Effect of Early Mobility and Activity Interventions to Reduce Patients' Respiratory Complications Associated with Congestive Heart Failure at Coronary Care Unit

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Abstract

Background: Patients with congestive heart failure (CHF) suffers from fatigue and dyspnea. As a result, exercise tolerance is reduced, leading to diminished physical function and quality of life. **The aim** of this study is to evaluate the effects of early activity and mobility interventions in reducing respiratory complications in patients with CHF. **Design:** Quasi-experimental research design. **Setting:** Coronary Care Unit (CCU) of El-Orman Cardiology Hospital, at Assuit University Hospitals. **Sample:** Seventy critically ill adult males and females' patients' divided into two matched and equal groups (35 study & 35 control). **Tools:** -Three tools; Tool 1: Patient assessment sheet, Tool 2: Early mobility and activity levels interventions and Tool 3: Monitoring respiratory complications sheet. **Results:** patients in study group had lesser dyspnea attacks, fewer respiratory complications and absence of abnormal lung sounds as compared with the patients in the control group. **Conclusion:** Early mobility and the use of activity interventions significantly improve dyspnea. Improving oxygen saturation and reducing respiratory complications associated with CHF. **Recommendations:** Emphasize the importance of implementing early mobility and activity for cardiovascular disease patients to avoid complications.

Keywords: Congestive Heart Failure, mobility and activity, and respiratory complications

Introduction

Heart failure (HF) is an international public health problem affecting 26 million people worldwide ***(Savarese* and *Lund, 2017)***. In the USA, more than one million people are currently hospitalized for heart failure every year and the expected 5- year mortality is about 50%. The burden of heart failure is predictable to increase over the next decade, and HF is expected to affect one in every thirty three people in the United States. Chronic but stable HF has significantly lesser likelihood of death, re-hospitalization and complications than Acute HF. The total number of HF hospitalizations continues to increase due to an aging population, improved survival rates following an acute heart attack, and efficient prevention of

sudden cardiac death ***(Members et al., 2017)***.

For several years, data on HF was limited to Western countries only. In recent years, new developing data on HF have been obtained from several countries in the Middle East region including HEARTS and Gulf CARE registries ***(Sulaiman et al., 2015)***. Data on HF in Egypt was very sparse until recently, when Egypt was involved in the European Heart Failure Survey for both chronic and acute heart failure. ***(Hassanein et al., 2015)***.

Patients with congestive heart failure (CHF) frequently experience early fatigue and shortness of breath due to an intolerance to exercise. These symptoms make it hard for people to do the things they need to do every day, which makes it more likely that they won't participate as much and have a bad quality of life. In an effort to both reduce the significant respiratory complications imposed on the health care system and improve these patients' outcomes, ***(Adsett & Mullins, 2016).***

Congestive heart failure (CHF) is associated with an exaggerated respiratory response to exercise. In this population, it has been demonstrated that physical activity and mobility consistently reduce respiratory complications. A marker of the severity of CHF, the ventilation to carbon dioxide production, has also been shown to consistently improve with exercise training. Together, these variables might add to a decreased awareness of breathing difficulty ***(Prado et al., 2016).***

The patient must change their way of life, especially with relation to everyday tasks, all of which could make the heart work harder. As a result, the nurse should both implement provisional nursing interventions for the patient's life-changing and counsel the patient on how to improve their health. In the event that the patient is overactive, the nurse should initially create a caring environment that encourages rest for the patient to prevent the need for oxygen ***(Amakali, 2015).***

Patients with CHF as it stated a significant decrease in mortality and hospital readmissions among those who participated in mobility and exercise levels in addition to the safety of activity and exercise in this population. After taking into account highly prognostic predictors of the end point, exercise was associated with a significant reduction in all causes of mortality and hospital admissions, as well as cardiovascular mortality and admissions. Additionally, a recent Cochrane review revealed a significant decrease in admissions for heart failure, but only a non-significant decrease in mortality. ***(Morris and Chen, 2019).***

Significance of the study:

According to Assuit University Hospital's statistics in year 2018, 110 patients with respiratory complications related to congestive heart failure were admitted to the coronary care unit (CCU).**(Assuit University Hospital records , 2018).**

Aim of the study:

To assess the effects of early activity and mobility interventions in reducing respiratory complications in patients

with congestive heart failure at CCU.

