Effect of Clinical Pathway Implementation as an Essential Part on Health Outcomes of Patients with Chronic Bronchitis

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Abstract: *Chronic bronchitis is a common condition with significant morbidity and mortality worldwide. Clinical Pathways (CPs) encourage the implementation of evidence based practice; improve clinical processes by reducing risks and disparities in the provision of health services and reduce duplication by using a standardized approach to clinical management. **The study aimed** to evaluate the effect of clinical pathway implementation as an essential part on health outcomes of patients with chronic bronchitis. **Research design:** A quasi-experimental research design was utilized in this study. **Setting:** The current study was performed in the Chest Department at Benha University Hospital. **Subjects:** The study included (60) adult patients with chronic bronchitis, they were recruited equally into 2 groups (control & study groups 30 for each). **Tools of data collection:** Two tools were used for data collection: Tool I- chronic bronchitis assessment sheet. Tool II - Clinical Pathway Protocol. **Results:** There were highly significant statistical differences among the two groups regarding hospital stay, psychological problems and dyspnea scale on discharge. **Conclusion:** Implementation of clinical Pathway has a positive effect on the study group compared to control group in managing patients with chronic bronchitis. **Recommendations:** Clinical Pathway should be implemented for patients with chronic bronchitis to improve patients' condition. Health care professionals involved in patients care with these diseases faces several complex challenges, compounded by the limited evidence base regarding cost-effectiveness of different treatment systems, and therefore, clinical pathway should be implemented to replace the traditional nursing care plan.*

Keywords: *Clinical Pathway, Chronic bronchitis and Hospital Stay.*

I. Introduction

Chronic bronchitis (CB) is a pulmonary disorder causes inflammation of the bronchial tubes that leads to obstructed airflow to the lungs. Symptomized by cough, shortness of breath, chest pain **(American Lung Association, 2016).** CB is a common but variable phenomenon in chronic obstructive pulmonary disease (COPD). It has numerous clinical consequences, including an accelerated decline in lung function, greater risk of the development of airflow obstruction in smokers, a predisposition to lower respiratory tract infection, higher exacerbation frequency, and worse overall mortality. CB is caused by overproduction and hypersecretion of mucus by goblet cells, which leads to worsening airflow obstruction by luminal obstruction of small airways, epithelial remodeling, and alteration of airway surface tension predisposing to collapse **(Kim and Criner, 2013).**

Chronic bronchitis (CB) is a growing healthcare problem that is expected to worsen as the population ages and the worldwide use of tobacco products increases **(Burney, 2015)**. Smoking cessation is the only effective means of prevention. CB it is the fourth leading cause of death after heart disease, cancer, and cerebrovascular disease. CB is projected to become the

third leading cause of death worldwide. Most patients with CB are middle-aged or elderly **(Murray and Lopez, 2018).** Cigarette smoking is the principal risk factor for CB. Occupational and environmental exposures to chemical fumes, dusts, and other lung irritants account for 10% to 20% of cases. Most cases with a history of severe lung infections in childhood are more likely to develop COPD. **(Murray and Lopez, 2018).** Also low socio-economic status and obesity are some of the factors associated with the increased prevalence and incidence of CB **(Pahwa et al., 2017).**

Chronic bronchitis (CB) has been shown to have the most significant clinical impact regarding morbidity as well as the quality of life **(Dutta and Deshmukh, 2015) and (Mejza et al., 2017).** The lifetime risk of chronic bronchitis among smokers is approximately two in five and almost one half of smokers who have chronic bronchitis also acquire COPD. Chronic bronchitis is related to earlier death, also in never-smokers, probably partly through a rapid decline in pulmonary function **(Panigrahi and Padhi, 2018).** CB is associated with numerous comorbid conditions. These include ischemic heart disease, glaucoma and cataracts, osteoporosis and osteopenia, anemia, cachexia and malnutrition, peripheral muscle dysfunction, cancer and the metabolic syndrome. Rates of accepted depression and anxiety in CB vary from 20% to 50% and increase with disease severity **(Mohammad et al., 2018).**

