

CHF CLINICS: BENEFITS, MODELS, UTILIZATION, AND PATIENT COMPLIANCE

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Abstract

Heart failure clinics have shown to provide improved patient outcomes through reduced healthcare utilization. This paper reviews different models of heart failure clinics and their benefits through literature review. Clinic utilization and patient compliance are reviewed through studies that have identified areas of noncompliance and tools for improvement. A broader review of nursing theory as it applies to chronic disease management provides a tool for patient assessment and treatment that can be applied in the care of the heart failure patient in any setting.

Congestive Heart Failure (CHF) affects approximately 5.8 million people in the United States. It is one of the most common reasons for people over the age of 65 to require hospitalization (Hall, Shaleah & DeFrances, 2012). According to the American Heart Association (2012), heart failure was listed on one in nine death certificates as an underlying cause in 2009 (274,601 deaths) slightly improved from 1995 when heart failure was listed as an underlying cause on 287,000 death certificates, while hospital discharges for CHF from 2000 to 2010 are essentially unchanged. The Centers for Disease Control (CDC) reported on the findings of the National Hospital Discharge Survey (NHDS) from 1995 through 2009 and estimates 15,208,518 preventable hospitalizations occurred during this 15 year period (Will, Valerrama & Yoon, 2012). These statistics demonstrate an ongoing need to improve the management of patients with heart failure to keep them out of the hospital and functioning at their maximum capacity.

The management of heart failure is aimed at the prevention of disease and symptom progression to maximize functional capacity and prevent hospitalizations (Jaarsma, 2005). This is done through vigilant outpatient management by frequent physical assessment, evaluation of pharmacologic therapies and education (Crowder, 2006). CHF clinics have been developed to manage these aspects of patient care with the goal of improving quality of life and functional capacity. This requires patient education, self-monitoring skills, and knowing when to contact the clinic or doctor for additional help. These skills help to promote patient compliance, autonomy, and reduce unnecessary hospitalizations (Andersson, Eriksson & Nordgren, 2013). The majority of CHF patients are in the community and are high utilizers of primary care services (Lloyd-Williams et al., 2005). CHF clinics have proven to be effective in supporting these needs as well as reducing emergency room visits, hospitalizations, rehospitalizations, length of stay, and total costs (Crowder, 2006).

There are multiple different CHF management models currently being utilized. Outpatient clinics, home-management programs, and home telemonitoring. There are also many variations within these models. Due to the complex nature of heart failure a multi-disciplinary approach is necessary. This includes nurses, cardiologists, primary care providers, social workers, pharmacists, and dieticians. The effectiveness of each model is individual in nature and is often dictated by patient level of mobility. Outpatient clinics often provide access to medical staff and equipment, but accessibility can be problematic for less mobile patient. Home based models provide a full assessment of a patient's home and social situation and is accessible for less mobile patients, however, it is limited in regards to equipment and can be time consuming (Jaarsma, 2005). Telemonitoring has proven to be an effective

model in increasing patient knowledge and treatment compliance while reducing overall costs. However, specific telemonitoring devices were found to be more effective than others and the method of utilization was not clear, for example, whether the program was used in combination with CHF clinic staff or homecare staff (Inglis, Clark, McAlister, Stewart, & Cleland, 2011).

Prevalence

Approximately five million Americans over the age of 20 currently have heart failure and projections estimate an increase in the prevalence of heart failure by 25% by 2030. The incidence of heart failure is approaching 10 in 1000 people over the age of 65 with increasing incidence noted with increasing age. Hypertension has been identified as the primary risk factor in 75% of patients with heart failure. Utilization of services reports outpatient department visits have gone from 293,000 in 2009 to 1.8 million physician office visits in 2010. There were 668,000 emergency room visits for CHF in 2009, and hospital discharges for CHF from 2000 to 2010 are essentially unchanged. It is estimated that the cost of heart failure management and treatment will increase to \$70 billion, almost 120% higher than the original estimate of \$32 billion (Go et al., 2013).

Will, Valderrama & Yoon (2012) have published a report for the CDC to measure trends and disparities in preventable hospitalizations for CHF. Using the 1995-2009 National Hospital Discharge Survey (NHDS) data, this represented 1% on hospitalizations in the United States each year. The data was race-stratified, ages 18 years and older, with a primary diagnosis of CHF. From 1995-2009, the NHDS had 121,741 records with preventable hospitalizations due to CHF, translating to a weighted value of 15,208,518, averaging 1,013,901 annually for adults in the United States. Race-stratification revealed higher CHF hospitalization rates for blacks with levels staying the same or increasing, and an alarming rise in younger black men. Rates for whites appear to be decreasing in a linear fashion. The CDC has identified that many of these hospitalizations can be prevented through the use of early access to high quality care that focuses on disease management and self-management skills such as daily weight, symptom monitoring, and medication adjustments. Other areas for improvement identified by the CDC are the use and adherence to evidence based guidelines in the management and treatment of CHF which include, controlling hypertension and low-density lipoprotein cholesterol, the use of angiotensin-converting enzyme inhibitors, smoking cessation, weight management, physical activity, and diabetes management. The collection of this data was done prior to healthcare reform, therefore, the CDC is hopeful that this report will assist in assessing future changes which may be impacted by healthcare reform.

