2016 WRITING CONTEST GRADUATE WINNER

Cardiovascular Disease Training for Community Health Workers Serving Native Hawaiians and Other Pacific Peoples

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His winning manuscript, "Cardiovascular Disease Training for Community Health Workers Serving Native Hawaiians and other Pacific Peoples," describes and evaluates a cardiovascular disease training seminar for paraprofessional health care workers from federally qualified community health centers and Native Hawaiian health care systems. Under the mentorship of Mele Look, Director of Community Engagement at the UH-JABSOM Department of Native Hawaiian Health, this research investigates the effectiveness of a novel educational training designed and rooted in the principles of community-based participatory research, culture-based education, and adult learning theory. The data analysis showed statistically significant gains in cardiovascular disease knowledge from pre- to post-seminar among participants, as well as long-term cardiovascular disease competency measured at six months post-seminar. Findings of this research provide an evidence-based approach for capacity building and workforce development of a class of health care workers with increasing importance to the well-being of Hawai'i's most health disparate populations.

Abstract

To help community health workers (CHW) meet increased demand for their services, it is essential to have data supported strategies for approaches to their training and capacity development. The objective of this paper is to report on the development, implementation, and evaluation of "Heart 101," a cardiovascular disease (CVD) training program, conducted among CHW in Hawai'i who serve Native Hawaiians and other Pacific Peoples (NHPP). Principles from Community-Based Participatory Research provided a framework to develop and implement the 5-hour training curriculum. Developers incorporated teaching strategies shown to be effective among learners that represent the majority of CHW, and included principles of adult learning theory and culture-based education. Training participants completed pre-, post-, and 6-months post-training knowledge tests, as well as demographic and participant satisfaction surveys. Data analysis based on pre- and post-training knowledge tests (n=30) indicated that Heart 101 significantly increased CVD knowledge by 32% (P<.001, t test). Long-term CVD competency measured at six-months post-training (n = 20) was also shown to be significant (P<.001, t test). Analysis of knowledge by subtopic suggested CHW strengths in clinical aspects of CVD and weaknesses in medical terminology and basic science aspects. These results, along with positive participant satisfaction, suggest that a culturally relevant and interactive course is a strong approach for CVD information dissemination to CHW serving NHPP communities, and provides insight on potential areas for special focus in their training. The demonstrated success of Heart 101 has positive implications for the standardization of CHW education and for their professional development.

Keywords

Community Health Workers, Native Hawaiians, Pacific Islanders, Cardiovascular Disease, Culture-Based Education, Health Disparities

Abbreviations and Acronyms

CVD = Cardiovascular Disease
NHPP = Native Hawaiians and other Pacific People
NHOPI = Native Hawaiians and other Pacific Islanders
CHW = Community health workers
DNHH = Department of Native Hawaiian Health
Center = Center for Native and Pacific Health Disparities Research
HCIE = Hawaiian Cultural Influence in Education
CBE = Culture-Based Education

Introduction

Cardiovascular disease (CVD), including ischemic heart disease and stroke, continues to be the leading cause of death worldwide.[1] In the United States, disproportionate prevalence of CVD is particularly notable in racial/ethnic minorities.[2] Among the most disparately affected are Native Hawaiians and other Pacific People (NHPP), who have some of the highest CVD mortality rates in the United States and experience earlier disease onset compared to nearly all other groups.[3-6] The US Federal Government uses the designation "Native Hawaiian and other Pacific Islanders" (NHOPI) to refer to persons of heritage in any of the original peoples of the islands of Polynesia, Micronesia, and Melanesia,[7] Here, the term NHPP is used to broaden our scope so as to include Filipinos, who represent the third largest ethnic group in Hawai'i and experience cardiometabolic health challenges more similar to NHOPI than that of other Asian subgroups with which they are typically aggregated by federal standards.[3,8]