Chronic bronchitis can be partially cured. With appropriate management, most people with CB can gain quality of life and good symptom control, as well as reduced risk of other associated conditions **(Mayo Clinic Staff, 2017) and (Mohammad et al., 2018).** It is essential to diagnose the disease in its early stages and take the necessary preventive measures, thus avoiding disability or death **(Cazzola et al., 2018).** The goals of management of CB are to relieve symptoms, prohibit disease progression, decrease mortality, increase exercise tolerance, recover health status, prevent and treat complications and exacerbations. Goals of acute care include improving airflow obstruction. Treatment regimens are based on severity of CB **(Nettina, 2014) and (Lundell et al., 2015).**

Clinical pathways (CPWs), known as integrated care pathway, is a multidisciplinary management tool based on evidence-based practice **(Panella et al., 2012).** CPW differs from practice guidelines, protocols, and algorithms because they are utilized by a multidisciplinary team and have a focus on the quality and coordination of care. CPW is a feature tool that details processes of care and highlights inefficiencies of care **(Mohammad et al., 2018).** CPWs are a common component in the quest to improve the quality of health. CPWs are used to reduce variation, improve quality of care, and maximize the outcomes for specific groups of patients **(Adegboyega et al., 2016).** If a patient's progress deviates from the planned path, a variance has occurred and the interprofessional team members must create an action plan to address the problem or issue **(Adegboyega et al., 2016) and (Mohammad et al., 2018).**

The aim of CPWs is to develop real-world guidelines that enhance the quality of care provided to a patient throughout treatment. This approach helps improve patient outcomes, promote patient safety, increase patient satisfaction, and optimize the use of resources in evidence- or value-based practice **(Morris and Arone, 2017).** The professional nurse is responsible for initiating and updating the care map or plan of care that is used to guide and evaluate patient care. The CPW provides a time frame for expected outcomes of care and involves an interdisciplinary team of caregivers who use the pathway to provide consistent care **(Masters, 2014).** CPWs considered as a road map to health care team and used to guide and evaluate patient care. CPWs were developed in response to the need to identify cost-effective care plans and quality to reduce the patients' hospital stay **(Cherry and Jacob, 2014) and (Mohammad et al., 2018).**

Significant of Study

Chronic bronchitis (CB) has been shown to have a great public health attention. The lifetime risk of chronic bronchitis among smokers is approximately two in five and almost one half of smokers who have chronic bronchitis also acquire COPD. It is presently the concentrate of intense research because of its increasing spread, mortality, and disease burden. In Benha, the number of CB patients who were admitted to chest department was approximately 580 cases in 2018 **(Benha University Hospital Records, 2018).** The patient suffering from CB is associated with numerous comorbid conditions, often have prolonged hospitalizations, which may be marked by many complications and is related to earlier death , therefore requiring the integration of skills from numerous different specialties. Current literature and best nursing practice suggest implemented clinical pathways have likely to reduce hospital stay and restrict variability in care, thus achieving cost savings.

Aim of the study:

The current study aimed to evaluate the effect of clinical pathway implementation as an essential part on health outcomes of patients with chronic bronchitis.

Research hypothesis:

Patients with chronic bronchitis will be improved positively and will have less hospital stay after the implementation of clinical pathway than those who will receive a traditional hospital care.

II. Subjects and Methods

Research design:

Quasi-experimental research design was utilized to meet the aim of this study.

Study setting:

The study was carried out in the Chest Department at Benha University Hospital.

Study Sample:

Purposive sampling technique was used to select the samples. The sample comprised of sixty adult patients with chronic bronchitis who admitted in the above mentioned setting and divided into 2 groups (control who received a routine hospital care and study group who received a clinical pathway 30 for each). According to the following criteria:

Inclusion criteria:
1- Patients with chronic bronchitis.
2- Both male and female.
3- Patients' age is between 18 and 70 years old.
4- Patients are conscious and able to communicate.
5- Patients who accepted to participate in the study.

Data Collection Tools:
Two tools were used to collect study data:
Tool I- chronic bronchitis assessment sheet, developed by the researcher based on reviewing relevant literatures, and scientific references. It was designed to assess patient's condition and it included three parts to cover the following data:
Part (1): Socio demographic data: characteristics of studied subjects to collect baseline data which consist of age, sex, domicile, marital status, level of education, occupation, date of discharge and admission, hospital stay, previous admission to hospital, number of admissions in the last year, age of start CB and patient's condition at discharge.

