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TO STUDY INCIDENCE, PROGRESSION, AND BURDEN OF LONG COVID AMONG POST COVID PATIENTS AND ITS IMPLICATION IN HEALTHCARE SETTINGS.

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ABSTRACT **Introduction-** The long-term effects of SARS-CoV-2 infection are becoming a significant burden on society and healthcare systems. Data on post-COVID-19 syndrome in the general population is needed to organise healthcare treatments and resources in a timely manner.(1) In adults hospitalised with severe coronavirus illness, long-term symptom duration and impairment are typical (COVID-19). Understanding the complete spectrum of COVID-19–associated disease and adjusting public health messages, treatments, and policies requires characterising return to baseline health among outpatients with milder COVID-19 illness.(2) **Aims and Objectives** This study aims to find incidence and assess progression and burden of long covid among post covid patients. **Methodology-** A cross sectional interview-based study was conducted for a period of 3 months among post covid patients to find the incidence of long Covid. The list of respondents was obtained from health departments records listing post covid patients from March 2021 to November 2021. **Results-** Our study found that symptoms of Covid persisted long after patient was declared Covid negative. Majority of the patients 78 patients reported dermatological symptom of hairfall along with memory loss and muscle weakness. **Conclusion-** This study will help the public health care providers, clinicians and the policymakers to be prepared for the symptoms faced in post COVID-19 and general public in the coming months and years. It will also throw light into the possible factors which are associated with persistent post-acute COVID-19 infection.

KEYWORDS :

INTRODUCTION

There is escalating concern and supporting evidence that some people who are tested positive for COVID-19 do not make a speedy or full recovery and have recurring symptoms for longer durations and are called "long-COVID" or "long-haulers.[1] Multiorgan symptoms after COVID-19 are being reported by increasing numbers of patients. They range from cough and shortness of breath to fatigue, headache, palpitations, chest pain, joint pain, physical limitations, depression, and insomnia, and affect people of varying ages. These persistent symptoms post-acute COVID-19 infection will pose newer challenges to patients, healthcare providers, administrators, and public health practitioners.

Due to its relatively new nature, burden of long Covid needs to be assessed in terms of sex, contacts, age groups as well as co-morbidities. To allow compilation of data there must be a system to classify and aggregate the long Covid patients among the post Covid cohort. [2]

NICE (National Institute for Health and Care Excellence) has developed guidelines for defining post Covid 19 symptoms and uses following clinical definitions for the initial illness and long COVID at different times.[3]

Acute COVID-19: signs and symptoms of COVID-19 for up to 4 weeks. Ongoing symptomatic COVID-19: signs and symptoms of COVID-19 from 4 -12 weeks.

Post-COVID-19 syndrome: signs and symptoms that develop during or after an infection consistent with COVID-19, continue for more than 12 weeks and are not explained by an alternative diagnosis. Symptoms of COVID 19 average around 11.5 ± 5. 7 days. In order to understand the complete natural history of the disease, to decide if the patient needs in-patient or post-discharge treatment and rehabilitation of the patient, one needs to understand the short, medium and the long-term impact of COVID-19. [4]

AIMS AND OBJECTIVES

This study aims to find incidence and assess progression and burden of long covid among post covid patients.

METHODOLOGY

A cross sectional interview-based study was conducted for a period of 3 months among post covid patients to find the incidence of long Covid. The list of respondents was obtained from health departments records listing post covid patients from March 2021 to November 2021.The total covid infected patients during this time duration were 5,32,0000. By applying slovin's formula:

$n = N / (1+N)(e)^2$.

where:

n = no. of samples

N = total population

e = error margin / margin of error

$n = 532000/1 + 532000(0.05)^2 = 400$

Keeping the rate of attrition in mind 600 patients were selected, Out of which 45 died due to complications of Covid. 155 respondents did not either pick up the phone or had their phones switched off. The study included respondents who Respondents who are 18 years of age or

older, have tested Covid 19 positive during the second wave and are currently Covid19 negative The interview was conducted telephonically via questionnaire in two parts. Part one explained the patient about the nature of the study and sought their consent. Part two entailed putting forward the questionnaire that will seek information on various aspects like symptoms, type of isolation, need for ventilation, vaccination status as well as details of any comorbidities. Outpatient clinics where the patients visited, whether there was a need for medical assistance or a need for rehospitalisation will be questioned. The number of days patients were hospitalized was also assessed.

