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COVID-19 Symptoms and Post Complications among Libyans

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Abstract:

The battle against COVID-19 does not always end when recovery is declared. Many individuals confirmed recovered from COVID-19 continue to experience a variety of symptoms. The aim of this study was to shed more light on COVID-19 and post-COVID-19 symptoms in Libya. Two hundred and twenty Libyan individuals (58% female; 42% male), who recovered from COVID-19, were asked to answer a questionnaire that was performed to inquire about the presence of COVID-19 and post-COVID-19 symptoms. Additionally, comorbidities and demographic data were included. The most common comorbidities were hypertension (20%), diabetes (16%), and lung disease (08%). The main COVID-19 symptoms were headache (56%), anosmia and ageusia (52%), Arthralgia (48%), cough (46%) and fever (41%). While the post-COVID-19 symptoms were fatigue (64%), sleep disorders (52%), insomnia, anxiety, depression (42%), and anosmia and ageusia (32%). Persistent COVID and its related long-term complications may continue to affect patients and their families.

Keywords: COVID-19 symptoms, post-COVID-19, comorbidities

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أعراض كوفيد-19 ومضاعفاته بين الليبيين

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الملخص

المعركة ضد كوفيد-19 لا تنتهي دائمًا عندما يتم الإعلان عن التعافي، ولا يزال العديد من الأفراد الذين تأكد شفاؤهم من فيروس كورونا (COVID-19) يعانون من مجموعة متنوعة من الأعراض. كان الهدف من هذه الدراسة هو تسليط المزيد من الضوء على أعراض كوفيد-19 وأعراض ما بعد كوفيد-19 في ليبيا. طُلب من مائتين وعشرين ليبيًا (58% إناث، 42% ذكور)، ممن تعافوا من كوفيد-19، الإجابة على استبيان تم إجراؤه للاستفسار

عن وجود أعراض كوفيد-19 وأعراض ما بعد كوفيد-19. بالإضافة إلى ذلك، تم تضمين الأمراض المصاحبة والبيانات الديموغرافية. وكانت الأمراض المصاحبة الأكثر شيوعًا هي ارتفاع ضغط الدم (20٪)، والسكري (16%)، وأمراض الرئة (08%). وكانت الأعراض الرئيسية لكوفيد-19 هي الصداع (56%)، وفقدان حاسة الشم والشيخوخة (52%)، وآلام المفاصل (48%)، والسعال (46%)، والحمى (41%). بينما كانت أعراض ما بعد كوفيد-19 هي التعب (64%)، واضطرابات النوم (52%)، والأرق والقلق والاكتئاب (42%)، وفقدان حاسة الشم والشيخوخة (32%). قد يستمر فيروس كورونا والمضاعفات المرتبطة به على المدى الطويل في التأثير على المرضى وعائلاتهم.

الكلمات المفتاحية: أعراض كوفيد-19، ما بعد كوفيد-19، الأمراض المصاحبة.

1 Introduction:

Infection with SARS-CoV-2 resulting in COVID-19, an acute illness affecting multiple body systems [1]. Around December 2019, the first case of SARS-CoV-2 was reported in Wuhan, Hubei Province, China [2]. No animal source has been confirmed, but it is hypothesized that bat or pangolin could serve as a reservoir of SARS-CoV-2 [3]. On March 11, 2020, WHO declared the COVID-19 outbreak a global pandemic after 200,000 cases were reported, with over 8,000 people died as a result of COVID-19 complications in over 160 countries [4, 5].

The majority of COVID-19 patients have mild-to-moderate illness, with 10%-15% developing severe illness and 5% becoming critically ill. The average recovery time from COVID-19 is 2-3 weeks, depending on the severity of the symptoms. However, 1 out of 5 people may experience symptoms for 5 weeks or longer, while 1 out of 10 may experience symptoms for 12 weeks or longer [6]. Most countries rely on symptom-based testing systems for diagnosing SARS-CoV-2 infection [7].

