

Meeting the Health Care Needs of a Rural Hispanic Migrant Population With Diabetes

Loretta Heuer, PhD, RN;^{1,2} Carla W. Hess, PhD;³ and Marilyn G. Klug, PhD⁴

ABSTRACT: *Context:* There is a need for models of health care that provide accessible, culturally appropriate, quality services to the population of Hispanic migrant farmworkers at risk for or diagnosed with diabetes. *Purposes:* The purposes of this study were to describe the Migrant Health Service, Inc (MHSI), Diabetes Program, the conceptual model on which it is based, and 4 types of outcomes achieved over a 3-year period. *Methods:* Types and amounts of medical services and education were studied. Qualitative data obtained from program records and documents were analyzed to determine the nature of the program. Quantitative data were used to measure outcomes of the program. *Findings:* The multiple-component MHSI Diabetes Program is addressing economic, cultural, and language barriers experienced by the target population. The program provides a continuum of health services and education that meet American Diabetes Association (ADA) Clinical Practice Recommendations on diabetes. The program exposes regional health care professionals and university students from numerous academic disciplines to Hispanic farmworker culture. *Conclusions:* Evidence-based program management, patient care, and program evaluation are traits of this program, which offers accessible, culturally appropriate, quality health services and education to Hispanic farmworkers. The multicomponent program model has high potential for positively impacting the health of the target population.

those states.⁴ Minnesota has the highest rate of growth, a 141.7% increase in the Latino percentage of the total state population compared with an increase of 12.4% in the general population of the state over the decade 1990–2000.⁴ In North Dakota, similar comparisons showed a 71.4% growth in the Latino population, whereas the overall state population grew by 0.5%.⁴ Such growth has placed unprecedented pressure on health care systems to provide services to this population of Americans who represent the ethnic/racial group with the lowest rate of insurance in the United States⁵ and the highest rate of diabetes complications such as kidney disease, eye disease, and peripheral vascular disease.¹

Minnesota and North Dakota are rural, agricultural states that depend on the Hispanic migrant population as a source of seasonal farmworkers. Hispanic migrant farmworkers are essential to agriculture, yet they rank among the most disadvantaged, medically underserved populations in the United States.⁶

The acute and chronic health problems of the Hispanic migrant farmworkers pose special challenges to health care professionals because of transient lifestyles, poverty, lack of resources, and occupational risks in the fields and factories. Although chronic conditions such as diabetes, hypertension, and arthritis are prevalent in this population, quality health care is often limited.

Hispanic Americans are the second-largest and fastest growing minority group in the United States. It is estimated that by year 2050, Hispanics will number 97 million and constitute 25% of the US population.¹ In 2000, about 2 million (10.2%) of all Hispanics had been diagnosed with diabetes.² The prevalence of type 2 diabetes among the Hispanic population in the United States is estimated to be 3 to 5 times greater than that of the general population.³

In the Midwestern states, the number of Hispanics is growing far faster than the general populations of

¹College of Nursing, University of North Dakota, Grand Forks, ND.

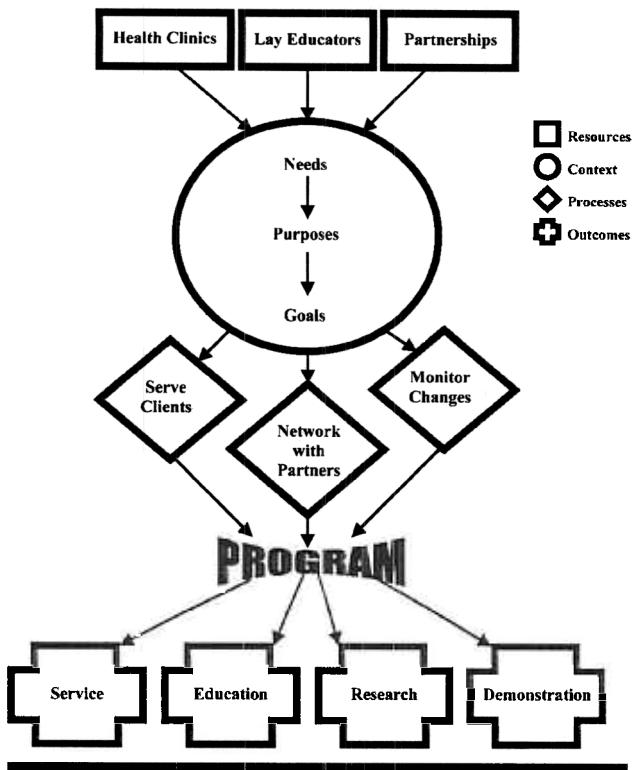
²Migrant Health Service, Inc., Moorhead, MN.