Research hypotheses: the following research hypotheses were formulated in order to achieve the study's aim;

- Critically ill Congestive heart failure patients (CHF) who will be exposed to early mobility and activity interventions will be have better hemodynamic stability as (improvement of oxygenation, improvement in dyspnea, respiratory rate <30 b/m, and absence of abnormal lung sounds) than those who only receive routine care in the hospital.
- Critically ill (CHF) patients who will be exposed to early mobility and activity interventions will have fewer respiratory complications than those who only receive routine care in the hospital.
- Critically ill (CHF) patients who will be exposed to early mobility and activity interventions will have less CCU stay (per day) than those who only receive routine care in the hospital.

Operational Definition:

Early Mobility and activity; which consist of 3 levels (level I which include 6 items, level II include 2 items and level III include 4 items).

Subjects and Method

Research design:

In this study, a quasi-experimental research design was used. This design is used to describe specific incidents, describe relationships, or both. This design is also a means of investigating causality, quasi-experimental studies are poorly controlled compared to experimental study designs in at least one of three areas; 1) manipulation of the treatment variables 2) manipulation of the setting 3) choosing of participants. Participants in clinical nursing studies are frequently not selected at random, but the samples are convenient. As a result, nurse researchers engage in more quasi-experimental research. ***(Goodrick, 2014)***.

Setting: The study was conducted at CCU of El-Or-man Hospital, Cardiology at Assuit University Hospitals.

Subjects: This study involved a convenience sample of 70 adult females and males of critically ill CHF patients. They were evenly divided into two matched groups at random; study and control (each with 35 patients).

Tools: After reviewing the relevant literature, three tools were developed to collect data for the control group and the study group.

Tool 1: Patient assessment sheet:

Based on the relevant literature ***(Gonce and Dorrie, 2013)***, the researcher developed this tool to assess the critically ill patients with

CHF; it involved three parts:

Part I: Patients' background and medical data

It covers background data as: age, marital status, gender and medical data as present diagnosis.

Part II: Cardiovascular assessment items:

Hemodynamic status, which involved 3 items as (respiration, pulse rate b/m and mean arterial blood pressure)

Part III: Respiratory assessment which included items.

- Oxygen saturation monitoring (**Sao2, Pao2** and **Fio2**), and lung sounds assessment as (wheezing and crackles), which included four items.
- **Assessment of dyspnea by using Medical Research Council (MRC) scale *(Bestall et al., 1999)***: This scale was used to measure breathing difficulty. It's a simple categorical scale evaluating the effect of dyspnea on activities of daily live. Self-reported or administered by the interviewer, it has been reported to take 30 seconds to complete. It starts at number 1, where breathing is easy, and goes all the way up to number 5, where breathing is the hardest.

Tool 2: Mobility and Activity levels *(Bruce, 2011)*

These are three levels as following:

Level I involved 6 items (Bed side commode privilege if stable, assisted bath , Bed rest, feed self, Deep breathing /coughing and Ankle/foot exercises).

Level II consisted of two items (Bathroom privileges and Sit up for 20 min TID).

Level III consisted of four items (Shower, Sit Up For Meals, Up in Room, and Walk in Hall).

Used to measure the ability of patient to endure or consume exercise, used activity **level I and II** at the 2nd and 3rd days then increased to activity **level III** at the last 3 days of study for CHF patients.

Tool 3: Monitoring respiratory Complication sheet

It involved a design sheet for studying possible respiratory complications among patients with CHF.

Methods

This study was carried out in three main phases: preparatory, implementation and evaluation phases.

1- Preparatory phase:-

- A written permission was attained from the hospital administrator to collect the required data.
- 5 experts—two assistant professors of critical care and emergency nursing and three professors of medical surgical nursing department—checked the tools' content validity and consequently, the necessary modifications had been made.
- Ten percent of patients participated in a pilot study (7 patients) were chosen

for their convenience—to verify the tools' clarity, applicability, and feasibility. Since no modifications were required, pilot study subjects were included in the actual study.

- Cronbach's alpha was used to test the reliability of the assessment tools.

Ethical considerations:

- The Ethical Committee in Faculty of Nursing, Assuit University approved the research proposal.
- The study was following common ethical principles in clinical research.
- After clarifying the nature and purpose of the study to patients who are willing to participate, written consent is obtained.
- Patient assured that the data of this study will not be used again without a second approval.
- Anonymity and privacy were assured.
- Patients can withdraw from the study or refuse to take part in it at any time without providing a reason.

Data collection:

- The intervention for studied participants was started on 2nd day of hospitalization. Due to the acute nature of the patient's condition, no intervention was done on the 1st day of admission. The data was accomplished through 6 days.

- Data were completed through 6 months period beginning from April 2019 to September 2019.