Models

Multidisciplinary Model

Multidisciplinary heart failure clinics are out-patient facilities often hospital based, associated with a transplant center, or may be affiliated with a university (Albert et al., 2009).

Due to the complex nature of heart failure a multidisciplinary approach can help to provide optimal patient care and outcomes. Treatment of heart failure includes medication regimes consistent with current guidelines that include titration schedules based on patient symptoms, patient and family education, dietary modifications, exercise, and social support (Jaarsma, 2005). Evaluation of each of the roles in the care of heart failure patients demonstrates the complex nature of managing the disease.

- The primary care provider assists in prevention, initial diagnosis and implementation of evidenced based treatment, on-going medical management of comorbid conditions, and subsequent care regarding follow up needs and optimizing functional capacity (Jaarsma, 2005; Stewart, 2010).
- The cardiologist carries the final responsibility of medical management which is done through advanced diagnostic testing which provides a thorough investigation of cardiac structure and function to guide therapeutic strategy (Jaarsma, 2005; Stewart, 2010).
- The heart failure nurse plays a key role in patient and family education, patient assessment, symptom recognition, lifestyle modification, medication management and titrations, self-monitoring skills, how to manage symptoms, and when to seek help (Jaarsma, 2005).
- The case manager assist in the coordination of the healthcare plan as agreed upon by the heart failure team (Stewart, 2010).
- The pharmacist optimizes the medical regime through assessment of medication interactions, advising physicians, and educating patients. Studies have demonstrated increased patient knowledge and compliance when instructed on medication use by a pharmacist (Stewart, 2010; Jaarsma, 2005).
- The dietician evaluates nutritional needs of the heart failure patient taking all comorbidities into consideration. The dietician provides dietary education and strategies for patients as they implement modifications in their diet to decrease sodium intake and restrict fluid (Stewart, 2010; Jaarsma, 2005).
- The social worker assists the heart failure patient with coordination of services and to provide necessary psychological support. Depression is a common occurrence in heart failure and a social worker can provide early recognition and intervention as needed (Stewart, 2010; Jaarsma, 2005).
- Physical therapists play an important role in establishing a training plan to optimize physical conditioning and counsel patients on energy conservation. Heart failure patients commonly express fear that their symptoms may worsen with exercise. However, low intensity exercise has proven to be a safe and effective way to improve functional status (Jaarsma, 2005).

The evidence supporting the positive outcomes of multidisciplinary heart failure clinics is indisputable. An analysis of the use of specialized, multidisciplinary, community-based care led by the Medical Advisory Secretariat (2009) in Ontario, Canada revealed a reduction in all-cause mortality by 29-40%, a reduction in all cause hospitalizations by 12%, and a reduction in heart failure specific hospitalizations by 25-27%, as compared to usual care.

Jain et al., (2010) conducted a study analyzing the effectiveness of a heart failure clinic (HFC) in a community setting with limited resources as compared to non-heart failure clinic (non-HFC) care. They pointed out that the majority of studies focus on larger area university based hospitals and few studies exist which reflect data in a community hospital setting. The HFC group had a significant reduction in hospital readmission rates. A crossover group of patients that began in the non-HFC group and entered the HFC group demonstrated a 60% decrease in readmission rates. There was no statistical difference in mortality and length of hospital stay in the two groups. Jain et al. (2010) reports the utilization of an expert knowledge algorithm, patient education, and monitoring attributed to the success in this clinic. This study did demonstrate that a multidisciplinary outpatient approach in the community setting can

reduce hospital readmissions, reduce expenses associated with healthcare delivery, and improve quality of life in heart failure patients.

An earlier study by Jain et al., (2005) conducted in the United Kingdom evaluated the effectiveness of a clinic staffed with a nurse, pharmacist, and consultant cardiologist analyzed the success of up-titration of key therapeutic agents. Three clinics were established with strict guidelines and protocols for up-titration. Medications included in the treatment plan were ace-inhibitors, digoxin, beta-blockers, angiotensin receptor blockers (ARBs), spironolactone, and diuretics. Symptom analysis was done at each visit and revealed clinical improvement with dyspnea from 30% to 10%, fatigue from 25% to 19%, peripheral edema from 7% to 4%. Through close symptom evaluation and frequent follow-up visits, cardiac nurses and pharmacists were able to successfully improve symptom management through increasing the number of patients on therapeutic doses of ace-inhibitors or ARBs and beta-blockers while preserving renal function. Jain et al. (2005) does note that a portion of the success of this model may lie with the strict protocols and extensive staff training involved that may have added to the commitment to their respective clinics.

Feldman et al. (2011) conducted a study of six multidisciplinary heart failure clinics to evaluate the outcomes of both men and women over a 12 month period as there are a higher prevalence of men in their clinics in Quebec. Questionnaires gathered information regarding socioeconomic status, healthcare utilization, and self-perception of health status from participating patients. Clinical data collection included New York Heart Association (NYHA) functional class, patient age and gender, medications, left ventricular ejection fraction, and comorbidities. A six minute walk test was also done to evaluate exercise capacity. Results revealed a statistical improvement in the six minute walk test, decrease in emergency room visits and hospitalizations in both genders after 12 months, leading to the conclusion that attending a heart failure clinic for 12 months is beneficial for both men and women.