A previous study, in which factor analysis was performed, has revealed that COVID-19 symptoms could be classified as respiratory-digestive, neurological, cough-wheezing, upper respiratory, and digestive symptoms, with respiratory symptoms dominating [8] In addition to other less common symptoms, the most commonly reported symptoms are fever, cough, myalgia, fatigue, loss of smell and taste [9-12].

The battle against COVID-19 does not always end when recovery is declared. Many studies have shown that those who have been confirmed recovered from COVID-19 continue to experience a variety of symptoms. These post-Covid-19 symptoms vary from one person to another in terms of the number of symptoms, their severity, and their duration [13-16].

In Libya, where this study was conducted, the first confirmed case of COVID-19 was officially registered on March 24, 2020 [17-19]. A study conducted in Libya, included 1207 COVID-19 patients, has revealed that diabetes mellitus (40.6%), hypertension (34.3%) were the most predominant comorbidities, while the most reported symptoms were anorexia (83.5%), followed by fatigue (81.4%), myalgia (72.6%), and fever or feeling feverish (68.2%) [20]. Another observational cross sectional study, included 935 subjects recovered from COVID-19, revealed that the most frequently reported persistence post-COVID-19 symptoms were cough (26.3%); fatigue (24.3%) and dyspnea (24%) [21]. As there is a limited number of published articles that addressed COVID-19 and post-COVID-19 symptoms in Libya, the aim of this study was to shed more light on this research theme in Libya.

2 Material and methods:

This study was conducted at the Libyan Centre for Research and Biotechnology. The study protocol was approved by the Scientific Research Ethics Committee at this centre and informed consent was obtained from the participants.

2.1 Participants:

Two hundred and thirty-six of COVID-19 patients, with age range 18-75 years, were diagnosed negative of the virus during the period from November 2020 to March 2021 at the Libyan Center for Biotechnology Research. All participants received a soft copy questionnaire after being assured of their recovery, and they were instructed to answer the questions, and turn it in to a member of the present study's research team after two weeks.

2.2 Recovery diagnosis:

After taking a nasal swab from the patient, a code was assigned for the sample, then it was analyzed to determine whether it was positive or negative using the technique real-time PCR Rotor-Gene Q (QIAGEN, Inc., Hilden, Germany), with the aid of the detection Kit for 2019-nCoV (PCR-Fluorescence) purchased from Da An Gene Co.,

Ltd. of Sun Yat-sen University, Guangzhou, Guangdong, P. R. China. All steps were carried out according to the instruction manuals.

2.3 The questionnaire:

The questionnaire used in this study was developed by the head of the research team of the current study, and it was reviewed and approved by a scientific committee at the Libyan Center for Research and Biotechnology.

The first section of the questionnaire was about the demographic data: age, gender, educational level and job type; whereas the second section consisted of multiple choice type that inquired about: the symptoms that appeared and their duration such as fever, cough, shortness of breath, runny nose and loss sense of smell and taste, headache, sore throat, nausea, chest pain, diarrhea, stomach pain, joint and muscle pain, fatigue, chills and other symptoms. In addition to that, comorbidities and post complications (after negative diagnosis) and their period was also included in this questionnaire.

2.4 Statistical analysis:

The collected data were reviewed and all statistical analyses were performed using Microsoft Excel (2010) and IBM SPSS (21). Categorical data were described in numbers and percentage, while continues data were presented as Mean±Standard Deviation and Range (Max and Min). Chi-square test was performed to investigate the relationship between the demographics and symptoms and their duration. P-value of <0.05 was considered as significant.

3 Results:

In the present study, 236 individuals who recovered from COVID-19 were selected as participants and asked to answer the questionnaire; 16 of them were excluded due to a lack of information. The whole analysis was based on 220 patients: 58% were female and 42% were male. 78% of the participants have a job. The mean age was 47.98±15.21 and 66% were between 30 to 59 years.

The mean duration of symptoms was 8.13±7.38 days for the participants, 88% showed symptoms of COVID-19. The most common symptoms were headache (56%), anosmia and ageusia (52%), Arthralgia (48%), cough (46%) and fever (41%). Most individuals (94%) have not needed a blood plasma transfusion and 42% had at least one comorbidity.