2- Implementation phase for the control and study groups:

For control and study groups:

- Using tool one (Part one), the researcher evaluated the patients on the 1st day of admission and note down demographic, clinical data, and other data.
- Observed patient during exercise and documented patient's dyspnea scale (MRC scale) from 1st day and every day for 6 days using tool 1 part III.

For study group:

Patients' assessment: The study group was evaluated using Tool I from admission as baseline, with patient assessments every 15 minutes for the first hour, every 30 minutes for the second hour, and then hourly followed by 4 hours for 6 days. A patient assessment was performed for each and then these readings were averaged.

- At the time of admission, all of the patients in the study group completed demographic and medical forms to establish a baseline data.
- Measured vital signs every shift such as, pulse, respiration and mean arterial blood pressure.
- During exercise, the patient was observed and the dyspnea scale (MRC scale) was taken from 2nd day and every day for 6 days.

- The researcher started application of mobility and activity levels on the second day of the study. At 2nd and 3rd days the patients started to make the items of activity level I and level II as (Bed side commode privilege,

Assisted shower, feed self, Ankle/foot exercises, deep breathing and coughing, Sit up for twenty min 3 times daily and Bathroom privileges. If the patients completes these activities successfully, they can proceed to level III activity items as (Up in Room, Sit Down for Meals, Take a Shower, and walk in Hall) on the Third, Fourth, and Sixth Days of Study.

3- <u>Evaluating Phase:</u> (Monitoring respiratory Complication sheet)

The effectiveness of the application of mobility and activity levels for CHF was evaluated by determining outcomes for the patient using patients' tools, for both groups the outcomes were compared to determine the following:

- Less dyspnea attacks,
- Less respiratory complications.
- Stabilized hemodynamic conditions as compared with admission.
- Enhancement of lung sounds.
- Decrease length of stay.

<u>Statistical analysis</u>

Using computer-programmed SPSS (version 20.0), data were gathered and analyzed. Descriptive statistics—frequency and percentage for qualitative variables, as well as mean and standard deviation for quantitative variables—were used to present the data. Quantitative continuous data were compared by t-test for comparisons between 2 groups. Chi-square test was used to compare qualitative variables to determine significance test for non-parametric variables, which is used to determine numerical variables' significance. When P was < 0.05, the significance of the test was considered statistically significant.

Results

Table (1): Show comparison between study and control group subjects as regards Patient's background data

Background data		Study group N=35		Control group N= 35		P. value
		No.	%	No.	%	
Age	20 < 31	0	0.0	0	0.0	0.900
	≥31 < 41	3	8.6	4	11.4	
	≥41 < 51	8	22.9	7	20.0	
	≥51 - 60	24	68.6	24	68.6	
	Mean ±SD	51.7±8.7		50.3±9.6		0.524
Gender	Male	19	54.3	20	57.1	1.000
	Female	16	45.7	15	42.9	
Marital status	Married	31	88.6	31	88.6	0.707
	Single	4	11.4	4	11.4	
Current diagnosis:						
Congestive heart failure+ Diabetes Mellitus		10	28.6	11	31.4	0.884^{NS}
Congestive heart failure+ Hypertension		11	31.4	12	34.3	
Congestive heart failure+ Ischemic heart disease		14	40.0	12	34.3	

Table 1: As regard gender it showed that, about (54.3% and 57.1%) respectively of studied groups were males, were in the age group of 51 to 60 years old with a mean of (51.7±8.7) and (50.3±9.6) respectively, also there were (88.6%) of both groups being married.

Section II: Hypotheses testing

As regard the 1st hypothesis, which state: Critically ill CHF patients who will be exposed to **early mobility and activity interventions will be h**ave more hemodynamic stability as (improvement of oxygenation, respiratory rate <30 b/m, improvement in dyspnea and no abnormal lung sounds) than patients who receive the routine nursing care

Table (2): Comparison between study and control groups regarding Respiration and Pulse monitoring

