

# Comprehensive Nursing Care for COVID-19: It's Effect on Prognosis of Patients with Chronic Diseases

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## Abstract

**Background:** COVID-19 is severe in patients who have chronic diseases as hypertension, ischemic heart disease, diabetes mellitus, chronic obstructive pulmonary disease, renal and liver diseases, additional cancer, and the risk of mortality rate increases among elderly people.

**Aim of the study:** To evaluate the effect of comprehensive nursing care for COVID-19 on prognosis of patients with chronic diseases.

**Design:** Quasi Experimental design.

**Setting:** The current study was carried out at isolation medical ward for COVID-19 patient (6th floor) at Menoufia University Hospital, Egypt.

**Subject:** Purposive sample of 300 COVID-19 patients who fulfilled the inclusion criteria. They were divided randomly and alternatively into two equal groups 150 in each group: Study group (1): COVID-19 patients who received the hospital routine care and comprehensive nursing care provided by researchers. Control group (2): COVID-19 patients who received only protocol of care provided by the hospital.

**Tools of the study:** Three tools were used to collect the data; as follows: Tool I: Interview questionnaire sheet; it developed by researchers it divided into four parts: Part (1): Sociodemographic data, Part (2): Questionnaire for medical data, Part (3): Laboratory and diagnostic data and Part (4): Clinical manifestation with categories of COVID-19. Tool (II): Chalder fatigue scale. Tool (III): Zung Self-Rating Depression Scale.

**Results:** There was a statistically significant difference between the study and control group concerning to the duration of hospitalization, Sao<sub>2</sub>, vital signs post one week and before patients' discharge from hospital. There was a statistically significant difference in study group at different intervals related to categories of clinical manifestations, reduction in mean score of fatigue and depression compared to control group post intervention.

**Recommendations:** Integrate comprehensive nursing care in the protocol of care for COVID-19 patients. Establish multidisciplinary rehabilitation programs to determine discharge readiness and needs of patients recovering from Covid-19.

**Conclusion:** Comprehensive nursing care has a positive effect on reducing the length of patients' hospitalization stay and enhanced patients' prognosis.

**Keywords:** Comprehensive Nursing care • COVID-19 • Chronic diseases

## Abbreviation

COVID-19: Coronavirus disease of 2019; CRP: C reactive protein; TLC: Total Leucocyte Count; CT: Computed Tomography; Sao<sub>2</sub>: Oxygen Saturation

## Introduction

Coronavirus disease 2019 (COVID-19) is a wide rapid spread respiratory viral disease. It has rapidly spread worldwide and is associated with an international pandemic [1]. COVID-19 passes to the human body through the respiratory tract and gradually causes systemic disease. So, the virus causes multi organ dysfunction. The disease is mild in eighty one percent of the patients and severe in the balance. Respiratory failure, septic shock, and multiorgan dysfunction are seen in five percent of the positive cases and result in a fatality in half of such cases [2].

There is no doubt that, the body organs affected by the disease. The most affected organ is the lungs and the cardiovascular system follows it

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closely. Other organs developing a significant dysfunction are the kidney and intestines. Patient with COVID-19 has low of oxygen saturation which considers an early warning sign that requires immediate care [3].

The symptoms of COVID-19 may range from mild to severe such as fever, dyspnea, and dry cough, shortness of breathing, headache, nausea, vomiting, abdominal pain, and diarrhea [4]. Other symptoms such as anosmia, hyposmia, and dysgeusia have also been reported. At general, the symptoms may appear 2 to 14 days post-exposure. But other people may asymptomatic [5,6].

Regarding to the prognosis of the disease for patients with chronic illness, the disease becomes worsen for people who have severe chronic diseases as hypertension, ischemic heart disease, diabetes mellitus, chronic obstructive pulmonary disease (COPD), or cancer and among people who are more than 60 years old, and these people have a high mortality rate [7].

COVID-19 pandemic not only affects the patient physically but also has a negative effect on psychological & mental health. Isolation, limitation

of movement, fatigue which is one of the most reported symptoms of COVID-19, all of these factors leads to anxiety and depression [8].

Nurses play a key role in the public health response to such crises. They are health care professionals who play pivotal roles in providing care to patients to serve their needs in both physical and psychological dimensions. Furthermore, nurses work on the front line, providing direct care to an infected patients with COVID-19, symptom relief for patients, maintain patients' safety, and monitor the body functions of critically ill patients [9,10].