³HB Associates, Grand Forks, ND.

⁴School of Medicine, University of North Dakota, Grand Forks, ND.

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Conceptual model of the MHSI Diabetes Program.



Statement of the Problem

The development of comprehensive models that address the health care and health education needs of the Hispanic migrant population have been slow to emerge. Even more rare are models that address barriers such as language, economics, educational levels, family values, and cultural beliefs that inhibit provision of quality health care services to this population. For example, when monolingual, Spanish-speaking individuals seek health care, there are language barriers to effective treatment. Further, there is little understanding by most health care providers of the roles for Hispanic family members and traditional medicinal practices. One program specifically designed to address these barriers while providing health care and diabetes education to Hispanic migrant farmworkers is the Migrant Health Service, Inc (MHSI), Diabetes Program.

Purposes of This Study

The purposes of this study were (1) to describe the MHSI Diabetes Program, and (2) to identify the health

care, diabetes education, research, and demonstration outcomes of the program.

MHSI Diabetes Program. MHSI of Moorhead, Minnesota, began providing health care to Hispanic migrant farmworkers and their families in 1973. Over the years, MHSI has provided direct services through extensive voucher agreements with more than 400 health providers in Minnesota and North Dakota. MHSI also provides access to health care and education for the Hispanic migrant population through the operation of (1) 3 seasonal, satellite, nurse-managed health centers; (2) 2 seasonal mobile units (open 2 to 5 months a year); and (3) 4 primary centers operating on a year-round basis. These 9 health centers serve migrant farmworkers over an area that includes all or parts of 30 counties spanning 447 linear miles from southern Minnesota to northeastern North Dakota. Each MHSI nurse-managed health center is staffed with seasonal nurse(s), midlevels at year-round sites, bilingual health outreach workers, and an office manager. In 2001 the MHSI staff provided services to 6,400 patients during 27,196 visits.

In 1998 MHSI piloted a diabetes program in 6 nurse-managed health centers located in northern Minnesota and North Dakota. In 1999 the program was revised and expanded to all 9 MHSI nurse-managed health centers. In 2000 diabetes lay educators (DLEs) were incorporated into the base MHSI Diabetes Program. These DLEs provide support group meetings and diabetes education in Minnesota and North Dakota from April to September. They then return to their homes in southern Texas where they continue to provide support group meetings and home visits to their migrant clients from October through March.

Each season in Minnesota and North Dakota, MHSI staff members provide health and educational services to more than 600 migrant farmworkers with diabetes. In August 2003 an MHSI Diabetes Registry included 1,579 of these MHSI patients, with more than 600 registrants now being added annually.

The conceptual model for the MHSI Diabetes Program is shown in the Figure. That figure depicts the relationships among 4 types of key programmatic components: context, resources, processes, and outcomes. This study addressed these 4 components.

Context of the MHSI Diabetes Program. The MHSI Diabetes Program exists within the national context of needs to (1) reduce the elevated mortality rate and high medical costs associated with diabetes in the Hispanic population; and (2) provide access to quality, culturally sensitive health care services accompanied by effective patient self-management. The 5 major program goals are to (1) provide preventive diabetes screening and

education for MHSI patients; (2) identify patients with diabetes and obtain baseline assessment data; (3) provide diabetic patients with preventive health care services and education via DLEs and professional health staff; (4) improve the quality of care and the continuity of services for MHSI patients by enhancing health professionals' knowledge of related complications and cultural aspects of diabetes; and (5) evaluate the development and implementation of all program aspects.

Resource Inputs to the Program. The primary inputs in the MHSI model are (1) medical services and diabetes education provided during prevention screenings and cluster clinics (discussed below), (2) the work of the DLEs, and (3) collaboration of agency and institutional partners. These resources augment the more general support of the program by the MHSI nurse-managed health centers.

Diabetes prevention screening events are offered to Hispanic farmworkers and their family members in churches, at community outreach activities, and at campsites where some migrant workers reside. MHSI nurses and bilingual outreach workers offer blood sugar and blood pressure screenings and make indicated referrals. Because eating is a primary time of socialization in the Hispanic culture,⁷ MHSI supplies a variety of healthy foods to promote companionship while providing nutrition education at these events.

