care according to a practice agreement overseen by the health district's medical director which is consistent with state rules and regulations governing advanced nursing practice.

Cultural competency.

In preparation for participation in the, FWFHP graduate and under-graduate nursing students engage in educational activities concerning Latino farmworker culture and health. These pursuits are aimed at improving participant's knowledge of common health beliefs and health seeking behaviors of Latino farmworker families as well as therapeutic approaches in treating common farmworker health problems. Discussion of multiple barriers to health care experienced by MSFWs is a component of the pre-program curriculum. During the 2 week program medical interpretation is provided by volunteer certified medical interpreters and bilingual community health workers. While many program participants have medical and conversational Spanish fluency, training and proficiency testing in communicating with non-English speakers through medical interpreters is given. Additional educational activities aimed at fostering sensitivity to Latino farmworker culture and health continue throughout the 2 week program including farm tours, community health assessments and seminars regarding unique ethical considerations in MSFW health. Daily faculty guided multidisciplinary reflection groups provide a forum where students discuss their clinical experiences and strategize for improved healthcare delivery for this population.

Accountability.

The FWFHP` benefits the community by targeting many top chronic and acute farmworker family health concerns including DM, HTN, obesity, cervical cancer, dental

caries, anemia, infections, occupational problems and others. The annual program increases the number of patients the MHC can reach for preventive screening and treatment of many of these conditions. The number of FWFHP patient encounters enhance to the MHCs ability to achieve the 3000 required annual non-duplicated patients needed to secure continued federal funding. Thus the two week FWFHP further augments the MHC's ability to provide year round care to the MSFW community. Access to follow up care is facilitated by MHC staff present at the FWFHP evening clinics who coordinate appointments and transportation for farmworkers who are referred. An additional element in the domain of accountability is outcome evaluation. Student evaluations concerning their educational experiences are performed. Post program collaborative debriefing meetings to document successes and identify additional needs are regularly conducted.

Client

5. What are the demographics of the population served at the FWFHP mobile evening clinics?

Ethnicity was listed as "Latino" in 99.6% (445/447) of the adult population seen at the evening FWFHP clinics. Male gender was recorded in 94.2 % (421/447) of the population; 5.8% (26/447) was female. Mean age was 31.3 (SD= 9.33). Mexico was listed as country of origin by 97.5% (436/447) (Table 1).

Intervention

6. What were the processes for screening adult patients in the mobile clinics for diabetes risks and for providing diabetes education?

Screening for diabetes risk is initiated at admission where patient demographic information, past medical history (PMH) and medication history is recorded. Patients are then directed to stations where height, weight, BP and BG are measured. Patients are advised of results and directed to a NP student for further care for abnormal findings and any patient concerns. NP students then perform problem oriented histories and physical examinations related to risks and patient concerns, formulate plans, present findings and plans for faculty approval before implementation. Education for patients with DM risk consists of nutritional counseling aimed at reducing consumption of high fat, sodium, and glycemic index foods and beverages and suggestions on how to increase physical activity. Referrals to the MHC for further care are given based on patient histories, physical assessments and laboratory values. Activities are consistent with ADA guidelines (2012) for identifying DM risk and initial behavioral therapies.

Outcome

7. What diabetes outcomes result from FWFHP interventions?

There were missing data possibly related to patients self-selecting screening stations. Specifically, 22.8% (102/447) had no entry for BMI; 17% (76/447 had no entry for BG and 4.9% (22/447) had no entry for BP. One hundred percent of the population had age recorded. BMI was elevated in 58.3% (201/345) of the population with reported BMIs and 45% (201/447) of the total population. BG was elevated in 28.6% (106/371) of the population with reported BG and 23.7% (106/447) of the total population. BP was elevated in 20.2% (86/425) of the population with BP reported and 19.2% (86/447) of the total population. Age $\geq$ 45 was observed in 9.8% (44/447) of the population. A total of

64.4% (288/447) had identifiable risk for diabetes in addition to Latino ethnicity (Table 1).