Nurse-Led Model

Nurse-led heart failure clinics are another popular model of CHF clinics. These are out-patient clinics that are run with protocols for patient care and collaboration with providers. Nurse-led clinics provide patient education regarding self-monitoring skills regarding symptom recognition and daily weights, provide patient assessment, and adjust medications according to clinic guidelines (Ross, Ohlsson, Blomberg & Gustafsson, 2015).

A comparative study of nurse-led clinics for patients with coronary heart disease in Australia found that nurse led clinics measured the short and long term outcomes of several risk factors which included: angina, readmission and admission rates, blood lipids, blood pressure, body weight, smoking, consumer satisfaction, general health, and compliance. While this study is a reflection of patients with coronary heart disease and not heart failure specifically, the evaluation of this model of care is relevant. The outcomes were compared to patients that attended the nurse led clinic versus usual care by their primary care provider. No adverse effects were experienced by any of the patients cared for in the nurse led clinics. Blood pressure, blood lipids, and quality of life showed initial improvement, but long term outcomes were equal to those attained through usual care. Hospital admissions and readmissions rates measured ten years after the study was initiated demonstrated no difference in outcomes. Overall this study supported the short term benefits that patients receive in improved outcomes through health promotion at nurse led clinics (Schadewaldt & Schultz, 2011).

Phillips, Singa, Rubin and Jaarsma (2005) conducted a meta-regression analysis of outcomes of heart failure management in nurse-led heart failure clinics as compared to usual care. Hospital readmissions were not reduced, however in settings with discharge planning, total hospital days were

reduced and readmissions were less. All-cause mortality was reduced in study groups that had optimal use of ACE inhibitors of 75%, however there was no reduction in all-cause mortality associated with suboptimal use of ACE inhibitors. The outcome of this study revealed that nurse-led heart failure clinics with consistent protocols are effective in a select group of heart failure patients, but also points out the significant benefit seen with discharge planning in the reduction of hospital readmissions and in-hospital days.

A study of nurse-led clinics was conducted in Sweden to assess how to make their patient education more patient-centered. The nurse-led clinics in Sweden focus on educating heart failure patients about self-monitoring skill and medication management. Assessment of patients learning needs has shown to increase satisfaction, motivation, and knowledge. Improvements in self-care have resulted from an individualized education plan that includes more than one, individualized meetings and more than one form of educational media. This clinic aimed to improve individualized patient educational needs through questionnaires which asked patients to write down the questions they wanted answered during their visit. These individual educational needs were addressed in addition to routine education which included: etiology, symptom recognition, diet, exercise, risk-factor modification, immunizations, sexual activity, sleep and breathing disorders, and psychosocial needs. This study revealed that utilizing the questionnaire ensured that patients receive patient-centered, individualized education. Studies in Sweden have made the correlation between shorter hospital stays and improved quality of life by using a patient-centered approach in the care of heart failure patients. Nurses discovered that patients need more time during clinic visits to discuss the overall impact that the disease has on their daily lives (Ross, Ohlsson, Blomberg & Gustafsson, 2015).

Lloyd-Williams et al. (2005) conducted a qualitative study to assess the patients' and nurses' experiences in a nurse-led CHF clinic situated in a general practice office. The study takes place in England and includes participants from eight general practices. There were 15 patient participants who were currently being cared for at one of the eight general practices ranging in age from 60-88 years old. Thirteen of the participants were men which has been identified as a limiting factor. A semi-structured interview process was used during the interviews of both nurses and patients. The nurses were questioned on positive and negative aspects of the clinic care and what they felt the patients' experience of clinic attendance was. The patient interviews focused on communication, what aspects were felt to be beneficial or not, knowledge base, and what they felt might benefit from change.

Based on the above questions, four themes emerged: communication, testing, self-care monitoring, and medications. Both nurses and patients felt that communication was good and adequate time was allowed. However, the majority of patients stated that they did not ask any questions. This finding supports the need for nurses to evaluate patient understanding with open-ended questions. When patients were asked about testing, they were vague in their understanding of the results, indications for the test, or had forgotten. This supports the need to provide patients with simple written reports outlining testing indications and results. Life-style modification and self-care monitoring such as signs and symptoms of disease progression, weight, diet, exercise, smoking cessation, sodium, and vaccinations were addressed through education by nurses who believed the patients were fully aware and compliant. The patients found life-style modification to be difficult to adhere to and often forgot many of the details. The majority of patients did recall the importance of monitoring weight and how that related to sodium intake. However, compliance to low sodium diets was still a challenge for most patients. Nurses felt that their education regarding medication indications and use helped to increase patient compliance. Most patients were able to recall the medication used to treat their heart failure and had positive experiences related to necessary titrations that improved symptoms. Some patients had a more difficult time recalling

medications. This reinforces the need to provide simple written material regarding medications in addition to discussions (Lloyd-Williams et al., 2005).