Respondents will be equally selected from both home and hospital who had been isolated during their illness. Respondents testing positive in the second wave and have completed 3 months post their diagnosis will be enrolled in the study. Respondents will be those who were affected by Covid 19 in the second wave. This study will help us to find correlation between severity of symptoms and long covid duration. Difference in incidence of long covid between home isolated and hospital admitted patients was assessed based on their symptoms duration and recovery process.

RESULTS

Table 1. General symptoms

Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Fever										
Yes	48 (12)	43 (10.75)	14 (3.5)	65 (16.25)	40 (10)	78 (19.5)	27 (6.75)	07 (6.60)	09 (8.49)	11 (10.37)
No	159 (39.75)	113 (28.25)	23 (5.75)	192 (48)	103 (25.75)	216 (54)	79 (19.75)	18 (16.98)	29 (27.35)	32 (30.18)
Yes	91 (22.75)	89 (22.25)	27 (6.75)	128 (32)	79 (19.75)	143 (35.75)	64 (16)	16 (15.09)	19 (17.92)	29 (27.35)
No	116 (29)	67 (16.75)	10 (2.5)	129 (32.25)	64 (16)	151 (37.75)	42 (10.5)	09 (8.49)	19 (17.92)	14 (13.2)
Generalized pain										
Yes	43 (10.75)	40 (10)	19 (4.75)	60 (15)	42 (10.5)	64 (16)	38 (9.5)	10 (9.43)	08 (7.54)	20 (18.86)
No	164 (41)	116 (29)	18 (4.5)	197 (49.2)	101 (25.2)	230 (57.5)	68 (17)	15 (14.15)	30 (28.30)	23 (21.69)

Table 2. Respiratory symptoms

Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Dyspnoea										
0	167 (41.7)	101 (24.25)	15 (3.75)	187 (46.75)	96 (24)	226 (56.5)	57 (14.25)	13 (12.26)	26 (24.52)	18 (16.98)
1	26 (6.5)	34 (8.5)	10 (2.5)	39 (9.75)	31 (7.75)	45 (11.25)	25 (6.25)	05 (4.710)	05 (4.71)	15 (14.15)
2	10 (2.5)	17 (4.25)	10 (2.5)	25 (6.25)	12 (3)	21 (5.25)	16 (4)	05 (4.75)	05 (4.75)	06 (5.66)
3	3 (0.75)	04 (1)	02 (0.5)	06 (1.5)	03 (0.75)	02 (0.50)	07 (1.75)	02 (1.88)	02 (1.88)	03 (2.83)
4	1 (0.25)	00 (00)	00 (00)	00 (0)	01 (0.25)	00 (0)	01 (0.25)	00 (0)	00 (0)	01 (90.94)
Breathlessness										
Yes	32 (8)	36 (9)	12 (3)	50 (12.5)	30 (7.5)	55 (13.75)	25 (6.25)	07 (6.60)	03 (2.83)	15 (14.1)
No	175 (43.75)	120 (30)	25 (6.25)	207 (51.75)	113 (28.25)	239 (59.75)	81 (20.25)	18 (16.98)	35 (33.01)	28 (26.41)
Cough										
Yes	38 (9.5)	38 (9.5)	10 (2.5)	60 (15)	26 (6.50)	50 (12.5)	36 (9)	09 (8.49)	09 (8.49)	18 (16.98)
No	169 (42.25)	118 (29.9)	27 (6.75)	197 (49.25)	117 (29.25)	244 (61)	70 (17.5)	14 (13.20)	29 (27.25)	25 (23.58)

