



A cross-sectional study of the physical and mental well-being of Long COVID patients in Aruba

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Introduction

COVID-19 disease causes several respiratory, neurological, and general symptoms. To date, the long-term effects of the novel coronavirus are yet to be uncovered, and the few studies which described the medium-term effects call for more information on the physical and mental effects of post-COVID-19 virus disease. Most infected patients recovered fully within a few weeks. However, there is emerging evidence about the long-term sequelae and substantial organ dysfunction following COVID-19 infections. This phenomenon, termed the Post COVID-19 Syndrome (PSC), is defined by WHO as a condition occurring in individuals with history of SARS-CoV-2 infection, usually 3 months from initial onset of symptoms and lasting at least 2 months, which cannot be explained by an alternative diagnosis. Common symptoms include fatigue, dyspnea, and cognitive dysfunction [1]. Others specify it to include findings of spirometry disturbance, or a significant radiological alteration in post-COVID-19 patients [2]. About 80% [3, 4] of people who were infected with COVID-19 will have at least one persistent symptom six months post-acute infection. While this phenomenon is studied widely, the published studies are short-term follow-up, majority 6 months, and some 1 year. It is hypothesized that COVID-19 patients have relevant clinical symptoms beyond this cut off, affecting their physical and mental well-being.

Objectives

To better understand the impact of COVID-19 on the admitted patients, this study aims to:

- Investigate the prevalence of the persistent symptoms in these patients 3-, 6-, 12, and 18-months post-discharge.
- Determine associated risk factors in these patients that can explain the persistence of these symptoms.

Table 2. Multivariate analysis of predictor of **fatigue** post Covid-19 using logistic regression and Chi-Square

Predictor variable	β	P value *	OR (95% CI)	P value*
Sex (ref=male)	0.758	0.016	2.135 (1.154-3.949)	0.065
Age category	0.023	0.835	1.023 (0.827-1.266)	0.018
BMI category	0.181	0.128	1.199 (0.949-1.514)	0.017
Respiratory comorbidities	0.553	0.161	1.739 (0.802-3.767)	0.012
Nº comorbidities w/o respiratory	0.179	0.137	1.196 (0.945-1.514)	0.047

Abbreviations: CI, confidence interval; OR, odds ratio

X: P value for logistic regression covariate

* : P value for Chi-Square

Table 1. Prevalence of COVID-19 symptoms at the point of infection and at point of survey collection.

Symptoms	During initial infection N = 222	Time since COVID-19 infection			
		3 months N = 13	6 months N = 30	12 months N = 100	18 months N = 79
Fatigue	70.7%	7.7%	16.7%	42%	45.6%
Joint pain	32%	7.7%	13.3%	21%	15.2%
Muscular pain	37.4%	7.7%	13.3%	22%	16.5%
Fever	81.1%	0%	0%	0%	0%
Dyspnea (new onset)	83.3%	7.7%	23.3%	41%	46.8%
Cough (new-onset)	58.1%	0%	13.3%	12%	13.9%
Sore throat	28.8%	0%	3.3%	6%	0%
Mucus production	27.5%	15.4%	13.3%	11%	7.6%
Wheezing	24.8%	0%	6.7%	3%	0.0%
Chest pain ^x	36%	-	-	-	-
Loss of taste/smell	50%	7.7%	0%	3%	8.9%
Cognitive impairment^x	-	0%	3.3%	8%	8.9%
Headache	43.7%	0%	6.7%	9%	7.6%
Nausea and/or vomiting	26.6%	0%	3.3%	3%	1.3%
Diarrhea	32.9%	0%	0%	6%	2.5%
Hair loss	8.6%	38.5%	23.3%	18%	19%
Skin rash	6.3%	7.7%	6.7%	7%	2.5%

^x: The symptom was only asked as either part of the ‘initial infection’ or ‘post COVID-19’ set of questions.