Variables	Study group N=35	Control group N=35	P. value
	Mean ±SD	Mean ±SD	
Respiration			
1st day	34.2±6.7	36.5±8.1	0.199 **Ns**
2nd day	28.4±3.6	32.3±5.5	0.000**
3rd day	25.4±3.1	29.3±6.1	0.001**
4th day	23.6±5.6	28±7.1	0.005**
5th day	21.2±4.8	27.7±6.6	0.001**
6th day	20.8±5.8	26.3±7.4	0.009**
Pulse			
1st day	100.1±28.3	103.3±30.2	0.648 **Ns**
2nd day	96.4±26.8	100.5±26.4	**0**.550 **Ns**
3rd day	94.3±20.9	95.7±16.7	0.757
4th day	92.9±19.7	94±20.5	0.819
5th day	91.6±21.5	90.1±19.9	0.762
6th day	89.3±19.3	92.7±23.7	0.512
Mean arterial pressure(MAP)			
1st day	120.9±19.5	139.17±30.6	0.004**
2nd day	121.18±20.6	132±20.7	0.031*
3rd day	123±18.6	125.8±21	0.647
4th day	121.2±11.5	125.4±21.7	0.315
5th day	119.3±15.1	118.3±22.6	0.828
6th day	117.3±13.6	115.5±22.7	0.688

Independent t-test- * Statistically significant difference ($p<0.05$)
Ns: no statistically significant ** statistically significant ($p<0.01$).

Table (2) illustrates that, regarding **respiration;** there was statistically significant difference between both groups at second to sixth day. Also there was no significant difference between both groups in relation to pulse with reading decrease from third to sixth day. Regarding **Mean arterial pressure (MAP);** in the first day only there was statistically significant difference, also found statistically significant difference in comparison between first and second day as regards to control group participants.

Table (3): Comparison between study and control group patients regarding lung sound

Variable	Days	Lung sound	Study group N=35		Control group N=35		P. value
			No.	%	No.	%	
Lung sound assessment	On admission (1st day)	Normal	11	31.4	3	8.6	0.054
		Crepitation	21	60.0	27	77.1	
		Wheezing	3	8.6	5	14.3	
	2nd day	Normal	13	37.1	3	8.6	0.016*
		Crepitation	21	60.0	31	88.6	
		Wheezing	1	2.9	1	2.9	
	3rd day	Normal	18	51.4	4	11.4	0.014*
		Crepitation	16	45.7	30	85.7	
		Wheezing	1	2.9	1	2.9	
	4th day	Normal	23	65.7	8	22.9	0.001**
		Crepitation	12	34.3	26	74.3	
		Wheezing	0	0.0	1	2.9	
	5th day	Normal	33	93.3	10	26.7	<0.001**
		Crepitation	2	6.7	24	70.0	
		Wheezing	0	0.0	1	3.3	
	6th day	Normal	33	93.3	10	26.7	<0.001**
		Crepitation	2	6.7	24	70.0	
		Wheezing	0	0.0	1	3.3	
		P1	**0.007****		**0.257**		
		P2	**0.0601**		**0.393**		

* Statistically significant (p<0.05) ** statistically significant (p<0.01).
P1 value: comparison btw 1st &4th days, **P2 value:** comparison btw 4th &6th days.

Table (3) illustrates comparison between the studied groups as regard assessment of lung sound: with statistically significant difference between both group from second to sixth day with P value less than (0.001), and also there statistically significant difference when comparing bet 1st&4th days only in study group.

Table (4): Comparison between study and control group regarding Medical Research Council (MRC) scale for dyspnea assessment

Variables	Days	Study group N=35	Control group N=35	P. value
		Mean ±SD	Mean ±SD	
Assessment of dyspnea by using MRC scale	On admission (first day)	3.41+0.92	3.48+0.62	0.706
	2nd day	2.48+1.12	3.26+0.79	0.002**
	3rd day	1.73+1.15	2.76+0.78	<0.001**
	4th day	1.19+0.97	2.55+1.00	<0.001**
	5th day	0.67+1.21	2.59+1.07	<0.001**
	6th day	0.47+1.22	2.63+0.98	<0.001**
	P1	<0.001**	<0.001**	
	P2	<0.001**	0.736	

- Independent t-test-,
* Statistically significant (p<0.05) ** statistically significant (p<0.01).
P_1 value: comparison between on first & fourth day.
P_2 value: comparison between fourth & sixth day

Score

☒ Breathless with vigorous exercise 0

☒ Dyspnea when ascending a small hill or hurrying on the level. 1

☒ Walk slower than peers on the level due to shortness of breath. Or when walking at my own pace on the level, I must stop to take a breather. 2

☒Stop breath after walking about 100 yards or after a few minutes on the level. 3

☒ Too exhausted to leave the house, or too exhausted to put on clothes 4

Table 4: illustrated that, on admission means score and standard deviation of both group were (3.41±0.92 and 3.48±0.62) respectively, with no statistically significant difference. On the sixth day, however, the illustrated means score and standard deviation of the study group and the control group were (0.47±1.22 and 2.63+0.98) respectively, with a statistically significant difference between the two groups' scores from the 2nd to 6th day.