Of the 288 farmworkers who had identifiable risks for diabetes 76% (219/288) received diabetes risk reduction education at the FWFHP evening camps and 26.7% (77/288) received referrals for follow up care at the MHC. Fifteen of the 77 (19.5 %) farmworkers identified with DM risks that were given referrals were seen for follow up care by MHC personnel prior to March 31, 2103 (Table 1). Follow up care occurred in two locations: in home visits and at the MHC. Nine of the 15 patients receiving follow up care were seen by community health workers during outreach visits in farmworker housing areas while six were seen at MHC. All 15 farmworkers who returned had BP taken both at the FWFHP and at follow up. Six patients had pre/post weights and BMIs; eight had pre/post BGs. There were no significant statistical differences in initial and follow up comparisons of BP, weight and BMI. All follow up BG levels were lower than those recorded at the FWFHP and differences were statistically significant (p=.008) (Table 2).

Discussion

Evidence has been provided that the FWFHP has multiple structures in place that assure sustainable, clinically and culturally competent, and accountable care resulting in benefit to the community served. STMMs have been criticized for failure to address these features as well as lacking meaningful outcomes evaluations. Nurses and other healthcare providers in global health leadership roles should advocate for a unified international approach in the design and adoption of standardized outcomes measures. Until standardized evaluation criteria are developed and widely adopted, it remains

incumbent upon program organizers and providers to seek empiric findings from similar programs and report their own outcomes. The FWFHP model for addressing sustainability, clinical and cultural competency, and accountability can be adapted for use in a variety of settings.

Demographic differences between FWFHP adults and MSFWs in the SE US were seen. Six percent of FWFHP adults were female compared to 20 % female in the south east (SE) US (Sologaistoa, 2012). Additional demographic differences between included country of origin (98% Mexican vs. 60% respectively) and ethnicity (99.5% Latino vs. 68%) (Sologaistoa, 2012). The differences observed in the FWFHP adult population compared to SE US may reflect possible access barriers for female non-Mexican and female MSFWs. Additional investigation into actual area farmworker demographics is needed. If indicated, development of strategies for removing barriers for women and non-Mexican MSFW's access to care is imperative.

The intervention, DM screening and initial treatment processes, was consistent with ADA standards for identifying DM risks and for initial healthy lifestyle therapies (ADA, 2012). Additional outreach services might include point of care diagnostic testing such as hemoglobin A1Cs for high risk individuals. This would allow definitive stratification of risk status such as diagnosis of DM, pre-diabetes or risk present but no evidence of disease. With this knowledge, providers might identify those needing referrals for follow-up with greater precision and give more individualized education. Patients would have more information concerning their health and perhaps be better equipped to make decisions concerning risk reduction and the necessity of follow-up care.

Risks for DM were identified in 64.4 % (288/447) of the FWFHP adults. This is consistent with findings in the literature regarding high rate of farmworker health care visits related to DM (Sologaistoa, 2012) and high rate of concern for DM expressed by farmworkers themselves (Luque et al, 2012). Elevated BMI was the most frequent risk factor in the population (58.3%). In view of the hard physical work the farmworkers perform for long hours most days of the week, the high frequency of elevated BMI is a surprising finding. There is a clear need for additional research on factors contributing to excess weight in MSFWs as well as community and workplace interventions directed at improved farmworker nutrition. Low food security has been associated with elevated BMI and obesity in low income Latinos (Leung, Williams & Villamor, 2012). Many farmworker's meals are restricted to what is available at the cantinas in their housing areas. These dietary limitations must be factored into nutritional education strategies.

Providing appropriate health information can be seen as the first step in promoting positive behavioral changes. Individuals who are made aware of their risks for DM through consultation with doctors and other health care providers are more likely to make healthy lifestyle changes compared to those who are not told of their risks (Okosun, Davis-Smith & Seale, 2012). Seventy-six percent (219/288) of farmworkers with DM risk received risk reduction education implying they were told of their risks. A 100% risk reduction education rate for those at risk would be ideal. However many farmworkers presenting for care during the FWFHP, though found to have risks for DM, have other problems as chief concerns. These competing priorities likely affect the risk reduction education rate. FWFHP providers should maintain awareness of the population's overall high risk for DM and give healthy lifestyle education whenever clinically feasible.

Referrals for follow-up care were given to 26.7% (77/288) of the farmworkers identified with DM risk. It is important to recognize that not all individuals found to be at risk necessarily needed referral. For example, Latino farmworkers with a BMI >25 as a single additional risk factor could be managed reasonably by informing them of their risk and providing health education aimed at weight loss with additional recommendations for annual surveillance. Fifteen farmworkers (15/77, 19.5%) who received referrals sought additional healthcare from MHC personnel during the follow-up period. A key finding is also the pattern where follow-up care was received. Of those that followed up, 60% (9/15) were seen by MHC outreach workers in their housing areas and 40% (6/15) were seen at the MHC. Trends reported here are important for recognition that barriers to health care persist after the FWFHP departs and continued outreach services are critical for farmworker access to health care. Continued investigation into viable solutions to removing these barriers is needed and/or expanding outreach services is needed.

