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Effectiveness of Community Health Workers (CHWs) in Coordinating Diabetes Self Management Education (DSME) for High-Need Appalachian Clients

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Abstract

Objective

Examine effectiveness of CHWs in supporting a nurse-led DSME intervention among clients who are characterized by high rates of poverty and poor education.

Methods

Study Population/Research Design: New Kentucky Homeplace clients (3,217) ages 18-65+ from a 26-county study area who were processed prior to study starting date July 1, 2011. The 30.6% (983) of clients who had been told by a health professional they were diabetic, could speak English, and were willing to sign IRB consent were eligible to participate. Women who were diagnosed with diabetes during pregnancy were not eligible. Clients were able to enroll on a first-come basis up to a cutoff of the sample size of 495, with approximately 20 from each county to maintain geographic representation. After dropouts and disqualification for failure to keep appointments, 215 clients completed a single-group pretest and posttest design.

Demographic and background variables included age, gender, marital status, education, income, federal poverty level, health insurance status, visit to diabetes educator, and New Vital Sign (NVS) test of health literacy level.

Pretest and posttest measures included A1C, Weight (pounds), Height (ft., in.), Diabetes Knowledge Test (DKT), Diabetes Empowerment Scale – Short Form (DES - SF), and the Summary of Diabetes Self-care Activities (SDSCA) Measure.

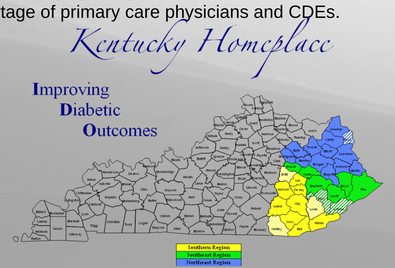
Demographic and background data were collected by CHWs, and they administered the NVS, DKT, DES - SF, and SDSCA tests. The nurse educator administered measures of weight, height, and A1C.

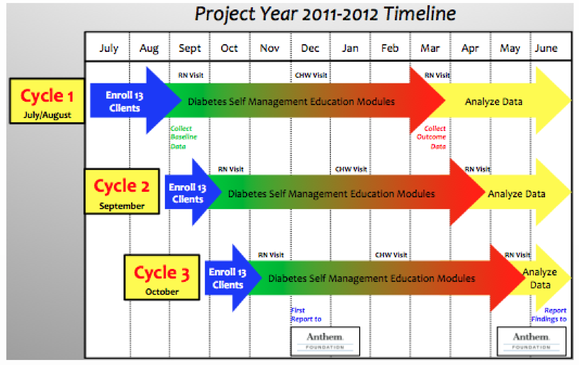
Key Findings

Study group was predominantly female (65.7%), poorly educated (29.8% < high school), 45.6% in poverty, 58.1% without health insurance, 68.8% never visited a diabetes educator, and 44.7% with the possibility of limited health literacy. Glucose testing improved and A1C lowered in post testing after DSME intervention.

Conclusions

CHWs were effective in providing support for DSME. They succeeded in screening clients, obtaining their IRB consent, and enrolling them in the study. They successfully administered study instruments, provided follow-up assistance to clients regarding the DSME and entered data into the Homeplace database. CHWs can play a key role in DSME in areas where there is a shortage of primary care physicians and CDEs.





Improving Diabetes Outcomes (I DO) study was from July 1, 2011 through June 30, 2012

CHW Research Training

CHWs were trained in the methods of the Improving Diabetes Outcomes (I DO) Phase I research project in a hands-on environment in a computer lab. Active supervision and monitoring were available throughout the research project. Graphics and algorithms of the type depicted were developed to aid the CHWs throughout the research process from screening, through enrollment of clients, and the administration of the pre/post measures. A hot-line process was established to quickly resolve issues and to share the results of frequently asked questions (FAQs) with all CHWs, principal investigator, and other study personnel.

Data Collection and Quality Control

Special attention was given to the optimal role CHWs can play in field research with hard to reach and enroll clients. Web-based data management enabled active monitoring of adherence by CHWs to the research design, study progress, and problem solving by the PI and Regional CHW Supervisors. ß

- **Online Database (DB) Controls for Accurate Data Entry**
  - Proper sequencing of research measures is enforced by DB
    - Intervention cannot commence before pretest measures
    - Posttest measures must come after intervention
  - Data input by CHWs validated for range and type
    - Cannot enter text in numeric field
    - Dates entered cannot be in future or distant past
  - Most input fields are required to be filled
- **Monitoring of CHW performance**
  - Reports alert supervisors of missing measures
  - CHWs run reports highlighting suspicious data
- **Regional CHW Supervisors**
  - Gather questions and issues from CHWs
  - Work with data management staff to assess problems and update procedures
  - Disseminate solutions and best practices to CHWs

