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Health Related Quality of Life for Patients Post Coronavirus (COVID-19) Pandemic

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ABSTRACT

Background: Coronavirus disease 2019 is a serious respiratory disease that is caused by a novel severe acute respiratory syndrome coronavirus 2. Understanding health-related quality of life (HRQOL) of hospitalized COVID-19 survivors is an emerging global challenge arising from the current pandemic. **Aim:** This study aimed to assess health related quality of life for patients post coronavirus (COVID-19) pandemic. **Design:** A prospective research design was used to achieve the aim of this study. **Setting:** This study was conducted at medical outpatients clinic affiliated to Helwan General Hospital. **Sample:** A purposive sample of 100 recently recovered patients post COVID-19 from the selected setting was included in the study. **Tools:** two tools were used in this study; Patients structured Interview Questionnaire, Euro Quality of life 5-dimensions questionnaire (EQOL-5D). **Results:** The majority of post COVID-19 patients had a history of chronic diseases and a contact with COVID-19 patient. The most common symptoms at admission were hyperthermia, dry cough, dyspnea, nausea and vomiting. After discharge, majority of studied patients complain of fatigue, joint pain, myalgia, headache, and anxiety. More than half of them reported some problems in walking; performing usual activities and moderate pain or discomfort. **Conclusion:** There were statistically significant relations between history of chronic disease and total QOl scores, as well as, between physical and psychological complications post COVID 19 and total QOl scores. **Recommendations:** Healthcare workers should pay more attention to physical and psychological rehabilitation of discharged COVID-19 patients.

Keywords: COVID-19, Health Related Quality of Life & Panedemic

Introduction

Coronavirus disease 2019 (COVID-19) is a serious respiratory disease that is caused by a novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) which was firstly reported in December 2019 (World Health Organization, 2020). COVID-19 pandemic has generated a health emergency of worldwide proportions, and it has been declared as pandemic because of its rapid transmission from human to human, unprecedented economic and social consequences, and its significant influence on global healthcare systems (Tayyib, & Alsolami, 2020).

Patients suffer from different symptoms while symptoms of severe acute respiratory infection most commonly occur in early phases of the disease (Huang, et al. 2020). The severity of the case may progress rapidly to acute respiratory distress syndrome or respiratory failure, and other serious complications (Wu & McGoogan, 2020). COVID-19 can impact multiple other organ systems, including neurological,

cardiovascular, hematopoietic, and psychological status (Chen, et al., 2020).

Designated coronavirus units provide intensive care and services for treating patients with signs of severe COVID-19-related disease (Bearman, et al. 2020). These intensive care units are under strict isolation principles during epidemics (Park, et al. 2020). Isolation period for COVID-19 can be related to age and comorbidities of the infected patients, and may last for more than two weeks (Karimi, et al. 2020). Prolonged isolation represents a treat to authentic care for both the patients and healthcare workers (McClendon, 2017).

In recent years, health-related quality of life (HRQOL) has pay worldwide interest (Xie, et al. 2020) as a result of social development and the revolution of medical service systems. Health-related quality of life is defined as the subjective measure described by patients of the multidimensional effect of a disease on the physical, psychological, and social domains of patient's health (Caballero, & Prior, 2017). The assessment of HRQOL helps healthcare workers recognize the factors affecting HRQOL and identify the aspects of COVID-19 management that needs to be enhanced for improving the HRQOL (Hashemi, et al., 2020).

Critically ill patients with COVID-19 disease are an especially susceptible population to develop Post-intensive Care Syndrome (PICS) due to acute respiratory distress. Patients can suffer from acute severe pain and may have long-term deterioration in mental, cognitive, and functional health (Inoue, et al. 2019), as well as poor health-related quality of life and persistent symptoms after discharge (Taboada, et al. 2020). Since millions of people have been infected with COVID-19 and more will continue to be infected, healthcare professionals and researchers need to identify, classify, and understand the sequelae of COVID-19 (Fernández-de-las-Peñas, et al., 2021).

Significance of the study

The high prevalence of COVID-19 in the general population of many countries, its novelty, highly infectious nature, and the associated morbidity and mortality rates, in addition to the admission of high numbers of critically ill patients to hospital are placing an unprecedented demand on health care services worldwide (Bridges, & Maben, 2020).