FWFHP clinic and follow-up BG measurements were recorded in 53.3% (8/15) of the farmworkers who sought additional care. All BG levels were lower at follow-up and differences reached statistical significance (p=.008). It is possible that observed reductions in BG may have been secondary to behavioral changes which resulted from information provided at the FWFHP. It is also possible that differences were related to the timing of the tests. All baseline BGs were measured after 6:30 pm thus it was more likely that these were postprandial. Follow-up BGs are more likely to be fasting, as patients are instructed to fast for 8 hrs prior to having blood tests checked.

Diabetes is now emerging as a world-wide pandemic disproportionately affecting populations in low and middle income countries where most STMMs offer health care. Reports on diabetes care are absent in the literature on international STMMs. Clinical services aimed at identifying individuals with DM risk and providing them with information should be considered in STMM programs in areas where the disease is seen as a health priority. These activities have been proven to promote behavioral change which can result in improved population health. Factors affecting access to follow-up care for patients served in STMMs should be considered when planning all STMM health care.

Limitations

Missing data in the health records may limit conclusions concerning the number of farmworkers found to be at risk for DM. Also the small number of baseline and follow up clinical data sets in the subset of farmworkers who followed up limits the strength and generalizability of conclusions concerning the effect of risk reduction education on clinical outcomes. Possible inaccuracies in recording farm worker identifying information due to language differences or farmworker use of aliases could have limited access to follow up records. Additionally farmworkers may have migrated to other agricultural areas or returned home and sought care after relocating. As a result the follow up rate may be under-reported.

Conclusion

The nurse led FWFHP has multiple structures in place that assure sustainability, clinical and cultural competencies and accountability. Program providers successfully identify conditions associated with increased DM risk and provide appropriate initial

therapies. Findings concerning the follow-up rate have relevance for all STMMs in facilitation of follow-up care for their patients. The FWFHP model for health care delivery and the methodology used in this capstone can be adapted and used by STMM organizations in planning and evaluating their activities in a variety of international and domestic scenarios. Participation in STMMs will likely remain robust since these activities provide accessible and richly rewarding opportunities for volunteers from diverse healthcare disciplines. It is hoped that this study will inspire nurses to reflect upon their work in STMMs, empirically examine how their programs address common challenges to providing health care in these scenarios and publically share results.

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Table 1

Summary FWFHP *Demographic and Diabetes Outcome Statistics*

Variable	n/total	percent
Male	421/447	94.2%
Female	26/447	5.8%
Latino Ethnicity	445/447	99.6%
Country of Origin Mexico	436/447	97.5%
Other Country of Origin (Guatemala, USA, Puerto Rico, Honduras)	11/447	2.5%
Age $\geq$ 45	44/447	9.8%
Mean age: 31.3*		
Median age: 29*		
Standard Deviation: 9.33*		
Elevated BMI	201/345 201/447	58.3% 45%
Mean BMI 26.3*		
Median BMI: 25.7*		
Standard Deviation: 4.1*		
Elevated BP	86/425 86/447	20.2% 19.2%
Mean BP 125/78*		
Median BP: 122/80*		
Standard Deviation: 11.7/10.5*		
Elevated BG	106/371 106/447	28.6% 23.7%
Mean BG: 127*		
Median BG: 121*		
Standard Deviation: 42.8*		
1 or more risks for DM	288/447	64.4%
At risk receiving DM preventive education	219/288	76.0%
At risk receiving referral to clinic	77/288	26.7%
At risk receiving referral who came for f/u	15/77	19.5%

*The statistic is for the full sample N=447

Table 2

Summary Statistical Analyses of Comparisons of FWFHP *Clinical Measures and Follow-up Measures*

Variable	n	Mean difference (Baseline - Follow up)	95% Confidence Interval	Test (*p* value)
Systolic Blood Pressure	15	-2.933	-11.964, 6.097	Paired Samples *t* Test (*p*=.497)
Diastolic Blood Pressure	15	3.200	-2.992, 9.392	Paired Samples *t* Test (*p*=.286)
Body Mass Index	6	.317	-.838, 1.471	Related Samples Sign Test (*p*=.688)
Blood Glucose	8	87.625	48.989-126.261	Related Samples Sign Test (*p*=.008)
Weight	6	1.333	-5.489, 8.156	Related Samples Sign Test (*p*=1.00)