Overall the patients' recollections of their interactions in the CHF clinic are positive and they feel supportive. Nurses' feel they are provided adequate time to assess and educate patients to maintain optimal health. This study does point out that patient compliance and understanding is overestimated by the nurse and could be improved by a more interactive approach during clinic visits and through the use of simple user-friendly written materials (Lloyd-Williams et al., 2005).

Home-Based Model

Home-based care allows for face to face support between the health care provider and the heart failure patient in the comfort of the patients home. This allows nurses the advantage of thorough assessment of patients' social and economic situation as well as the ability to identify any limiting physical factors. The home based setting also provides a better opportunity for nurses to develop a therapeutic relationship with their patients (Stewart et al., 2014).

A multicenter trial to determine which heart failure intervention is most cost-effective and consumer friendly in reducing hospital care (WHICH) compared all-cause admissions, all-cause stay, cardiovascular related admissions, and cardiovascular stays in the hospital. The comparison groups were heart failure patients that received care in home-based and clinic-based heart failure interventions. While both the home-based and clinic-based heart failure interventions proved to reduce all-cause hospitalizations and death during 12-18 month follow-up, the home based clinic had a significant reduction in the length of hospitalization (Stewart et al, 2012). This resulted in a savings of 30% in favor of home based intervention. The conclusions of the WHICH trial led to an overall favoring of the home-based intervention in heart failure care due to the reduced hospital days resulting in an overall cost savings of 30% as compared to clinic based care (Stewart et al, 2012).

Primary Care Provider Model

Andersson, Eriksson, and Nordgren (2013) conducted a qualitative study in Sweden to assess the differences in patient experiences in out-patient specialist based heart failure clinics (HFC) versus primary health care (PHC) in the management of heart failure. Participants were screened through the use of medical records, with criteria for participation being that they were patients that had received care at a HFC and then care was transferred to a PHC within the last five years from data collection which was 2011. ICD-10 codes revealed 413 patients from HFC, 1,673 patients from PHC, but only five patients that met the criteria, four of which participated in the study. This small number of participants is a limiting factor. Face to face interviews were conducted in each participant's homes and they were asked about their life situation, symptoms and length of time with CHF, along with their experiences and support received from HFC / PCC.

Patients reported a notable change from the HFC to PHC. Lack of follow-up from the PHC was evident as patients were accustomed to routine follow-up calls from the HFC, leaving patients with a feeling of abandonment. However, most admitted that they had nothing to complain about as their heart failure was not interfering with activities of daily life. Participants expressed a trusting relationship with both physicians and nurses. Participants did say that they had experienced a major change in the transition from the HFC to PHC, primarily in the area of self-monitoring and reporting data to the HFC. Participants attributed this lack of self-monitoring to improved health, although most wanted the occasional call to check in. When participants were asked about their condition, the information was

ambiguous, while they felt well equipped to handle their health care, they were unable to articulate specifics about their diagnosis, medications, and living with heart failure. There was a consistent message from participants that they were well informed while they received care at the HFC, but had not received any information at the PHC. In conclusion this article highlights the need for a patient-centered approach to the management of heart failure and the risk of losing these patients in the PHC system is high. The benefit of the HFC in management of medically stable heart failure appears to be a superior option given the illness trajectory of heart failure and its high mortality (Andersson et al., 2013).

Telemonitoring Model

Telemonitoring is done through digital transmission of physiological data such as blood pressure, heart rate, weight, pulse oximetry, respiratory rate, and electrocardiography. The transmission of this data to heart failure specialists allows patients access to care that might be otherwise unavailable due to geographical reasons or physical limitations (Inglis et al, 2011).

A study conducted by Dendale et al., (2012) analyzed the utilization of telemonitoring to communicate the data obtained at a heart failure clinic to the primary care provider. This European based study was prompted to improve communication and patient outcomes as only one-third of heart failure programs in Europe have primary care provider involvement. This study concluded that the utilization of telemonitoring demonstrated a significant reduction in both in all-cause mortality and days lost to death, dialysis, or hospitalization for heart or renal failure. Medication use was optimized through significantly more medication changes in the group using telemonitoring. It also improved the collaboration between the primary care provider and the heart failure clinic as all of the physiologic data transmission allowed the primary care provider the information necessary to make medication changes and assume care when the heart failure specialists were unavailable.

Inglis et al., (2011) have conducted a study analyzing the effectiveness of usual care versus the use of telemonitoring (TM), or structured telephone support (STS), in the outcomes of patients with heart failure. STS is simple telephone support that assists with monitoring and self-care management. "Usual care" is defined as "standard post-discharge care without intensified attendance at cardiology clinics or clinic-based CHF disease management programs or home-visits" (Inglis et al, 2011, p.1029). Methods of studies used were randomized controlled trials that analyzed primary outcomes (hospitalizations and mortality) and secondary outcomes (cost, length of stay, and quality of life). Participants of the study were 18 years or older with a definitive heart failure diagnosis. The study determined that both TM and STS followed similar trends exhibiting a 34% reduction in all-cause mortality as compared to usual care. CHF hospitalizations were found to be reduced by 23% with STS and 21% with TM, with length of stay reduced in STS. Quality of life was measured using a number of different questionnaires that showed a statistically significant improvement in quality of life. Varied data was collected inclusive of both STS and TM to reflect cost savings from per admission to total healthcare costs ranging from 14% to 86%. Compliance was reported as 65.8% with STS and an average of 86.8% with TM and 97% of patients were able to learn to use the technology used. Other improvements noted through the use of TM and STS were improved patient knowledge, medication use, and physical function. This study supported the benefits of the use of STS or TM as an effective method of treatment in the management of heart failure particularly for those who have difficulty accessing care.

