COMMUNITY HEALTH WORKERS AND CONTROL OF HEART FAILURE EXACERBATION

By

REBECCA RAWSON

A manuscript submitted in partial fulfillment of the requirements for the degree of

Master in Nursing

DECEMBER 2009

WASHINGTON STATE UNIVERSITY

College of Nursing
To the Faculty of Washington State University

The members of the Committee appointed to examine the manuscript of REBECCA BARRETT RAWSON find it satisfactory and recommend that it be accepted.

Chair: Louise Kaplan, PhD, ARNP

Lorrie Dawson, PhD, ARNP

Dawn Rondeau, MS, ACNP, FNP
Community Health Workers and Control of Heart Failure Exacerbation

Abstract

By Rebecca Rawson

Washington State University

November 2009

Chair: Louise Kaplan

Promoting optimal health for patients with heart failure remains one of the most difficult disease management challenges in the primary care setting. Nurse practitioners are seeing more patients with heart failure who have complicated management issues. Control of heart failure exacerbation involves both pharmacological and non-pharmacological interventions. Office based encounters alone make it difficult for the nurse practitioner to adequately address and support a patient. Community health workers (CHWs) are a resource that can be utilized to supplement traditional patient care management. According to the Centers for Disease Control and Prevention, CHWs function within their own communities to support, encourage and promote self-management of chronic disease symptoms. This article seeks to explore the potential of expanding the health care team to include a CHW who would provide education, prevention, and case management for the heart failure patient in collaboration with a nurse practitioner provider. The CHW can reinforce and encourage many of the goals established by a nurse practitioner and patient.
TABLE OF CONTENTS

Abstract .................................................................................................................. iii

Chapter

1. Introduction....................................................................................................... 1
2. Background of the Problem.............................................................................. 2
3. Non-pharmacological symptom Control....................................................... 3
4. Disease Management....................................................................................... 6
5. Evolution of the Community Health Worker.............................................. 7
6. Review of the Literature.................................................................................. 8
7. Exemplars of Programs Using Community Health Workers....................... 9
8. Discussion.......................................................................................................... 12
9. Conclusion......................................................................................................... 13
10. Bibliography..................................................................................................... 15
Heart failure affects 5.7 million people annually in the United States with about 670,000 new cases identified per year (American Heart Association [AHA], 2009). As the baby boomer population and survival rates following myocardial infarction increase, greater numbers of Americans will be diagnosed with heart failure. Surviving a myocardial infarction incurs an eight to ten fold increased risk of development of heart failure (Heart Failure Society of America [HFSA], 2006). Heart failure is often referred to as a growing epidemic and is the most common hospital discharge diagnosis in patients over age 65. By age 75, ten percent of the population will have the diagnosis of heart failure (AHA, 2009). The annual mortality rate is as high as sixty percent, and the five year survival rate for patients with severe heart failure is fifty percent. The cost of care and evaluation of patients with heart failure exceeds $10 billion per year (Dunphy, Winland-Brown, Porter, & Thomas, 2007).

Symptom control to prevent exacerbation of heart failure is a multi-factorial combination of modifiable and non-modifiable components. A major intervention in the treatment of heart failure is pharmaceutical management to optimize cardiac and systemic function in the setting of cardiac compromise. Non-pharmacological management is equally important, and self-management of symptoms to prevent worsening exacerbation of heart failure can be extremely challenging for patients and providers. Chronic disease management has incorporated models using Registered Nurses (RNs) as case managers for a variety of disease processes including asthma, heart failure, diabetes, and chronic kidney disease. The community health worker (CHW) is an additional non-nursing member of the health care team. CHWs serve in multiple capacities in the health care arena. According to the Centers for Disease Control and Prevention (2005), one role is that of promoting, encouraging, and supporting positive self-management.
behaviors among fellow community members. CHWs have been used extensively in programs targeting AIDS prevention, maternal and child health, and diabetes care (Health Resources and Services Administration [HRSA], 2007). There are also a growing number of programs utilizing CHWs for hypertension and coronary artery disease risk control. Very little information exists on the utilization of CHWs in assisting with self-management of heart failure. This article explores self-management of heart failure and utilization of CHWs. Expanding the traditional model of patient care for the heart failure patient to include a CHW is an approach that has the potential to supplement and improve care given by a nurse practitioner.