Part (2): Patients' health relevant data: It was devoted to assess medical history, exposure to risk factors, medications, history of chronic diseases, laboratory investigations, diagnostic procedure, physical examinations, complications, vital signs and psychological problems (Hamilton Anxiety Rating Scale):The scale consisted of 14 items, each determined by a series of symptoms, and measures both pathological somatic condition and psychic anxiety. Each item was scored on a scale rating of 0 indicates (not present), a rating of 1 indicates (mild), A rating of 2 indicates (moderate), A rating of 3 indicates (severe), a rating of 4 indicates a (very severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity, 25–30 indicates a moderate to severe **(Hamilton, 1959).**

Part (3): The Modified Borg Scale (Dyspnea Scale): It was adopted from **Borg (1982) & Kendrick et al. (2000).** This scale was used to measure the degree of dyspnea on admission and discharge. It ranged from 0 to 10. Nothing at all (0), very very slight (Just Noticeable) (0.5), very slight (1), slight (2), moderate (3), somewhat severe (4), severe (5-6), very severe (7-8), very very severe (Almost Maximal) (9) and maximal (10).

Tool II: Clinical Pathway Protocol: This tool was adopted from **Grey Bruce Health Network (2014),** and then modified after the approval of collaborative pathway team. The pathway consisted of 5 parts:

Part I: Pre-Printed Orders (CB Admission Order Set): These orders were started in an in-patient unit once a patient was admitted with CB.

Part II: CB Clinical Pathway: The CB CP had a 5 day predestined length of remain. It had two stages (stage (1) was almost 2 days and stage (2) was almost 3 days). If the patient met the outcomes at the top of the page, he was ready to transfer to the next stage. Staff member used the column for his shift and initial tasks as they were done, or enter not implemented and initial if they are not implemented to the patient. Throughout each stage, staff pointed out and completed the discharge criteria page (If any of the criteria had been met, these initialed and dated).

Part III: Patient Pathway: It explained to the patients what was happened to them during hospitalization. It was offered to the patient at admission to discharge.

Part IV: Patient Education Materials (CB booklet): It was developed according to assess CB patients' needs and prepared in a simple clear Arabic language developed by the researcher and based on the reviewing related literatures, and scientific references.

Content of CB booklet:
- **Theoretical part covered:** introduction about the disease, anatomy and physiology of respiratory system, definition of CB, causes, signs and symptoms, complications, factors that can make symptoms worse (CB exacerbation), suggestions to reduce or avoid exposure to those factors, diagnosis, management, smoking cessation, nutrition and prevention.
- **Practical part covered:** using inhalers or nebulizer, breathing and coughing exercise, body positions to reduce shortness of breath and relaxation techniques.

Part V: CB Teaching Checklist: It was placed in the chart and used to track what education had been done with the patient and what was not completed to cover before the patient's discharge.

Method

Ethical Consideration

Patients' approval was taken after informing them that their participation is optionally, and that they have the right to withdraw at any time without any consequences. Then, Verbal consent was obtained from each patient enrolled into the study. The researcher assured maintaining anonymity and confidentiality of data.

Pilot study:

A pilot study was conducted on 10% of study sample in a selected setting recruited to test the clarity and applicability of the tool and the necessary modification was done prior to data collection. Patients who participated in the pilot study were excluded from the main study sample.

Fieldwork:

- Official permissions were obtained from the responsible authorities at the previously mentioned research setting after explaining the study aim.
- Sampling and data collection were started and completed during the period from the beginning of November 2018 to the end of January 2019. The study was conducted through the following three phases:

Phase I: Preparatory and planning phase:

In the planning phase, approval was obtained from the head of the chest department at Benha University Hospital. Meeting and discussion was held between the researcher and the nursing administration to make them aware about aims and objectives of the study, as well as, to get better cooperation during the implementation phase of the study. Based on the information obtained from pilot study, in addition to reviewing the recent related literatures relevant to the effect of clinical pathway implementation on outcomes of patients with chronic bronchitis and various aspects of problem.

Phase II: Implementation phase:

● Staff members who participated in the patient care (all nurses and physicians in the department) were met in separated sessions to explain the pathway in brief and outline the main roles to be performed by each one.

● The researcher interviewed the patients and took the consent of them to be recruited in the study after explaining the aim of the study. The researcher confident that the data collected and information were confidential and would be used to improve their health and the purpose of the study only.