National and public health interest in the utilization of community health workers (CHW) as extenders of healthcare delivery has in recent years been an area of significant promise and continues to grow.[9-12] One reason for this has been the demonstrated success of CHW initiatives for addressing health disparities, particularly those of medically underserved populations such as NHPP.[13] As a specific class of allied health professionals, CHW are often utilized as peer counselors, outreach workers, and case managers—areas where their strong interpersonal skills, knowledge of cultural preferences, and community networks are particularly well suited.[14-16] The effectiveness of CHW in helping to provide chronic disease self-management education, screening, and care has been established in numerous studies.[17-21] Recent CVD studies utilizing CHW to deliver interventions in minority and at-risk populations have also reported consistent clinical improvements.[22-24]

A significant barrier, however, to expanding the utilization of CHW in clinical initiatives is the recognition of their generally limited health and medical training, particularly in knowledge of chronic diseases including CVD.[25] Presently there is a lack of published studies describing effective CVD education and training approaches for these health professionals. An important consideration in training efforts is the fact that most CHW are considered "non-traditional students,"[25] defined as having delayed enrollment in a post-secondary education, maintaining a part-time course load, having a full-time job, having dependents other than a spouse, or not possessing a high school diploma.[25,26]

In this paper the development, implementation, and evaluation of a CVD training seminar for CHW serving NHPP is reported. The primary aim was to determine if an interactive and culturally relevant CVD program for training CHW who serve NHPP would lead to an increase in CDV knowledge and long-term information competency over six months.

Methods

This study was determined exempt from review by the Institutional Review Board at the University of Hawai'i and followed the tenets of the Declaration of Helsinki. Participants were in full-disclosure to the research component of the training and gave written consent to participate.

Planning and Strategy Development

In 2003, the Department of Native Hawaiian Health (DNHH) at the University of Hawai'i John A. Burns School of Medicine facilitated creation of the Ulu Network, a coalition of community-based organizations committed to improve the cardiometabolic health of NHOPI. Since that time the Ulu Network has grown to include 30 organizations with over 70 sites in Hawai'i and into the continental US (Figure 1). Ulu Network members participate in research, training, information dissemination, and health policy advocacy. An initial needs assessment with Ulu Network organizations involving 64 clinical and administrative leaders identified improved chronic disease knowledge of their CHW as a top priority.[27] Subsequently, the Center for Native and Pacific Health Disparities Research (Center), which is a part of the DNHH, committed to grow CHW chronic disease knowledge through capacity-building seminars. Using a Community-Based Participatory Research approach, seminars for diabetes mellitus and chronic kidney disease were developed and implemented and found to be successful in increasing CHW knowledge about disease causes, treatment, and management.[28]

Building on this foundation, a multidisciplinary team of curriculum developers composed of Center staff, Ulu Network-associated CHW, and community clinicians set forth to develop "Heart 101," a CVD training for CHW serving NHPP. The group recognized that participants could be resistant to a purely didactic format for new and complex material, such as the pathophysiology of diseases and drug therapies associated with CVD. Further, the curriculum developers concluded that a teaching team of multidisciplinary community-based instructors would: (1) provide multiple professional perspectives, (2) increase awareness of community-based resources, (3) provide exposure to role models, and (4) improve attention with a rotation of speakers. PowerPoint was chosen as the presentation media because of its potential to allow for strong visuals and its ability to be readily formatted for easy distribution.

Consistent with the Hawaiian Cultural Influence in Education (HCIE) theoretical model, curriculum development prioritized materials and delivery strategies that were: (1) interactive, (2) facilitated the delivery and long-term information competency, and (3) relevant to NHPP cultural and community activities.[29] The HCIE model describes an approach to Culture-Based Education (CBE) specific to Native Hawaiians, who experience disparities in educational achievements that mirror those of Indigenous peoples worldwide. Scholars of CBE identify the incongruity of the dominant and minority culture of the Indigenous student as a major determinant of low educational attainment.[30] Heart 101 implements aspects of HCIE (eg, language, cultural content, cultural context, and family and community) to connect the learner's perspectives with institutional values, knowledge, and practices of CVD (Table 1).