COVID-19 is a serious disease that can significantly distress the daily living of recovered patients and their families in terms of mental health problems such as post-traumatic stress, anxiety, depression, and insomnia, as well as the negative effect on patients' HRQOL, since the patients are not immune to future infection (Nguyen, et al. 2020). So, understanding the health-related quality of life (HRQOL) of hospitalized COVID-19 survivors is an emerging global challenge arising from the current pandemic (Wu, et al., 2021).

One of the most critical aspects related to COVID-19 is the high spread rate, millions of people have been infected around the world, and hundreds of thousands of deaths had been recorded (Kamal, et al. 2020). Globally, as of 28 May 2021, there have been 168.599.045 confirmed cases of COVID-19, including 3.507.477 deaths, reported to world health organization (WHO). In Egypt, there have been 259.540 confirmed cases of COVID-19 with 14.950 deaths till 28 May 2021 (World Health Organization, 2021).

Aim of the Study

The study aimed to assess health related quality of life for patients post coronavirus (COVID-19) pandemic.

Research question:

1. What is the health related quality of life for patients post COVID-19 pandemic?

Operational definition:

Health related quality of life: assessing physical and psychological domains of patient's health.

Research design

A Prospective research design was used to achieve the aim of this study. "Prospective" refer to the timing of the research in relation to the development of the outcome. In prospective studies, the outcome has not occurred when the study starts and participants are followed up over a period of time to determine the occurrence of outcomes (Ranganathan, & Aggarwal, 2018).

Setting

This study was conducted at medical outpatients clinic affiliated to Helwan General Hospital, Helwan, Egypt. The clinic has one room, with one bed for receiving one patient.

Subjects

A purposive sample of 100 post COVID-19 patients from total 135 patients attended in the above mentioned setting in the previous year were included in the study according to the following:

Inclusion criteria:

Adult patients, recently recovered from COVID-19 and willing to participate in the study

Sample size calculation:

The sample size estimated by using the following equation:

$$N = \frac{N \times p\,(1-p)}{\{N-1 \times (d^2 \div z^2)\} + p\,(1-P)}$$

- Type I error with significant level (α) = 0.5.
- Type II error by power test = 90%.
- With power of test 0.80% (Suresh & Chandrashekara, 2012).

Nxp(1-p)	= 135x 0.5x (1-0.5)
N-1	= 135 -1
d^2/z^2	= 0.0025 / 3.8416
p(1-p)	= 0.5x (1- 0.5)
n	= 100.0= 100

N= Community size

z= Class standard corresponding to the level of significance equal to 0.95 and 1.96

d= the error rate is equal to 0.05

p= Ratio provides a neutral property = 0.50

Based on the equation, the sample size is 100 patients participated in this study.

Tools for data collection:

Data were collected using the following two tools:

The Tool I: Patients structured Interview Questionnaire. It was an Arabic structured interview questionnaire constructed by the researchers after reviewing the recent related literature (Ping, et al., 2020), (Lim, et al. 2020), (Garrigues, et al., 2020). It was divided into (3) parts:

Part A: Demographic characteristics of studied patients. It concerned with demographic data such as age, gender, and marital status, level of education, working status, and monthly income.

Part B: Medical history of studied patients

It concerned with collecting data about the patient's history regarding the presence of chronic diseases, number and type of chronic diseases as well,

patient's present history of COVID 19 pandemic as contact with COVID 19 patient, signs and symptoms of COVID 19 at hospital admission, type of hospital admission and hospital stay period.

Part C: Post COVID 19 physical and psychological symptoms tool

It was used to collect data about signs and symptoms post COVID19, diagnostic investigations and receiving medications for post COVID 19 symptoms and complications.

Tool II: Euro Quality of life 5-dimensions questionnaire (EQOL-5D)

This tool was adapted from Euro QOL Group (1990) to assess health-related quality of life. It asks patients to categorize their health status on five dimensions (mobility, self-care, daily activities, pain/discomfort, and anxiety/depression) in which each dimension has three possible levels of response.

Scoring system of Euro Quality of life 5-dimensions questionnaire

The tool contained five dimensions in which each dimension has three possible levels of response (1- no problems, 2- moderate problems, and 3- extreme problems). The total quality of life scores ranged from 3 to 15.