Telephone Support Model

Telephone support is a low-tech way to provide patients who may be limited by geography or physical limitations a means for consistent contact with a heart failure specialist.

A large multicenter trial studied the effectiveness of telephone intervention in chronic heart failure, known as the DIAL trial. The participants in this trial were stable heart failure patients. Telephone support was provided by trained nurses who counseled patients on diet, medications, symptom recognition (dyspnea and fatigue), daily weight and edema, and physical activity. Telephone support was provided at routine intervals using a predetermined questionnaire and protocols for interventions that allowed nurses to titrate diuretics. The group of patients receiving the telephone support were compared to a group receiving similar care by their cardiologists. A 16 month follow up revealed no change in all-cause mortality. All-cause hospital admissions were reduced by 15% and cardiovascular admissions were reduced by 24%. Improved quality of life was demonstrated through use of the Minnesota living with heart failure questionnaire. Medication compliance and optimal use were improved as well as compliance with dietary recommendations. This study demonstrates the success of an accessible form of support to effectively improve outcomes in heart failure patients (Gesica, 2005).

Staples & Earle (2009) reported on a study conducted in Ontario that analyzed the effectiveness of telephone support provided to 591 heart failure clinic patients. The telephone support was provided by a nurse practitioner, clinical nurse specialist, and a registered nurse. Medical protocols allowed for all three nurses to initiate medication titrations. Written instructions were provided to patients instructing them to call with worsening heart failure symptoms. The nurses provided routine telephone support with increased communication after medication titrations, emergency room visits, hospitalizations, or exacerbations of heart failure symptoms. This telephone support was extended to nurses in home care and long term care as well as physicians' offices. Findings of this study revealed a decrease in emergency room visits from 199 to 40, hospitalizations were decreased from 973 to 134, and readmission rate was decreased from 23.6% to 13%. The success of this study is attributed to the extensive time spend educating patients regarding symptom recognition and medication use and rationale for changes made. The multidisciplinary aspect of this clinic also provided heart failure patients the benefit of access to the appropriate provider (Staples & Earle, 2007).

Utilization

The use of heart failure clinics, regardless of the model, has statistically demonstrated their benefit to heart failure patients. However, despite the evidence based support of the use of heart failure clinics few patients utilize the service. Gravely, Ginsburg, Stewart., Mak & Grace, (2012) conducted a study of 57,969 patients in the United States using Get With the Guidelines (GWTG) found that only 19.2% of patients hospitalized with heart failure were referred to a heart failure disease management program.

This study assess the rates of heart failure clinics and factors related to their use in 270 participants. Variables assessed were health system types and whether a heart failure clinic was on site, sociodemographic status, education, work status, depressive status, access, and family support. Comorbidities, risk factors, functional status, and health care utilization were also assessed. Results revealed that only 15% of the study participants were referred. However, 92% of those patients that were referred did use the clinic, demonstrating a high compliance rate with these referral recommendations. The study did reveal that patients with lower functional capacity, lower ejection fraction, lower stress, and higher education were more likely to use the heart failure clinic. Patients who were also referred to other disease management programs such as cardiac rehabilitation, or diabetes education, were five

times more likely to utilize the heart failure clinic, and over 90% of the patients using the clinic had received referrals to other disease management programs. Access to a heart failure clinic was found to be a significant factor as patients were eight times more likely to be referred when the hospital had an on-site clinic. This was the key factor noted in referral patterns as on-site clinics increase providers awareness of the service. This identifies a need for a broader mechanism for referral and the inquiry and use of alternative models such as home care, telephone support, or telemonitoring (Gravely et al, 2012).

Crowder (2006) conducted a qualitative study analyzing the referral patterns of outpatient congestive heart failure (CHF) clinics. She points out that there is much data available outlining medical expenses, emergency room visits, and hospital admissions associated with CHF, but utilization of CHF clinics and referral patterns are not reported. There were 15 participants in this study and were 21 years or older and had a definitive diagnosis of CHF according to the New York Heart Association Classification I-IV. The participants were limited to patients who were currently seeking care at one outpatient CHF clinic. This has been identified as a limiting factor. Interviews were conducted on a one-on-one basis and included questions regarding CHF referral, decisions and influences regarding enrollment, and any recommendations from participants.