Kentucky Homeplace CHW Characteristics

• Age, mean (SD), y	49.3 (10.5)
• Annual Income, mean (SD)	$31,393 ($15,817)
• Employed Kentucky Homeplace, mean (SD), y	8.1 (5.1)
• Lived in Service County, mean (SD), y	34.4 (19.2)

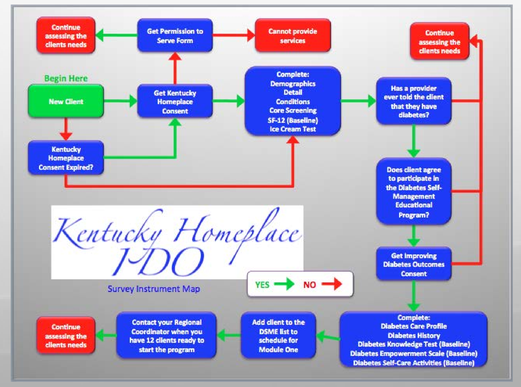
Source: 2010 Survey of Kentucky Homeplace CHWs

Seventeen CHWs were trained to administer the study measures, provide coordination for the nurse educator, and to answer questions and provide supporting educational materials after clients received the intervention. The nurse educator was trained to make measurements and to deliver the intervention. Data management staff provided technical assistance.

Training emphasized the requirement that CHWs follow the research protocol and active monitoring was used to assure that the traditional client advocacy of CHWs did not compromise objectivity of data collection.

Pre/Post Test Group Socio/Demographics N = 215

- Lower median household incomes ($15,990) compared to Kentucky ($41,576) and US ($51,914).
- Percentage below the federal poverty level based on household income and family size was much greater (45.7%) than the State (17.7%) and US (13.8%).
- Were less educated, with 47.6% completing high school and 5.2% completing college when compared to the State (81% and 20.3% respectively) and US (85% high and 27.9% respectively).
- Had both a higher rate of marriage (60.9%) and divorce (19.5%) when compared to Kentucky adults (52% and 12.4% respectively).
- Females comprised the largest percentage (65.7%)
- Self-declared racial identification 98.1% White, 1.4% Black/African American and 0.5% other, reflects the comparative lack of racial diversity throughout the I DO study area.
- Much higher rate reported not having health insurance coverage (58.1%) compared to Kentucky adults (16.9%) and US (15.0%).



Findings

- ✓ 44.7% of sampled clients measured as having a high (8.5%) likelihood to possible (36.2%) limited health literacy using the “Ice Cream Label Test” quick assessment scale.
- ✓ 17% tested in an initial assessment using the BMI scale as being overweight and 77.8% as obese.
- ✓ Of the 215 clients receiving pre/post testing using BMI, 107 (50.5%) gained weight, with an average of 6.9 pounds.
- ✓ Ninety-eight clients lost weight, with an average of 7.0 pounds.
- ✓ The distribution among the 215 I Do clients by classes of obesity was: Obese (48.1%), severe (22.2%), morbid (25.5%), and super (4.2%).
- ✓ While weight increased for those receiving pre/post testing from an average of 226.8 to 227.0 pounds after completion of nurse-led DSME, the difference was not statistically significant.
- ✓ The average A1C dropped from 7.8 to 7.4 (P=.000).
- ✓ Knowledge of diabetic conditions and self-management increased among clients in this group from an average score across all items of 66.2% to 73.9% (P<.001).

Limitations of Study

There are two major limitations. The first is the lack of randomization in the selection of study subjects. Enrollment was voluntary by clients up to the limit of the sample size for clients who had been told by a health professional they have diabetes. Second is the dropout rate of clients from the initial sample and after the first DSME session, which was worsened by the tendency of Homeplace clients not to keep appointments and travel expense. Efforts were made to lessen the effect of travel expenses for the intervention group by providing gasoline payment cards and meals during the nurse-led DSME.

Discussion

A program to lessen diabetes in this population has the opportunity to focus on modifiable behavioral risk factors that can be prevented or lessened and improved glycemic control through DSME. Based on CDC data from 2008, it was estimated that 12.5% of adults aged ≥ 20 in Kentucky’s diabetes belt counties had type 2 diabetes, 32.3% were obese, and 36.1% were physically inactive. It is not surprising that 71.8% of I DO clients, who are characterized by these risk factors, report their health as fair (39.5%) or poor (32.3%).

One obvious approach to lessening these problems would be concentrated and sustained DSME led by Certified Diabetes Educators (CDEs). Given the shortage and mal-distribution of CDEs and the long time that it takes to become a CDE, we recommend much greater use of CHWs linked with CDEs in DSME throughout Kentucky and more effective coordination with primary care physicians in our 68 diabetes belt counties.

I DO Phase II research is in progress Statewide with a random sample of 600 each for intervention and control groups.

Acknowledgements

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