Quality of life scores were categorized as follows;

Worse quality of life if score < 60% of the maximum score (9).

Good quality of life if score 60% - 100% of the maximum score (10-15).

Tools validity and reliability

a) Content validity

Content validity was conducted to test the tool for appropriateness, relevance, correction, comprehension, and clearance through a jury of five experts, from the medical-surgical nursing staff at the faculty of nursing, Helwan University. Juries were from different academic categories (professors and assistant professors). Their opinions were elicited regarding the tool format layout, consistency, and scoring system.

b) Testing reliability

EQ-5D Questionnaire was translated and retranslated to ensure its accuracy. Internal consistency of EQ-5D dimensions was investigated using α Cronbach's. Its values were 0.766 indicating that the EQ-5D has an acceptable internal consistency.

Ethical Considerations

Consent was taken from patients who agreed to participate in the research process. The agreement was taken after the aim of the study has been simply explained to them before data collection. They were assured that anonymity and confidentiality would be guaranteed and the right to withdraw from the study at any time without giving any reason. Values, culture, and beliefs would be respected.

Pilot Study:

A pilot study was applied on a group of 10 patients (10% of the sample) to test the applicability of tools and clarity of the designed questionnaire, as well as to estimate the time needed to answer them. Patients included in the pilot study were replaced by other patients.

Field Work:

- Data collection was started and completed within 6 months in the period from the beginning of January 2021 until the end of June 2021.
- Data collection included two phases:

1. Objective phase:

- During this phase, the researchers collected data from the patients' files.
- They collected patients' demographic data, history regarding the presence of chronic

diseases, number and type of chronic diseases, as well, patient's history of COVID 19 pandemic as contact with COVID 19 patient, signs and symptoms of COVID 19 at hospital admission, type of hospital admission and hospital stay period.

2. Subjective phase:

- During this phase, the researchers collected data through interviewing patients at medical outpatients' clinic at affiliated to Helwan General Hospital.
- The researchers were available at medical clinic one day per week.
- A telephone survey was done by the researchers to COVID-19 survivors following their discharge from hospital.
- One to two months after discharge, the researchers scheduled a meeting with each patient individually.
- The researchers interviewed each patient and started to collect data related to post COVID-19 complications and patients' health related quality of life post recovery.

Administrative Design:

To carry out the study, the necessary approvals were obtained from the Helwan General hospital. Official letters were issued to them from the Faculty of Nursing explaining the aim of the study to obtain permission for data.

Statistical Design

Data collection was obtained; they were organized, categorized, tabulated, and analyzed. Data were presented in tables using the Statistical Package for Social Science (SPSS). Statistical significant associations were assessed using percentage (%), mean, standard deviation, chi-square, t-test, and p-value. The observed differences were considered as follow: Not significant (NS) $p > 0.05$, Significant (S) $p < 0.05$ and highly significant (HS) $p < 0.001$.

Results

Table (1): Demographic characteristics of the study patients (N=100).

Demographic Characteristics		No	%
Age (in years)	20- <30	6	6.0
	30- <40	11	11.0
	40- <50	24	24.0
	50 or more	59	**59.0**
Mean + SD	**47.19 + 9.34**		
Gender	Male	59	**59.0**
	Female	41	41.0
Marital Status	Single	11	11.0
	Married	71	**71.0**
	Divorced	6	6.0
	Widow	12	12.0
Educational level	Illiterate	12	12.0
	Read and write	13	13.0
	Secondary	28	28.0
	University	43	**43.0**
	Post graduate	4	4.0
Working Status	Governmental work	17	17.0
	Private work	44	**44.0**
	Retired	19	19.0
	Not working	20	20.0
Monthly Income	Adequate	50	**50.0**
	Inadequate	50	50.0

Table (I): Illustrates that (59.0%) of the study patients were in the age group 50 years or more, with a mean age (47.19 + 9.34), the same percent (59.0%) of the study patients were males and (71.0%) of them were married, as well**,** (43.0%) of the study patients had university educational level. Regarding occupation, (44.0%) had private work, and (50.0%) had adequate monthly income.

