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Research Paper

Evaluation of a community health worker training program in rural Appalachia, USA

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Abstract

Background: Limited support for healthcare services is one reason rural Appalachia is among the unhealthiest regions in the United States.
Objective: Evaluate Level 1 of a multi-level community health worker (CHW) training program designed to train CHWs easily so they can affect community health.
Methods: 198 CHWs evaluated their training curriculum. CHW activities were tracked for 19 months. Group data were analyzed with t-tests and ANOVA using mean ± SEM comparisons. Correlation coefficients and rank sum difference analyses were used to evaluate ranked variables. Statistical significance was set at $p<0.05$.
Results: Excellent or good rankings were given by 100% of CHWs for their instructor's knowledge, 100% being treated fairly, 99% overall class rating, 97% fairness of exam, 96% course objectives met, and 92% course manual. CHW test performance did not affect any variable. CHWs were only asked one question every two months they could not answer. CHWs talked to four new people each month, two people a month for multiple visits, and three people a month for follow-up visits.
Conclusions: No need to change the CHW curriculum, training materials, or testing procedures. A 15-hour CHW training program is adequate enough to provide valid healthcare service support in rural Appalachia, USA.

Keywords: *Community Health Worker; Rural Medicine; Community Health Educator; Health Education; Rural Healthcare.*

1. Introduction

The United States Patient Protection and Affordable Care Act encourages the use of community health workers (CHWs) for providing preventive healthcare services (National Center for Chronic Disease Prevention and Health Promotion 2011). The Act defines a CHW as an individual who promotes health or nutrition within a community by serving as a liaison between communities and health care agencies, by providing guidance and social assistance to community members, by enhancing community members' ability to communicate with health care providers, by providing health and nutrition education, by providing referral and follow-up services, and by proactively enrolling eligible individuals in human services programs. Infrastructure suggestions for effective use of CHWs are: 1) having a statewide uniform training system for CHWs, 2) using CHWs in the medical home/primary care model, and 3) partnering agencies, health education centers, and academic institutions to develop training and certification standards for CHWs (National Center for Chronic Disease Prevention and Health Promotion 2011).
Recent movements across the United States have focused on raising the status of CHWs through training and certification programs. Nonetheless, national training and certification standards for CHWs have not been established. The only national effort to train CHWs comes from the National Cancer Institute (2015). However, this is a patient navigator program that teaches CHWs how to help cancer patients navigate their treatment from diagnosis to remission or death. In essence, these CHWs are trained in cancer patient care, and nothing else.
The Centers for Disease Control and Prevention (2011) provides a training manual for preventing heart disease and stroke that CHWs and trainers of CHWs can download for free. This Community Health Worker's Sourcebook has two purposes: 1) as an instruction manual for training CHWs and 2) as a reference and resource for CHWs working with community members. Yet again, this program is limited in scope, focusing solely on heart disease and stroke. Furthermore, there is no formal training or certification process associated with this sourcebook. Thus, there is no way to know if a CHW has gained the skills necessary to help people who are at risk for or have been diagnosed with heart disease or stroke.
Only a few states in the country have adopted a statewide credentialing system for CHWs, while a handful of other states has partial or highly focused CHW certification programs (Center for Health Law and Policy Innovation 2014, Center for Rural Health 2012). Regardless of what a small number of states do, most CHWs do not receive formal training. Educational backgrounds for CHWs range from some on-the-job training to formal college-based programs that grant certifications or associate degrees. Although some colleges provide various CHW certificate programs, the educational offerings vary from institution to institution, even within a given state. Regardless of what a small number of states are doing, most practicing CHWs do not receive formal training. The CHW workforce study found that 47% of CHWs were trained only through mentoring, and 43% were trained through on-site technical assistance (United States Department of Health and Hu-

man Services 2007). The diversity and depth of training were also manifest by the fact that the length of CHW training reported ranged from 9 to 100 hours.

Overall, just a few states have comprehensive statewide training and certification criteria for CHWs. These state-required programs are taught at colleges and are generally designated for health care professionals, not lay people. A few other states have recognized standards for CHW training, but the implementations of consistent training requirements are not uniform, or the standards cover only one or two health issues. Most CHWs are trained by either their employers or by peer mentors, and their training is not based on a uniform set of core competencies. It is evident that there is no consistency in CHW training standards and competencies across the country or within most states.