Nursing care during COVID-19 or any other pandemic should start from the initial patient assessment and triaging, sample collection and diagnostic testing, assessing the severity of patients symptoms, following which providing necessary care to patients with mild to moderate symptoms, catering to intensive care of a critically ill patient, and are also involved in care of the dead bodies [9].

Comprehensive nursing care for COVID-19 patients can manage prognostic factors that have been linked with increased severity and mortality of the disease. There are many indicators for good prognosis of COVID-19 patients as improvement in patients' laboratory results; clinical data; clinical manifestations categories; lowering reinfection and decrease length of hospital stay [11].

### Significance of the study

By searching of web sites for the registration researches in Menoufia University, the researchers found that; there is no research has been done about the effect of competent nursing care for COVID-19 on prognoses of patients with chronic diseases in the faculty of nursing. Patients have any type of chronic diseases become more liable to COVID-19 infection, which increased the risk of delayed recovery, bad death showed that the illness is severe in people who have severe chronic diseases such as hypertension, ischemic heart disease, diabetes mellitus, chronic obstructive pulmonary disease or cancer and elderly people who are over the age of sixty years, and these individuals have a higher risk of death.

Management of patients had COVID-19 with chronic diseases need to a comprehensive nursing management which is established on evidence based practices which delivering an organized nursing care to reduce early mortality; disability and improves patients' prognosis.

### The aim of the study

This study aimed to evaluate the effect of comprehensive nursing care for COVID-19 on prognosis of patients with chronic diseases.

### Research hypothesis

- There will be an improvement in patients' prognosis in the study group compared to control group by the comprehensive nursing care effect.
- The length of hospitalization will decrease in the study group after applying comprehensive nursing care compared to control group.
- There will be a reduction in fatigue and depression scores in the study group compared to control group after applying comprehensive nursing care.

## Materials and Methods

### Design

Quasi Experimental design was utilized for this study.

### Setting

The current study was carried out at isolation medical ward for COVID-19 patient (6th floor) at Menoufia University Hospital, Egypt.

### Subject

Purposive samples of 300 COVID-19 patients, who fulfilled the inclusion

criteria. They were divided randomly and alternatively into two equal groups 150 in each group as follows: Study group (1): COVID-19 patients who received the routine care provided by hospital and comprehensive nursing care provided by researchers. Study group (2): COVID-19 patients who received only protocol of care provided by the hospital.

### Inclusion criteria

Patients who were willing to participate at the time of the study. Both sex if available. Adult or elderly had chronic diseases.

### Exclusion criteria

Patients were excluded from the study if they: Not willing to participate in the study. Covid-19 patients with acute state of diseases.

### Tools of the study

Three tools were developed to collect the current data; as follows:

**Tool I:** Interview questionnaire sheet; it developed by researchers; divided into four parts: Part (1): Socio demographic data as age; gender, patient's education, marital status, place of residence and smoking; Part (2): Questionnaire for medical data; included the weight, medical history, vital signs, duration of hospitalization, oxygen saturation; Part three: Laboratory and diagnostic data included laboratory investigations that confirmed COVID-19 infection as Complete blood count, ferritin, D-Dimer, C- reactive protein (CRP) and Computed tomography and Part four: Clinical manifestation with categories of COVID-19; divided into: Mild category: patients had fever, cough, sore throat, headache, malaise, nausea, vomiting, diarrhea, muscle pain, loss of taste and smell but who do not have shortness of breath, dyspnea, or abnormal chest imaging. Moderate category: the patients had signs and symptoms in mild category with show evidence of lower respiratory disease during the clinical assessment or imaging (pneumonia) and who have oxygen saturation (SpO<sub>2</sub>) ≥ 94% on room air at sea level. While the severe category included the patients who had SpO<sub>2</sub> less than <94% on room air at sea level.

**Tool II:** Chalder fatigue scale; it developed by Cella and Chalder (2010) [12]; this scale included 11 questions; (questions 1-7) measured physical fatigue and (questions 8-11) measured mental fatigue.

**Tool III:** Zung Self-Rating Depression Scale; it developed by Zung (1965) [13] and translated into Arabic by Kirkby, Al Saif, and Mohamed, (2005) [14]. It had 20 questions to assess the depression level.

### Scoring system

**Tool II:** Chalder fatigue scale; each question graded from 0-3; total score ranged from (1-33) grade. It's defined as follows; from 1-11 indicated mild fatigue, 12-22 indicated moderate fatigue and 23-33 indicated severe fatigue.