Table (2): Frequency distribution of the study patients according to history of chronic disease (N=100)

Items	No	%
History of chronic disease		
Yes	80	**80.0**
No	20	20.0
Number of chronic diseases		
One chronic disease	26	32.5
2 chronic diseases	33	**41.2**
3 chronic diseases	15	18.8
More than 3	6	7.5
Type of chronic disease		
Hypertension	54	**67.5**
Diabetes Mellitus	42	52.5
Coronary artery disease	21	26.2
Heart failure	8	10.0
Bronchial asthma	17	21.2
Hypercholesterolemia	8	10.0

Table (2): shows that (80.0%) of the study patients had a history of chronic diseases, (41.2%) of them had a history of two chronic diseases and (67.5%)

of them had hypertension followed by a percent of (52.5%) had diabetes mellitus

Table (3): Frequency distribution of the study patients according to current history of COVID 19 pandemic (N=100)

Items	No	%
Contact with COVID 19 patient		
Yes	69	**69.0**
No	31	31.0
Signs and symptoms of COVID 19 at hospital admission		
Hyperthermia	79	**79.0**
Dyspnea	52	52.0
Dry cough	66	**66.0**
Chest pain	39	39.0
Fatigue	50	50.0
Anorexia	50	50.0
Nausea and vomiting	56	**56.0**
Myalgia	40	40.0
Taste loss	36	36.0
Smell loss	33	33.0
Others (Diarrhea)	3	3.0
Type of admission		
Word	46	46.0
Intensive care unit	54	**54.0**
Hospital stay period		
1-10 days	45	45.0
11-20 days	49	**49.0**
21-30 days	6	6.0
Mean + SD of hospital stay period	**13.22 + 5.54**	

Table (3): presents that (69.0%) of the studied patients had a history of contact with COVID 19 patient. The most common reported symptoms at admission to the hospital were hyperthermia (79.0), dry cough (66.0%), nausea and vomiting (56.0%), followed by dyspnea (52.0%), fatigue and anorexia (50.0%). (54.0%) of patients were admitted to the intensive care unit and (49.0%) had stayed at hospital for 11-20 days, with a mean stay period (13.22 + 5.54).

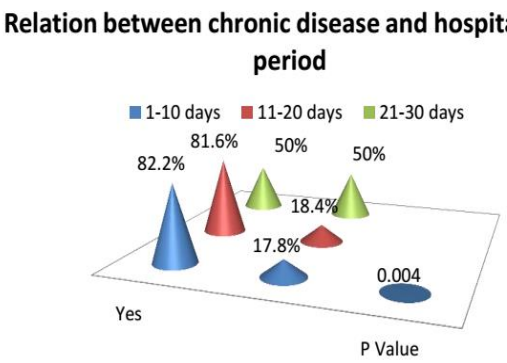

Figure (3): Relation between history of chronic disease of the studied patients and hospital stay period (N=100).

This figure presents that there is a significant relation between history of chronic disease of the studied patients and hospital stay period, where, the majority of the studied patients who stayed for 11-20 days at the hospital had history of chronic diseases.

Table (4): Frequency distribution of the study patients according to post COVID 19 complications (N=100)

Items	No	%
Physical complications post COVID 19		
Fatigue	70	**70.0**
Joint pain	64	**64.0**
Myalgia	53	**53.0**
Chest pain	23	23.0
Dyspnea	17	17.0
Headache	51	**51.0**
Tinnitus	28	28.0
Blurred vision	35	35.0
Myocarditis	9	9.0
Dysrhythmia	19	19.0
Others (Pulmonary fibrosis)	5	5.0
Psychological complications post COVID 19		
Anxiety	48	**48.0**
Depression	32	32.0

Table (4): Illustrates that the most common reported physical symptoms post COVID 19 were fatigue (70.0%), joint pain (64.0%), myalgia (53.0%), followed by chronic headache (51.0%). While, the most common reported psychological symptom was anxiety (48.0%).

Table (5): Levels of health related quality of life among the studied patients post COVID-19 (N=100)

Items	No	%
Good health related quality of life	39	39.0
Worse health related quality of life	61	61.0

Table (5): shows that (61.0%) of the study patients had worse health related quality of life post COVID-19.

Table (6): Relation between history of chronic disease of the studied patients and total Euro-QOl life scores (N=100).