**Background of the Problem**

According to the Heart Failure Society of America, heart failure “is a syndrome characterized by elevated cardiac filling pressure or inadequate peripheral oxygen delivery, at rest or during stress, caused by cardiac dysfunction” (HFSA, 2006, p.5). The phenomenon of systolic dysfunction, or inability to efficiently eject blood, and diastolic dysfunction, or inefficient ventricular filling, causes compromised myocardium with extensive systemic sequelae. While there are multiple potential causes of congestive heart failure, the vast majority of cases are caused by coronary artery disease. Other factors that affect heart failure risk are obesity, valve abnormalities, diabetes, renal insufficiency, anemia, sleep apnea, dysrhythmias, thyrotoxicosis, and pulmonary embolus (Guyton & Hall, 2006).

Heart failure is often stratified based on the New York Heart Association (NYHA, 2002) classification system which aids the clinician in diagnosis and treatment paths. In class I, mild heart failure, the patient has no limitation of physical activity. In Class II, also described as mild,
the patient has no symptoms at rest, but even mild physical activity can cause symptoms of
dyspnea, palpitations, or fatigue. Class III, moderate heart failure, encompasses marked
limitation of physical activity with less than ordinary activity resulting in fatigue, palpitations or
dyspnea. Patients categorized as class IV, the most severe, are unable to carry out any physical
activity without discomfort. Even while at rest, cardiac insufficiency, manifested as dyspnea,
pain, or fatigue occurs (HFSA, 2006). This gradually worsening progression of illness is often
manifested by episodes of acute exacerbation when the disease is not well managed.

**Non-pharmacological approaches to the management of heart failure**

Proper management of heart failure and limiting exacerbation of worsening disease involves
decreasing cardiac workload, decreasing volume overload, and optimizing left ventricular
function (Dunphy et al., 2007). Non-pharmacological symptom control in the care of heart
failure patients is multifaceted. Controlling exacerbation of heart failure symptoms involves
sodium restriction and dietary controls, exercise, smoking cessation, limiting alcohol intake,
addressing mental health issues, and self-management of signs and symptoms such as daily
weight monitoring.

Diet and nutrition are important factors for the control of heart failure. While there is no
consensus on the amount of sodium restriction recommended for prevention of heart failure
exacerbation, the range is between 2 and 3 grams of sodium per day. During an acute
exacerbation, a sodium target of 1500 mg per day is generally recommended (HFSA, 2006).
Addressing diet with the overweight and obese patient is another nutritional aspect of the
prevention of worsening heart failure. In general, being overweight causes increased myocardial
demands and increased insulin resistance which leads to greater systemic vascular resistance and
eventual cardiac myopathy. While the recommendations are not specific, an overall balanced nutrition plan is important for the heart failure program with incorporation of multivitamin therapy and an emphasis on fresh fruits and vegetables rather than high sodium packaged products (HFSA, 2006).

Exercise is another non-pharmacological factor for controlling symptoms in heart failure. More recent evidence supports the importance of the role of exercise in modification of symptom exacerbation. In a study of 54 patients with diastolic dysfunction over a three month period of physical training, an improvement was found in parameters of exercise performance, improved NYHA class, reduced brain naturietic peptide (BNP) and reduced pulmonary pressures (Malfatto, 2009). It is important to individually tailor an exercise program based on medication regimen and tolerance. It has been discovered that a warm-up period of ten to fifteen minutes is optimal, a cool down post-exercise period is important, and that a frequency of three to five days per week with some walking on the alternate days may be beneficial for the person with heart failure (Pina, 2003).

Smoking cessation has proven to be of benefit in the prevention of heart failure symptom exacerbation. Nicotine release contributes to vasospasm, catecholamine release, and increased aggregation of platelets, all of which cause blood pressure to rise, thereby increasing oxygen requirements for the myocardium (Copstead & Banasik, 2005). Increasing oxygen demands further exacerbates heart failure.

Limiting alcohol intake is another non-pharmacological measure that can prevent the worsening of heart failure. Alcohol intake contributes to hypertension further exacerbating myocardial strain and heart failure, especially in patients who may have alcohol-induced
cardiomyopathy. Diminishing or ceasing alcohol intake has a positive benefit for the heart failure patient (HFSA, 2006).

A cornerstone of control of heart failure exacerbation is the monitoring of physical symptoms. A critical aspect of heart failure monitoring is tracking daily weights which are an essential tool for monitoring volume status. Daily weights are an objective tool for effectively screening potential cardiac compromise. Other symptoms of exacerbation that signify worsening disease include increasing edema, dyspnea, and cough, all of which, when monitored judiciously, can often be effectively controlled.

Factors affecting the ability of patients with heart failure to self manage symptoms

There are several factors which affect the ability of patients with heart failure to control their symptoms. Some of these include financial resources, types of insurance, co-pays and regulations, literacy and cognitive issues, language and cultural barriers, physical disabilities, and mental health challenges.