**Tool III:** Zung Self-Rating Depression Scale; some questions graded from 1-4 and others graded from 4-1; then the total scores range from 25-100 by the following categories: the 25-49 scores considered a normal range; 50-59 are mildly depressed; 60-69 are moderately depressed and 70-100 considered severely depressed.

### Validity of the tools

All tools were tested for its content validity by three experts in the field of Medical Surgical Nursing and two experts in the field of psychiatric health nursing, Faculty of Nursing, Menoufia University. Modifications were done accordingly.

### Reliability of tools

Reliability was estimated among ten of participants by using test retest method with two weeks apart between them. Then Cronbach alpha reliability test was done through SPSS computer package.

**Regarding tool I:** Interview questionnaire sheet; it was 0.60 for three parts of medical data, laboratory results, diagnostic data and category of clinical manifestations) this reliability value indicator for the variation among

subjects related to these three parts).

**Regarding tool II:** Chalder fatigue scale; Cronbach alpha reliability value was 0.98.

**Regarding tool III:** Tool (III): Zung Self-Rating Depression Scale; Cronbach alpha reliability value was 0.78.

The Cronbach alpha reliability for the three tools and their subscales indicate that the three tools are reliable to detect the objectives of the study.

**Pilot study:** It was done by 10% of patients before starting the actual data collection to evaluate the effectiveness of the study tools, clarity, techniques and the availability of the study sample; and subjects who participated in the pilot study were not included in the study sample.

**Ethical considerations**

The official permission to conduct the study was obtained by the researchers from the dean and ethical committee of the Faculty of Nursing after comprehensive explanation of study purpose and data collection procedures. The researchers obtained an official permission from hospital manager, executive of the Menoufia University Hospital and from head nurse of isolation ward. The contributors were informed that the participation in this study is voluntary and they can withdraw at any time without giving reasons. The purpose of the study was explained to them and they were reassured that any information obtained would be confidential and would be used only for the study purpose.

**Field work**

Data were collected from the beginning of October 2020 to the end of April 2021. The aim of the study was explained to the participants by the researchers. Also, they obtained their agreement for sharing in the study, and then completed the interview questionnaire (Tool I). The needed time for completing the questionnaire was about 30 minutes.

The researchers set up the comprehensive care plan guidelines and distributed the roles for each one on the care team; the care included essential practices for the category of mild-moderate Covid-19 patients. During the period of study, the researchers met the participants daily except the Friday to perform the comprehensive nursing care divided into two phases.

The first phase was during the management of Covid-19 included symptomatic and supportive nursing care, started by assessed and managed patient's respiratory system, maintained patent airway, suction if patient need, assessed oxygen saturation, administered O2 as prescribed; put patients in semi fowler's position to facilitate breathing; assessed breathing sounds, a respiratory exercise that help to expel sputum; checked vital signs, managed fever through cooling patients by cold compress and partial bed bath; maintained patients bed rest in proper position; monitored fluid and output, laboratory results; nutritional support, the researchers contacted with hospital dietitian to write nutritional supplement based on each patient need from daily requirements, encouraged diet enhanced immunity, the researchers took permission from the responsible physician for added honey, Cinnamon, Ginger and Turmeric with daily oral fluid intake to cleanse and detoxify the lung if there was not any contraindication to patients, restricted more intake from salt, sugar, and fats; allowed patients express their feelings and emotional support; health education about the importance of increasing fluid intake, eating a healthy diet, promote sleep hygiene and importance of applied infection control measures for patients as proper hand washing, how to deal with respiratory discharge, proper wearing face mask, social distance and used items individually.

Evaluation and follow-up during first phase as follows: the researchers took 4 measurements for evaluating the intervention; pre-measurement at the time of admission; first measurement after 3 days of admission; second measurement after one week of admission and third measurement before the discharge.

The second phase started after patients' recovery from acute stage

of disease and continued for 6 months, the nursing management included management of post Covid-19 fatigue and depression; by establishing a proper activity schedule to maintain a mental and physical balance with keeping low activity levels for physical and cognitive activities to save energy; do some low energy activities as watching television, using phones and social media, perform daily living basic activities, take frequent bed rest, promote sleep hygiene by avoiding caffeine, nicotine and using strategies of stress management as a relaxation technique, breathing, meditation, maintain calmly and dark room, eating healthy food and drink enough fluids, cognitive behavioral therapy, emotionally focused therapy by engage the patient' family in therapy and avoid social and interpersonal triggers.