Items	Good QOL		Worse QOL		Chi-square	P value
	No	%	No	%		
History of chronic disease						
Yes	36	36.0	44	44.0	19.31	0.000**
No	6	6.0	14	14.0		
Number of chronic diseases						
One chronic disease	11	13.75	15	18.75	11.755	0.019*
2 chronic diseases	15	18.75	18	22.5		
3 chronic diseases	5	6.25	10	12.5		
More than 3	0	0.0	6	7.5		
Type of chronic disease						
Hypertension	22	40.7	32	59.3	4.026	0.035*

***Statistically significant at p = ≤ 0.05**

****Highly statistically significant at p= ≤0.001**

Table (6): Illustrates that there was a high statistically significant relation between history of chronic disease of the studied patients and total Euro-QOl life scores, and there were statistically significant relations between number of chronic diseases, hypertension and total Euro-QOl life scores

Table (7): Relation between history of COVID 19 of the studied patients and total Euro-QOl life scores (N=100).

Items	Good QOL		Worse QOL		Chi-square	P value
	No	%	No	%		
Contact with COVID 19 patient						
Yes	38	38.0	31	31.0	9.646	0.022*
No	12	12.0	19	19.0		
Signs and symptoms of COVID 19 at hospital admission						
Hyperthermia (79)	42	53.1	37	46.9	11.195	0.011*
Dyspnea (52)	31	59.6	21	40.4	12.229	0.007*
Dry cough (66)	30	45.5	36	54.5	10.471	0.015*
Nausea and vomiting (56)	32	57.1	24	42.9	18.445	0.000*
Type of admission						
Ward (46)	29	63.0	17	37.0	17.050	0.001*
Intensive care unit (54)	21	38.9	33	61.1		

***Statistically significant at p = ≤ 0.05**

Table (7): shows that there were statistically significant relations between history of contact with COVID 19 patient, signs and symptoms of COVID 19 at hospital admission, type of admission and total Euro-QOl life scores.

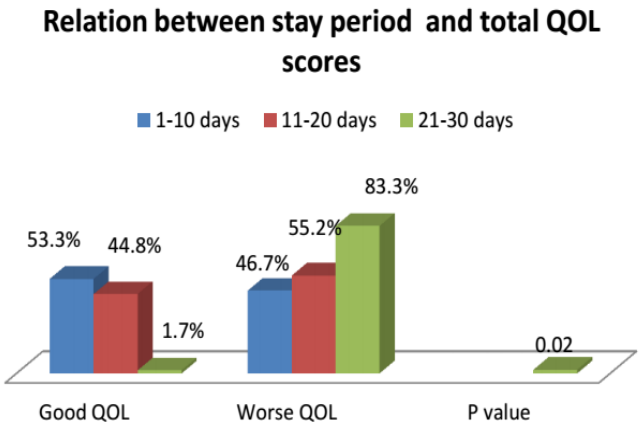

Figure (4): Relation between hospital stay period of the studied patients and total quality of life scores (N=100).

This figure shows a significant relation between hospital stay period of the studied patients and total Euro-QOl life scores, where, the majority of the studied patients stayed at the hospital for 11- 20 days had worse QOL scores.

Table (8): Relation between post COVID 19 complications of the studied patients and total Euro-QOl life scores (N=100).

Items	Good QOL		Worse QOL		Chi-square	P value
	No	%	No	%		
Physical complications post COVID 19						
Fatigue (70 patients)	32	45.7	38	54.3	14.922	0.002*
Joint pain (64)	38	59.3	26	40.7	17.158	0.001*
Myalgia (53)	30	56.7	23	43.3	10.038	0.018*
Headache (51)	25	49	26	51	8.047	0.045*
Psychological complications post COVID 19						
Anxiety (48)	23	48	25	52	8.104	0. 044*
Depression (32)	12	37.5	20	62.5	9.674	0.022*

***Statistically significant at p = ≤ 0.05**

Table (8): presents that there were statistically significant relations between physical and

psychological complications post COVID 19 and total Euro-QOl life scores.