The cluster clinics consist of screening, monitoring, examining, and referring of diabetic patients for complications related to hypertension, cardiovascular disease, retinopathy neuropathy, and nephropathy. These services are offered as a series of mini-clinics, physically arranged so patients can circulate at a single site (eg, a health center, school, or church) for 2 or 3 hours to receive medical care, diabetes education, and counseling. A multidisciplinary diabetes team—consisting of an ophthalmologist, diabetes educator, nutritionist, hygienist, phlebotomist, nurses specializing in podiatry, midlevel and/or physician, MHSI nurses, and bilingual outreach staff—provides health care, education, and counseling according to the American Diabetes Association (ADA) Clinical Practice Recommendations.⁸ The education and counseling address such issues as nutrition, diet, exercise, tobacco use, foot care, and access to recommended services and referrals.

The input of the Hispanic DLEs in this program model consists of language interpretation, case management, advice, and advocacy offered from an intracultural perspective. DLEs schedule, convene, and moderate diabetes support group meetings at which professional health care providers disseminate educational information. DLEs conduct home visits

during which they (1) individualize and reinforce the application of information disseminated at the prevention clinics and support group meetings, and (2) facilitate follow-through on recommendations and referrals made at the cluster clinics.

In this model, institutional partners collaborate in (1) the exchange of information; (2) the identification and referral of patients; (3) the provision or recommendation of personnel to conduct support group sessions and screen patients; and (4) the education of patients, DLEs, and medical professionals. The 4 partners in this program are MHSI; Altru Diabetes Center of Grand Forks, North Dakota; the Migrant Clinicians' Network of Austin, Texas; and the Minnesota State University Moorhead Division of Continuing Education. MHSI provides the management and administration of the Diabetes Program and provides direct services to the population. The Altru Diabetes Center provides training for the DLEs, assists in the provision of direct services, and collaborates with the network partners about the latest advances in medical care for diabetics. The Migrant Clinicians Network assists in management and support of DLEs in Texas from October to March and maintains and shares migrant health records. Minnesota State University—Moorhead collaborates in planning, offering, and providing continuing education credit for an annual regional conference on topics related to diabetes and the Hispanic culture.

Processes Implemented in the Program. Program processes consist of a multitude of activities involved in serving members of the target population, networking with the partners, and monitoring the progress and changes in the patients and in the program itself. An activities audit⁹ conducted by an external program evaluator in 2001 revealed that 42 different activities were being successfully used to achieve the objectives of the program.

Outcomes of the MHSI Diabetes Program. Four outcomes of the MHSI Diabetes Program have been service, education, research, and demonstration (ie, dissemination of the model). The present study focuses primarily on the health care outcomes of the MHSI Diabetes Program, although some quantitative results are also identified for the education, research, and demonstration components of the program.

Method

Sample. The population for this study was the Hispanic farmworkers or family members served by the program. Some results are reported for a systematic sample ($n = 451$) consisting of approximately every

Table 1 Change in Percent of Migrant Health Service, Inc, Diabetes Program Patients Receiving Glycosylated Hemoglobin (A_{1c}) Measurements During 2000 and 2002

| Number of A_{1c} Measurements | Percent of Patients 2000 (n = 165) | Percent of Patients 2002 (n = 140) |
|---------------------------------|------------------------------------|------------------------------------|
| None | 40 | 6 |
| 1 | 39 | 54 |
| 2 | 18 | 29 |
| 3 | 2 | 9 |
| 4 | 1 | 2 |

third patient served at each of the 9 MHSI health centers from 2000 to 2002. Comparative results are provided for 2 annual subsamples (n = 165 [2000]; n = 140 [2002]). Some preliminary 2003 data are also provided.

Hispanic migrant farmworkers with type 2 diabetes constituted 91% of the sample; 9% were diagnosed with type 1 diabetes. These subjects ranged in age from 23 to 77 years (mean = 51 years; SD = 11 years). Women constituted 53% of the sample. The annual income of the subjects ranged from no income to \$32,000 with a mean of \$9,988 (SD = \$5,751). The most common sources of nonpersonal funding for medical costs were MHSI vouchers and state programs, which were used by 83% of the subjects. Only 1% had private health insurance, 8% had Medicare, and 4% had Medicaid coverage.