● Each patient involved in the study (in the control then the study group) was assessed for his or her medical condition (**Tool I**). First, data was collected from control group, then from the study group to avoid sample confusion. The control group received the routine hospital care while the study group undergone developed clinical pathway protocol (**Tool II**).

● Each patient in the study group informed the patient's pathway and the contents of the booklet and taught them how to do breathing and coughing exercises.

● Data used to be collected every day from patient's admission until discharge from the Chest Department in Benha University Hospital for patients with CB during three shifts for both groups.

Phase III: Evaluation Phase:

At the end of the clinical pathway implementation evaluation was done to compare the patient's outcomes of both groups during the admission and discharge.

Statistical analysis

The collected data were tabulated and analyzed using Statistical Package of Social Science (SPSS) version (23). Descriptive statistics (number, percentage, mean ± S.D) were done. Qualitative variables were comparing by chi-square test. For independent samples, quantitative variables were comparing by t-test. Statistical significance was considered at: P- Value > 0.05 insignificant, P- Value < 0.05 significant, P- Value < 0.01 highly significant.

III. Results

Table 1: illustrates that, more than three quarters of study and control groups (76.7 %) at the age between 50-70 years old, Regarding to sex nearly three quarters of study group were males (70 %), whereas more than half of the control group were females (53.3 %), As regard their marital status it was found that most of the study group (93.3%) was married, whereas the entire of the control group (100 %) was married. The table also reveals that most of the study and control groups lived in rural area (90 %). Slightly two third of both groups (66.7%) were illiterate. As regard to occupation two third of the study group and more than half of the control group (63.3%), (56.7%) were working respectively.

Table 2: displays that, there were highly significant differences between the two groups in relation to length of hospital stay and number of admission in the last year. Also there was significant statistical difference between the two groups regarding previous admission to hospital, while there was no significant difference between the two groups related to patient's condition at discharge and age of starting CB.

Table 3: shows that, there was no significant statistical difference among the two groups relevant to their medical history except long duration of cough there was highly significant statistical difference.

Table 4: demonstrates that, regarding the types of medications taken on admission and discharge for both groups the bronchodilators medications had the highest percentage. While diuretics had the lowest percentage in both groups.

Table 5: revealed that, there was statistical significant difference between the two groups concerning heart diseases and the most common chronic diseases in both groups were hypertension, heart disease and diabetes mellitus.

Table 6: explains that, there was highly statistically significant difference between the two groups relevant to magnesium on admission and complete blood count, sodium and kidney function on discharge. There was statistically significant difference

between the two groups concerning Potassium, liver function and blood sugar on discharge. It is clear that the study group had done little laboratory investigations than the control group.

Table 7: exhibited that, there was highly statistically significant relation between total Dyspnea Scale score and total Hamilton Anxiety Rating Scale score for study group.

Table (1): Number and percentage distribution of the studied subjects according to their socio-demographic variables (study & control group) (n=60).

Sociodemographic variables	Group			
	Study (n=30)		Control (n=30)	
	Number (N)	Percentage (%)	Number (N)	Percentage (%)
Age in years				
18-30	1	3.3	0.0	0.0
> 30 - < 40	2	6.7	2	6.7
≥ 40 - < 50	4	13.3	5	16.7
≥ 50 - 70	23	76.7	23	76.7
Sex				
Male	21	70.0	14	46.7
Female	9	30.0	16	53.3
level of education				
Illiterate	20	66.7	20	66.7
Read /writes	5	16.7	6	20
Primary School	3	10	2	6.7
Intermediate/high	2	6.7	1	3.3
Domicile (Residence)				
Urban	3	10	3	10
Rural	27	90	27	90
Marital status				
Married	28	93.3	30	100
Single / Widow	2	6.7	0.0	0.0
Occupation				
Working	19	63.3	17	56.7
Not working	11	36.7	13	43.3

Table 2: Number and percentage distribution of the studied subjects according to their days of hospital stay (study & control group) (n=60).