Most referrals by health care providers were triggered by a hospitalization for CHF in the majority of participants. Self-referrals came through patient inquiry regarding treatment options and from those that had known of the CHF clinic through family members. Participants were influenced to enroll as a result of physician recommendation, fear, and urging family members. Influences on participants to stay enrolled and attend were positive outcomes, feeling stronger, sense of belonging, and education. Participants recommended enrollment at symptom onset to increase awareness of symptoms and how to handle them, and also recommended hospitalized patients visit the CHF clinic prior to discharge so patients will know what to expect. This study also makes note of the benefit of CHF clinics to patients with multiple co-morbidities as a holistic treatment option to help improve outcomes and decreased mortality. Participants of this study report the support of the CHF clinic as an overwhelmingly positive experience that provides them with a family atmosphere, feelings of normalcy, and tools to continue to live active and fulfilling lives. This study concludes that CHF clinics are underutilized and access to these clinics in rural areas is a real concern. It also raises the important question which is why have previously enrolled patients dropped out? This can provide valuable information in program planning to meet the needs of those patients who are in need of continued support in the management of their CHF (Crowder, 2006).

Patient Compliance

Jia-Rong et al, (2013) report on a study that relates the impact of medication adherence to hospitalization. During the study, 592 participants were asked, "Over the past seven days, how many times did you miss a dose of any of your heart medication?" (p. 2556). This single question served as an accurate predictor of heart failure admissions and death in heart failure patients over one year. The findings supported that patients who were fully adherent had lower rates of hospitalizations and death.

There are many different factors to consider as health care providers work with their heart failure patients to implement the strategies that have been proven to be effective in improving outcomes and functional capacity. Considerations must include a patient's ability to comprehend, to read and to write, and to interpret their health plan. Additionally, it is important to understand a patient's personal goals for health improvement, mental status, level of motivation and ability to afford and access the recommended treatment.

Educating patients about heart failure, symptom recognition, and medication use is the cornerstone of improved outcomes in functional capacity and healthcare utilization. It is evident that despite health care professionals efforts to educate patients there remains a lack of understanding in patients (Rabelo, 2007). The management of heart failure includes many variables such as fluid restriction, daily weights, dietary restrictions, medication management, symptom recognition, and when to call for help. This difficult treatment regime becomes more even more complex in the setting of cognitive impairment, which is found to present in as many as 75% of heart failure patients (Alosco et al, 2012). Other factors affecting adherence is poor literacy, lower education and socioeconomic status, sensory impairment, depression and anxiety, fatigue, previous hospitalizations, age, and comorbid conditions. This reinforces the need for health care professionals to evaluate all of these factors and be realistic in what a patient's actual ability is when creating a treatment plan (Alosco et al, 2012).

More than 90 million adults in the United States have reported difficulty with understanding and interpreting health information. This has increased awareness regarding health literacy, reducing costs, and improving outcomes. A study of healthcare educational tools was done to test for suitability and readability. Suitability was assessed by message content, text appearance, visuals, and layout and design. Readability was assessed by using the Fry assessment tool. A total of eighteen different tools were analyzed and of those only two were found to be appropriate for use in patients with limited health literacy. The tools that were found to have ideal readability focused on using a fifth grade reading level. The average reading level of Americans is eighth grade, however, the average reading level of Medicare and Medicaid recipients is fifth grade. Educational materials found to have superior suitability were found to have clear font no smaller than 12-14 pt., dark bold fonts on lighter backgrounds, no italics or script lettering, short words, simple sentence structure, culturally appropriate, and clear visuals. In addition to improving educational tools, healthcare professionals must also ensure patients comprehend the information delivered through patient feedback or return demonstration (Taylor-Clarke et al, 2012).

Stevenson, Pori, Payne, Black & Taylor (2015) conducted a study in an 84 bed rural Veterans Hospital which assessed Veterans with heart failure and readmission rates. Twenty-five Veterans participated in this study. Reasons for readmission were found to be related to compliance with treatment, comorbidities, and worsening symptoms. The facility had increased their education as a result of the readmission rate which was effective in 30 day readmission studies, however at 60 and 180 days readmission rates gradually increased. Reasons for noncompliance was further analyzed to reveal causative factors of expense, poor health care literacy, depression, attitudes regarding medication, and effects on sexual function. Veterans were given a questionnaire to assess self-monitoring skills and follow-up care. The findings revealed only 35% of Veterans weighed themselves daily, 71% followed the prescribed diet, 81% reported no problems taking medications, and 43% needed help with transportation with follow-up visits. The key identifier in this study was the Veterans inability to recognize worsening symptoms. Almost half of the Veterans identified shortness of breath as the primary reason for seeking help, which is a late sign of CHF. This study prompted a change in the educational tools used to highlight symptom recognition and reporting. Through this intervention a reduction in readmission rates from 35% to 23% was seen.

Exercise is known to improve the physical and emotional status of patients with heart failure. A study aimed at determining the physiological and psychological responses to exercise was done to help improve understanding regarding exercise adherence in heart failure patients. The interest and motivation to exercise is challenged by the prevalence of anxiety and depression in heart failure patients. Patients express increased fear and anxiety related to the feelings of dyspnea and fatigue associated with exercise. This can lead to a lack of confidence which impacts success with home-based exercise plans.

Participants of this study were given weekly exercise goals that included both aerobic and resistance training and follow up was done at 12 and 24 weeks. Findings of this study demonstrated that adherence to exercise varied from one to four times weekly following the 24 week trial. What was consistently improved despite level of adherence was improved exercise self-efficacy. One recommendation of this study is the need for a continued structured exercise program for heart failure patients to provide support and symptom recognition related to CHF versus normal exercise-induced symptoms (Duncan, Pozehl, Hertzog & Norman, 2014).