Development of Heart 101 Curriculum and Training Materials

The Heart 101 seminar is a 5-hour long training delivered in three modules over two days. Module 1 - *Introduction to the Cardiovascular System and Cardiovascular Disease*, is taught by a health educator; Module 2 - *Types of Cardiovascular Disease and Treatments*, is taught by a clinician such as a NHPP physician, nurse, or nutritionist; and Module 3 - *Successful Strategies in Treatment and Management of Cardiovascular Disease,* is taught by a senior CHW.

Class lectures are augmented with stories and examples from instructors' field experience, interactive group CVD knowledge games, small group and class discussions, and role-play scenarios. A student workbook is provided to all attendees containing lecture slides, a glossary of medical terminology, nutritional and dietary information, scientific and general public articles, culturally relevant brochures, and a reference list of other resources for CVD information.

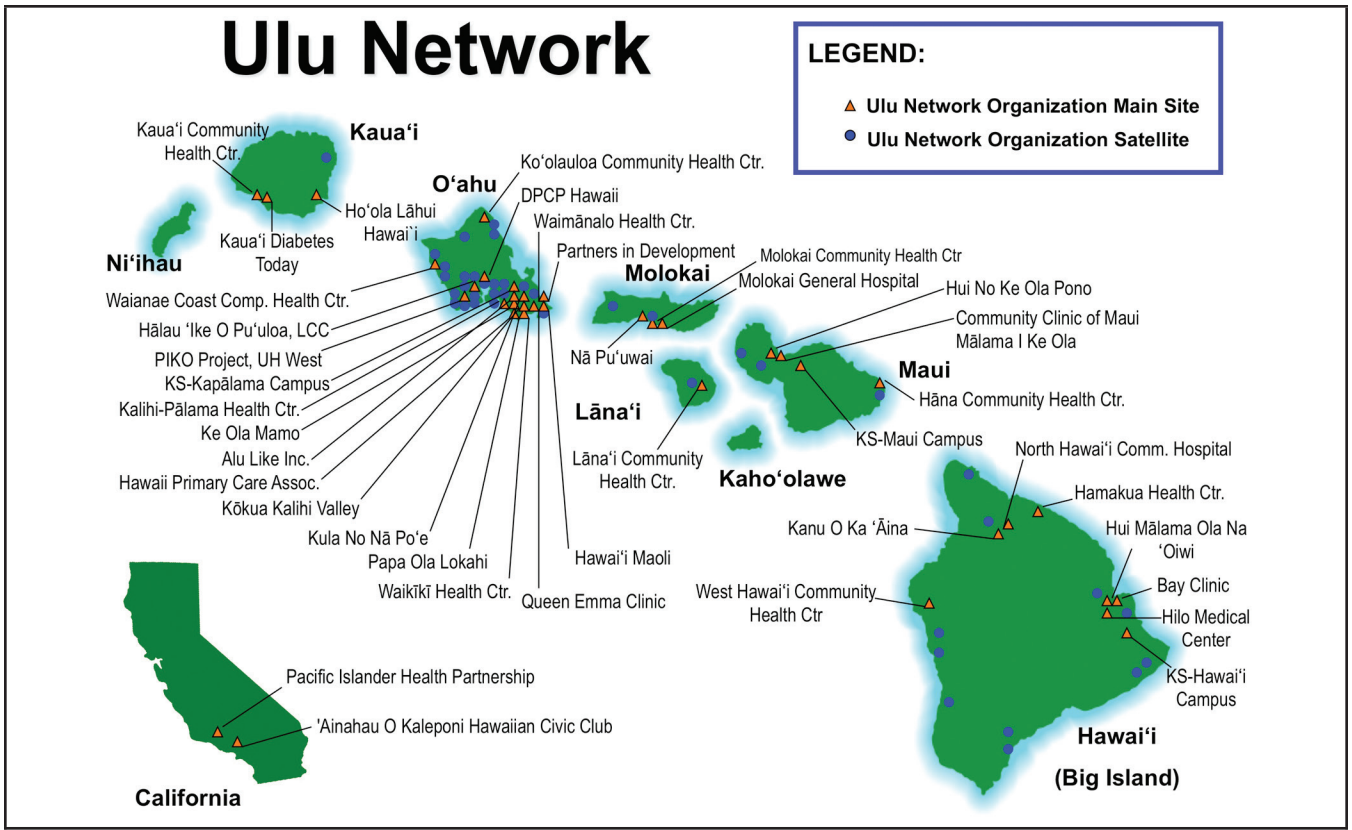

Figure 1: Ulu Network Organizations in the State of Hawai'i, 2016. SOURCE: Look & Furubayashi, 2004.
Today the Ulu Network consists of 30 community organizations. The membership includes 14 federally qualified community health centers in Hawai'i; five federally established Native Hawaiian Health Care System organizations; two partners in California; and several rural community hospitals, non-profit organizations, educational institutions, and Hawaiian Civic Clubs that serve Native Hawaiians and other Pacific Peoples.

Table 1. Examples of CBE Strategies Incorporated into Heart 101.

CBE Principles	Strategies and Examples
Language	• Use of commonly spoken Hawaiian and Hawai'i Creole English words and phrases both in colloquial conversations with participants and also in articulating otherwise complicated scientific concepts.
CULTURAL Context	• Warmly greeting and embracing each participant individually in the traditional Hawai'i manner. • Establishing group cohesiveness by sharing personal and emotional connections to CVD. • Acknowledging the importance of group wellbeing with the incorporation of team challenges and small-group discussions. • Addressing and referring to well-known and highly respected senior authority figures from the community with culturally appropriate titles (eg, Aunty, Uncle, Papa, Kumu, Kahu, Kauka, etc.) • Presenting lei to invited speakers and other special guests.