If financial resources are limited, it can be difficult to eat fresh, healthy foods, most of which are significantly more expensive than high sodium, packaged foods. Organized exercise programs can be costly, and if the patient is working, time to dedicate to an active exercise regimen may be minimal.

Literacy and cognitive issues may present a problem for the heart failure patient when presented with an overwhelming array of parameters to monitor and control. Visual and hearing difficulties may interfere with the ability to see a scale, read a label on a can of soup, or interpret instructions. Patient understanding is also hampered by the fact that most heart failure patients are dealing with other co-morbidities which may conflict with or further confuse the appropriate
plans of action. For example, patients with both heart failure and COPD may be confused about the etiology of their dyspnea, or there may be several different dietary recommendations to follow based on co-morbidities such as diabetes and clotting disorders (Riegel, 2009).

Co-existing depression brings with it a significantly worse prognosis for heart failure patients (Jiang et al., 2004). In a study evaluating heart failure patients with depression, patients listed strategies for dealing with depressive symptoms that included exercise, keeping active, distraction, spirituality, and dwelling on positive thoughts (Dekker, Peden, Lennie, Schooler, & Moser, 2009). Addressing each of these non-pharmacological components has value in the intervention of a heart failure patient. Riegel and colleagues found evidence that when depression and anxiety were addressed and treated, self-care practices improved (Riegel, 2009).

A final barrier to self-care symptom monitoring is that of the health care system itself. Coverage issues such as co-pays, benefits and eligibility, and lack of reimbursement for preventive services make it difficult for a patient to access appropriate care and to negotiate a confusing system.

The Heart Failure Society of America has recommended the value and importance of a comprehensive disease management program for patients with heart failure. The National Guideline Clearinghouse has given disease management programs for heart failure patients a strength of evidence of “A”, its highest rating, which is based on randomized, controlled, clinical trials. In patients recently hospitalized for heart failure and those considered to be at high risk with renal insufficiency, low cardiac output, diabetes, COPD, multiple comorbidities, history of depression or cognitive impairment, or medication non-adherence, disease management programs have been found to be beneficial (NGC, 2006). Based on the average patient’s needs,
such a program would include at least seven components. These components are thorough education and counseling, promotion of self-care management, behavioral strategies for adherence, vigilant access to follow-up, optimal medical therapy, early awareness of fluid overload, and assistance with social and financial concerns. Many of these components can be effectively managed by CHWs as members of a health care team.

In 2007, the Health Resources and Services Administration (HRSA), a division of the US Department of Health and Human Services, issued a statement about community health workers (CHWs). CHWs were identified as community members with varying roles and responsibilities that range from providing health education, advocacy and support, intake and referral to higher levels of care, and provision of direct patient services (HRSA, 2007). HRSA describes CHWs as "lay members of communities who work either for pay or as volunteers, in association with the local health care system in both urban and rural environments and usually share ethnicity, language, socioeconomic status and life experiences with the community members they serve" (HRSA, 2007).

HRSA identified five different roles in which community health workers are utilized. One role is as a member of the health care team in which specific duties are assigned by the lead provider. A second role is as a navigator in which the CHW assists patients in steering through the intricacies of the health care system. The third, and most common, role is health education provider and screener. In this role, the CHW teaches self-care and administers basic screening tools. The CHW is actively involved with difficult to reach populations in the community. A CHW can be assigned to recruit patients who qualify for outreach. Finally, the CHW may serve as an organizer in the community related to a specific health issue such as HIV/AIDS or drug
and alcohol prevention (HRSA, 2007). While all of these roles can be applied to assisting with control of heart failure, the roles of health care team member, system navigator, health education provider, and recruiter for outreach are the most relevant.

**Review of the Literature**

A literature search with the electronic databases CINAHL and PubMed using the keywords “community health workers”, “heart failure”, “self-management”, and “prevention” was conducted. Search criteria included articles published in English after 2004 related to health care in the United States only. In addition, national organizations including the CDC, AHA, HFSA, and Disease Management Association of America were searched. Ten articles described the use of CHWs in programs related to chronic disease prevention, reduction of cardiac risk factors, and promotion of heart healthy behaviors. Only one program reported the use of CHWs as partners in case management of complex disease processes. There were twenty-one articles describing the use of CHWs specifically targeting patients with diabetes. The majority of models utilized CHWs in diabetes case management. There are many aspects of the role of the CHW in supporting people with diabetes that are generalizable to people with heart failure given the chronic nature of both of these health problems.