How do we motivate the patients to participate?

The studies reviewed in this paper provide valuable information regarding the positive benefits that can be achieved through lifestyle modification. Short term outcomes reveal improvements, but long term lifestyle modification presents another challenge to healthcare professionals in the management of heart failure. A broader view of chronic disease management, which encompasses heart failure, can provide valuable insight to treatment options and patient approach.

Approximately one half of American adults suffer from chronic diseases such as heart failure, diabetes, cardiovascular disease, and cancer. This accounts for over 133 million Americans. Chronic conditions consume more than 75% of our health care dollars and are responsible for 70% of deaths in the United States (US). According to the Centers for Disease Control (CDC) 84% of Americans feel the US should make disease prevention a higher priority. The Trust for America's Health estimates that community-based programs focusing on reducing risk factors such as poor nutrition, physical inactivity, and smoking could yield a \$16 billion savings in medical costs annually within 5 years. Despite these staggering figures, our health care system continues to be one that is based on treatments and cures, not prevention. Patient-provider experiences are infrequent and brief (Centers for Disease Control and Prevention, 2011), which does not allow time to adequately educate patients related to disease prevention.

Fisher et al., (2009), report on barriers in the improvement of healthcare and identify ways to reduce spending and increase the value of care. One of the strongest barriers is the misconception that more medical care results in better outcomes; in fact, evidence has proven this to be incorrect. When discussing improvements in healthcare, Fisher et al. (2009) focus on the importance of implementing a plan that incorporates the patient's well-informed preferences regarding their treatment plan. This reiterates the importance of primary prevention in the form of risk factor reduction as a means to improve patient involvement, satisfaction, and healthcare outcomes. Studies conducted by the U.S. Preventive Services Task Force (USPSTF) have found that setting patient directed dietary goals along with primary care provider, and nutritionist counseling have resulted in clinically significant changes in diet (Berg, 2003). Establishing goals is a well-known way to promote behavior change. Done in a collaborative fashion, patient and provider can establish realistic and achievable goals to improve healthcare outcomes (Bovend'Eerdt, 2009). Approaching a patient's health care needs based on their individual health care goals has proven to have several advantages. It helps to identify individual versus universally applied outcomes, it can simplify treatment options when multiple conditions are present, and it allows the patient to prioritize what health care goals they would like to meet (Reuben & Tinetti, 2012).

A Theoretical Analysis: Health Promotion

As the focus of health care shifts from a treatment based model to one of prevention, health care workers are faced with the task of educating patients in the realm of disease prevention and health promotion. Community based programs designed to assist patients with risk factor reduction such as cardiac and pulmonary rehabilitation, diabetic education, dietary counseling, and heart failure clinics are an essential component of disease prevention. In these programs patients receive the education necessary to manage the complexity of their chronic illnesses and how to modify any identified risk factors. The success of prevention lies within the patient's motivation to be an active participant in the process of wellness and disease management. A better understanding of where motivation is derived can help healthcare workers to ensure patient success in chronic disease prevention.

To fully understand and appreciate the concept of motivation it is important to consider its use in nursing and how it relates to health promotion. As nurses seek to foster health, disease prevention, and motivation in patients, it is first necessary to define health. Pender defined health as "the actualization of inherent and acquired human potential through goal-directed behavior, competent self-care and satisfying relationships with others, while adjustments are made as needed" (as cited in Peterson & Bredow, 2013, p. 226). Nurses must work with patients to determine how they define health, as this varies for each individual. The determination of health leads to the creation of health care goals and then allows the nurse and patient to begin the assessment into behaviors to achieve set goals. It is important for nurses to understand what factors will motivate patients to change certain behaviors to achieve those goals.

Nola Pender's Health Promotion Model is a mid-range nursing theory that focuses on assessing behaviors related to health promotion, primary prevention, disease prevention, and how healthcare professionals can assist patients to adopt healthy behaviors (Peterson & Bredow, 2013). Pender defines Health Promotion as "behavior motivated by the desire to increase well-being and actualize human health potential" (Pender, Murdaugh & Parsons, 2011, p.5). Disease prevention or health protection is defined by Pender as "behavior motivated by a desire to actively avoid illness, detect it early, or maintain functioning within the constraints of illness" (Pender, et al., 2011, p. 5).

Pender et al., (2011) identifies that to date, no one theory can fully describe how to motivate a patient to initiate behavior change. However, Pender does rely on several theories and models to assist in the prediction of behavior to include the Health Belief Model (HBM), the Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB), and the Social Cognitive Theory (SCT).

The Stimulus Response Theory (SRT) and Cognitive Theory (CT) are two theories developed in the 1950's by social psychologists to help evaluate the Health Belief Model (HBM). The HBM was designed in the 1950's to assess the failure of people to participate in preventative health practices offered by the U.S. Public Health Service. The SRT focused on the study of cause and effect of behaviors that result in negative experiences. Stimulus Response theorists identified that people act when a positive response is received. The cognitive theorists focused more on the persons anticipated outcome as an explanation for his or her action or motivation. The concepts formulated using the HBM were the desire to prevent illness and the belief that certain actions could prevent illness. The HBM was further developed to include screening behaviors that influence motivation which included assessments of perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Glanz, Rimer & Frances, 2002).