Table (5): Comparison between the study groups regarding Pao_2, Sao2 and Fio2

Variables	Days	Study group N=35	Control group N=35	P. value
		Mean ±SD	Mean ±SD	
Pao2	On admission	75.37+25.89	70.47+38.46	0.577
	2nd day	78.06+25.52	82.21+33.17	0.661
	3rd day	95.44+26.83	83.64+42.67	0.170
	4th day	93.11+11.83	82.48+36	0.113
	5th day	95+18.32	85.38+21.31	0.044*
	6th day	96.67+13.66	82.11+29.86	0.010*
	P1	0.005**	0.181	
	P2	0.274	0.962	
Sao2	On admission	88.99+19.86	87.83+18.84	0.825
	2nd day	92.69+12.51	91.35+6.96	0.664
	3rd day	97.89+1.27	87.75+17.66	0.100
	4th day	96.66+2.39	92.71+5.91	0.017*
	5th day	97.22+2.11	91.06+8.15	0.038*
	6th day	97.83+1.27	81.84+23.7	0.028*
	P1	0.026*	0.148	
	P2	0.012*	0.010	
Fio2	On admission	39.43±11.13	42.6±13.8	0.331
	2nd day	34.43±11.13	42.6±13.8	0.006**
	3rd day	27.5±8.55	39.87±11.42	0.000**
	4th day	23>7±7.42	37.07±13.56	0.000**
	5th day	21.66±3.53	36.31±12.67	0.000**
	6th day	21.52±2.69	36.48±11.98	0.000**
	P1	<0.001**	0.407	

- Independent t-test * Statistically significant (p<0.05)

- Independent t-test * Statistically significant (p<0.05)

** Statistically significant (p<0.01).

It shows mean score and standard division of study group and control group related to **PO_2** were (75.39±25.89 and70.5±38.5) respectively at admission of study, but at 6th day mean score and SD of study group and control group were (96.67±13.66 and 82.11±29.86) respectively with statistically significant difference (p= 0.010).

SO_2 mean score and SD of study group and control group (88.99+19.86and87.83+18.84) respectively at the first day of study, but at 6th day mean score and SD of study group was (98±1.2) and mean score and SD of control group was (97.83+1.27and 81.84+23.7) respectively with statistically significant difference. In addition, statistically significant difference at 3rd to 6th days with p value less than (0.017).

In the same table illustrates comparison between both groups regarding Fio2: with statistically significant difference between the two groups from second to sixth day with P value less than 0.001), and in addition there statistically significant difference when comparing between 1st & 4th days only in study group.

Table (6): Comparison between study and control groups in relation to mobility/ activity

Days	Item of Mobility/activity		Study group (35)				Control group (35)				P. value
			Done		Not done		Done		Not done		
			No	%	No	%	No	%	No	%	
2nd day	Level 1	Bed rest	35	100.0	0	0.0	35	100.0	0	0.0	-
		Bed side commode privilege if stable	35	100.0	0	0.0	35	100.0	0	0.0	-
		feed self	23	65.7	12	34.3	20	57.1	15	42.9	0.027*
		Assisted bath	25	71.4	10	28.6	16	45.7	19	54.3	0.007**
		Ankle/foot exercises	28	80.0	7	20.0	10	28.6	25	71.4	0.000**
		Deep breathing /coughing.	28	80.0	7	20.0	5	14.3	30	85.7	0.000**
	Level 2	Sit up for 20 min TID.	0	0.0	35	100.0	0	0.0	35	100.0	-
		Bathroom privileges.	0	0.0	35	100.0	0	0.0	35	100.0	-
3rd day	Level 1	Bed rest	10	28.6	25	71.4	27	77.1	8	22.9	0.296
		Bed side commode privilege if stable	17	48.6	18	51.4	25	71.4	10	28.6	0.115
		feed self	35	100.0	0	0.0	20	57.1	15	42.9	0.002**
		Assisted bath	35	100.0	0	0.0	23	65.7	12	34.3	0.003**
		Ankle/foot exercises	35	100.0	0	0.0	13	37.1	22	62.9	<0.001**
		Deep breathing /coughing	35	100.0	0	0.0	12	34.3	23	65.7	<0.001**
	Level 2	Sit up for 20 min TID.	25	71.4	10	28.6	16	45.7	29	82.9	<0.001**
		Bathroom privileges.	20	57.1	15	42.9	10	28.6	25	71.4	<0.001**

Table (6): Continue show comparison between both groups in relation to mobility/ activity