In June 2009, the Agency for Healthcare Research and Quality (AHRQ) published an evidence report regarding the outcomes of CHW interventions (Viswanathan et al., 2009). Thirteen studies regarding chronic disease management were reviewed; of these thirteen articles, seven were less than ten years old. Two articles related to asthma prevention, three focused on diabetes self-management and two focused on hypertension control. The AHRQ reported no
articles specifically focused on prevention of exacerbation of heart failure symptoms. Articles focused on hypertension and diabetes control have implications for the topic of heart failure given the similarity of lifestyle control parameters among the disease processes. Studies addressing the outcomes of the use of CHWs with patients who have hypertension compared to programs without CHWs showed no significant difference in blood pressure control. The outcomes of the two studies of CHWs working with people with diabetes demonstrated a decrease in hemoglobin A1c. While the report failed to show a consistent improvement in health outcomes related to chronic disease management, the lack of recent data and the lack of studies related to the topic of heart failure underscore the importance of more investigation.

**Exemplars of Programs Using Community Health Workers**

In a clinic on the border between Texas and Mexico, CHWs were part of a staff which suffered from a severe shortage of health care providers. The CHWs in the program implemented a lay diabetes self-management program from the CDC. They taught self-management classes, helped patients with goal setting and symptom monitoring, and functioned as team members in case management with providers. The CHWs utilized progress notes to track patients’ successes and barriers, and a procedure was developed to follow when adverse symptoms needed to be communicated to the health professional. Clinic staff stressed the importance of active participation by the patients’ primary providers in creating and implementing the use of CHWs, in oversight of activities, and in considering the CHW as an integral member of the health care team (Sixta & Oswald, 2008).

In an intervention focused on outreach to vulnerable populations along the US-Mexico border, clients reported that the CHW functioned as a conduit between the community and
the health care system and was perceived as a natural helper who embodied the value of trust for clients seeking care (Reinschmidt, 2006). The Center for Community Health in Dallas, Texas, utilizes CHWs in their chronic disease management program focusing on helping patients in navigating the complicated healthcare system, increasing adherence to plans, and helping to coordinate care for homebound patients with complex conditions (Senteio, Jackson, & Walton, 2008).

Allen (2003) makes a convincing case for the implementation of greater use of CHWs after listing some job responsibilities implemented in clinical trials. These tasks include completing a training course, ability to perform and teach patients to perform blood pressure and pulse checks, home visits involving family members, education, medication assistance, problem solving, attending appointments, reporting to providers, and referral assistance.

In a rural, medically underserved area of Oregon, chronic disease patients have benefited from an ongoing CHW program. Pasos, or Steps to Wellness, is under the auspices of the Rural Health Services Outreach Program. This rural outreach of CHWs focuses on diabetes management, obesity reduction, and mental health support. The CHWs ran a weekly healthy living class for 15 weeks as well as a childhood obesity program using a popular education, interactive model in addition to conducting regular home visits. Feedback from 241 adults and 35 children was positive, and there was an increase in exercise and vegetable intake, weight loss, improved LDL and A1C levels, as well as reported mental health improvements (M. Dogotch, personal communication, August 3, 2009). While the Pasos program in rural Oregon focused on diabetes, it serves as a template for CHWs working to control symptom exacerbation in heart failure, especially since so many of the baseline parameters of diet, weight loss, exercise, and
control of hypertension are all important issues to address.

A study funded by the National Institute of Health (NIH) investigated coronary artery disease risk reduction in 350 Black American adults utilizing risk specific guidelines of the Adult Treatment Panel II (ATP II), the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure VI (JNC VI), and smoking cessation guidelines from AHRQ. Half of the participants were placed in a community based care group while the other half was in an enhanced primary care group. Both groups had access to free medications through a charge card as well as free diet, exercise and smoking cessation programs. The enhanced primary group (EPC) received all the same risk-specific information and the providers followed the same guidelines. The community based care (CBC) intervention occurred in a nonclinical setting near bus and subway lines. The site had an exercise room, exam rooms and children’s play area. On each visit a nurse practitioner performed an assessment and evaluated pharmacotherapy and national guideline adherence in executing appropriate treatment plans. The CHW completed dietary and exercise counseling, smoking cessation and conducted exercise sessions. The CBC group had 50% improvement in cholesterol control compared to 30% for the EPC group, 60% improvement in blood pressure control compared to 40% for the EPC group and 8% smoking cessation compared to 4% overall for black Americans (Becker, Blumenthal, and Johnson, 2005). One of the reasons cited for the success of the CBC group was obtaining input early on from two local pastors, a community health worker and local residents who created the framework for the services and activities (Becker, Blumenthal, and Johnson, 2005).
Discussion