Table 3. CVS symptoms Table 5- Neurological symptoms

CVS symptoms / Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Chest pain										
Yes	16 (4)	13 (3.25)	02 (0.5)	23 (5.75)	08 (2)	24 (6)	07 (1.75)	02 (1.88)	01 (0.94)	04 (3.77)
No	191 (47.75)	143 (35.75)	35 (8.75)	234 (58.5)	135 (33.75)	270 (67)	99 (24.75)	23 (21.69)	37 (34.90)	39 (36.79)
Chest tightness										
Yes	14 (3.510)	12 (3)	01 (0.25)	19 (4.75)	08 (2)	20 (5)	07 (1.75)	02 (1.88)	01 (0.94)	04 (3.77)
No	193 (48.25)	144 (36)	36 (9)	238 (59.5)	135 (33.75)	274 (68.5)	99 (24.75)	23 (21.69)	37 (34.90)	39 (36.79)
Palpitation										
Yes	12 (3)	15 (3.75)	02 (0.5)	15 (3.75)	14 (3.5)	16 (4)	13 (3.25)	02 (1.88)	04 (3.77)	07 (6.60)
No	195 (48.75)	141 (35.25)	35 (8.75)	242 (60.5)	129 (32.25)	278 (69.5)	93 (23.25)	23 (21.69)	34 (32.07)	36 (33.96)

Table 4- Neurological symptoms

Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Brain fog										
Yes	33 (8.25)	49 (12.25)	11 (2.75)	55 (13.75)	38 (9.5)	66 (60.5)	27 (6.75)	05 (4.71)	08 (7.5)	14 (13.20)
No	174 (43.5)	107 (26.75)	26 (6.5)	202 (50.5)	105 (26.25)	228 (57)	79 (19.75)	20 (18.86)	30 (28.30)	29 (27.35)
Disturbed Sleep										
Yes	27 (6.75)	37 (9.25)	11 (2.75)	41 (10.25)	34 (8.5)	58 (14.5)	17 (4.25)	04 (3.77)	06 (5.66)	07 (6.60)

	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
No	180 (45)	119 (29.75)	26 (6.5)	216 (54)	109 (27.25)	236 (59)	89 (22.25)	21 (19.81)	32 (30.18)	36 (33.96)
Headache										
Yes	39 (9.75)	53 (13.25)	11 (2.75)	60 (15)	43 (10.75)	73 (18.25)	30 (7.5)	07 (6.60)	10 (9.43)	13 (12.26)
No	168 (42)	103 (25.75)	26 (6.5)	197 (49.25)	100 (25)	221 (55.25)	76 (19)	18 (16.98)	28 (26.41)	30 (28.30)
Dizziness										
Yes	17 (4.25)	28 (7)	07 (1.75)	28 (7)	24 (6)	42 (10.5)	10 (2.5)	04 (3.77)	01 (0.94)	05 (4.71)
No	199 (49.75)	128 (32)	30 (7.5)	229 (47.25)	119 (29.75)	252 (63)	96 (24)	21 (19.81)	37 (34.90)	38 (85.84)
Loss of taste and smell										
Yes	12 (3)	07 (1.75)	01 (0.25)	13 (3.25)	07 (1.7)	16 (4)	04 (1)	02 (1.88)	01 (0.94)	01 (0.94)
No	195 (48.75)	149 (37.25)	36 (9)	244 (61)	136 (34)	278 (69.5)	102 (25.5)	23 (21.69)	37 (34.90)	42 (39.62)

Table 5- Musculo-skeletal complaints

Musculo-skeletal complaints										
Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Joint pain										
Yes	48 (12)	60 (15)	15 (3.75)	79 (19.75)	44 (11)	89 (22.25)	37 (9.25)	08 (7.55)	11 (10.37)	15 (14.15)
No	159 (39.75)	96 (24)	22 (5.5)	178 (44.5)	99 (24.75)	205 (51.25)	69 (17.25)	17 (16.03)	27 (25.47)	28 (26.41)
Muscle pain										
Yes	64 (16)	62 (15.5)	16 (4)	97 (24.25)	45 (11.25)	106 (26.5)	36 (9)	08 (7.5)	09 (8.49)	19 (17.92)
No	143 (35.75)	94 (23.5)	21 (5.25)	160 (40)	98 (24.5)	188 (47)	70 (17.5)	17 (16.03)	29 (27.35)	24 (22.64)

