

Effect of applying a clinical pathway for patients with Congestive Heart Failure on their health status outcomes

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Received: January 10, 2019 | **Published:** February 20, 2019

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Abstract

Over time, heart failure (HF) turns into a typical cardiovascular condition whose occurrence and predominance are increasing. Being a typical cause for urgent hospital admission, it is a noteworthy cause for morbidity and mortality for patients with CHF. In Egypt around 1.5 million individuals have CHF. A multidisciplinary approach appears the most ideal approach to manage patients with HF since it has been appeared to enhance clinical outcome and particularly to diminish the rate of readmission related to acute or chronic decompensation. The aim of this research is to determine the effect of implementing a clinical pathway for patients with Congestive Heart Failure on their health status outcomes. A quasi-experimental research design was utilized in this study on a convenient sample of 68 patients with CHF divided to equal group (34 patients each). The study was conducted, in the cardiology department and outpatient clinic of cardiology at Sohag Cardiac and Hepatic institution. Three tools were used for data collection: Congestive Heart Failure Patient Assessment, Clinical Pathway Protocol, and a Congestive Heart Failure Patient Variance Sheet. The results of the study showed good improvement in complaints of the study group. Improving care and practice can provide a favorable effect on the incidence of the complications CHF patients are exposed to. The recommendation based on the results of this study is to apply a clinical pathway for patients with CHF, rather than the traditional care with the aid of established guidelines of care and illustrated patient education handout. In addition, providing comprehensive education and training for nurses who care for CHF patients lays the foundation for quality care.

Keywords: Congestive Heart Failure, multidisciplinary, clinical pathway, health outcomes

Introduction

Over time, heart failure (HF) turns into a typical cardiovascular condition whose occurrence and predominance are increasing. Being a typical cause for urgent hospital admission, it is a noteworthy cause for morbidity and mortality for patients with congestive heart failure (CHF). In developed countries, coronary artery disease remnants are the main reason of HF; although in underdeveloped countries, rheumatic heart disease prompting valvular lesion still remain the most common cause of HF admission.¹

WHO reported that 23% of recorded deaths were affirmed to heart failure in Egypt in 2014.² Through a lifetime hazard of one in five, HF can begin from coronary artery disease (CAD), hypertension, rheumatic heart disease, or different causes like cardiomyopathy, congenital heart disease, endocarditis and myocarditis.³

As mentioned in Rosenberg,⁴ nurses ought to be effectively engaged in monitoring the quality of care to reduce gaps in its conveyance. Moreover, Rosenberg discusses the significance of nurses in determining root causes of gaps in care delivery and working with the healthcare team to extend them.

Care Plans (CPs) are organized, multidisciplinary care strategies that detail the fundamental steps in the care of patients with a specific

clinical problem.⁵ CPs additionally have been shown to advance patients' right of information, improve patients' satisfaction with the service, and prompt a decline in the cost of patient care with enhanced patient outcomes. In general, CPs improve the quality of patient care.⁶

Nurses play a main role in this "heart failure team" because of their incredible clinical assessment and communication skills in addition to their capacity to work intimately with the patient.⁷ Expert nurses in heart failure care can assess the signs and symptoms of cardiac deterioration, screen therapy compliance, give instruction and psycho-social support plus counseling, develop behavior alteration techniques, and also serve as the healthcare connection for the patients and their family through all stages of the disease. The vital aim through this integrated approach is to diminish mortality, avoid re-hospitalization, and raise functional ability. Furthermore, quality nursing care improves quality of life for heart failure patients.⁸

In Egypt around 1.5 million individuals have CHF, and around 111,937 new CHF cases are diagnosed each year. Additionally, the WHO reported that 23% of recorded deaths were due to heart failure in Egypt in 2014.⁹ This study will be the first study in this location handling this topic to help those patients. There is statistically significant less complaints in patients going through a clinical pathway than those who undergo hospital routine care. The aim of this study is

to determine the effect of implementing a clinical pathway for patients with Congestive Heart Failure on their health status outcomes, such as Tachycardia, Dyspnea, Fatigability and Hepatojugular Reflux.