Discussion

COVID-19 pandemic caused by the virus SARS-CoV-2 is certainly the major challenge to worldwide health today (Fernandes, & Mariani, 2021). As the duration of the pandemic extends and the number of patients who have recovered increases, many researchers have been asking about chronic alterations caused by COVID-19. Some patients report persistent symptoms as dyspnea, fatigue, coughing, chest pain, myalgia and arthralgia, other symptoms that have been reported include depression, cognitive disorders, headache and palpitations among patients whose acute phase of the disease was mild (Centers for Disease Control and Prevention, 2021).

Regarding the demographic characteristic of studied patients, the present study showed that about two thirds of the study patients were in the age group of 50 years or more, were males and married. As well, about half of them had university educational level, were working and had adequate monthly income. This age could be due to the majority of the patients had a history of chronic diseases. These result findings are in agreement with Hashemi, et al, (2020) in their study about "Health-Related Quality of Life and its associated factors in COVID-19 Patients", they mentioned that about half of the study patients were aged from 51-60 years, were male and married.

Concerning history of chronic diseases, the results showed that the majority of the patients had a history of chronic diseases. This result can be interpreted by patients with chronic diseases were more susceptible to COVID-19 infection than others. This result goes in line with World Health Organization, (2020), which stated that noncommunicable diseases, including cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases, are currently the leading national cause of death in Egypt and are estimated to account for 82% of all deaths in Egypt.

Considering type of chronic diseases, about two thirds of the study patients had hypertension; and more than half of them had diabetes mellitus. This could be due to the majority of the patients had a history of chronic diseases. These study findings are congruent with Lim, et al, (2020) in their study about "Impact of COVID‐19 on health‐related quality of life in patients with cardiovascular disease: a multi‐ethnic Asian study", they mentioned that about two thirds of the study patients had hypertension; and nearly half of them had diabetes mellitus.

In relation to history of contact with COVID-19 patient, the present study revealed that the majority of the study patients had a contact with COVID-19 patient; this may be interpreted by COVID-19 is a new pandemic disease and majority of people all over the world didn't have enough awareness how to deal with the pandemic, and how to practice the strategies to prevent or limit transmission of infection including strict hand washing, wearing mask, coughing and sneezing precautions, social distance, and home isolation.

As regard to signs and symptoms of COVID 19 at hospital admission, the present study revealed that the majority of the patients experienced hyperthermia, dry cough and more than half had dyspnea, nausea and vomiting. This could be due to the pathophysiology of the disease and the involvement of the upper airways, the disease manifests with symptoms of fever, malaise and dry cough Parasher, (2021). This result in agreement with Galal, et al. (2021), who studied determinants of persistent post-COVID-19 symptoms: value of a novel COVID-19 symptom score and observed that the most common presenting symptoms

during the acute attack were myalgia, fever, and restriction of daily activities.

Regarding patients' admission, the present study finding showed that more than half of patients had admitted to the intensive care units, nearly half of them had stayed a period of 11-20 days with a mean period of (13.22 + 5.54). This result may be due to the history of chronic diseases of the majority of the studied patients caused their health status to be critical requiring admission to intensive care unit. This result is inconsistent with Hashemi, et al, (2020), who mentioned that the minority of patients had intensive care units admission and more than half of their patients stayed a period of less than 10 days.

Regarding health related quality of life post COVID 19, the present study revealed that recovered COVID-19 patients reported a wide range of symptoms, and that the most common physical symptoms post COVID-19 were fatigue, joint pain, myalgia and headache. These findings can be explained by the pathophysiology of Post-acute COVID-19 syndrome including virus-specific pathophysiologic changes, immunologic abnormalities and inflammatory damage in response to the acute infection; and the sequelae of post-critical illness (Nalbandian, et al. 2021).

This result is in accordance with Kamal, et al. (2020), who investigated and characterized the manifestations which appear after eradication of the coronavirus infection and its relation to disease severity and mentioned that most subjects of their study suffered from fatigue. Additionally, these study results were in agreement with Carfì, et al. (2020), in a study entitled "COVID-19 Post-Acute Care Study Group. Persistent symptoms in patients after acute COVID-19", and revealed that a high proportion of individuals still reported fatigue, dyspnea, and joint pain.