How can the concept of utilizing a CHW in management of heart failure exacerbation become reality? According to the National Guideline Clearinghouse, there are essential components of care to be taught and reinforced with the heart failure patient. Some of these include monitoring for specific signs and symptoms such as increasing exertional dyspnea, orthopnea, paroxysmal nocturnal dyspnea, and increasing edema, documentation of daily weights, developing action plans for notification of providers, promotion of smoking cessation, sodium intake monitoring, exercise, activity and exercise plans and goals to increase medication adherence including methods of securing prescription refills (NGC, 2005). All of these self-management parameters could be taught and monitored by a trained CHW.

Incorporating CHWs into pre-existing disease management is a strategy that bears consideration. Medicaid disease management programs list eighteen states that include heart failure patients as target populations (National Conference of State Legislators [NCSL], 2007). According to the national conference of state legislatures, the role of CHWs within Medicaid programs is important because they serve a unique function to bridge health resources with underserved populations (NCSL, 2008). In a 2003 study of Baltimore Medicaid patients, the ability of CHWs to connect patients with providers and appointments and to assist with self care management resulted in 38% fewer ER visits, 30% fewer hospitalizations and 27% reduction in Medicaid costs (NCSL, 2008). Kentucky Homeplace is a lay health worker program that has utilized CHWs and has been funded with general legislative dollars for over thirteen years. In this program, CHWs focus on preventive care, health education and disease self-management in rural areas where cancer, diabetes and heart disease are especially high (University of Kentucky
The CDC’s center for chronic disease prevention and health promotion has called for increased utilization of CHWs to address the alarming increase in Type 2 diabetes (CDC, 2007). Utilizing CHWs for prevention of heart failure exacerbation is a natural extension of this call.

Nurse practitioners (NPs) who want to adopt this model of care could work to establish a program that uses CHWs as members of the health care team. Whether a practice is located in an urban or rural setting, a CHW who comes from and represents the community is a valuable partner extending trust and legitimacy for patients. A heart failure disease management program, either under the auspices of established Medicaid programs or other managed care entities can include a CHW focused on assisting patients with heart failure in self-management, just as the programs described which target diabetes and coronary artery disease risk reduction. The CHW would coordinate the patient’s access to care and assist in self-monitoring for symptom control and running diet and exercise interventions while the NP would oversee the treatment guidelines, pharmacological management, and overall treatment plan. Developing a team partnership approach to patient care utilizing trustworthy members of the community is an excellent model for assuring that patients receive the best possible outcome. The presence of a partner in delivery of health who can help patients negotiate the system, offer prevention education, and be an advocate for patients’ needs has the potential to positively impact care.

**Conclusion**

The growing epidemic of heart failure in the United States is a critical health care problem that must be addressed with consideration of alternative resources. While careful
pharmacological intervention is a necessary component of effective treatment, judicious attention to the non-pharmacological factors that affect heart failure exacerbation is essential. Parameters such as decreasing sodium intake, weight control, increasing exercise, smoking cessation, alcohol reduction, dietary modification, and blood pressure control have all been shown to have an effect on preventing exacerbation of heart failure.

CHWs have been utilized in intervention programs which focus on healthy behaviors such as those needed for controlling heart failure. As health care costs escalate, the use of CHWs may prove to be a cost-effective mechanism to promote optimal health among people with heart failure. The majority of CHWs function in areas such as women’s health, prenatal care, HIV/AIDS prevention, and diabetes. Skills used by CHWs to work with patients who have these problems are transferable to the needs of people with heart failure.

Future research regarding CHWs would include a comparison of baseline clinical parameters in patients with heart failure and parameters after a directed intervention with CHWs. Patients would benefit from research focused on whether use of such interdisciplinary models with the community health worker at the central hub of the wheel of health care delivery affects a positive outcome in the management of very challenging disease entities. Public policy could be focused on expanding disease management programs to utilize the specific niche of community health workers to work with the heart failure population. Some of the important policy implications include standardization of training and certification for CHWs, practice, and reimbursement issues. However, with national entities such as the CDC and the HRSA calling for greater utilization of CHWs, it is imperative that expanded concepts of the traditional primary care model be further explored.
The control of heart failure is a complex constellation of many variables and a significant challenge for the primary care provider. Incorporating a team member such as a CHW in the care of such complicated patients has the potential to make a difference for individual patients and their families and to impact the heart failure epidemic.
References


16