Evaluation and follow-up during second phase as follows: the researchers took 4 measurements for a period of 6 months for evaluating the effect of comprehensive nursing intervention on fatigue and depression. Pre-intervention at the time of patients complain; first, follow up post one month of intervention, second follow up after 3 months of interventions, and third follow up after 6 months of interventions.

**Statistical analysis**

The data were coded and transformed into a specially designed format suitable for computer feeding to use it for statistical analysis. All entered data were verified for any errors. Statistical package for social sciences (SPSS) version 20 were used to analyze the data. Added to that, data were presented in tables and graphs. Types of test included Chi-square test, independent sample t-test, repeated measures ANOVA, and mean and standard deviations were computed. P-value at 0.05 was used to determine level of significance:

- P-value>0.05 to be statistically insignificant.
- P-value ≤ 0.05 to be statistically significant.
- P-value ≤ 0.001 to be highly statistically significant.

**Results**

The mean age of studied sample were (55.6 ± 7.5 & 54.3 ± 8.1) in study & control group respectively. More than half of the participants were males in study group & control group (64.0% & 66.7%). The majority of participants in the study group were married (80.7%), while 62.7% in the control group were males. Regarding medical history; 28.7% in the study group had heart failure while 25.3% in control group had diabetes mellitus showed in Table 1.

**Table 1.** Distribution of socio-demographic characteristics and medical data among studied sample (n= 300).

Socio-demographic characteristics & Medical data	Intervention group ( n = 150)	Control group ( n = 150)
Age (years): Mean + SD	55.6 ± 7.5	54.3 ± 8.1
20- 59	100(66.7%)	105(70.0%)
≥ 60	50(33.3%)	45(30.0%)
Gender:		
Male	96(64.0%)	100(66.7%)
Female	54(36.0%)	50(33.3%)
Level of Education:		
Uneducated	60(40.0%)	58(38.7%)
Primary education	34(22.7%)	33(22.0%)
Secondary education	25(16.7%)	34(22.7%)
University	31(20.7%)	25(16.7%)
Marital status:		
Married	121(80.7%)	94(62.7%)
Widow	29(19.3%)	43(28.7%)
Divorced	0(0.0%)	13(8.7%)
Residence:		

Urban	59(39.3%)	76(50.7%)
Rural	91(60.7%)	74(49.3%)
Smoking	58(38.7%)	66(44.0%)
Comorbidities (Medical history):		
Hypertension	30(20.0%)	9(6.0%)
Ischemic heart disease	5(3.3%)	4(2.7%)
Heart failure	43(28.7%)	34(22.7%)
COPD	4(2.7%)	11(7.3%)
Diabetes mellitus	32(21.3%)	38(25.3%)
Liver disease	23(15.3%)	30(20.0%)
Renal disease	8(5.3%)	18(12.0%)
Cancer	5(3.3%)	6(4.0%)

Table 2 exposed that; there was no statistically significant difference between the study and control group regarding Sao2, vital signs, and body weight pre and post three days from intervention; While there was a statistically significant difference between the intervention and control group regarding Sao2, vital signs post one week and before patients' discharge from hospital (P<0.001) (Table 2).

Table 3 displayed that; the mean and standard deviation of CRP decreased in the study and control group at different intervals (25.23 ± 4.9; 15.9 ± 3.1 & 23.51 ± 5.6; 4.11 ± 3.2) respectively. The mean and standard deviation of Ferritin level decreased in the study and control group at different intervals (304.2 ± 26.8; 65.1 ± 22.1; 235.2 ± 17.1 & 322.3 ± 40.5; 294.1 ± 50.3; 237.9 ± 17.5) respectively. Regarding computed tomography (CT) 2.7% had very low patches in study group compared to 8.7% in control group. Also, there was a significant difference among studied sample post-intervention (p<0.05) (Table 3).

Table 4 clarified that; 47.3% of the participants in the study group had severe clinical manifestation of COVID-19 pre-intervention; while 42.7% had moderate clinical manifestation of COVID-19 post week from intervention. However, most of participants (97.3%) didn't have any symptoms. Also, there was a statistical significant difference in the study group at different intervals (P<0.001) (Table 4).

Table 5 presented that; the reported mean duration of hospitalization among the patients who had severe symptoms in the study and control group was 14.7±2.1 & 18.9±4.3 respectively. Moreover, there was a statistically significant difference between the studied samples in relation to patients duration of hospitalization (p<0.001).