The most common comorbidities were hypertension (20%), diabetes (16%), and lung disease (08%). 50% of patients used antibiotics to relieve symptoms of COVID-19, and only 13% required ICU follow-up or isolation center. Tables 1 and 2 present the demographic and characteristics of COVID-19 of the selected participants.

Table 1: Frequency distribution of characteristics in all selected participants.

Variables			n	Percentage
Gender		Male	92	42%
		Female	128	58%
City		Tripoli	67	30%
		Gdames	97	44%
		Al-Zawia	12	06%
		other	44	20%
Career		Employee	56	25%
		Teacher	37	17%
		Housewife	33	15%
		Business	23	11%
		Retired	16	07%
		Other	55	25%
Age		10-29	31	14%
		30-59	145	66%
		60-90	44	20%
Blood Type		A+	34	15%
		A-	13	06%
		B+	38	17%

		B-	24	11%
		AB+	28	13%
		AB-	07	03%
		O+	63	29%
		O-	13	06%
Symptoms		Yes	193	88%
		No	27	12%
Types of diagnosis		RT	167	76%
		CT + RT	28	13%
		RT + Anti-gen	10	4%
		Anti-gen	02	01%
		CT	01	01%
		CT + Anti-gen	02	01%
		ALL	10	04%
A blood plasma transfusion		Yes	14	%06
		No	206	%94
Post- COVID-19 complications		Yes	177	%81
		No	43	%19
Symptoms duration		< 1 week	95	%43
		2 weeks	72	%33
		3 weeks	41	%19
		4 weeks	10	%04
		above month	2	%01

Table 2: Mean and standard deviation of quantitative variable in selected participants.

Variables	Mean ±**SD**	Min	Max
Age (years)	47.98±15.21	12	89
Isolation period (day)	1.12±3.59	0	30
Symptoms duration (day)	8.13±7.38	0	60

SD: Standard deviation

The majority of the participants (96%) used medical herbal. The most common herbal was lemon (74%), saussurea costus (67%), and (honey and Ginger) (62%).

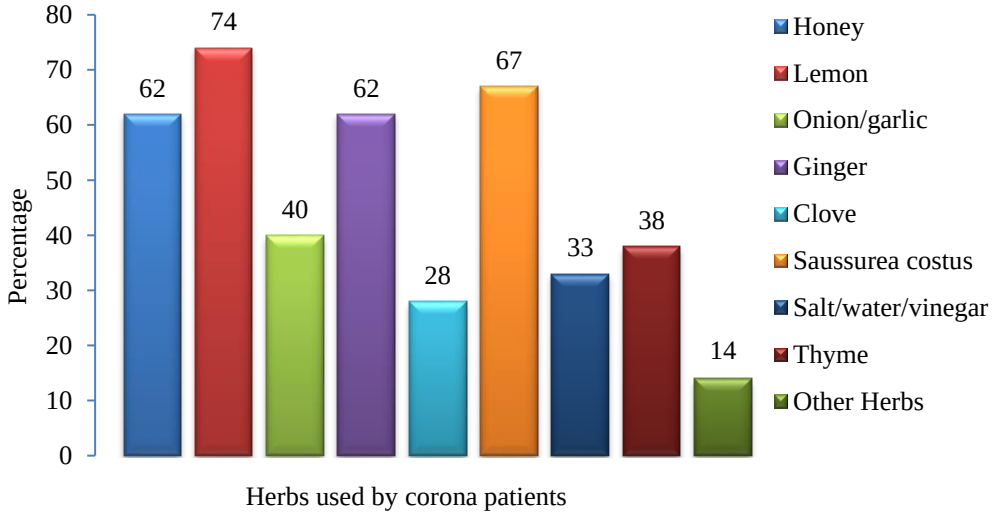

Figure 1: The percentage of participants who used Medical Herbs.

Although the duration of symptoms was between one to two weeks for more than half of the participants, about 81% of individuals suffered from post-COVID-19 complications. Most of which were fatigue and general failure (64%), sleep disorders (52%), insomnia, anxiety, and depression (42%), and anosmia and ageusia (32%).