Variables	Group				p-value
	Study (n=30)		Control (n=30)		
	Number (N)	Percentage (%)	Number (N)	Percentage (%)	
Previous admission to hospital					
Yes	13	43.3	21	70	0.05*
No	17	56.7	9	30	
Age of start of CB					
18-39 years	11	36.7	10	33.3	0.82 **NS**
40-55 years	18	60	18	60	
More than 55 years	1	3.3	2	6.7	
Length of stay in hospital					
1-5 days	28	93.3	4	13.3	0.001**
6-10 days	2	6.7	16	53.3	
More than 10 days	0	0.0	10	33.3	
Number of admission in last years					
1- 4 times	30	100	21	70	0.001**
5-10 times	0	0.0	9	30	
Patient condition at discharge					
Improve	29	96.7	28	93.3	0.23 **NS**
Do not improve	1	3.3	2	6.7	

*** =Highly Significant Difference   * =Significant Difference   NS =Not Significant*

Table 3: Number and percentage distribution of the studied subjects according to their medical history (study & control group) (n=60).

Variables	Study (n=30) Number (N)	Study (n=30) Percentage (%)	Control (n=30) Number (N)	Control (n=30) Percentage (%)	p-value
Chronic cough					
Present	30	100	28	93.3	0.24 **NS**
Not present	0	0.0	2	6.7	
How much time you have					
1 - ≤ 10 years	13	43.3	26	86.7	
11 - ≤ 20 years	12	40	4	13.3	0.001**
21 - ≤ 30 years	5	16.7	0	0.0	
More 30 years	0	0.0	0	0.0	
How much do you cough					
Sometimes	2	6.7	2	6.7	
Moderate	8	26.7	10	33.3	0.63 **NS**
Intense	19	63.3	18	60	
Continuous throughout the day	1	3.3	0	0.0	
Frequent colds in the winter					
Present	22	73.3	21	70	0.50 **NS**
Not present	8	26.7	9	30	
Weight loss					
Present	5	16.7	5	16.7	0.60 **NS**
Not present	25	83.3	25	83.3	
Hypoxemia					
Present	26	86.7	26	86.7	0.64 **NS**
Not present	4	13.3	4	13.3	

N.B. For all statistical tests done; P value ˃ 0.05 insignificant, P value P ≤ 0 .05 significant,
and P value ˂ 0.001 highly significant.

Table 4: Number and percentage distribution of the studied subjects regarding to their medications (study & control group) (n=60).

Variables	Study (n=30) Taken No	Study (n=30) Taken %	Study (n=30) Not taken No	Study (n=30) Not taken %	Control (n=30) Taken No	Control (n=30) Taken %	Control (n=30) Not taken No	Control (n=30) Not taken %
Bronchodilator Medications								
On Admission	30	100	0	0.0	30	100	0	0.0
On Discharge	30	100	0	0.0	30	100	0	0.0
Steroids								
On Admission	28	93.3	2	6.7	30	100	0	0.0
On Discharge	3	10	27	90	9	30	21	70
Antibiotics								
On Admission	30	100	0	0.0	30	100	0	0.0
On Discharge	25	83.3	5	16.7	21	70	9	30
Oxygen Therapy								
On Admission	29	96.7	1	3.3	28	93.3	2	6.7
On Discharge	3	10	27	90	2	6.7	28	93.3
Diuretics								
On Admission	8	26.7	22	73.3	11	36.7	19	63.3
On Discharge	9	30	21	70	10	33.3	20	66.7
Histamine-2 Blockers								
On Admission	27	90	3	10	30	100	0	0.0
On Discharge	2	6.7	28	93.3	1	3.3	29	96.7
Pulmonary Rehabilitation								
On Admission	30	100	0	0.0	30	100	0	0.0
On Discharge	30	100	0	0.0	30	100	0	0.0

Significant statistical difference P ≤0.05

Table 5: Number and percentage distribution regarding to history of chronic diseases for study and control groups (n=60).

Variables	Group				p-value
	Study (n=30)		Control (n=30)		
	Number (N)	Percentage (%)	Number (N)	Percentage (%)	
Hypertension					
Present	10	33.3	6	20	0.13 **NS**
Not present	20	66.7	24	80	
Heart diseases					
Present	18	60	10	33.3	0.03 *
Not present	12	40	20	66.7	
Diabetes Mellitus					
Present	8	26.7	9	30	0.50 **NS**
Not present	22	73.3	21	70	
Liver diseases					
Present	3	10	0	0.0	0.11 **NS**
Not present	27	90	30	100	
Neurological disease					
Present	0	0.0	0	0.0	-
Not present	30	100	30	100	
Previous history of DVT					
Present	0	0.0	0	0.0	-
Not present	30	100	30	100	

*** =Highly Significant Difference   * =Significant Difference   NS =Not Significant*

Table 6: Number and percentage distribution regarding to various laboratory investigations for study and control groups (n=60).