Methodology

Research Design

A quasi- experimental design was utilized to meet the aim of the present study.

- **Setting:** The study was conducted in the cardiology department and outpatient clinic of cardiology at Sohag Cardiac and Hepatic institution.
- **Sample:** The study's subjects were comprised of a convenience sample of 68 adult patients with congestive heart failure. They were sequentially recruited equally into 2 separated age-matched groups; control and study group (34 patients each).
- **Tools of data collection:** Three tools were used for data collection.
 - **Tool 1:** Congestive Heart Failure Patient Assessment:

This tool was developed by the researcher based on a recent literature review and was used to assess patients' status in five parts:

Part I: Socio demographic data: age, sex, residence, phone number, level of education, marital status and occupation.

Part II: Patient medical data: associated medical diseases, date of admission & discharge, degree of CHF, health habits, causes, signs and symptoms of CHF, patient medications

Part III: Physical assessment: weight in kg, height in meters, body mass index (BMI), abdominal girth cm, Vital signs, hepatojugular reflux, chest pain, fatigue scale, edema measurement and level of dyspnea.

Part IV: Laboratory Investigation: ECG, complete blood count, blood coagulation studies, electrolyte levels (K^+ , Ca^{++} , Na^+) and liver functions.

Part V: Post discharge patient's follow up: evaluation of patients post discharge was carried out by the researcher to assess signs and symptoms of CHF; patient medications, physical assessment, and laboratory investigation.

- **Tool 2:** Clinical Pathway Protocol: This protocol was developed by the researcher on a recent literature review,¹⁰⁻¹³ then modified after the approval of collaborative pathway team. The timeline is divided into in three phases as follows: admission, hospitalization and discharge. The activity listed in rows to cover each phase, including: patient outcomes, assessment\ monitoring, physical needs, psychosocial needs and patient\family education. A discharge criterion is the final item in pathway developed to help staff when patient discharged from hospital.
- **Tool 3:** Congestive Heart Failure Patient Variance Sheet:

This tool aimed to assess the variation of the pathway. An observational checklist was developed by the researcher to elicit the variances in patients do not follow the plan outlined in the pathway from the following aspects:

1. Patient/ Family: This is comprised of changes in the patient's status that includes (edema of the lower extremities, hepatomegaly, ascites, tachycardia, increase fatigability, progress dyspnea level, positive hepatojugular reflux, increase anxiety level, decrease in patient satisfaction, admission of more than 8 days,) and patient/family refusal of care decision.
2. Health Care Providers: This involves decision by providers, physician orders, care not done within time frame, care done incorrectly and care not done.
3. Facilities: This encompassed equipment which can be unavailable or inefficient, staffing number and qualifications and inter-department (x-ray, laboratory, dietary) delays.

Pilot Study

The pilot study was carried out in mid-August 2015 to evaluate the clarity and applicability of the tools on 10% of groups (8 patients), samples were selected conveniently using 4 patients for each group. The data obtained from the pilot study were analyzed; no change was done in the assessment sheet, so the 8 patients selected for the pilot study were included in the main study.

Validity and Reliability

The developed tools were tested for content validity by 5 experts in the field of medical – surgical nursing and cardiology, and the needed modifications were completed accordingly. The reliability of the developed Tools 1-3 was tested with a correlation coefficient of 0.93.

Procedure

The current study was carried out with three phases: preparatory phase, implementation phase and evaluation phase.

1) Preparatory phase:

The patient's agreement for voluntary participation was obtained, and the purpose and nature of the study was explained to the patient. A review of current and past, local and international related literature in the various aspects of the problems using books, articles, periodicals, and magazines was completed. This phase ended with a pilot study plus assessment of routine and current hospital care to patients at admission, during hospitalization and discharge.

2) Implementation phase:

- Data were collected during the period from 15/8/2015 to 28/1/2016. All patients who were present in the units during the period of data collection and met the criteria of subject selection were included in the study after obtaining the written informed consent.
- The first group (control group) was managed according to usual hospital routine; the second (study group) was subjected to the clinical pathway.