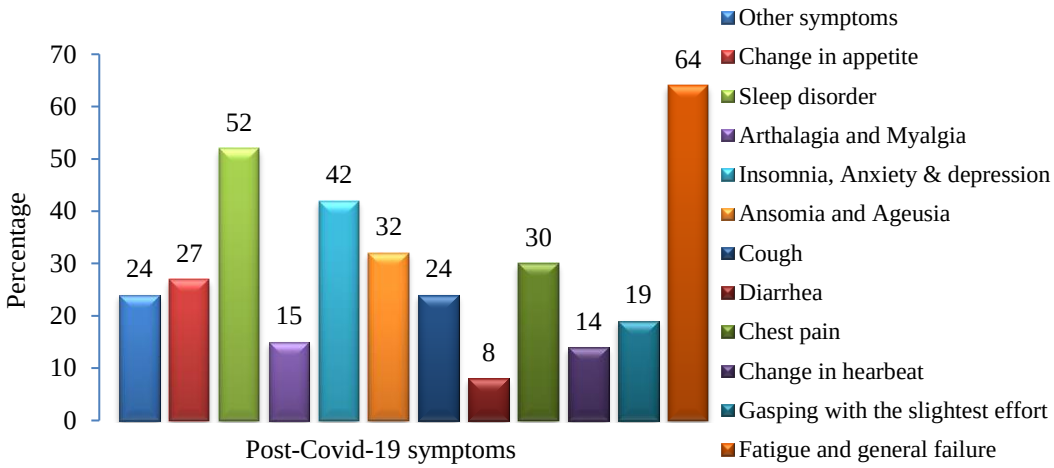

Figure 2: The percentage of participants suffered from post-COVID-19 symptoms

The findings showed that there is a relationship between admission to the isolation center and people who have chronic diseases. It is noticeable that 27% of participants who suffer from chronic diseases needed to enter the isolation center, while only 3% of participants who did not suffer from chronic diseases needed to enter isolation (Table (3))

Table 3: Chi-Square test results for participants: chronic diseases and both admission to the isolation center and post-COVID-19 complications.

		Suffering from chronic diseases		
		No	Yes	p-value
Transfer to the Isolation Centre	No	124	4	0.000
	Yes	67	25	
Post- COVID-19 complications	No	38	5	0.000
	Yes	90	87	

Furthermore, the results showed that there is a relationship between suffering from chronic diseases and post-corona symptoms. It is clear that about 95% of participants who suffer from chronic diseases have at least one post-corona symptom, and 70% of participants who did not suffer from chronic diseases also have at least one post-corona symptom.

As shown in Table 4, there is a statistical relationship between the participants who suffered or did not suffer from post-corona complications and their blood type.

Table 4: Chi-Square test results for the participants who suffered or did not suffer from post-corona complications and patients' Blood Type.

		Blood Type				
		A	B	AB	O	p-value
Post- COVID-19 complications	No	07	05	02	29	0.000
	Yes	40	57	33	47	

It is noticeable from figure (3) that the percentage of the participants who suffered from post-corona complications was higher among those who had a positive blood type, regardless of its type, than among those who had a negative blood type.

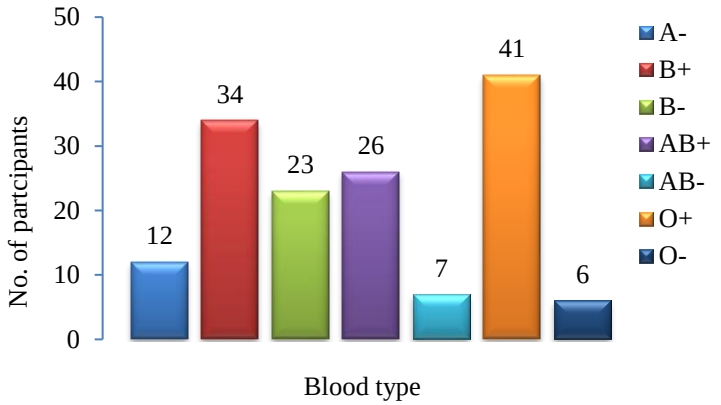

Figure 3: The distribution of participants suffered from post-corona complications based on their blood types.