4th day	**Level 3 as tolerated**	Up In Room	31	88.6	4	11.4	15	42.9	20	57.1	<0.001**
		Sit Up For Meals	34	97.1	1	2.9	21	60.0	14	40.0	<0.001**
		Shower	32	91.4	3	8.6	6	17.1	29	82.9	<0.001**
		Walk In Hall	32	91.4	3	8.6	6	17.1	29	82.9	<0.001**
5th day	**Level 3**	Up In Room	33	94.3	2	5.7	17	48.6	18	51.4	<0.001**
		Sit Up For Meals	34	97.1	1	2.9	21	60.0	14	40.0	<0.001**
		Shower	33	94.3	2	5.7	13	37.1	22	62.9	<0.001**
		Walk In Hall	33	94.3	2	5.7	10	28.6	25	71.4	<0.001**
6th day	**Level 3**	Up In Room	33	94.3	2	5.7	17	48.6	18	51.4	<0.001**
		Sit Up For Meals	34	97.1	1	2.9	25	71.4	10	28.6	<0.001**
		Shower	33	94.3	2	5.7	10	28.6	25	71.4	<0.001**
		Walk In Hall	33	94.3	2	5.7	8	22.9	27	77.1	<0.001**

* Statistically significant (p<0.05) ** statistically significant (p<0.01).

Table 6: Illustrated that there were statistical improvement at 3rd day as compared with 2nd day for study group in activity tolerance as (Sit up for 20 min& Bathroom privileges).

Table (7): Comparison between study and control groups regarding respiratory complications

Item	Days	Complications	Study group N=35		Control group N=35		P. value
			No.	%	No.	%	
Respiratory complications	On admission (1st day)	Pulmonary edema	3	8.6	5	11.4	0.567
		Pulmonary congestion	14	40.0	16	37.1	
		No complication	18	51.4	14	51.4	
	2nd day	Pulmonary edema	3	8.6	4	5.7	0.488
		Pulmonary congestion	13	37.1	17	37.1	
		No complication	19	54.3	14	57.1	
	3rd day	Pulmonary edema	2	5.7	4	5.7	0.223
		Pulmonary congestion	8	22.9	13	37.1	
		No complication	25	71.4	18	57.1	
	4th day	Pulmonary edema	2	5.7	4	2.9	0.016*
		Pulmonary congestion	3	8.6	13	37.1	
		No complication	30	85.7	21	60.0	
	5th day	Pulmonary edema	2	5.7	2	5.7	0.003**
		Pulmonary congestion	1	2.9	12	34.3	
		No complication	32	91.4	21	60.0	
	6th day	Pulmonary edema	1	2.9	2	5.7	0.008**
		Pulmonary congestion	1	2.9	10	28.6	
		No complication	33	94.3	23	65.7	
		P1	0.005**		0.427		
		P2	0.478		0.665		

* Statistically significant (p<0.05) ** Statistically significant (p<0.01).

P1 value: comparison between 1st day & 4th day, **P2 value:** comparison between 4th day &6th day.

Table 7: Showed that on admission (48.6%, 48.5%) respectively of study and control group had respiratory complications. Additionally, respiratory complications decreased on the second day of the study, with a statistically significant difference between the two groups on the fourth, fifth, and sixth days. Compared by 6th day, about (5.8%, versus 34.3%) had respiratory complications throughout CCU period with statistically significant differences between them (p=0.008) in addition found statistically significant difference when comparing between first and fourth day regarding study group only.