The National Human Services Assembly Policy Brief #14 (2006) states that this lack of accepted CHW standards, such as CHW definition, core competencies, and scope of practice, impedes CHWs' ability to link families with a full range of support. This underdeveloped status of CHW training across the United States presents a unique problem in delivering quality healthcare services and support to communities where there are health disparities in the first place. Appalachian America is one of these regions of health disparity.

The formation of the United States Appalachian Regional Commission, in 1965, defined Appalachia as a specific geographical region consisting of 420 counties in 13 states, where 42% of the population is rural. West Virginia (WV) is the only state in the Union that lies entirely within Appalachia, with 67% of its population being rural. Appalachia is recognized as one of the least healthy regions in the United States. WV ranks 1st or 2nd of all the 50 states for smoking, drug deaths, obesity, preventable hospitalizations, diabetes, poor physical health days, and premature deaths (United Health Foundation 2014).

The problems of health disparities and lack of access to healthcare in WV are compounded by the nature of Appalachian culture. Rural Appalachians believe they are healthier than they actually are, and therefore, do not seek preventative healthcare services (Griffith et al. 2011). Appalachians do not trust authority figures and institutions, which also prevents them from seeking healthcare services (Miller & Heinsberg 2012). On the other hand, Appalachians form tight bonds of trust with their communities. Knowing this, it seems that WV could benefit greatly if a state-wide CHW program were instituted.

WV does not have an established mechanism or infrastructure for training CHWs and integrating them into community settings or into standard primary care practice with its patient-centered medical home. Recognizing the potential CHWs have for improving health in the communities in which they reside, the West Virginia School of Osteopathic Medicine, the West Virginia Bureau for Public Health, and other stakeholders initiated a multi-level CHW training program across the state of WV. The conceptual goal of a multi-level CHW training program was to get community members trained quickly, at the lowest level, so they could immediately affect change in their communities. The aims of this project were to evaluate the curriculum for the first level (Wellness) of a multi-level CHW training program in WV, and to assess the activities of the newly-trained Wellness CHWs.

2. Methods

The name of the multi-level CHW training program referred to in this paper is CHERP (Community Health Education Resource Person). Level 1 or the lowest level of CHERP training is called Wellness. The first goal of the multi-level CHERP training program in WV was to facilitate getting CHWs into communities to affect change quickly. This would require the first level of training (Wellness) to be dense in content, but not burdensome for the student. The second CHERP training goal was to develop a broad curricula, so that CHWs would be trained in more than one disease or more than one health need. This would require upper levels of training to build on the foundations formed in level 1, and to broaden the scope of content to include the major health behaviors, health conditions, and chronic diseases that plague our modern society. This study is limited to the evaluation of the first level of CHERP training – Wellness.

2.1. Curriculum development

Two authors were selected to develop and write the curriculum. One author had a doctorate degree, with experience in community health, community outreach, curriculum development, and health education. The other author had a bachelor's degree in health and marketing, with experience in community health promotion, clinical practice, and education. An external advisory board was assembled to review the curriculum for content. The external advisory board consisted of five members, each of whom had expertise in one or more of the following disciplines: medicine, medical education, clinical exercise physiology, nutrition and dietetics, psychology and behavior, and community health. All the external advisory board members had doctoral degrees, except for a Master's level community health educator. A clinical advisory board was assembled to review the curriculum for clinical accuracy and appropriateness. The clinical advisory board consisted of one clinician who was a registered nurse and nurse practitioner, with a Ph.D.; a doctor of allopathic medicine (M.D.) and two doctors of osteopathic medicine (D.O.).

The curriculum development and production followed an organized protocol. First, the authors and external advisory board designed the outline for the Wellness curriculum. Second, the authors wrote the first draft of the training materials. Third, the external advisory board reviewed the curriculum for content-specific accuracy. Fourth, the authors revised the curriculum according to the suggestions of the external advisory board. Fifth, the curriculum was passed to the clinical advisory board for their review. Sixth, the authors revised the curriculum according to the clinical advisory board recommendations. Last, the curriculum was put into production.