CULTURAL Content	• Incorporation of Pacific-oriented graphics that emphasize NHPP engaged in traditional NHPP activities in an island setting. • Discussions that illustrate health disparities experienced by NHPP and the significance of it in comparison to other ethnic groups. • Providing historical perspectives that dispel negative modern stereotypes about NHPP such as NHPP being overweight by nature. • Referencing and emphasizing traditional and cultural NHPP diets and forms of physical activities in discussing the importance of maintaining a heart healthy lifestyles. • Illustrating CVD risk factors with special attention to those most significant within NHPP communities. • Incorporation of specific strategies for working with NHPP clients that promote lifestyle modifications, such as familial, communal, and cultural motivations.

CBE=Culture-Based Education; CVD=Cardiovascular Disease; NHPP=Native Hawaiian and other Pacific Peoples

CBE strategies were consistently utilized to incorporate language, images, and concepts familiar and endearing to NHPP throughout the curriculum and training material. For example, PowerPoint slides discussing the importance of physical exercise in maintaining cardiovascular health featured images of NHPP engaged in traditional and cultural activities like canoe paddling and hula dancing. The same approach was extended to the topic of keeping a heart healthy diet, which also incorporated the use of locally produced nutritional fact sheets for foods unique to Hawai'i and portion appropriate food models of items important in NHPP diets as teaching tools.[31]

Implementation of CVD Training for Community Health Workers

Flyers, mailers, and email announcements were sent to Ulu Network clinical and administrative leadership to solicit enrollment in the Heart 101 training seminars. Community-based, typically NHPP, instructors were recruited and encouraged to incorporate community-specific and NHPP cultural practices to establish personal, familial, and geographic connections to students. A relaxed and informal learning atmosphere was established early in the training by individually greeting each participant in the customary Hawai'i/Pacific manner as they entered the seminar space. This would typically include a warm physical embrace (such as a hug, kiss on the cheek, or handshake), a self-introduction, and some light, playful chatting. Rapport among the participants and with the training facilitator was further built through the sharing of personal and emotional connections to CVD in a self-introduction at the start of the seminar. Testimonials about working with patients and loved ones afflicted with CVD were also encouraged during group discussions around related case studies. In NHPP culture, collectivism is often emphasized over individualism;[32] therefore, motivating participants through group challenges for increasing the level of cognitive engagement was a key strategy.