Table 3. Multivariate analysis of predictor of **dyspnea** post Covid-19 using logistic regression and Chi-Square

Predictor variable	β	P value *	OR (95% CI)	P value*
Sex (ref=male)	0.706	0.025	2.026 (1.093-3.756)	0.033
Age category	-0.096	0.378	0.909 (0.735-1.124)	<0.001
BMI category	0.139	0.241	1.149 (0.911-1.451)	0.066
Respiratory comorbidities (ref=no)	0.986	0.014	2.681 (1.223-5.873)	<0.001
Nº comorbidities w/o respiratory	0.077	0.522	1.08 (0.853-1.369)	0.518

Abbreviations: CI, confidence interval; OR, odds ratio

X: P value for logistic regression covariate

* : P value for Chi-Square

Methods

A cross-sectional cohort study was conducted, including patients older than 18 years with laboratory-confirmed COVID-19, discharged from the Dr. Horacio E. Oduber Hospital between March 2020 and July 2021. Study participants completed a 20-question survey comprising of a self-reported symptoms questionnaire about newly-occurring and persisting symptoms post COVID-19 infection, quality of life (ED5Q) and mental well-being (WHO Five). Continuous variables were described as mean with standard deviation (SD). Categorical variables were described as percentage and compared using the Chi-square test. Logistic regression analysis was used to study the independent covariates for the presence of fatigue, dyspnea and cognitive impairment 3-, 6-, 12- and 18-months post COVID-19 hospital admission. ≤ 0.05 was chosen as level of statistical significance for all analyses. Statistical analyses were performed using SPSS Version 28.0.

Results

Out of 643 initially identified eligible participants, 222 patients who completed the phone survey and had full medical dossier data were included in the analysis. The population ranged widely in age, between 29 and 83 years, with a mean BMI 33.9 ± 9.3 kg/m², 82.9% of the study population had at least one comorbidity and over half were of American Caribbean (predominantly Aruban) ethnicity. The majority of the participants were interviewed a year or more since their initial COVID-19 infection (100 and 79, at 12 and 18 months respectively), with smaller groups at 6 and 3 months (30 and 13 respectively). Participants were first asked to recall their symptoms during initial COVID-19 illness, most common were new-onset dyspnea (83.3%), fever (81.1%), fatigue (70.7%), new-onset cough (58.1%), and loss of taste and or smell (50%, Table 1). The most frequently reported symptoms matched at all four times of survey collection, namely fatigue, muscle pain, new-onset dyspnea, and hair. With an outlier of mucus production at 3 months post COVID-19 illness. Looking at the mean number of PCS symptoms reported, there is a trend of the number symptoms increasing with time since COVID-19 infection. Concurrently, the self-reported Health score is getting lower between 3 and 12 months follow up, and slightly improved at 18 months post. Interestingly, mental health score improved with time.

The Chi-Square results showed that fatigue was associated ($P \leq 0.05$) with sex, age, BMI, respiratory (co)morbidity and number of comorbidities (Table 2). Dyspnea was associated ($P \leq 0.05$) with sex, age and respiratory (co)morbidity (Table 3). Cognitive impairment was not found to be associated with any of the potential predictor variables. Based on the Chi-Square results of the different categorical variables with the fatigue, dyspnea and cognitive impairment, further multivariate analysis was performed using logistic regression. Female participants were found to be more likely to experience fatigue post COVID-19 ($P \leq 0.05$, OR 2.135, 95% CI 1.154-3.949, Table 2) and dyspnea ($P \leq 0.05$, OR 2.026 95% CI 1.093-3.756, Table 3) post COVID-19. Participants with one or more respiratory comorbidity ($P \leq 0.05$, OR 2.681, 95% CI 1.223-5.873, Table 3). Not one of the predictor variables was found to be associated with cognitive impairment.

Conclusion

This study of prevalence of Post COVID-19 Syndrome in hospitalized patients in Aruba, identified female sex and respiratory comorbidity as crucial risk factors for PCS. Females were also found to have significantly lower health scores and were more likely to experience fatigue and dyspnea after COVID-19 infection. The identified frequent persistent symptoms post COVID-19 infection were confirmed by literature [1-6]. There is a need for long-term research into COVID-19 patients to understand consequences of PCS better.

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