Table 6- Psychiatric/ Psychological symptoms

Psychiatric/ Psychological symptoms										
Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Depression										
Yes	13 (3.25)	25 (6.25)	06 (1.5)	23 (5.75)	21 (5.25)	35 (8.75)	09 (2.25)	02 (1.88)	00 (0)	07 (6.60)
No	184 (46)	131 (32.75)	31 (7.75)	234 (58.5)	122 (30.5)	259 (64.75)	97 (24.25)	23 (21.69)	38 (35.84)	36 (33.96)
Anxiety										
Yes	43 (10.75)	44 (11)	09 (2.25)	56 (14)	40 (10)	69 (17.25)	27 (6.75)	05 (4.71)	07 (6.60)	15 (14.15)

	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
No	164 (41)	112 (28)	28 (7)	201 (50.25)	103 (25.75)	235 (58.75)	79 (19.75)	20 (18.86)	31 (29.24)	28 (26.41)

Table 7- Gastro intestinal symptoms

Table. GIT symptoms										
Symptoms	Age Group (Years) N=400 (%) Gender N=400 (%)					Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Diarrhoea										
Yes	14 (3.5)	21 (5.25)	08 (2)	44 (11)	30 (7.5)	24 (6)	19 (4.75)	04 (3.77)	06 (5.66)	09 (8.49)
No	193 (48.25)	135 (33.75)	29 (7.25)	213 (53.25)	113 (28.25)	270 (67.5)	87 (21.75)	21 (19.81)	32 (30.18)	34 (32.07)
Abdominal pain										
Yes	15 (3.75)	19 (4.75)	05 (1.25)	23 (5.75)	16 (4)	23 (5.75)	16 (4)	04 (3.77)	05 (4.71)	07 (6.60)
No	192 (48)	137 (34.24)	32 (8)	234 (58.5)	127 (31.75)	271 (67.75)	90 (22.5)	21 (19.81)	33 (31.13)	36 (33.96)
Nausea										
Yes	11 (2.75)	18 (4.5)	05 (1.25)	21 (5.25)	13 (3.25)	21 (5.25)	13 (93.25)	03 (2.83)	04 (3.77)	06 (5.66)
No	196 (49)	138 (34.5)	32 (8)	236 (959)	130 (32.5)	273 (68.25)	93 (23.25)	22 (20.75)	34 (32.07)	37 (34.90)
Loss of appetite										
Yes	36 (9)	37 (9.25)	13 (3.25)	56 (14)	30 (7.5)	69 (17.25)	17 (4.25)	06 (5.66)	03 (2.83)	08 (7.54)
No	171 (42.75)	119 (29.75)	24 (6)	201 (50.25)	113 (28.25)	225 (56.25)	89 (22.25)	19 (17.92)	35 (33.01)	35 (33.01)

Table- 8 Ear nose and throat symptoms

Table. ENT symptoms										
Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Tinnitus										
Yes	10 (2.5)	08 (2)	07 (1.75)	11 (2.75)	14 (3.5)	19 (4.75)	06 (1.5)	01 (0.94)	01 (0.94)	04 (3.77)
No	197 (49.25)	148 (37)	30 (7.5)	246 (61.5)	129 (32.25)	275 (68.75)	100 (25)	24 (22.64)	37 (34.90)	39 (36.79)
Earache										
Yes	7 (1.75)	09 (2.25)	06 (1.5)	07 (1.75)	15 (3.75)	18 (4.5)	04 (1)	01 (0.94)	01 (0.94)	02 (1.88)
No	200 (50)	147 (36.75)	31 (7.75)	250 (62.5)	128 (32)	276 (69)	102 (25.5)	24 (22.64)	37 (34.90)	41 (38.67)
Sore throat										
Yes	21 (5.25)	14 (3.5)	01 (0.25)	28 (7)	08 (2)	18 (4.5)	18 (4.5)	03 (2.83)	05 (4.71)	10 (9.43)