Appendix F

Author Guidelines for the Journal of Transcultural Nursing

Journal of Transcultural Nursing

A Forum for Cultural Competence in Health Care

Manuscript Submission Information for Authors

The *Journal of Transcultural Nursing* is the official journal of the Transcultural Nursing Society. It is a peer-reviewed, multidisciplinary journal that aims to advance the field of cross cultural nursing and healthcare. Its mission is to contribute new knowledge about the relationship between social and cultural factors related to healthcare, with a focus on improving care for persons of all cultures. Research reports, analysis and discussion articles, systematic reviews of the literature, theoretical articles, clinical applications, and analytical case studies are desired. The journal is a member of the Committee on Publication Ethics (COPE).

Departments

Manuscripts must be original, unpublished works submitted for the exclusive use of the JTN in accordance with these guidelines. Manuscripts must be submitted via SageTrack, an online submission system.Guidelines must be followed exactly. JTN encourages submission of original research reports that contribute to expanding the body of knowledge of transcultural nursing and health care. Systematic and analytic reviews of the literature, theoretical articles, clinical applications, and analytical case studies are also desired. International submissions are highly encouraged. Submission of manuscripts to one of the following departments are encouraged:

· **Theory**

Manuscripts concerning theory design, construction, development, utilization, application and critique will be presented in this department. Of interest are theories related to transcultural nursing, relationships between culture and health care, including ethnopharmacology or ethnonutrition, anthropological or cross-cultural patterning of health care beliefs and practices, inter- and intra- cultural communication, or transcultural ethics. In addition, manuscripts discussing organizational, technological, political or economic theories that influence health care delivery to specific cultural groups are encouraged. Articles discussing the application of nursing theories to transcultural nursing are also suitable for submission.

· **Research**

Research studies that expand the body of knowledge of transcultural nursing and health care as a human science will be included in this department. Studies will be considered that utilize such qualitative methodologies as: ethnography, ethnonursing, grounded theory, phenomenology,

oral/life histories, critical theory, focus group methods, hermeneutics, participant observation, case study analysis, pattern recognition, or other innovative methods that relate the dynamics of culture to health care. Additionally, studies that utilize a variety of quantitative methodologies to investigate transcultural nursing and health care phenomena are also welcomed. Discussion and/or analytical articles on such topics as instrument development or themes related to the conduction of research on these phenomena are likewise encouraged. Publication of research studies requires a letter of approval from a Human Subjects Committee (IRB) at the time of manuscript submission. Processing of the manuscript will not begin until the IRB approval letter is received.

It is highly recommended to follow publishing guidelines recommended by the National Institute of Health, National Library of Medicine (http://www.nlm.nih.gov/services/research_report_guide.html) to "specify a minimum set of items required for a clear and transparent account of what was done and what was found in a research study, reflecting, in particular, issues that might introduce bias into the research" (adapted from the EQUATOR Network Resource Centre). This may include (but not limited to) the following:

1. CONSORT: Consolidated Standards of Reporting Trials

2. STROBE: STrengthening the Reporting of OBservational studies in Epidemiology

3. PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

4. MOOSE: Meta-analysis of Observational Studies in Epidemiology

5. QUOROM: QUality Of Reporting Of Meta-analyses

· **Education**

Manuscripts included in this department aim to promote the understanding of the sociocultural context of the nursing educational structure, processes and outcomes. Topics may focus on the organizational culture of schools, teacher/student /client relationships, teaching methods, learning and cognitive styles, curricular designs, evaluation strategies and academic outcomes. Additionally, content focusing on extra-curricular strategies such as recruitment, advisement, peer support, financial aid and mentoring are invited. Topics relevant to teacher training and development are also solicited. Subject content may pertain to any aspect of the educational experience in the undergraduate or graduate levels, or in any setting, including clinical practice, which emphasizes the linkage between culture and education.