The CHERP Wellness curricular materials included an 87 page training manual, a student resource CD, an instructor CD, a 3-ring binder, and laminated educational sheets. A brief outline of the curriculum follows:

- Health Promotion and Vocational Liability
- Vocational Ethics and Ethical Practices
- Communication Skills
- Health Literacy
- The Health and Disease Continuum
- Community Member Health History
- Nutrition Basics
- Exercise Basics

2.2. CHW training process

The CHERP level one training course was segmented into five 3-hour instructional blocks, with a 3-hour comprehensive exam. The course was taught in either one of two formats. The first format was a 6-week course, where students met once a week, for three hours, for five weeks of instruction, and the sixth week for the 3-hour exam. The alternative format was a compact teaching schedule, where the students met for 2.5 days. Instructional blocks went from 09:00 h to 12:00 h and from 13:00 h to 16:00 h on two consecutive days, then from 09:00 h to 12:00 h the third day. The exam was administered two weeks later in a 3-hour block of time. All courses were taught by any combination of two of the three instructors. In order to pass the course, a student needed to pass the exam with a minimal grade of 80% correct. If the student scored lower than 80%, he/she could retake the exam one time to achieve a passing score.

All the training courses were provided on site, within different communities across the state of WV. Between four and sixteen students attended each course. All the training and instructional

materials were provided free. The only pre-requisites for receiving the CHERP Wellness training were an eighth-grade reading level and 18 years of age.

2.3. Evaluation procedures

This study of the evaluation of the CHERP Wellness training program was deemed exempt by the West Virginia School of Osteopathic Medicine Institutional Review Board. The evaluation entailed a two-part process. The first part of the evaluation was performed by administering a survey to each trainee immediately following the course exam. The purpose of the survey was to obtain student feedback on the course curriculum. The survey consisted of 12 questions (Table 1).

Table 1: Cherp Wellness Course Post-Training Survey Questions

Question	Response Method
Overall, how do you rate the CHERP Wellness training course?	4-point Likert scale
Please evaluate each of the training methods used in the course.	4-point Likert scale
The training manual	
The training compact disc (CD)	
The case examples used in class	
The instructor's ability to teach	
The slide presentations used in class	
Working with a partner or in a small group	
Discussion among students rather than between the instructor and students	
Did the instructor demonstrate knowledge of the course materials?	5-point Likert scale
Did the instructor treat the students fairly?	5-point Likert scale
Were you able to get the help you needed or information you needed outside of class?	5-point Likert scale
Were the learning objectives and skills to be acquired clearly presented?	5-point Likert scale
Did the course meet your expectations for difficulty?	5-point Likert scale
Did the exam represent the course content?	5-point Likert scale
Was the length of the course appropriate?	5 discrete options
What made it more difficult for you to perform well in the course than you would have liked?	Check – No Check
Nothing	
Time constraints	
Family obligations	
Work obligations	
I did not have a quiet place to study	
Unexpected emergencies	
I lost interest along the way	
The course difficulty got me discouraged	
I fell behind and never did catch up	
I felt less knowledgeable than my classmates	
Other	Open-end Response
Will the knowledge and skills you learned in this class help you serve your community?	5-point Likert scale
Would you recommend this course to others?	5-point Likert scale

The second part of the evaluation consisted of collecting information from monthly logs of activity's Wellness CHERPs performed while in the field. Each month the CHERP reported his/her activities. The activity logs were either completed online, completed offline (PDF form) and submitted electronically, or hard copy faxed or sent by postal service. A total of 19 consecutive months of activity were tallied.

Table 2: Wellness Cherp Monthly Activity Logs

Question
1) How many times did people come to you this month with a health-related question or to get health-related advice?
2) How many times were you NOT able to answer somebody's health-related question or NOT able to give them the health-related advice they needed?
3) How many NEW people talked to you this month about a health-related issue?
4) How many people came to you more than once this month to get help or advice with a health-related issue?
5) How many people who came to you this month for help or advice had already talked to you at least once before?
6) How many days during the month did you talk to or give advice to at least one person about a health-related issue?
7) What health services did you perform this month other than working one-on-one or face-to-face with somebody?
8) Other than individuals, what groups or businesses contacted you this month requesting services or information?