Additionally the studied patients reported psychological complications post COVID 19, the study results indicated that less than half of the study patients were suffering from anxiety and about one third had depression. This may be due to direct viral infection, severe systemic inflammation, and neuroinflammation causing COVID-19 survivors to report a post-viral syndrome of chronic malaise, and depressive symptoms (Nalbandian, et al. 2021). This result is congruent with Kamal, et al. (2020), who found a proportion of about two fifths of their study subjects suffered from anxiety.

By evaluating levels of health related quality of life, the present study demonstrated that about two thirds of the study patients reported worse health related quality of life post COVID-19, this can be due to the consequences of post-acute COVID-19 syndrome and that the majority of the studied patients had history of chronic diseases. These results go in line with Taboada, et al. (2020), who assessed quality of life, functional status, and persistent symptoms after intensive care of COVID-19 patients and stated that large proportions of patients had moderate to extreme problems in the dimensions of quality of life.

Regarding the relations between history of chronic disease and total quality of life scores, there was a high statistically significant relation between history of chronic disease and total QOl scores. These finding can be explained by restricted opportunities of patients with chronic medical conditions for treatment follow-up visits at the hospitals during the lockdown period as these patients require urgent medical attention to worsening symptoms and complications (Alsaif, et al. 2020).

This result is in accordance with Qiu, et al, (2020) in a study entitled "A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic"; they reported largely negative

effects of the COVID-19 pandemic on quality of life and the well-being of individuals with chronic medical conditions.

In the same context, this study results showed that there was a statistically significant relation between hypertension and total QOl scores, with a highest percent of hypertensive patients experienced worse QOL scores. This result is consistent with the study findings of Algahtani, et al. (2021); which demonstrated that respondents with chronic medical conditions (hypertension, diabetes, heart disease, and cancer) reported significantly lower QOL scores.

This study finding showed that there were statistically significant relations between physical and psychological complications post COVID 19 and total Euro-QOl life scores. These findings are supported by Qu, et al. (2021), who indicated that HRQOL of discharged COVID-19 patients was affected by some factors as physical symptoms after discharge. Additionally, these results go in line with Ping, et al. (2020), who demonstrated that patients who were anxious reported more problems in quality of life dimensions.

Considering the relations between hospital admission and total quality of life scores, this study illustrated that there was a statistically significant relation between type of hospital admission and total QOl life scores, with a higher proportion of ward admitted patients presented better QOL than ICU patients. This finding may be because ICU patients experienced more severe problems related to COVID-19. This result matches the result of Hashemi, et al, (2020), they reported that the difference between mean scores of HRQOL was significant for ICU admission and patients admitted to the ICU for COVID-19 treatment had lower scores of HRQOL than those admitted to a hospital wards.

As well, this study finding indicated a statistically significant relation between hospital stay period of the studied patients and total Euro-QOl life scores, where, the majority of the studied patients stayed at the hospital for 11-30 days had worse QOL scores. This may be due to the majority of the studied patients who stayed for 11-20 days at the hospital had history of chronic diseases. this result agree with the result reported by Garrigues, et al. (2020), who found no significant difference regarding mean scores HRQOL between patients stayed for < 10 days and patients stayed for more than 10 days.

Conclusion

This study concluded that: The majority of the recovered COVID-19 patients had a history of chronic diseases and reported a wide range of symptoms. The most common symptoms at hospital admission were hyperthermia, dry cough, dyspnea, nausea and vomiting compared to fatigue, joint pain, myalgia, chronic headache, and anxiety post COVID-19. Regarding HRQOL, about two thirds of the study patients reported worse QOL post COVID-19.

There were statistically significant relations between history of chronic diseases, physical and psychological complications post COVID 19, hospital admission, hospital stay period and total QOl scores; with a higher proportion of ward admitted patients presented better QOL than ICU patients, as well, the majority of the studied patients who stayed at the hospital for 11-30 days had worse QOL scores

Recommendations

Based on the previous results, the following recommendations are suggested:

- Healthcare workers should pay more attention to the physical and psychological rehabilitation of discharged COVID-19 patients.

- Health care service should plan for the ongoing support and treatment of survivors of COVID-19
- Future studies on a larger sample are highly recommended to achieve generalization of the results.
- Further research studies are needed to achieve long-term follow-up on COVID-19 patients to determine the dynamic recovery of HRQOL.

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