- The development of care procedures guideline checklist for CHF patient. This guideline checklist contains the recommended nursing care procedures for patients with CHF to be used with pathway as a guide for detailed procedure steps. It was prepared by the researcher using relevant literatures and tested for content validity by jury members. It included CHF patient education, teaching patient deep breathing exercise, diet, exercise, teaching medication regimen, follow up, warning signs, cardiovascular system assessment, assess peripheral pulse, and assess respiration, brachial artery blood pressure and insertion intravenous line.
- The development of CHF Illustrated educational materials included a PowerPoint presentation and videos developed by the researcher in Arabic language to teach patient and family about anatomy and physiology of cardiovascular, pathophysiology and causes of CHF, signs, symptoms and complications of CHF, treatment modalities for CHF, diet, exercise, medication regimen, warning signs, follow up, salt/fluid restriction and daily weights. A handout in a form of an illustrated colored educational booklet for patient was developed in Arabic language by the researcher to help the patient and his family to know what would be expected post-discharge and to reinforce the oral materials taught.

3) Evaluation Phase:

Upon the completion of the clinical pathway implementation, the post test to evaluate the outcomes was done using the same pre test tools.

Ethical Consideration

The researcher introduces himself to every subject patient included in the study and explained the purpose of the study. Informed consent of participants was taken and anonymity was assured. Confidentiality and privacy was asserted.

Statistical design

After data were collected and transferred in to specially design formats, so as to be suitable for computer feeding. Data were analyzed using PC with statistical package for social science (SPSS) version 22. Qualitative data were expressed as frequency and percentage. Comparison of means was performed using paired-sample t-test. Likelihood Ratio chi-square and Fisher's exact test used for tables with a cell or more with an expected frequency of less than 5.

Results

Regarding sociodemographic characteristics upon admission age, it was observed that (58.8%) and (41.2%) respectively for both study and control group patients were in the age between (40-49 years). The mean age of both study and control groups were approximately equal (47.13 years) and (47.04 years) respectively. More than half of both study and control group patients were males represented (70.6%) and (64.7%) respectively. Half of both study and control group patients were from rural area. Regarding level of education, observed that (44.1%) and (29.4%) respectively for both study and control group patients were hold secondary school certificate. Table 1 shows the respective medical data of the study and control group upon admission.

Table 1 Distribution the study and control group patients regarding their medical data upon admission.

Patients Medical Data	Study group		Control group		X ² / FET	P			
	No (34)		No (34)						
	No	%	No	%					
Degree of CHF according to NYHA	Class II	10	29.4%	11	32.4%	1.000	0.200		
	Class III	24	70.6%	23	67.6%				
	No associated disease	2	5.9%	9	26.5%				
Associated diseases	Hypertension	15	44.1%	12	35.3%	0.036	0.01*		
	Pulmonary disease	6	17.6%	4	11.8%				
	Kidney disease	0	0.00%	4	11.8%				
	Endocrine disease	8	23.5%	3	8.8%				
	Tumors disease	3	8.8%	2	5.9%				
	Ischemic heart disease	2	5.9%	8	23.5%			0.083	0.03*
	Dilated cardiomyopathy	10	29.4%	7	20.6%			0.576	0.157
Causes of CHF #	Post viral	6	17.6%	4	11.8%	0.734	0.215		
	Hypothyroidism	3	8.8%	2	5.9%	1.000	0.322		
	Hypertension	11	32.4%	14	41.2%	0.615	0.150		
	Familial	13	38.2%	16	47.1%	0.624	0.149		
	Valve disease	5	14.7%	8	23.5%	0.539	0.161		

More than one answer might be given

Table 2 shows the distribution of the study and control group patients regarding their medical data upon admission. Regarding their degree of HF according to NYHA, it was noticed that more than two third of study and control group patients were class III represented (70.6%) and (67.6%) respectively; the difference was not statistically significant. As for associated medical diseases, more than one third of study and control group patients were suffering from hypertension, representing

(44.1%) and (35.3%) respectively; the difference was statistically significant. In relation to causes of CHF, no statistically significant differences between the study and control group patients was found. It was observed that about one third of both study and control group had a family history of CHF and/or other causes of hypertension (38.2%, 32.4%) and (47.1%, 41.2%) respectively.