The seminars were conducted at rural and urban locations typically at an Ulu Network organization site or a University of Hawai'i facility. Seminar enrollment was limited to 20 participants to ensure an appropriate classroom size to facilitate discussions and interactive group activities.

Knowledge Assessments and Satisfaction Evaluations

CVD knowledge assessments were administered to participants at three time points: baseline (T1) was assessed immediately prior to the Heart 101 seminar, the first of two post-tests was administered immediately post-seminar (T2), and a final assessment was given 6-months post seminar (T3). All three evaluations were identical in content and consisted of 16 multiple-choice questions on cardiovascular physiology, disease, and treatment selected from two validated instruments: the Dutch Heart Failure Knowledge Scale and the Coronary Heart Disease Knowledge Test.[33,34] A two-part participant satisfaction evaluation was given at the conclusion of the seminar and included: (1) a preference assessment with four open-ended questions probing attendees on the most and least liked aspects of the seminar, ideas for improvements to curriculum delivery and subject matter, and suggestions on other areas of CVD education of interest; and 2) a performance and delivery assessment with nine 3-point Likert scale questions on instructors communication abilities, length of training, content, scope, and complexity of seminar material.

Data Collection and Management

CVD knowledge assessment results were examined from three Heart 101 seminars held in rural and urban sites across the State of Hawai'i between January and May of 2010. All participants were consented before each seminar and a demographic questionnaire was administered in addition to the knowledge assessment. Of the 46 participants who attended all five hours of the training, 30 completed all necessary forms and assessments to be considered for analysis (eg, consent form, pre- and post-training knowledge tests, and demographic and satisfaction surveys). Twelve participants were inadvertently given a defective version of the test, while the remaining four exclusions were due to failure to obtain either a post-test or consent form.

To measure immediate knowledge changes from pre- to post-seminar, the CVD knowledge assessment was given before any education was delivered and again at the very end of the seminar. Participants were encouraged to finish the tests within 15 minutes of starting and were instructed not to discuss questions or share answers. For long-term information competency, six-month post-training assessment tests were sent electronically via email to all 30 participants included in the pre- to post-seminar analysis. Up to three reminder emails were sent to participants who were non-responsive, with a final hard copy mailed 26-weeks post-training. Twenty participants ultimately responded and each received a small gift card incentive upon return of the 6-month post-training follow-up assessments.

Data Analysis

For the CVD knowledge assessment analyses, a unique number was assigned to each participant and used as the only identifying marker for matching of all pre- and post-assessment forms. Assessments were reviewed and scored by project staff and JMP software, a SAS-FSP (Cary, North Carolina) based statistical analysis software program, was used in all analyses. Paired t-tests determined differences in the mean values between T1 and T2 to measure knowledge changes during the training, and between T1 and T3 for long-term information competency gained from baseline. A question-by-question analysis was performed to assess changes in knowledge by cardiovascular health subtopics using paired t-tests to compare the proportion of correct responses for each assessment question between T1 and T2 periods.

Responses to the open-ended participant preferences assessment were coded for general theme and tallies of the most frequent answers were noted. Frequencies of whether participants agreed with, were not sure, or disagreed with the prompts to assess satisfaction content delivery and facilitator performance were also recorded.

Results

Demographic Characteristics

Most participants identified their current employment position as a CHW or outreach worker (63%). Medical assistants, peer counselors, and health educators were among the most frequently specified job positions of those remaining. The majority of CHW were women (67%), and many were over 50 years of age (43%). Native Hawaiians (61%) were the largest ethnic/racial group represented, while other Pacific Islanders and Filipinos comprised 6% and 9% of participants, respectively (Table 2).