Variables	Study (n=30)				Control (n=30)				p-value
	Done		Not done		Done		Not done		
	No	%	No	%	No	%	No	%	
Complete Blood Count									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	5	16.7	25	83.3	27	90	3	10	0.001**
Calcium (Ca++)									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	5	16.7	25	83.3	6	20	24	80	0.5 **NS**
Magnesium (Mg++)									
On Admission	30	100	0	0.0	9	30	21	70	0.001**
On Discharge	8	26.7	22	73.3	6	20	24	80	0.4 **NS**
Potassium (K+)									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	24	80	6	20	30	100	0	0.0	0. 01*
Sodium (Na+)									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	22	73.3	8	26.7	30	100	0	0.0	0.002**
Erythrocyte Sedimentation Rate									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	2	6.7	28	93.3	2	6.7	28	93.3	0.5 **NS**
Liver function									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	2	6.7	28	93.3	8	26.7	22	73.3	0. 04 *
Kidney function									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	8	26.7	22	73.3	24	80	6	20	0.001**
Blood sugar									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	25	83.3	5	16.7	30	100	0	0.0	0. 02 *
Prothrombin time									
On Admission	30	100	0	0.0	30	100	0	0.0	-
On Discharge	4	13.3	26	86.7	6	20	24	80	0.4 **NS**

*** =Highly Significant Difference   * =Significant Difference   NS =Not Significant*

Table (7): Relationship between total Dyspnea Scale score and total Hamilton Anxiety Rating Scale score for study group (n =30)

Variables	HAM-A Scale Mean ± SD	Dyspnea Scale Mean ± SD	p-value
On Admission	28.12 ± 7.49	29.13 ± 7.56	0.001**
On Discharge	12.68 ± 6.12	13.66 ± 6.14	

IV. Discussion

A clinical pathway is a method for the patient-care management of a well-defined group of patients during a well-defined period of time. A clinical pathway explicitly states the goals and key elements of care based on Evidence Based Medicine (EBM) guidelines, best practice and patient expectations by facilitating the communication, coordinating roles and sequencing the activities of the multidisciplinary care team, patients and their relatives; by documenting, monitoring and evaluating variances; and by providing the necessary resources and outcomes. The aim of a clinical pathway is to improve the quality of care, reduce risks, increase patient satisfaction and increase the efficiency in the use of resources **Lee & Anderson (2017).**

The current study aimed to evaluate the effect of implementation of clinical pathway as an essential part on outcomes of patients with chronic bronchitis.

Based on the results of this study, in relation to patients' socio-demographic variables between the two groups were comparable and no significant differences were observed. This finding was in accordance with **Abd-Elwanees et al., (2014) & Mohammad et al., (2018)** who illustrated that there were no any significant differences regarding to age, gender, and other demographic and baseline characteristics between the clinical pathway and the non-clinical pathway groups. Regarding level of education, the present study illustrated that, slightly two third of both groups were illiterate. This finding is inconsistent with **Ismail et al., (2012)** who reported that, the non- clinical pathway group composed of patients with lower levels of education compared to the clinical pathway group. Concerning occupation, it was found that the two third of the study group and more than half of the control group were working, this disagrees with **Mohammad et al., (2018)** who reported that, Near half of the two groups were housewives.

Concerning the length of their stay in hospital, the current study revealed that there was highly statistically significant difference between the study and control groups; it is attributed to the use of clinical pathway in CB management that reduced the hospital stay, this result were in accordance with **Morris & Arone (2017)** who showed that the length of stay in hospital of patients managed by the clinical pathway was less than the non- clinical pathway group who were managed according to the units' routine care. The result also comes in agreement with **Mohammad et al., (2018)** who mentioned that a significant decline in length of stay of the clinical pathway group as compared to the non- clinical pathway group. As to patient condition at discharge, the present study showed that, there was no significant statistical difference between the two groups. Also the study clarified that one case of the study group whereas two cases of the control group not improved on discharge. This finding differs with **Lopez and Ramirez (2017)** who stated that, there were two deaths in the clinical pathway group and none in the non- clinical pathway group. This difference was not significant. Also, this finding was in contrast with **Mohammad et al., (2018)** whose study results revealed that all study groups were improved on discharge whereas two cases of the control group not improved.