Table 2 Distribution the study and control group patients regarding their signs and symptoms.

# Signs and symptoms	Type				X ² / FET	P
	Study group		Control group			
	No	%	No	%		
Dyspnea	34	100.0%	34	100.0%	-	-
Cough	18	52.9%	8	23.5%	0.024	0.01*
Orthopnea	19	55.9%	7	20.6%	0.006	0.001*
Oliguria	3	8.8%	2	5.9%	1.000	0.320
Dizziness, restlessness	6	17.6%	12	35.3%	0.168	0.05*
Altered digestion	7	20.6%	20	58.8%	0.003	0.001*
Anxiety	23	67.6%	22	64.7%	1.000	0.196
Hepatomegaly	23	67.6%	16	47.1%	0.132	0.02*
Distended jugular veins	28	82.4%	17	50.0%	0.010	0.004*
Ascites	19	55.9%	6	17.6%	0.002	0.001*
Nausea	13	38.2%	20	58.8%	0.145	0.04*
Weight gain	23	67.6%	19	55.9%	0.454	0.121
Fatigue	15	44.1%	24	70.6%	0.048	0.01*

More than one answer might be given

FET= Fisher's Exact Test

Statistically significant (P ≤ 0.05)

It was noticed that all the patients (100.0%) of both groups experienced dyspnea. Approximately half of study patients (52.9%) experienced restlessness, represented by 17.6% and 35.3% of the study and control groups, respectively, which was statistically significant. Regarding altered digestion, it was reported that one fifth of study patients (20.6%) were having altered digestion. On the contrary, more than half of control patients (58.8%) were having altered digestion, the difference of which was statistically significant.

Regarding fatigue, it was observed that about two thirds of both the study and control group patients were suffering from moderate fatigue represented by 61.8% and 52.9% respectively, and the difference was statistically significant. Concerning dyspnea level, the majority of study group was experiencing mild breathlessness at rest, which was worse on mild exertion (level III of dyspnea). 82.4% compared to more than two thirds of the control group experienced breathless on moderate exertion (level II of dyspnea). Both of these differences were statistically significant. The data regarding dyspnea and fatigue upon admission is shown in Table 3.

Concerning follow up signs and symptoms of groups, it was noticed that only three patients of study group had dyspnea (8.8%), while

all the patients of control group had dyspnea, giving a statistically significant difference. In the same way, orthopnea was reported in less than one fifth of study patients (17.6%) but two third of control patients (64.7%), which was statistically significant. About two third of study group, but less than one third of control group patients were having dizziness/restlessness (58.8% and 29.4%, respectively). This difference was statistically significant. No patient of study group was reported to have hepatomegaly, but majority of control group (85.3%) did experience this symptom, which was statistically significant. In the same way, only 2.9% of patients in study group experienced distended jugular veins, while less than three fourths of control group (70.6%) were reported to have this symptom. With regards to ascites, it was shown that only one patient of study group while less than three fourths of control group were had ascites, 2.9% and 73.5% respectively, and the difference was statistically significant. It was observed that less than one fifth of study group and less than half of control group were suffering from fatigue, represented by 17.6% and 44.1% respectively, the difference which was statistically significant. Table 4 shows the data regarding signs and symptoms in follow up.

In relation to heart rhythm it was noticed that majority of study group had regular heart rhythms, while majority of control group had irregular

heart rhythms. The difference was statistically significant. Concerning hepatojugular reflux, it was noticed that majority of study group had negative hepatojugular reflux (97.1%), while more than three fourths of control group was having positive hepatojugular reflux (79.4%) and the difference was statistically significant. Regarding fatigue, it was observed that nearly two thirds of study group (58.8%) was suffering from mild fatigue. On the contrary, more than three fourths of control group (79.4%) was suffering from moderate fatigue and the

difference was statistically significant. Concerning dyspnea level, all of study group was having no dyspnea at rest but some on vigorous exercise (level I of dyspnea), compared to nearly three fourths of control group experiencing mild breathlessness at rest, worse on mild exertion (level III of dyspnea) (73.5%), and the difference was statistically significant. Table 5 shows the differences between the study and control group patients regarding their physical examination post intervention during follow up.