Cardiovascular Health Knowledge Gained and Long-Term Information Competency

There was a statistically significant improvement ($P<.001$) in mean scores by 3.5 ±2.6 correct answers between T1 and T2, an overall 32% increase. Similarly, assessment of long-term information competency showed that participants maintained a statistically significant improvement ($P<.001$) in CVD knowledge from T1 to T3 of 2.2 ±2.3 correct answers (Table 3).

A question-by-question analysis of knowledge change found that the frequency of correct answers increased from T1 to T2 for all test questions. These improvements were statistically significant for 12 of the 16 assessment questions ($P=.04$ to $P<.001$). All 16 test questions had a correct answer frequency of 83% or higher at T2. As such, there were also improvements from T1 to T2 in each of the six subtopic areas: (1) CHD signs, symptoms, & medications, (2) risk factors, (3) exercise, (4) diet, (5) stress, and (6) CVD physiology. The questions with the greatest proportional increase in knowledge were in the subtopic areas of risk factors, exercise, and stress (Table 4).

Participant Satisfaction Evaluations

Analysis of the satisfaction evaluations revealed that participants found the most favorable aspects of the training to be (1) good information, (2) presentation format, and (3) interactive team games and other group activities. The results of the performance rating section were overwhelmingly positive, with more than 95% of respondents selecting the highest degree of satisfaction. The short duration of the training for the amount of material covered was the most frequently identified area of greatest dissatisfaction. Participants also noted that they desired more information on alternative and traditional medicine practices, as well as strategies for helping clients without health insurance coverage.

Table 2. Demographic Characteristics of Heart 101 Participants, 2010.

Characteristics	N=46, all participants Count (%)
Sex	
Male	15 (33)
Female	31 (67)
Age	
19-30 years	8 (17)
30-50 years	18 (39)
Over 50 years	20 (44)
Years of Experience	
0-1 years	5 (11)
1-2 years	2 (4)
2-5 years	7 (15)
5 or more years	32 (70)
Ethnicity	
Native Hawaiian	28 (61)
White	6 (13)
Asian	5 (11)
Filipino	4 (9)
Other Pacific Islander	3 (6)

Table 3. CVD Knowledge Test Scores.

	n	Pre-seminar score (Mean ±SD)	Post-seminar score (Mean ±SD)	6 month post-seminar score (Mean ±SD)	Change in Test Score (Mean ±SD)
Pre-Seminar to Post-seminar	30	11.1 ±3.0	14.6 ±2.0	N/A	3.5 ±2.6*
Pre-Seminar to 6-months Post-Seminar	20	12.1 ±2.6	N/A	14.2 ± 1.2	2.2 ±2.3**

*$P<.0001$; **$P<.0004$. SD=Standard Deviation

Table 4. Frequency and Proportion of Correct Answers on CVD Knowledge Tests (N=30).[33,34]

CVD Subtopic	Question	Pre-Test n (%)	Post-Test n (%)	Percent Change	*P*-value
CHD Signs, Symptoms, & Medications	2. The most common disease of the circulatory system among people in the United States is: a. Heart attack b. Stroke c. High blood pressure d. A blood clot in blood vessels of the heart	22 (73%)	29 (97%)	+32%	.01
	6. The condition in which the pumping power of the heart is reduced to the point where fluids begin to collect in the lungs and extremities is known as: a. Arrhythmias b. Congestive heart failure c. Coronary spasms d. Tachycardia	26 (87%)	28 (93%)	+8%	.33
	8. Beta-blockers are drugs that: a. Reduce heart rate & blood pressure b. Improve heart-muscle contractibility c. Interfere with blood-clotting ability d. Are used to reduce blood lipids	21 (70%)	27 (90%)	+29%	.03
	12. An occlusive blood clot that results in a small area of dead heart muscle is called: a. A myocardial infarction b. A stroke c. Endocarditis d. A pulmonary infarction	20 (67%)	28 (93%)	+40%	.01
Risk Factors	4. A risk factor of coronary artery disease that you CANNOT change is: a. Lack of exercise b. Heredity c. Obesity d. Stress	29 (97%)	30 (100%)	+3%	.33
	7. The single most preventable cause of death and disease in the United States is: a. Drug abuse b. Environmental pollution c. Poor nutrition d. Smoking	17 (57%)	30 (100%)	+76%	< .001
	15. Which of the following blood fats is thought to lower your risk of coronary artery disease: a. High density lipoprotein b. Low density lipoprotein c. Cholesterol d. Triglycerides	18 (60%)	27 (90%)	+50%	< .001
Exercise	11. Which of the following is a direct benefit of exercise: a. Reduced work of heart for a given workload b. Reduction of fat cells c. Enlarged lungs d. Increasing resting heart rate	14 (47%)	26 (87%)	+86%	< .001
	14. The best type of physical activity to maintain cardiovascular fitness is _____ exercise: a. Anaerobic b. Aerobic c. Non-aerobic d. Dynamic	26 (87%)	30 (100%)	+15%	.04
	16. The symptoms of angina pectoris after physical exertion include: a. Numbness of the legs b. Prolonged, severe chest pain c. Pain in the right arm d. Temporary chest pain	16 (53%)	25 (83%)	+56%	.001