· **Clinical Practice**

The focus of this department is to explicate the sociocultural context and universal and variant patterns influencing the delivery of nursing and health care. Examples of topics suitable for this department include culturally defined health beliefs and values, folk and professional models of health care delivery, practitioner/client interactions, family and community roles, or health care

outcomes. Specific content areas may include cultural variations in symptom management, birth or death rituals, use of home remedies, dietary considerations, cultural assessment tools, cultural conflict resolution, use of interpreters in the clinical setting, organizational culture of health care settings, ethical-legal conflicts, or other practice-related subjects. Case studies must include the following: statement and significance of the problem, a brief review of the literature, presentation of the case study, discussion and analysis of the case study within the cultural context, conclusions, recommendations for practice and references.

· **International**

This department will highlight themes and examples of international collaborative practice, education, research and consultation. This department will serve as an international forum for nurses and other health care disciplines to share expertise, knowledge, opinions and experience with nurses and health care professionals throughout the world.

· **Informational Resources**

Methods of accessing information concerning transcultural nursing or health care will be the major emphasis of this department. Articles regarding library searches, web page listings, internet resources, computer software packages and topics on informatics related to the journal's subject matter are encouraged. In addition, book reviews, critiques of videotapes or educational materials, annotated bibliographies and similar brief reports are welcomed.

Style

· Manuscripts should be prepared in accordance with the guidelines set forth in the Publication Manual of the American Psychological Association, 6th edition.

· Manuscripts, including abstracts and references, should be double-spaced, using 12-pt font type, left justified margins, one-inch margins on all sides.

· No identifying information about the author(s) should be on the body of the paper, abstract, or figures.

· A short heading and page number should be typed on each page.

· Manuscripts should not exceed 15 pages, excluding references, tables and figures.

· Each table, figure, graph etc. should have its relative placement noted within the text.

· Tables should be typed one to a page with any notes/legends typed on the same page.

· Tables should be numbered, titled, typed double-spaced, tab delineated, and without use of lines.

· Figures should be submitted digitally. Label each figure with its number and legend.

· Graphs or figures should NOT use gray-scaling or shading, but rather use hatch markings to demonstrate differences.

· Each figure, graph or drawing should be on a single page with its number, title and legend or caption typed on the same page.

· All tables, figures, graphs and drawings should follow the reference list, not placed within the text.

· If English is a second language, it is highly recommended to have article reviewed by an editor before submission.

Format

· **Cover letter**

A cover letter must accompany all manuscripts and should follow APA format and should state that the material has not been published elsewhere and that it is not under consideration at any other journal.

· **Title page**

A title page must accompany all manuscripts. Include the following for all authors: title, names of authors in the order to be listed, complete credentials, position titles, affiliations, and contact information (address, phone, fax, email). Indicate the corresponding author with an asterisk (*). Author names should appear only on title page, **not on any other page headings**. A secondary title page listing only the title must also be included. The title page must be submitted as a separate electronic file, not on the same file as the manuscript.

· **Permissions**

Written permission from the copyright holder must be submitted for any of the following: all figures, tables, or graphics taken from another author's work; quotations of 300 words or more from any academic journal or book, or for use of quotations of ANY length from newspapers, magazines, poems, songs or movies or any other previously copyrighted information. If a payment for permission to reprint is required, it will be the author's responsibility to pay all fees prior to publication and submit evidence of such payment to the editor.

Permissions must be included at the time of submission and must give permission to Sage Publications, Inc. to reproduce the material. Permissions should be scanned or copied into a file and uploaded as a "Supplementary file not for review". Permissions must include both print and electronic publication.

After a paper is accepted, the corresponding author will be prompted to complete an online copyright agreement.

NOTE: Do not pay fees until the manuscript has been accepted and scheduled for publication.

· **Acknowledgements**

Acknowledgements should be uploaded as a separate file. Acknowledgements include recognition of grant funding and appreciation to reviewers or colleagues and mentors. Please add this as a "supplemental file not for review" and upload it as directed in Manuscript Central.

· **Abstracts**

All manuscripts, except Letters to the Editor or Commentaries, should be accompanied by an abstract of no more than 150 words. Abstract headings for research articles are: purpose (include background and significance); design (include population, sample, setting; methods, including measures, and intervention if applicable), findings/results, discussion and conclusions, and implications for practice.

· **Review and Action**

Authors are notified when the manuscripts are received. Manuscripts are examined by the editorial staff and peer reviewed by at least two reviewers drawn from our editorial board and panel of peer reviewers. Authors are sent the comments from the reviewers but the manuscripts are not returned to the authors. The journal reserves the right to edit all manuscripts to its style and space requirements.