Procedures. This study involved mixed methods; both qualitative and quantitative data were analyzed and interpreted. Unpublished program descriptions, records, and reports were submitted to qualitative content analysis to obtain information needed to achieve this paper's first purpose (to describe the program). Several of the program evaluators' reports provided findings based on individual and focus group interviews; surveys of providers, patients, and seasonal staff; and audits of program activities. Quantitative patient data were obtained through systematic annual audits of medical charts and queries performed on MHSI Diabetes Registry data. The patient data were analyzed statistically using z-tests for differences in proportions between time periods in fulfilling this paper's second purpose (identifying program outcomes).

Results

Direct Services. Based on a content analysis of program documents and forms, patient medical charts, and the types of entries in the Diabetes Registry data

bank, this program is meeting the ADA Clinical Practice Recommendations for initial visits, continuing care, and special considerations. This program addresses the critical issues of poverty and lack of insurance by providing (1) vouchered services from an extensive network of health providers and (2) services within MHSI's own system of health centers. Further, examples of how the program addresses the barriers of culture and language include (1) the contributions of MHSI staff and DLEs to patient care and education, (2) culturally sensitive approaches such as family inclusion at screening events and clinical appointments for individual patients, and (3) the serving of food at screening and cluster clinics.

The analyses of quantitative data studied for the sample of 451 patients over the period 2000–2002 revealed a number of program outcomes. First, the program served 78% of these patients on 2 or more occasions each year. In a variety of settings including MHSI health centers, community events, prevention screenings, cluster clinics, and the patients' homes, 22% had 0 to 1 visits annually; 29% had 2 to 3 visits; 21% had 4 to 5 visits; and 27% had 6 or more visits.

Second, from May 2000 to May 2003 MHSI staff provided health care and education at 21 prevention screenings that served 1,629 individuals and at 26 cluster clinics that served 490 patients. Across these 3 years, DLEs served 1,235 individuals through 520 educational visits, 528 case management visits, and 187 visits that were both medical and educational.

A third type of outcome was the specific medical care rendered. Selected measures are reported in Tables 1, 2, and 3 to illustrate the percent of patients served and the increases in levels of service. A test for the significance of difference between 2 proportions was used to compare 2000 and 2002 data in those 3 tables.

The percent of patients receiving different numbers of glycosylated hemoglobin (A_{1c}) measurements is indicated in Table 1. As shown, 40% of the 165-patient sample did not receive this measurement in 2000. However, in 2002 only 6% of the 140 subjects had not received this measurement, indicating a statistically significant ($P < .01$) increase in this service. There were also significant increases ($P < .01$) from 2000 to 2002 in the number of subjects receiving 1, 2, or 3 A_{1c} measurements. These increases were facilitated when provision of A_{1c} measurements changed from a vouchered service to a direct service when Bayer DCA 2000 GlycoHemoglobin Analyzers¹⁰ were placed at each of the MHSI health centers.

Table 2 shows that the percent of patients receiving assessments for comorbidities and complications of diabetes also increased significantly ($P < .01$) from 2000 to 2002 for all 11 measures that were tracked. By 2002,

Table 2. Change in Percent of Migrant Health Service, Inc, Diabetes Program Patients Receiving Assessments for Comorbidities and Complications During 2000 and 2002*

| Comorbidities/Complications | Percent of Patients 2000 (n = 165) | Percent of Patients 2002 (n = 140) |
|-------------------------------|------------------------------------|------------------------------------|
| Hypoglycemia | 18 | 76 |
| Hyperglycemia | 52 | 85 |
| Hypertension | 48 | 94 |
| Visual problems | 52 | 96 |
| Cardiac problems | 21 | 96 |
| Circulatory problems | 2 | 92 |
| Urinary problems | 2 | 90 |
| Foot problems/leap risk | 22 | 86 |
| Dental problems | 24 | 84 |
| Renal problems | 3 | 90 |
| Psychological/social problems | 12 | 89 |

* All changes were significant at the .01 level.

from 76% to 96% of the patients were receiving these assessments.

The percent of patients receiving different types of care and services is shown in Table 3. In 2000, screening electrocardiograms (EKGs) and foot care were not offered but were included in the program by 2002. Most of the remaining measurements show significant increases from 2000 to 2002. However, nutrition/diet assessments were provided to high percentages of patients both years (84% and 89%, respectively). Counseling about exercise and self-management goals remained relatively constant across the program at 39% in 2000 and 44% in 2002.