Table 6 revealed that; presence of reduction in a mean score of depression in study group if compared with control group post intervention with a statistically significant difference; (67.8 ± 5.8 to 41.3 ± 9.3 and 63.7 ± 4.1 to 60.6 ± 4.4) P<0.001. In addition, reduction in mean score of fatigue in study group compared to control group post intervention (31.6 ± 3.5 to 1.69 ± 3.9 and 31.1 ± 4.1 to 23.1 ± 6.3) with a statistically significant difference (P<0.001) (Table 6).

Most of sample in the study group had no symptoms before discharge which was displayed in Figure 1.

Figure 2 illustrated that; there was a reduction in the mean score of depression in adult and elderly patients during pre and post 6 months during and post 6 months after the intervention (74.6 to 50.3 and 64.4 to 36.9 respectively).

Figure 3 clarified that; there was a reduction in the mean score of fatigue between the intervention and control group during pre and post 6 months from the intervention (31.1 to 23.1 and 31.6 to 1.69 respectively).

**Table 2.** Clinical data among studied sample at different intervals (pre and post intervention (n= 300).

Patients clinical data	Intervention group ( n = 150)	Control group ( n = 150)	Test of significance	p-value
Pre-measurement				
Sao2%	90.4 ± 2.8	90.5 ± 2.1	t=0.4	p>0.05
Temperature	39.09 ± 0.67	39.11 ± 0.61	t=0.2	p>0.05
Pulse	103.2 ± 3.4	102.6 ± 3.5	t=1.6	p>0.05
Respiratory rate	31.8 ± 4.9	31.8 ± 3.9	t=0.1	p>0.05
Systolic pressure	148.7 ± 8.4	143.3 ± 24.8	t=2.5	p<0.05
Diastolic pressure	93.9 ± 8.2	94.3 ± 7.5	t=0.4	p>0.05
Weight	71.6 ± 7.6	73.7 ± 8.9	t=2.5	p<0.05
Post 3 days				
Sao2%	90.7 ± 2.3	90.6 ± 2.1	t=0.3	p>0.05
Temperature	38.9 ± 0.63	39 ± 0.61	t=0.8	p>0.05
Pulse	100.8 ± 8.6	101.8 ± 11.9	t=0.9	p>0.05
Respiratory rate	30.9 ± 4.1	30.5 ± 3.1	t=0.9	p>0.05
Systolic pressure	146.6 ± 8.4	147.5 ± 8.3	t=0.9	p>0.05
Diastolic pressure	92.6 ± 8.1	93.2 ± 7.6	t=0.7	p>0.05
Weight	70.5 ± 7.5	71.2 ± 8.8	t=0.8	p>0.05
Post one week				
Sao2%	92.5 ± 2.2	91.4 ± 1.9	t=4.6	p<0.001
Temperature	37.8 ± 1.02	38.5 ± 0.6	t=6.9	p<0.001
Pulse	90.6 ± 3.3	93.4 ± 3.6	t=6.8	p<0.001
Respiratory rate	25.6 ± 4.1	27.6 ± 3.1	t=5.02	p<0.001
Systolic pressure	141.6 ± 8.6	146.3 ± 8.2	t=4.8	p<0.001
Diastolic pressure	86.5 ± 7.2	91.5 ± 6.6	t=6.2	p<0.001
Weight	71.2 ± 7.5	70.6 ± 8.6	t=0.6	p>0.05
Before discharge				
Sao2%	95.6 ± 1.5	95.4 ± 0.9	t=1.06	p>0.05
Temperature	36.6 ± 0.4	36.5 ± 0.5	t=2.7	p<0.05
Pulse	76.7 ± 4.8	76.5 ± 4.9	t=0.4	p>0.05
Respiratory rate	20.4 ± 3.1	24.7 ± 4.2	t=9.8	p<0.001
Systolic pressure	135.6 ± 8.2	145.5 ± 8.1	t=10.4	p<0.001
Diastolic pressure	85.8 ± 7.2	91.2 ± 6.4	t=6.7	p<0.001
Weight	71.2 ± 7.5	70.6 ± 8.6	t=0.6	p>0.05
Cancer	Cancer	Cancer	Cancer	Cancer

**Table 3.** Mean and standard deviation of the laboratory and diagnostic measures among studied sample at different intervals (pre and post intervention (n= 300)).