2.4. Statistical analyses

All statistical analyses were performed using the Systat 12 statistical software package (Systat Software, Inc.; Chicago, IL, USA). Empty data cells were not included in the analyses. Group data are reported as mean ± SEM. Spearman rank correlations were used to assess the relationship between two non-numerical variables. Pearson correlation coefficients were used to assess the relationship between two numerical variables. The t-test was used to evaluate the difference between two group variable means. Analysis of variance (ANOVA) was used to test for multiple group differences among variables, with a Tukey post-hoc test when a significant difference among groups was found. Statistical significance was set at the $P < 0.05$ level.

3. Results

The demographics of the sample population are presented in Table 3. In addition, 67% of the participants reported taking the training to volunteer in their community, while only 2% of the participants reported taking the training as a requirement for school or for their job. The racial distribution for the trainees represents accurately the racial distribution of WV.

Table 3: Participant Demographics (N = 198)

Age (y)	45 ± 1	range = 18-76
Education Level (y)	15 ± 1	range 8-18
Married or Partnered	129	(65%)
Men	30	(15%)
Women	168	(85%)
Caucasian	180	(91%)
African American	14	(7%)
Hispanic	4	(2%)

Values are Means ± SEM.

The pass rate for the course was 89% on the first attempt. All of the students who did not pass the exam on the first attempt passed it on their second try. Therefore, the overall successful completion rate for the course was 100%. The average test score was 84.4 ± 0.7% for the first attempt. Those with a 12th grade education or less scored lower than those with a higher education on their first attempt at the exam (79.2 ± 1.9% vs. 85.6 ± 1.8%, respectively). No significant difference was found in test scores between men and women, and there was no correlation between test scores and student age.

The percentage of students who reported an excellent or good ranking for the curriculum are as follows: overall class rating (99%), training manual (92%), training CD (61%), case examples used in class (89%), instructor's ability to teach (94%), slide presentations in class (88%), working with a partner or small group (71%), discussions among students (59%), instructor knowledge (100%), students treated fairly (100%), adequate outside help (83%), learning objectives presented clearly (96%), course expectations for difficulty (85%), fairness of the exam (97%), appropriate course length (96%), training will help me serve my community (97%), and recommend the course to others (92%). There was no significant correlation between any of the course evaluation variable rankings and the students' performance on the exam ($r = -0.11$ to $+0.19$). The correlation coefficient between overall course ratings and test exam scores was -0.08.

Although 100% of the students passed the course, approximately half of the class reported not performing as well in the class as they would have liked (48%). Of these, 55% said work obligations interfered with their study habits and 40% said family obligations interfered with their study habits.

Each Wellness CHERP was approached eight times a month with a health-related question or to receive health-related advice. Only once, every two months was a CHERP unable to answer a health-related question or resolve a health-related issue for a community member. Each CHERP talked to four new community members a month about a health-related issue. Two people were going to their CHERP for help more than once during a given month. Each CHERP had three people come to them for follow-up visits in a month. CHERPs were volunteering in their community an average of five days per month.

Various types of businesses and agencies contacted Wellness CHERPs for services. Some examples are: county health departments, CHIP (Children's Health Insurance Program), Senior Centers, civic groups, 4-H groups, Head Start, health clinics, TOPS (Take Off Pounds Sensibly), and public schools. Examples of community activities CHERPs performed are: work at health fairs, teach health education classes, conduct workshops, write news articles, serve on health committees, work at food banks, work with youth groups, and assist in elderly care.

4. Discussion

The first aim of this project was to evaluate the curriculum for the first level (Wellness) of a multi-level CHW training program (CHERP) in WV. The curriculum evaluation was primarily accomplished by student course evaluations, but some of the recorded activities of the CHERPs also assessed the quality of training.

More than 90% of all CHERP trainees gave good or excellent ratings for the course, the training manual, the instructor's teaching ability, the instructor's knowledge, getting needed help during the course, being treated fairly in the course, the course objectives. Skills learned, the comprehensive final exam, and recommending the course to others. Some people may think that student satisfaction with a course is not as important as a curriculum assessment tool as a more objective assessment. However, a vast majority of these students voluntarily took the course, and subsequently used what they learned in the course to serve voluntarily in their communities.