Additionally, the findings in Table 5 showed that there was a relationship between post-corona complications and blood type. It can be seen that post-corona symptoms were more common among participants with blood type B.

Table 5: Chi-Square test results for post-corona of COVID-19 and patients' Blood Type.

		Blood Type.				
		A	B	AB	O	p-value
Post-corona symptoms	Fatigue and general failure	31	49	27	35	0.000
	Amazed at the slightest effort	9	11	6	15	
	Change in heartbeat	10	8	5	9	
	Chest pain	12	26	15	13	
	Diarrhea	6	5	5	1	
	Cough	17	19	7	11	
	Anosmia	15	22	18	15	
	Insomnia/Anxiety/Depression	23	32	18	20	
	Arthralgia	10	11	7	5	
	Sleep disorders	24	37	21	32	
	Change in appetite	18	16	13	12	
	other symptoms	16	13	16	9	

This study also examined the relationship between post-corona symptoms and the rest of the study variables, such as gender, grouped age, blood plasma transfusion, etc. The results revealed there was no statistical relationship, and the outputs were not included.

4 Discussion:

Long-term effects of COVID-19 appears after being infected with the corona virus, which can last for weeks, months or even years. People infected can experience symptoms and health problems in different parts of their bodies, as the immune system might remain agitated or overactive [22-24].

This study found that about 81% of patients suffered from post- COVID-19 complications, mostly fatigue and sleep disorders. The results were similar to the study conducted in Italy by Carfì et al. which found that in patients who had recovered from COVID-19, 87.4% reported persistence of at least one symptom, particularly fatigue and insomnia [25]. Another study conducted by Havervall et al showed that a considerable portion of patients with mild COVID-19 reported several long-term symptoms such as anosmia, fatigue and ageusia [26]. Paul Garner, a professor at Liverpool School of Tropical Medicine, wrote in the British Medical Journal Opinion, that after nearly 3 months following the onset of symptoms, he could not be out of bed for more than three hours at a time, and that his arms and legs were permanently fizzing. He also reported ringing in his ears, palpitations, and dramatic changes in mood [27]. In a study that evaluated the long-term COVID-19 symptoms in 233 COVID-19 patients Cirulli et al. pointed out that about 24% of them still had at least one symptom after three months [28]. Another study reported by Taboada et al. showed that about 84% of COVID-19 patients were suffering from persistent symptoms at 6 months of follow-up [29].

The current study results showed that the majority of patients (95%) suffered from post-COVID-19 symptoms are those who have chronic diseases especially diabetes and hypertension, our finding was similar to the results of the study conducted by Liu et al in China in 2020 [30]. There are many suggested reasons for that: unhealthy life style, lack of exercise, poor education, low salary and other factors that affect health outcomes. Therefore, awareness about chronic diseases and the impact of COVID-19 must be raised [31].

The results also showed that the percentage of the participants who suffered from post-COVID-19 complications was higher among those who had a positive blood type, regardless of its type. These results are mostly consistent with the results reported by Zietz et al [32]. Due to the relative rarity of rhesus-negative blood groups, these blood groups could not be classified by blood type based on the number of patients in this study.

Surprisingly, our analysis revealed that there was no statistical relationship between post-COVID-19 complications and factors such as age and gender, although, many studies reported that the severity of the disease was higher among elderly people [33, 34]. The possible reason for that may be the limited literatures and limited documentation of symptom duration after infection among older patients.

5 Conclusion:

Persistent COVID-19 and its related long-term complications may continue to affect patients and their families, but more attention should be paid for the long-term effects. Caring for the affected patients presented challenges due to the incomplete nature of the research, lack of adequate diagnostic support and common problems with access services. Therefore, more systematic and organized researches, with considerable number of cases, should be done in the future to come up with an effective approach addressing the long-term effects of COVID.

Conflict of interest: None declared

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