Education. The second type of program outcomes involves education provided for farmworkers, their families, DLEs, health care providers in the region, and university students. Nurses, nutritionists, physicians, and diabetes educators provide diabetes education to MHSI patients during screening and cluster clinics. DLEs receive training annually in formal 2-day diabetes courses with monthly 1-day sessions while they reside in the upper Midwest. Seasonal nurses and bilingual outreach workers staffing the MHSI health centers are provided with annual educational sessions on chronic illness and on the culture of Hispanic migrant farmworkers.

Education on diabetes and Hispanic farmworker culture are also presented to regional health care providers and nursing, medical, nutrition, pre dental,

Table 3. Change in Percent of Migrant Health Service, Inc, Diabetes Program Patients Receiving Different Types of Care and Services During 2000 and 2002

| Care/Service | Percent of Patients 2000 (n = 165) | Percent of Patients 2002 (n = 140) |
|---------------------------------|------------------------------------|------------------------------------|
| Examinations/assessments | | |
| EKG | NA* | 10 |
| Peripheral vascular | 38 | 95 |
| Feet | 71 | 82 |
| Psychological/social | 71 | 87 |
| Nutrition/diet | 84 | 89 |
| Exercise | 56 | 89 |
| Tobacco use | 74 | 90 |
| Treatment | | |
| Foot care | NA | 68 |
| Influenza vaccine | 7 | 15 |
| Counseling | | |
| Exercise | 39 | 44 |
| Self-management goals | 39 | 44 |

* Not available in 2000.

prelaw, social worker, and clinical psychology students through their direct participation as program staff or volunteers. In addition, all of these constituents have had the opportunity to attend 3 annual regional conferences sponsored by the program with cooperation from the partners. Conference topics included "The Management of Diabetes in the Hispanic Population," "Enhancing Care for the Hispanic Population: Folk-healing Traditions in Contemporary Health Practices," and "Behavioral Health Care for Minority Populations."

Overall, extensive patient and participant evaluations of the education offered through this program have been very positive, although there have always been requests for additional training.¹¹ The annual conferences featured speakers with internationally or nationally recognized expertise on Hispanic culture, health, and education, as well as regional presenters on diabetes. Attendee evaluations were highly positive.¹²

Research and Demonstration. The third and fourth program outcome components are research and demonstration. Research-based program management, case management, patient care, and program evaluation are integral to this program. For example, decisions such as equipment purchases, protocols for screening at-risk patients, and determination of changes needed to assure

ongoing patient satisfaction are all driven by data analyses, interpretation, and application. Serving both research and demonstration purposes, the MHSI diabetes coordinator with several different coauthors has disseminated data-based reports and manuscripts of the processes and outcomes of this program. Formal research and scholarly outcomes from May 2000 through May 2003 have included presentations and poster sessions delivered at professional meetings and conferences: 1 international, 3 national, 3 regional, 4 state, and 1 local. Two refereed journal articles have been published, 1 in 2002,¹³ 1 in 2003,¹⁴ and a third has been accepted for publication. Three manuscripts are currently works in progress.

Discussion

A basic assumption underlying the design and interpretation of this study was that increasing services that are based on the ADA Clinical Practice Recommendations is a valuable programmatic outcome because such increases have the potential to impact patients' health positively. Since MHSI Diabetes Program services meet these standards and since all of the findings in this study show both increases in services and increases in the numbers and percentages of patients accessing those services, the MHSI Diabetes Program has high potential for impacting the health of its diabetic patients.

The barriers of cultural relevance, cultural appropriateness, and language differences are being addressed in this program through education of MHSI staff, the work of the DLEs, the timing and location of services, and the inclusion of family members in all program activities. According to participants in program-sponsored continuing education offerings, these events have improved regional health care providers' understanding of cultural barriers and the provision of culturally appropriate services to this underserved population.

Whereas the impact of the Diabetes Program is difficult to extract from the benefits of the overall MHSI Program, it is clear to the MHSI staff that the levels of direct medical services, patient education, and patient counseling during the Diabetes Program could not be provided to patients without the resources of the Diabetes Program. Further, by their own report,¹⁵ the MHSI staff cannot on their own achieve the educational and research components of the Diabetes Program.

Conclusions

Using the ADA Clinical Practice Recommendations as criteria against which to measure the quality of services, this program is successfully offering culturally appropriate, quality health services and education to

Hispanic migrant farmworkers with diabetes. Based on the assumption that such services and education positively impact the health of this population, this program has successfully increased its impact by expanding the type of services offered and the number of patients served during its 3-year existence. The multicomponent model on which this program is based has high potential for positively impacting the health of diabetic patients.

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