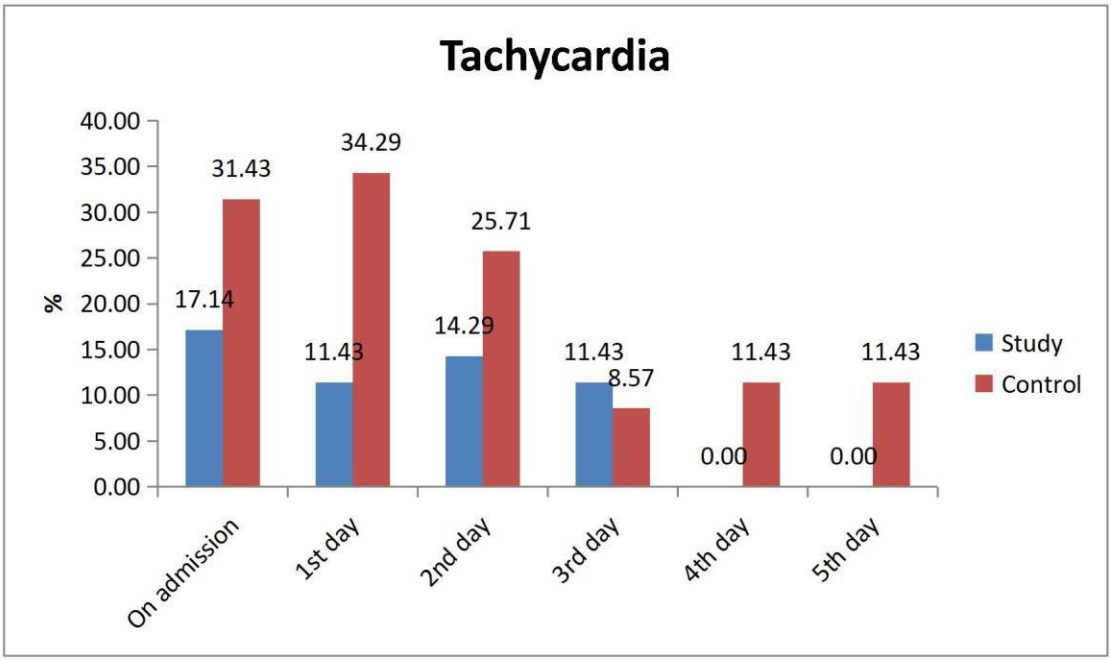

Fig (1): Comparison between study and control group subjects regarding Tachycardia

Fig (1) reveals that both the study and control groups had tachycardia upon admission, with no statistically significant difference between them (17.14% and 31.43%, respectively). By the fifth day, there were statistically significant differences in tachycardia between them, with 0.0% versus 11.43 percent experiencing it during the CCU period.

Table (8): Comparison between studied subjects regarding length of stay and Mortality rate at CCU

Groups / Variables	Study group N=35		Control group N=35		P. value
	No.	%	No.	%	
Length of stay in the ICU					
<7days	29	82.86	16	45.71	0.002**
≥ 7days	6	17.14	19	54.29	
Mean ±SD	5.6±1.4		7.7±2.5		<0.001**
Mortality rate					
No. of death	1	2.86	6	17.14	0.111

**** Statistically significant (p<0.01)**

Table (8) illustrates that the majority of subjects in the study group (82.86%), in contrast to the majority of subjects in the control group (54.29%), stayed less than seven days, with statistically significant differences between the two groups (at p = 0.002).

Discussion

Patients with congestive heart failure (CHF) often experience easy fatigue and dyspnea due to their inability to exercise. These symptoms make it hard for people to do the things they need to do every day, which makes it more likely that they won't participate as much and have a bad quality of life. This study aims to both reduce the significant financial burden placed on the health care system and improve these patients' outcomes. ***(Van Craenenbroeck, 2017.***

Therefore, the essential objective of this study is to assess the effect of mobility and activity interventions to decrease respiratory complications in patients associated with CHF in the coronary care unit (CCU) of El-Orman Cardiology Hospital, Assuit University Hospitals. Where, the most important change was reducing attacks of dyspnea and lesser respiratory complications. The present study compared the control group, which only received routine hospital care, to the study group that received mobility and activity interventions.

As regards to background data and medical data:

According to the findings of this study, there were no statistically significant differences between the two groups regarding the basic admission data of age, gender, and marital status. There were 70 patients in the study sample, with 35 patients in each group. The mean ages, were 51.78.7 and 50.39.6, respectively. There was no statistically significant difference between the control and study patients'

This study was supported with ***(Karapolat et al., 2008)*** who stated that thirty nine CHF patients were involved in the study with mean age of CHF

patients was (45.51 ± 14.42) years. In addition, the study by***(Pourmoghaddas et al., 2014)*** was stated that sixty patients with congestive heart failure were involved in the study, thirty participants in study group and thirty participants in control group with mean age (50.70 ± 12.5-54.47 ± 14.6) respectively.

The National Heart, Lung, and Blood Institute's findings ***(National Heart, 2009)*** reported that risk factors like high blood pressure often preceded the development of heart failure before the age of 50.

In relation to gender, males comprised more than half of the study group participants. This result in line with ***(Bui et al., 2011)*** who stated that m any men are at high risk of developing congestive heart disease. Also who reported that more male's patients are admitted to intensive care units than female's patients, with men accounting for about two thirds of the admission. This can be explained by the possible cardio-protective effects of female sex hormones.

The results in this study are disagree with ***(Bozkurt and Khalaf, 2017)*** they stated that men less predictable for heart failure than women; also they are less symptomatic and have better outcome.