Table 3 Distribution the study and control group patients regarding their physical assessment

Physical assessment	Type				X ² /FET	P	
	Study group No (34)		Control group No (34)				
	No	%	No	%			
Fatigue scale	No fatigue	0	00.00%	0	00.00%	0.001	0.001*
	Mild fatigue	0	00.00%	14	41.2%		
	Moderate fatigue	21	61.8%	18	52.9%		
	Sever fatigue	13	38.2%	2	5.9%		
	Worst fatigue	0	00.00%	0	00.00%		
Level of dyspnea	I (on vigorous exercise)	0	00.00%	0	00.00%	0.001	0.001*
	II (on moderate exercise)	4	11.8%	23	67.6%		
	III (worse on mild exertion)	28	82.4%	11	32.4%		
	IV (breathlessness at rest)	2	5.9%	0	00.00%		

Table 4 Significance of differences between the study and control group patients regarding their signs and symptoms post intervention during follow up.

Signs and symptoms in follow up	Type				X ² / FET	P
	Study group		Control group			
	No	%	No	%		
Dyspnea	3	8.8%	30	88.2%	0.001	0.001*
Cough	19	55.9%	27	79.4%	0.068	0.02*
Orthopnea	6	17.6%	22	64.7%	0.001	0.001*
Oliguria	1	2.9%	3	8.8%	0.614	0.250
Dizziness, restlessness	20	58.8%	10	29.4%	0.027	0.01*
Altered digestion	27	79.4%	16	47.1%	0.011	0.004*
Anxiety	2	5.9%	25	73.5%	0.001	0.001*
Hepatomegaly	0	00.00%	29	85.3%	0.001	0.001*
Distended jugular veins	1	2.9%	24	70.6%	0.001	0.001*
Ascites	1	2.9%	25	73.5%	0.001	0.001*
Nausea	11	32.4%	23	67.6%	0.007	0.003*
Weight gain	5	14.7%	16	47.1%	0.008	0.003*
Fatigue	6	17.6%	15	44.1%	0.034	0.01*

More than one answer might be given
FET= Fisher's Exact Test

Statistically significant (P ≤ 0.05)

Table 5 Significance of differences between the study and control group patients regarding their physical examination post intervention during follow up.

Physical examination Follow up	Type				X ² / FET	P	
	Study group No (34)		Control group No (34)				
	No	%	No	%			
Heart rhythm	Regular	31	91.2%	4	11.8%	0.001	0.001*
	Irregular	3	8.8%	30	88.2%		
Hepatojugular reflux	Positive	1	2.9%	27	79.4%	0.001	0.001*
	Negative	33	97.1%	7	20.6%		

Fatigue scale	No fatigue	13	38.2%	0	00.00%	0.001	0.001*
	Mild fatigue	20	58.8%	4	11.8%		
	Moderate fatigue	1	2.9%	27	79.4%		
	Sever fatigue	0	00.00%	3	8.8%		
	Worst fatigue	0	00.00%	0	00.00%		
Level of dyspnea	I (on vigorous exercise)	34	100.0%	0	00.00%	0.001	0.001*
	II (on moderate exercise)	0	00.00%	9	26.5%		
	III (worse on mild exertion)	0	00.00%	25	73.5%		
	IV (breathlessness at rest)	0	00.00%	0	00.00%		

FET= Fisher's Exact Test

Statistically significant ($P \leq 0.05$)

Table 6 shows the data relating to anxiety. It was observed that the study group was statistically differing from control group during discharge. The mean anxiety level during discharge in study group was (30.38) on the contrary in control group the mean of anxiety level during discharge was (71.64). The difference was statistically

significant ($t= 33.98, P= 0.001$).