No	186 (46.5)	142 (35.5)	36 (9)	229 (57.25)	135 (33.75)	276 (69)	88 (22)	22 (20.75)	33 (31.13)	33 (31.13)

Table 9- Dermatological symptoms

Dermatological symptoms									
Symptoms	Age Group (Years) N=400 (%)			Gender N=400 (%)		Type of Isolation N=400 (%)		Duration of Hospitalization N=106 (Days) (%)		
	18-39	40-64	≥65	Male	Female	Home	Hospital	<5	5-10	>10
Skin rash										
Yes	29 (7.25)	20 (5)	02 (0.5)	32 (8)	19 (4.75)	43 (10.75)	08 (2)	02 (1.88)	00 (0)	06 (5.66)
No	178 (44.5)	136 (34)	35 (8.75)	225 (56.25)	124 (31)	251 (62.75)	98 (24.5)	23 (21.69)	38 (35.84)	37 (34.90)
Hair fall										
Yes	78 (9.5)	53 (13.25)	11 (2.75)	69 (17.25)	73 (18.35)	101 (25.25)	33 (8.25)	06 (5.66)	10 (9.43)	17 (16.03)
No	129 (32.25)	103 (25.75)	26 (6.5)	188 (47)	70 (17.5)	185 (46.25)	73 (18.25)	19 (17.92)	28 (26.41)	26 (24.52)

Table 10- Association between vaccine status and need of ventilator support

Ventilator support	Vaccination Status		
	Not Vaccinated	Partially Vaccinated	Fully Vaccinated
Yes	14	03	01
No	296	60	26

Pvalue 0.0005   chi square value 14.85

From the upper table it is depicted that the participants who are fully or partially vaccinated the need of ventilator support was lesser as compared to those who are not vaccinated.

DISCUSSION

In our study out of 400 patients with history of Covid, 99 patients reported no symptoms of long Covid while 301 patients reported one or more symptoms 3 months after infection. Similarly the results of a telephone survey in France (with a 57% response rate reaching 478 patients) showed that at 4 months after hospitalization for COVID-19, about half the patients had at least one feature of long-COVID [4]. Out of 301 patients males reported to have more symptoms of long Covid as compared to females. Contrary to our study, an app based cohort study with 4,182 cases of COVID-19, 13% of respondents self-reported long- COVID features, with some evidence for higher rates in women and older people [5].

In the present study out of 400, 207(51.75%) patients reported generalized fatigue as a persistent symptom post covid followed by fever (26.25%) and generalized pain (25.5%). Similarly in a study carried out by Davis HE et al (2021) Conducting an International online survey of 3762 individuals who had covid 19 and assessed their fatigue through fatigue assessment scale score. It was found that unrecovered participants had higher FAS score than recurrent participants (31.8 vs 22.2), 40.7% reported to have extreme levels of fatigue post covid [6].

In the current study participants reported neurological symptoms: brain fog, distrubed sleep, headache, dizziness and loss of taste and smell. Out of 400 majority participants 93(23.25%) reported headache as the most common post covid neurological symptoms. Similarly in a study conducted by Altunisik E et al (2021) among 51 hospitalized patients found headache to be the most common neurological symptom (17.65%). [7] Contrary to this, study by Boesl F et al (2021) in neurological outpatient clinic for patients with post covid 19 syndrome found that among the first 100 ambulatory patients presenting to OPD more than equal to 12 weeks after covid 19 reposted cognitive impairment (72%) followed by headache(37%) and hyposmia (37%) as frequently reported neurological symptoms.[8]