Concerning the Marital status, the current study revealed that the highest percentage of the participants was married as compared to single participants in the studied groups. This result in line with ***(Grossniklaus et al., 2014)*** who stated that the majority of patients were married and the lowest were single. In addition (***Monahan et al., 2007)*** stated that married personal are more prone to social and psychological stress.

Regarding to lung sound:

This study revealed that the congestive heart failure patients in the study group showed gradually improved in lung sound after the first day of intervention. This enhanced improvement may be due to starting in mobility and activity exercises.

The study by ***(Ángeles et al., 2012)*** stated that patients with heart failure have improved lung function when performing breathing exercises and adopting helpful postures for clearing their chests of secretions and this promote full oxygen saturation.

Concerning to dyspnea score:

This study results illustrated that at the beginning of this study, both groups had a high dyspnea score. However, when compared to the control group, the study groups that received mobility and activity interventions had a significantly lower dyspnea score. Teaching the patient relaxation techniques and how to use them, elevating the head of the bed, and providing oxygen while monitoring oxygen saturation via pulse oximetry may have contributed to this rapid improvement.

The results of this study are consistent with study by ***(Abd-Elwanees, 2014)*** who stated that participants in the both groups were relatively evenly distributed in terms of dyspnea score, and on admission, there were no noticeable differences between participants. Additionally, the study demonstrated that patients in the study group had significantly lower dyspnea scores than those in the control group.

Regarding to complications:

Findings of the current study showed that there were statistically significant differences between the studied groups and that the study group had a lower incidence of morbidity, including respiratory problems.

The results of the current study showed that the study group's respiratory complications improved when compared to the control group, with a statistical difference between the two groups. Particularly after the patient's problems have been assessed, adjustments have been made, and the patient has undergone oxygen monitoring and performed coughing and breathing exercise.

Our study go in line with study by ***(De Arruda et al., 2009)*** who stated that A CHF patient's monitoring and guiding program considerably reduced the signs of complications such dyspnea, tachycardia, pulmonary edema, and pulmonary congestion.

The current study result was in accordance with ***(Dunlay et al., 2015)*** who stated that, activity and mobility had benefits for heart failure patients, it may be considered as a practical, safe, and easy way to enhance patient outcomes by reducing respiratory problems and increasing patient activities. So, the results of this study can provide clinical nurses a new perspective on patient care.

Concerning to length of stay:

This study reported that exercises and activity for CHF had a beneficial impact on how long patients were in coronary care units; patients in the study group stayed less time than patients in the control group. The patients were discharged from the hospital after 5.6 days as opposed to 7.7 days for the control group participants who just received standard treatment from the coronary care unit.

This brief period in the subjects in the study group could be due to the mobility and activity intervention that permit improving the quality of care while reducing duration of stay in hospital to an acceptable minimum time through early recognition and interventions of respiratory complications, nursing or social problems that call for prolonged hospitalization period. These influences may contribute to shorter length of stay (LOS) in the coronary care unit (CCU).

The findings of this study are in line with [21] who reported that the study group's duration of stay was significantly lower than the control group. This shortened time frame may be acknowledged for the implementation of interventions in accordance with the multidisciplinary critical care team's evidenced practices.

In addition, the results of the current study were agreed with the findings of other five studies (five clinical studies). They evaluating the influence of activity and mobility on the duration of stay, out of five studies by [22] three studies demonstrated a noticeably reduced length of stay (LOS) under the study group's care. The aggregate findings of these studies demonstrated that, when compared to conventional care, the care of study resulted in a beneficial reduction in length of stay (LOS).

In relation to mortality rate:

Our results showed that there was no significant difference between the study group and the control group in terms of the number of deaths, but we found a reduction in mortality in the study group along with no significant difference between the two groups.

The results of the present study disagree with two studies that were conducted to estimate mortality rate of the care in the study group compared to standard care group participants. In both studies, the mortality rate was significantly reduced by using mobility and activity exercise. ***(Panella et al., 2009).*** However, the current study's results are consistent with those of the other three studies: the care group's mortality rate decreased but not significantly. ***(Azad et al., 2008).*** The general outcomes of the combined randomized controlled trials were not statistically significant. It is obvious that mobility and activity can successfully improve quality of care for patients with congestive heart failure. Reduced mortality and shorter hospital stays were observed in patients in the study group.

Conclusion

- Early mobility and the use of activity interventions significantly improve dyspnea. Improving oxygen saturation and reducing respiratory complications associated with congestive heart failure.

Recommendations

- Emphasize the importance of implementing early mobility and activity for cardiovascular disease patients to avoid complications.

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