Table 7 shows that there were statistically significant differences between study and control group for their satisfaction level in all items of care.

Table 6 Significance of differences between the study and control group patients regarding their anxiety level

Anxiety level	Type				t- test	p
	Study group		Control group			
	Mean	Std. Deviation	Mean	Std. Deviation		
During discharge	30.38	± 5.35	71.64	± 4.62	33.98	0.001*

Table 7 Significance differences between the study and control group patients regarding their satisfaction level.

Satisfaction level	Type				t- test	P
	Study group		Control group			
	Mean	Std. Deviation	Mean	Std. Deviation		
Admission process (q1-2)	3.35	± 0.712	1.94	± 0.645	8.74	0.001*
Adequacy of information to patients and family; coordination of care (q3-7)	4.67	± 0.839	2.29	± 0.921	10.73	0.001*
Adequacy of nurse and physician knowledge; explanation about the caring process (q8-12)	4.91	± 0.483	2.32	± 0.740	16.32	0.001*
Proper arrangement timing of discharge instruction, and adequacy of overall quality of care and service (q13-15)	4.14	± 0.510	2.98	± 0.680	7.47	0.001*

q "Question number"

Discussion

The majority of the patients of this study were males were in forties. More than half were from rural area, about half obtained secondary school certificate as their highest level of education. These finding are consistent with Kul et al.¹⁴ and Lowery et al.,¹⁵ who reported that about half of the study patients were married males with a secondary school certificate.

In the studies carried out by Panella et al.¹⁶ and Ranjan et al.,¹⁷ the majority of the sample was above sixty years old and widowed. These results disagree with the present study. It has been observed that there

is no study with patients under 60 years of age, which is contradictory to this study. The explanation came at the hands of Sobhy and El Shahawy¹⁸ who reported in Cardio Alex conference (2013) that Egyptians are more vulnerable to heart diseases at an early age. The possible causes of this increase are the progressive ageing of the population, dietary changes, sedentary lifestyles, smoking and stress.

In relation to patient's residence, the results of the present study agree with study by Fahmy et al.¹⁹ who reported that in Egypt, heart failure is more common in rural than urban regions because rural regions deprived from medical education about risk factors, signs and symptoms of disease and ways of management.

The present study revealed that; the most common associated medical disease and cause of HF is hypertension. This result agrees with finding of Hassanein et al.²⁰ and Aljefree and Ahmed,²¹ who reported hypertension and diabetes as being the most common risk factors among heart failure patients.

Concerning signs and symptoms of patients during admission, it was noticed that all the patients were experiencing dyspnea, half of study and one fifth of control patients, respectively, were experiencing a cough, and more than half of study patients were having orthopnea in comparison to less than one third of control patients. Similarly, the majority of the study group and half of control group had distended jugular veins. Regarding fatigue, it was observed that more than two fifth of study group and less than three fourths of control group were suffering from fatigue. From these results it was concluded that patients suffering from heart failure have major signs and symptoms as dyspnea, orthopnea, distended jugular veins, ascites and fatigue. This result agrees with finding of Azzolin and et al.⁸ who reported that heart failure is characterized by many major and varied signs and symptoms that usually produce impaired function and poor quality of life especially orthopnea, edema of the lower extremities, distended jugular veins and fatigue.

Conversely, the present study noticed that about three fourths of study group had positive hepatojugular reflux, while majority of control group had negative hepatojugular reflux. It was observed that less than two thirds of study group and half of control group complained from chest pain.

As for patients physical assessment during hospitalization, it was observed that about two third of both study and control group patients were suffering from moderate fatigue. The majority of study group experienced level III dyspnea compared the control group, where more than two thirds experienced level II dyspnea. Also, nearly half of study group and majority of control group patients had a normal urine output. This finding was contradicted by Dubey et al.,¹ who reported that fatigue is a common symptom in heart failure patients and represented only (23%) in her study, but is in agreement with Campbell.²²(pp115-119) They pointed out that dyspnea is one of the defining symptoms in the clinical diagnosis of HF. Dyspnea, or shortness of breath, resulting from increased pressure, fluid, or both in the lungs, is a common symptom of congestive heart failure. Although breathlessness is most likely to be noticed during exercise it can also be a problem at rest, particularly when the patient is lying down.