Table 4. Frequency and Proportion of Correct Answers on CVD Knowledge Tests (N=30).[33,34] Con't.					
Diet	5. Most Americans could benefit from diets: a. Lower in complex carbohydrates and higher in protein b. Lower in complex carbohydrates and lower in fat c. Higher in complex carbohydrates and higher in fat d. Higher in complex carbohydrates and lower in fat	17 (57%)	26 (87%)	+53%	.001
	10. The type of fat that is solid at room temperature is called: a. Saturated b. Monosaturated c. Polyunsaturated d. Unsaturated	21 (70%)	29 (97%)	+38%	.003
	13. A reasonable weight loss goal is: a. 1 pound a day b. 2 pounds a day c. 2 pounds a week d. 5 pounds a week	25 (83%)	27 (90%)	+8%	.49
Stress	3. Which of the following is a physiologic response to stress: a. Feeling hungry b. Slower heart rate c. Decreased metabolism d. Increased blood pressure	29 (97%)	29 (97%)	0%	–
	9. What is the relationship between stress and atherosclerosis: a. Atherosclerosis is a major cause of stress b. Elasticity of the arterial walls will increase with atherosclerosis c. A single stress, by itself, is both necessary and sufficient to cause atherosclerosis d. The stress response causes cholesterol to be circulated in the bloodstream to aid in muscle activity	9 (30%)	25 (83%)	+178%	< .001
Normal Cardio-vascular Physiology	*1. What is the main function of the heart: a. To absorb nutrients from the blood b. To pump blood around the body c. To provide the blood with oxygen d. To remove wastes from the body	24 (80%)	29 (97%)	+21%	.02

The questions here are numbered as they appear on the actual knowledge tests provided to training participants included in our analyses. Correct answers are denoted by the underlined corresponding letter choice. An asterisk identifies the sole question taken from the "Dutch Heart Failure Knowledge Scale," while all others were compiled from the "Coronary Heart Disease Knowledge Test."

Discussion

As an effective culturally relevant and capacity-building training, Heart 101 serves as a model for educating CHW in cardiovascular health. The significant increases in mean test scores from T1 to T2 demonstrate significant gains in knowledge, while the increase in mean test score from T1 to T3 indicate meaningful long-term information competency.

Emerging research findings on Indigenous and culture-based education (CBE) identify specific strategies that may have contributed to the success of the training. Heart 101 utilized specific aspects of CBE, such as language, context, and content (Table 4).[35] Findings from other minority communities implementing CBE elements have also demonstrated the success of culturally relevant CHW training programs.[36] A notable example in another Indigenous community was a 5-day wellness course on health promotion and disease prevention delivered to CHW in an Alaskan village. The training incorporated Alaska Native cultural values and traditions that emphasize the interconnected relationships of family, community, and the land, as well as art and storytelling. By the end of the training, 98% of participants felt more confident in their knowledge and ability to present community wellness information.[37]