Laboratory and diagnostic measures	Intervention group ( n = 150)	Control group ( n = 150)	Test of significance	p-value
<b>Pre-test</b>				
Haemoglobin level	10.27 ± 1.2	10.15 ± 1.2	t=0.9	p>0.05
RBCs	3.91 ± 0.4	3.96 ± 0.4	t=0.9	p>0.05
TLC	3.04 ± 0.6	3.46 ± 0.8	t=4.9	p<0.001
Lymphocytes	10.69 ± 1.4	10.6 ± 1.32	t=0.1	p>0.05
Ferritin	342.6 ± 39.9	343.1 ± 38.7	t=0.1	p>0.05
CRP	25.8 ± 5.6	23.6 ± 5.9	t=3.4	p<0.001
D-Dimer	2.17 ± 0.8	2.13 ± 0.7	t=0.4	p>0.05
<b>CT:</b>				
Moderate patches	79(52.7%)	88(58.7%)	X <sup>2</sup> =1.1	p>0.05
High patches	71(47.3%)	62(41.3%)		
<b>Post 3 days</b>				
Haemoglobin level	10.31 ± 1.1	10.15 ± 1.2	t=1.2	p>0.05
RBCs	4.10 ± 0.4	4.11 ± 0.4	t=0.1	p>0.05
TLC	3.11 ± 0.7	3.46 ± 0.8	t=3.9	p<0.001
Ferritin	304.2 ± 26.8	322.3 ± 40.5	t=4.5	p<0.001
CRP	25.23 ± 4.9	23.51 ± 5.6	t=2.8	p<0.05
D-Dimer	1.97 ± 0.7	2.12 ± 0.7	t=1.6	p>0.05
<b>Post one week</b>				
Haemoglobin level	10.37 ± 1.1	10.48 ± 0.9	t=0.9	p>0.05
RBCs	4.16 ± 0.4	4.1 ± 0.4	t=1.1	p>0.05
TLC	3.41 ± 0.7	3.3 ± 0.7	t=1.2	p>0.05
Lymphocytes	12.79 ± 1.3	12.24 ± 1.2	t=3.6	p<0.001
Ferritin	265.1 ± 22.1	294.1 ± 50.3	t=6.4	p<0.001
CRP	15.9 ± 3.1	14.11 ± 3.2	t=4.9	p<0.001
D-Dimer	1.22 ± 0.4	1.23 ± 0.4	t=0.3	p>0.05
<b>Before discharge</b>				
Haemoglobin level	11.53 ± 8.4	10.54 ± 0.8	t=1.4	p>0.05
RBCs	4.23 ± 0.4	4.1 ± 0.4	t=2.4	p<0.05
TLC	3.67 ± 0.8	3.38 ± 0.7	t=3.4	<0.001
Lymphocytes	17.17 ± 1.6	12.91 ± 1.3	t=24.2	p<0.001
Ferritin	235.2 ± 17.1	237.9 ± 17.5	t=1.4	>0.05
CRP	6 ± 0.0	6 ± 0.0	-	>0.05
D-Dimer	0.7 ± 0.2	0.71 ± 0.1	t=0.5	>0.05
<b>CT</b>				
No patches	146(97.3%)	137(91.3%)	X <sup>2</sup> =5.1	p<0.05
Very low patches	4(2.7%)	13(8.7%)		

**Table 4.** Categories of clinical manifestations in study group at different intervals pre and post intervention (n=150).

Clinical manifestations categories	Intervention group n=150			
	Pre intervention	Post 3 days	Post one week	Before discharge
No symptoms	0(0.0%)	0(0.0%)	0(0.0%)	146(97.3%)
Mild	0(0.0%)	0(0.0%)	65(43.3%)	4(2.7%)
Moderate	79(52.7%)	82(54.7%)	64(42.7%)	0(0.0%)
Severe	71(47.3%)	68(45.3%)	21(14.0%)	0(0.0%)

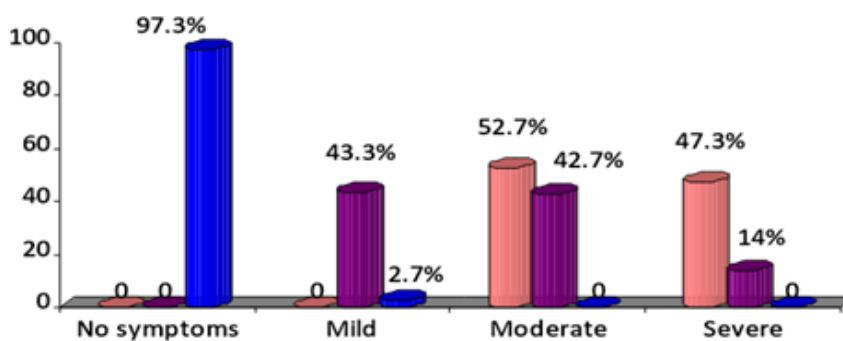
P <0.001

**Table 5.** Mean duration of hospitalization in relation to clinical manifestations for the study and control groups of patients (n= 300).