Concerning follow up signs and symptoms of groups post-discharge and applying clinical pathway, the present study noticed that improvement and no worsening in signs and symptoms of study group were as follows: only three patients of study group had dyspnea, less than one fifth of study patients had orthopnea, only one patient had distended jugular veins and ascites, and less than one fifth of patients suffered from weight gain and fatigue. These findings were attributed to applying the pathway for study group and lead to reduced variability in care and improvement in signs and symptoms outcomes. The results agree with Dunn,²³ who reported that the comparative results show statistically significant differences in use of the pathway by provider and a statistically significant increase in use during the project. The quality of care results varied in statistical significance. The pathway utilization increased over time and provided a method for standardizing documentation of care for the HF patient in this outpatient clinic and prevented worsening and improved signs and symptoms of HF. The findings of the present study are harmonious with

Riegel and et al.²⁴ who claimed that Heart Failure (HF) management pathways are widely applied, aiming to reduce or prevent HF re-admissions and improve the quality of life and survival of patients with HF. Angelidou²⁵ stated that a multidisciplinary approach seems the best way to manage patients with CHF since it has been shown to improve clinical outcome and especially to improve the clinical picture and activity level due to acute or chronic decompression.

In regards to follow up hepatojugular reflux in present study, it was noticed that majority of study group had negative hepatojugular reflux represented, while more than three fourths of control group had positive hepatojugular reflux represented. This result reflects improvement in study patient's results from applying the clinical pathway. Reddy et al.²⁶ stated that a positive result is defined by an increase in jugular venous pressure of more than 3 cm H₂O that is sustained for longer than 15 seconds. A positive abdominogular reflux sign suggests reduced right ventricular compliance in that the right ventricle cannot accommodate an increase in venous return.

Fatigue was shown to be present in nearly two thirds of study group (mild fatigue), but on the contrary more than three fourths of control group suffered from moderate fatigue. Likewise, Smith et al.²⁷ added that fatigue trajectories varied across CHF patients and had a differential effect on mortality. Persistent severe fatigue was a predictor of poor prognosis. These results may help identify distinct groups of CHF patients with potentially differential risks of adverse health outcomes.

The present study in follow up stated that, all of study group patients were experiencing level I of dyspnea, compared to nearly three fourths of control group patients with level III of dyspnea. The results of the present study are supported by Gopal and Karnath²⁸ who noticed that, dyspnea, especially with exertion, is one of the most common symptoms of heart failure, and it frequently appears early in the disease. In the early stages of heart failure, dyspnea occurs with severe exertion, but as the heart failure worsens the amount of exertion required to produce dyspnea progressively decreases. According to a study that assessed the features of heart failure, the absence of dyspnea on exertion essentially ruled out the presence of heart failure due to left ventricular dysfunction.

Conclusion

Based on findings of the present study, it can be concluded that the results showed statistically significant differences upon admission in signs and symptoms, hepatojugular reflux, fatigue scale, level of dyspnea between the study and control groups. The researcher found that there were statistically significant differences in follow up of patients post-discharge in relation to signs and symptoms, vital signs, hepatojugular reflux, fatigue scale, level of dyspnea between the study and control groups. Finally, all of the patients in study group had no variances, which proves the hypothesis of the study.

Recommendations

Recommendations for practice

- Apply clinical pathway for patients with CHF rather than the traditional care with the aid of established guidelines of care and illustrated patient education handout.
- Assess level of patient's satisfaction about caring process from admission to discharge.

- Perform annual competency skills assessment in order to maintain high skilled nurses caring for patients with CHF to improve quality of patients care.

Recommendations for further research

- Study the effect of using computerized clinical pathway on patient's health outcomes.
- Study the staff satisfaction and cost effectiveness after implementation of the clinical pathway.

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