The Theory of Reasoned Action and the Theory of Planned Behavior (TRA/TPB) was developed in the 1970's by Fishbein and Ajzen and is based on the concept of *intention*. Intention is described as "the extent to which someone is ready to engage in a certain behavior, or the likelihood that someone will

engage in a particular behavior” (Hayden, 2009. p. 19). The TRA/TPB has a similar framework to the SCT in that an initial behavioral assessment evaluates potential variables to predict four intentions which are: attitudes, subjective norms, volitional control, and behavioral control (Hayden, 2009).

Albert Bandura developed the SCT in the 1970’s, this theory analyzes the relationship between environment, personal factors and behavior (Hayden, 2009). The SCT is a concept of reciprocal determinism which describes the bidirectional relationship between personal determinants, action, and environment (Bandura, 1986). The determinants are knowledge of health and how to modify risk factors, health goals and how to achieve them, and perceived self-efficacy. Self-efficacy is determined by a number of factors including accomplishments, education, encouragement and bodily changes that helps to foster competence and confidence. Self-efficacy is a direct indicator for success and increased levels of motivation. Patients with higher levels of perceived self-efficacy are likely to set higher goal challenges and have the belief that they can meet them (Pender, et al, 2011).

Pender developed and published the Health Promotion Model (HPM) in 1982 (Raingruber, 2014). The HPM is an integration of nursing and behavioral science perspectives with a goal of health promotion and well-being. Pender has identified that the source of motivation as used in previous theories derives from “threat” or “fear” and that unless the “threat” or “fear” is immediate, it is often ineffective in motivating behavior change. This is also true with children and young adults who do not perceive themselves to be vulnerable to illness. The initial HPM attempted to predict health behaviors through the assessment of seven cognitive-perceptual factors which were the “importance of health, perceived control of health, definition of health, perceived health status, perceived self-efficacy, perceived benefits, and perceived barriers” (Pender, et al., 2011, p. 44). This included five modifying factors, “demographic and biological characteristics, interpersonal influences, situational influences, and behavioral factors” (Pender, et al., 2011, p. 44). The HPM was revised and published in 1996 and included three new variables, “activity-related affect, commitment to a plan of action, and immediate competing demands and preferences” (Pender, et.al. 2011, p. 44).

These concepts naturally relate to one another when used in patient assessment. Following this conceptual framework allows the nurse to systematically assess the patient in a holistic manner and to identify goals related to health promoting behaviors. The process allows nurses to assess and adjust goals related to characteristics that cannot be changed, such as demographics. The model allows for nurses to intervene in an attempt to alter patients perceptions related to health behaviors that are not amenable to goal attainment (Peterson & Bredow, 2013). The scientific relationship between concepts will vary depending on the behavioral goals established.

Pender’s model can be easily applied to the individual patient. Assessment of a patient is holistic in nature and includes eight components beginning with functional health patterns to include a physical assessment and family history. The second component is physical fitness, which includes cardio-respiratory endurance, muscular endurance, body composition, and flexibility (Pender, et al., 2011) followed by a nutrition component reviewing dietary habits, laboratory values and BMI. The fourth component is life stress with a focus on coping, anxiety, and a person’s response to stress. Pender identifies many tools that can be used to evaluate each component of this phase. Spiritual health is the fifth component of patient assessment and this is defined as “the ability to develop one’s inner being to its fullest potential” (Pender, et al., p.104, 2011). The next area of assessment is social support systems which includes culture, age, work or school commitments, and child or eldercare commitments. Health beliefs are included as a seventh component, an inquiry into the patient’s view on health and lastly assessment of lifestyle which includes inquiry into any and all activities that are a regular part of the patient’s life and may influence health (Pender et al., 2011).

Pender's HPM provides nurses with a systematic approach to patient assessment to define the multiple factors involved in the adaptation of healthy behaviors. Pender encourages nurses to reach out to their communities, local and state government to help facilitate healthy communities (Pender, et al., 2011). This model provides a very useful tool to guide nurses in the implementation of health and wellness for our patients to prevent the progression of chronic disease.

Conclusion

The care provided to patients in all heart failure clinic models is shown to improve outcomes through improved functional capacity, reduced healthcare utilization, improved patient satisfaction, and reduced healthcare expenses. This is done through treatment that includes medication, lifestyle modification, self-monitoring, and symptom awareness. Patients must comply with healthcare provider recommendations for optimum outcomes, however, noncompliance with treatment is the leading cause for poor outcomes. Health care professionals caring for heart failure patients must assess each individual in a holistic fashion and incorporate evidence based guidelines and nursing theory to formulate a treatment plan. The nurse must understand how individual characteristics, behavioral and environmental influences, perceived benefits and barriers and a planned strategy will all lead to positive health outcomes and hopefully improved quality of life. The identification and collaboration of the patient and healthcare professional in a patient-centered fashion can help to create an individualized plan of care including education and support as needed for the heart failure patient.

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