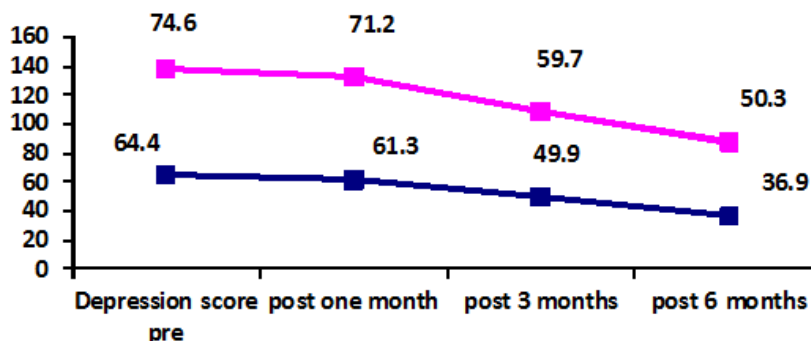
Duration of hospitalization:	Intervention group ( n = 150)		Control group ( n = 150)		Severe X <sup>2</sup> =5.3 p<0.001*
	Clinical manifestations		Clinical manifestations		
	Moderate	Severe	Moderate	Severe	
Mean ±SD	14.1 ± 0.1	14.7 ± 2.1	14.1 ± 0.7	18.9 ± 4.3	
Mean ±SD	14.3 ± 1.4		16.1 ± 3.6		
Minimum n of days	14		14		
Maximum n of days	21		28		

**Table 6.** Mean score of the depression and fatigue scales among studied patients pre and post intervention (n= 300).

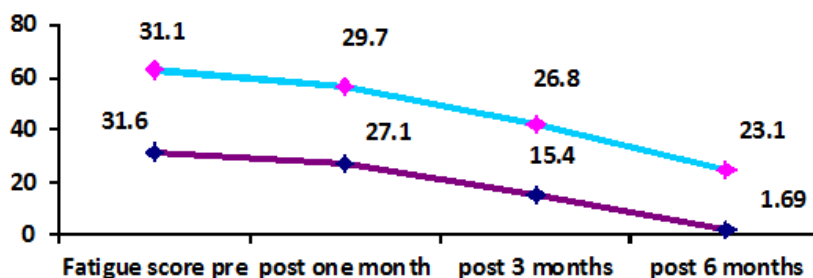
Variables	Intervention group ( n = 150)	Control group ( n = 150)	Test of significance	p-value
Depression scale score:				
Pre-intervention	67.8 ± 5.8	63.7 ± 4.1	t=7.1	p<0.001
Post one month	64.6 ± 5.8	63.1 ± 4.1	t=2.7	p<0.05
Post 3 months	53.2 ± 6.9	61.8 ± 4.2	t=13.1	p<0.001
Post 6 months	41.3 ± 9.3	60.6 ± 4.4	t=22.8	p<0.001
Fatigue scale score:				
Pre-intervention	31.6 ± 3.5	31.1 ± 4.1	t=1.2	p>0.05
Post 1	27.1 ± 6.1	29.7 ± 5.02	t=4.1	p<0.001
Post 2	15.4 ± 5.5	26.8 ± 5.4	t=17.8	p <0.001
Post 3	1.69 ± 3.9	23.1± 6.3	t=34.9	p<0.001



**Figure 1.** Clinical manifestations in study group at different intervals pre and post intervention (n=150).  
 Note: (■) clinical manifestations pre; (■) post one week; (■) before discharge



**Figure 2.** Mean scores of depression scale between adult and elderly in study group at different intervals (pre, post one month, post 3 months and post 6 months).  
 Note: (■) Adult; (■) Elderly



**Figure 3.** Mean scores of fatigue scale among studied sample pre and different intervals post intervention.  
 Note: (■) Intervention group; (■) Control group

## Discussion

The comprehensive nursing care is very important organized care can be provided to all category Corona Virus patients with or without chronic comorbidities, it follows the steps of nursing process, which based on evidence in management the patients' clinical manifestations and other problem can face them. It includes all guidelines of nursing knowledge and skills needed in caring Covid-19 effectively. So, cared patients had better prognosis in their health status and reduction of post-Covid-19 complications than other patients cared by routine nursing care. The aim of this study was to evaluate the effect of comprehensive nursing care for Covid -19 on prognosis of patients with chronic diseases.