Several of the behavior theories teach us that perception and self-efficacy are determining forces in driving behavior (Baronowski et al. 2003). If we apply this behavior theory concept to the CHERPs, it means that a CHERP will be more likely to go out into his/her community to do volunteer work if he/she feels he/she is well trained and if he/she has the self-efficacy to do the work. The high rankings of the CHERPs for the curriculum attest to the fact that they felt they were trained well – adding to their positive perception of the community health worker job and their self-efficacy to perform that job. Further evidence that the curriculum prepared the CHERPs to perform their job comes from the monthly logs. Each CHERP had enough self-efficacy to talk to 4 new members of the community each month about a health-related issue. Each CHERP was volunteering in the community five days a month. It seems unlikely that these CHERPs would be as actively engaged in their communities if they did not feel they were adequately trained. Probably the strongest piece of evidence that the CHERPs were well trained is the data showing the CHERPs were presented only one question or one health-related issue a month they could not answer or resolve.

The second aim of this project was to assess the activities of the newly-trained Wellness CHERPs to see if they were effective change agents in the communities where they live. Data from the CHERP monthly logs suggest that these CHWs were poised to affect change in their communities. Each CHERP was approached eight times a month with a health-related question or issue, and was not able to answer or resolve a question or issue only once every two months. If one extrapolates the data, this means that every month 1,584 health-related questions or issues were brought to the CHERPs and 1,485 were solved. This, in and of itself, suggests that the CHERPs are not only affecting change, but are saving the healthcare system money by resolving health-related questions and issues that formerly would have to be addressed by paid healthcare providers or allied health professionals.

The fact that each CHERP was helping four new members of the community each month with a health-related question or issue also testifies to effectiveness. This infers that 792 new community members were engaging in healthcare in a way they may not have engaged otherwise. This can be interpreted two ways. First, many of these community members may have engaged in a way that is more costly than with a volunteer CHW (i.e., engaging a healthcare professional). Second, many of these community members may not have engaged at all, because Appalachians have a cultural mindset of self-reliance and mistrust of authority figures (Miller & Heinsberg 2012). Thus, the engagement of more community members in healthcare can only be seen as a positive effect.

One of the advantages of CHWs is that they are trusted members of their communities (National Human Services Assembly 2006, United States Department of Health and Human Services 2007). The community trust of the CHERPs was manifest by the estimated 990 community members coming each month for a follow-up visit with a CHERP. Here again, the CHERPs were making a positive impact in a region where trust is often an issue.

Although no medical information was collected from the community members in this study, anecdotal evidence suggests that some of them have better health after working with a CHERP. A purchasing agent at a small rural clinic became a CHERP and was shortly thereafter asked to be a case manager for a 19-year-old young man with metabolic syndrome. This man was not compliant with his medication regimen. In her spare time, the CHERP made home visits and designed a mobile device application for the man, which would help him with his medicine regimen. Within three months, his metabolic profile improved dramatically.

A minister and his wife took the CHERP training. Subsequently, the minister started promoting health messages and activities in his congregation. One member of the congregation, who had been overweight and less healthy, reported being able to lose a significant amount of weight, and that her health had improved. These and other case studies provide anecdotal evidence that CHERPs have helped community members improve their health.

5. Conclusions

Recent data suggest that CHWs can be used in various settings to reduce healthcare disparities (Viswanathan et al. 2009). WV is one of the least healthy states in the United States, with many health disparities. Therefore, the first level of a multi-level CHW training program (Wellness CHERP) was implemented across the state of WV. The goal of this research was to evaluate the Wellness CHERP curriculum, and to assess the activities of the newly-trained Wellness CHERPs. Course evaluations and CHERP monthly activity logs suggest that the 15-hour Wellness instruction adequately prepared community members to act as volunteer agents of change within their communities. CHERP monthly logs also indicate that the newly-trained Wellness CHERPs can potentially alleviate some of the workload of the limited healthcare professionals in rural communities. Anecdotal evidence suggests that within a short period of time, CHERPs helped some patients improve their health profile.

6. Disclosure

No relevant financial affiliations or conflicts of interest to disclose.

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