In relation to medical history, the current study concluded that there was no statistically significant difference among the two groups relevant to their medical history except long duration of cough there was highly significant statistical difference. As to chronic cough present in all of the study group and in the most of the control group while it was severe in the two groups. This result were in accordance with **Beeh (2016) & Mohammad et al., (2018)** whose study results reported that cough is now take into account, along with sputum production and dyspnea, to be one of the essential symptoms of chronic bronchitis .These symptoms were most evident on rising in the morning and were more possible to be present than at other times of the day and which taken together with exposure to a suitable risk factor should lead to a diagnostic spirometry test. Its existence helps to identify those patients at greatest risk of future exacerbations.

As regards to medications, the study showed that the common type of medications taken on admission and discharge for both groups was bronchodilators medications. This analysis was agreement with **Beeh (2016)** who emphasized that bronchodilators are the cornerstone of symptomatic chronic bronchitis management. They are recommended on a regular basis to prevent or reduce symptoms, improve health status and exercise tolerance with a preference of long-acting over short-acting drugs where long-acting bronchodilators prevent the occurrence of exacerbations.

Concerning chronic diseases, the present study revealed that the most common current chronic diseases in both groups were hypertension, heart disease and diabetes mellitus. There was statistical significant difference between the two groups concerning heart diseases. This finding is supported by **Mohammad et al., (2018)** who emphasized on that there was there was significant statistical difference among the control and study groups concerning heart disease. And the most common comorbid diseases in all cases were diabetes, heart disease and hypertension. The result also comes in agree with **Beeh (2016)** who mentioned that the existence of respiratory impairment was linked with a higher risk of having cardiovascular, disease comorbid hypertension and diabetes, and also having at least two of these comorbid diseases. Also, this finding was in accordance with **Morris & Arone (2017)** who illustrated that more than half of chronic bronchitis patients had at least one comorbid disease. The most common comorbid disease was hypertension.

In relation to various laboratory investigations, the present study illustrated that the study group had done little laboratory investigations than the control group. These results agree with **Mohammad et al., (2018)** who reported in his study that the study group had done fewer laboratory investigations than the control group.

The present study showed that, there was highly statistically significant relation between total Dyspnea Scale score and total Hamilton Anxiety Rating Scale score for study group. This is confirmed with **Mohammad et al., (2018) & Tselebis et al. [2016]** whose study results stated that it is important to observe dyspnea at rest or on exertion does not correlate with the amount of anxiety-related symptoms, and furthermore, the amount of decrease in dyspnea with pharmacotherapy or exercise training is not associated with the reduction in anxiety-related symptoms, this indicates that there are other factors contributing to this relationship. Moreover, although patients with panic report more disastrous misinterpretations of physical symptoms, they don't vary from patients without panic on measures of physical functioning, disease severity, dyspnea, or psychological distress. Thereby, it has been offered that panic symptoms may reflect a cognitive demonstration of pulmonary symptoms rather than objective pulmonary status.

The prevalence of clinical pathways has increased significantly across the world. Countries have become more aware of the need for producing high quality care at an affordable cost. Barriers to cost effectiveness include but are not limited to variations in treatment; over-testing; over-prescribing; lackluster health outcomes across various populations. Implementing clinical pathways in acute and chronic respiratory diseases will have many financial and quality-driven benefits.

V. Conclusion

Based upon the results of this study, it could conclude that, implementation of clinical pathway in chronic bronchitis patients' management decreased the length of hospital stay, medications administration, investigations and improving dyspnea and levels of anxiety thereby yielding improve the quality of care, reduce risks, increase patient satisfaction and increase the efficiency in the use of resources and cost savings. These results justified the research hypothesis.

VI. Recommendations

This study recommended that emphasize the importance of implementation of clinical pathway as an essential part on outcomes of patients with chronic bronchitis to replace the traditional nursing care plan. Elaborating a training program for health team on the chronic bronchitis clinical pathway implementation for better quality of care.

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