### Regarding chronic diseases among Covid-19 patients

The present study documented that; most of studied sample had heart failure, hypertension and diabetes mellitus as comorbid chronic disorders, these findings in the same line with Liu, et al., 2020 [15] they reported that; patients who had cardiac diseases and diabetes had a high prevalence of Covid-19.

### Clinical data of patients (Vital signs, and Oxygen saturation)

The existing study reported improvement in study group as vital signs and Sao2 than control group with statistically significant difference during post one week and before patients' discharge from hospital by the effect of proper care provided by comprehensive nursing care team, this results supported by Sharma & Ahwal (2020) [9] who stated that; comprehensively organized nursing care had an effect on all stages of disease management started from assessment phase to evaluation of outcomes. The researchers explained that; continuous planned nursing care and follow up are very important in good patients' prognosis.

### Laboratory and diagnostic measures

The current study revealed that; gradually improvement in CRP, D-Dimer, Ferritin, Lymphocytes and TLC within different measurements and before patients' discharge as indicators of good prognosis among studied sample, these results supported by National Health Commission and National Administration, 2020 [16], which approved that; analysis of peripheral blood samples is helpful in diagnosis of suspected cases, necessary in monitoring treatment efficacy and recovery. Regarding Chest Computed Tomography, the majority of study group had no patches at the time of discharge compared to control group by the effect of comprehensive nursing care which included position management, respiratory exercise and cleansing and detoxification of the lung, these consistent with National Health Commission & State Administration of Traditional Chinese Medicine, 2020 [17], which recommended these interventions to manage chest manifestation with Covid-19 infection.

### Categories of clinical manifestations in study group pre and post intervention

The existing study documented a statistical significant difference and improvement in the severity of clinical manifestations among study group at different intervals after the comprehensive organized nursing intervention; these findings supported by Krakauer et al., 2020 [18] and Integrated care for older people (ICOPE) 2020 [19], they stated that; older chronic diseases patients who infected by COVID-19 had a risk factor for increased mortality so practice by doctors and nurses should be carried to improve clinical manifestations severity and reduce life-threatening conditions. The researchers explored that; skillful nurses had the capabilities needed for early detection, assessment, and management of any emergencies situations as respiratory distress.

### Duration of hospitalization in relation to clinical manifestations among the studied sample

The present study reported that the maximum days of hospitalization in the study group were 21 days compared to 28 days in the control group which evidenced improvement in clinical manifestations among the study

group as an effect of comprehensive nursing care in lowering Covid-19 clinical manifestations, these findings supported by Daher et al., 2021 [20], they found most of Covid-19 in the study stayed 20 days, because they needed to O2 supplement and stated that the duration of hospitalization varying depends on age and severity of manifestations.

### As regards fatigue and depression level among studied sample

The current study approved that; most of the adult chronic patients who had Covid-19 suffered from fatigue and depression post Covid-19 complications, while post-application of the second phase of comprehensive nursing care as cognitive behavioral therapy, psychological support skills and establish a schedule for the activity to maintain the mental, physical, and psychological status of the patients, the presence of reduction in fatigue and depression score in the study than the control group; these results agreed with Juan Bueno et al., 2021 [21] and IASC's Reference Group on Mental Health and Psychosocial Support 2020 [22], they recommended that; the protocol of care for adults chronic patients affected by COVID-19 must include long-term rehabilitation for fatigue and psychosocial support skills for depressed status.

## Conclusion

Finally, the researchers explained the improvement of patients' condition due to the application of comprehensive nursing care & continue follow-up care to these patients. The current study concluded that; comprehensive nursing care has a positive effect on reducing the length of patients' duration of hospitalization, and enhanced patients' prognosis.

## Recommendations

The current study recommended that establish multidisciplinary rehabilitation programs to determine discharge readiness and the needs of patients recovering from Covid-19.

Integrate the comprehensive nursing care in the protocol of care for Covid-19 patients.

Application of comprehensive nursing care on large samples and variable measurements are in need for generalization of the results.

## Conflict of interest

There is no conflict of interest and no fund from any institution.

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