In our study participants reported anxiety (24%) followed by depression (11%) to be the most common psychiatric / psychological symptoms. Out of 143 (35.75%) females 21 (14.68%) and 40(27.9%) reported depression and anxiety respectively as compared to males reporting 23(9.32%) depression and 56(22.65%) anxiety. Similarly in an study by Mazza M. G et al (2020) about anxiety and depression among 204 adults surviving covid 19 found (42%) experiencing anxiety followed by depression (31%). Females suffered more for both anxiety and depression as compared to male. [9] Another study by Klaser K et al (2021) to assess anxiety and depression among 413148 individuals using a validated questionnaire found these symptoms to be more prevalent among covid positive patients (30.4%) as compared to covid negative individuals (26.1%). [10]

Current study showed that out of 400 participants 98(24.4%) had some or other comorbidities. Among all comorbidities 43(10.5%) participants reported hypertension as the most common comorbidity with the focused age group being 40-64 years. Similarly meta-analysis conducted by Sanyaolu A et al (2020) among 1786 covid positive patients showed most common comorbidity to be hypertension (15.8%) followed by cardiovascular and cerebrovascular conditions (11.7%) and diabetes (9.4%). [11] In a study by Blonberg B et al (2021) among 312 patients to assess long term complications of covid 19 found that 137 patients(44%) had some or other co morbidity among which 38(12%) reported having asthma or COPD which delayed their recovery. [12]

In our study myalgia (35.5%) followed by joint pain (30.75%) were the most commonly reported musculoskeletal complaints. Similarly in a cross sectional study by Rizvan M et al (2022) among 452 covid positive patients shoulder pain 59.51% was reported to be most common musculoskeletal symptoms post covid. [13]

Present study showed that out of 400 participants 117 (29.5%) reported dyspnea followed by cough 86(21.5%) and breathlessness 80 (20%) to be the most common persistent respiratory symptoms post covid. Contrary to our study Mandal S et al (2020) carried out a cross sectional study among 384 covid 19 patients discharged post recovery on 54 days post discharge 53% patients reported persistent breathlessness followed by cough 34%. [14]

In our study 31(7.75%) participants reported chest pain to be the most common cardiovascular symptom post covid followed by chest tightness (6.75%) and palpitations (7.25%). Similarly in a case series reported by Carfi A et al (2020) on 143 patients, sixty days after being discharged from Covid 19 hospitalization found 22% patients persistently reporting chest pain. [15]

Current study showed that out of 400 participants 36(9%) participants still reported sore throat to be a prevalent ENT symptom. Similarly an online survey conducted by Yvonnemg et al (2020) among 2113 members of facebook group for covid patients established to report follow up symptoms 79 days after recovery from covid found that 26% of the members still reported symptoms of sore throat followed by anosmia 13%, sneezing 12% and earache 8%. [16]

Our study shows that among the dermatological manifestations following recovery from covid 19, 142(35.5%) participants reported hair fall followed by skin rashes (12.75%). Hair fall had no gender predilection. In an observational cross sectional study conducted by Sharquie KE et al (2021) among 39 post covid patients having symptoms of hair loss, 15(38.46%) reported mild symptoms while 24(51.53%) reported moderate symptoms. Female 92.3% were more affected as compared to males 7.69%, all these patients reported excessive hair loss within 2-3 months of covid infections. [17]

The most common gastrointestinal sequelae in our study reported by 86 (21.5%) participants was loss of appetite, similarly in a study conducted by Weng J et al (2021) on 117 covid 19 patients 90 days after discharge found 24% patients reporting loss of appetite followed by nausea 18% and diarrhea 15% . [18]

CONCLUSION

This study will help the public health care providers, clinicians and the policymakers to be prepared for the symptoms faced in post COVID-19 and general public in the coming months and years. It will also throw light into the possible factors which are associated with persistent post-acute COVID-19 infection. The persistence of numerous symptoms in patients who have recovered from COVID-19 (known as Long COVID) is a major health concern around the world. It

could be caused by a variety of factors, including post-intensive care syndrome, post-viral fatigue syndrome, persistent organ damage, and so on.

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Conflict of interest

None

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