Principles of adult learning theory may have also influenced the assessment outcomes. Adult education research reports that unlike children and traditional post-secondary students, adult learners have different motivators and values related to educational processes. For example, adults have a higher need to understand the purpose of their learning, and prefer being self-directed. They participate in learning activities with a greater volume and quality of experience and enter into a learning environment with a task-centered orientation.[38] Therefore, the format of the Heart 101 training suits these non-traditional adult learners well. The use of culturally and community relevant teaching approaches, such as role-playing scenarios and case studies, likely reinforce the real world relevance and applicability important to adult learning.

Implications of Knowledge Test Results for the Heart 101 Curriculum

While results improved in all CVD health subtopics, a broader categorical review indicated baseline understanding to be higher on questions dealing with clinical knowledge (eg, medication, signs and symptoms, etc), as opposed to those testing basic science principles of cardiovascular health (eg, physiology, pathophysiology). In addition, questions that included medical terminology like "hypertension" (rather than "high blood pressure") had greatest improvement, highlighting a key focus area for training of CHW. More broadly, this indicates that a stronger foundation in basic science aspects of chronic disease and in medical terminology would benefit CHW by providing more tools for influencing patients towards improved lifestyle measures. Additionally, this would help to improve CHW communication with clinicians and other health care team members.

Study Limitations

Because of the restricted scope of this analysis, a quantifiable measure on how cultural competency and interactivity specifically contributed to improvements in results cannot be reported at this time. Our modest sample sizes and the lack of randomization are other notable limitations to the statistical power of our findings. A practical alternative to excluding participants with defective tests would be to include only questions common to both test versions from all eligible participants. While this would allow for a larger sample size, it would also diminish the scope of our inquiry into CHW knowledge by CVD sub-topic. Finally, there is uncertainty in whether our long-term knowledge review reflects an actual long-term information competency or is the result of repeated use of the same instrument for all assessments, as well as the impact of higher scores at T1 among the subset of participants who also submitted tests at T3.

The positive responses of the participant satisfaction survey may reflect the overall positive attitude of CHW, and perhaps a general reluctance to provide negative critiques. Lastly, all classes were held in Hawai'i with Native Hawaiians as the majority of attendees. This may restrict the generalizability of our findings.

Summary

CHW represent a diverse class of health services professional of growing importance. Although most often reflective of the communities they serve, CHW demographics, skills and knowledge base, as well as work roles and responsibilities vary greatly. Current trends in US healthcare delivery that aim to address health inequities and identify efficient means of healthcare implementation call for the skills and services that CHW are uniquely equipped to provide. This increased reliance on CHW necessitates a better understanding of ways to help CHW increase their capacity to be contributing members of the healthcare team. The CVD seminars and subsequent knowledge assessments revealed insight on strength and weakness in foundational and operational knowledge of CHW serving Hawai'i's most health disparate populations. These findings also demonstrate that a culturally relevant and interactive course, such as Heart 101, is a strong approach for cardiovascular health information dissemination to CHW serving NHPP communities. The success of the training can be measured in the overall improvement of scores and key areas of CVD knowledge, as well as long-term competency in CVD information. The positive feedback received in participant satisfaction surveys offer additional support for the methods used.

From this study, it is believed that a training program modeled on CBPR and culturally competent principles could serve as a standardized model for CHW health education training. Achieving this might not only lead to improved patient care and capacity building within the Hawai'i's community health systems, but could also offer benefits for career development and advancement for this important member of the healthcare team.

Conflict of Interest

None of the authors identify any conflict of interest.

Acknowledgement

Mahalo piha is extended to the many Heart 101 instructors and Ulu Network members who have helped to make these trainings possible and to Dr. Kekuni Blaisdell for his advice and support. This publication was made possible by funding from the Queen's Health Systems and by Award Number P20MD000173 from the National Center on Minority Health and Health Disparities. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Center on Minority Health and Health Disparities or the National Institutes of Health.

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