The Effect of Long-Haul COVID Towards Domains of The Health Related Quality of Life Among Recovered Hospitalized Patients

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Research

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Abstract

Background

People with long-haul COVID could experience various health problems, from mild to more severe ones. This research aimed to identify the effect of long-haul COVID, specifically on the Quality of Life domains, experienced by COVID 19 survivor. Data collection was carried out online, using data from DKI Jakarta hospitalized patients who have been confirmed with and recovered from SARS-CoV-2 infections. We selected patients who have a minimum of 28 days after being hospitalized for COVID 19 positive. Logistic regression technique was used to analyze the data. The questionnaire used in this research was measured by WHOQOL-BREF. The WHOQOL-BREF is a self-administered questionnaire comprising 26 questions on the individual's perceptions of their health and well-being over the previous two weeks. Prior to the data collection, we tested the questionnaire with 30 recovered patients who were hospitalized outside DKI Jakarta.

Result

In total of 172 recovered inpatients who filled out the questionnaire correctly and aged 18 years and above, were selected by random sampling. Almost one-third (30.2%) of the recovered inpatients had long-haul COVID, with 23.8% experiencing one long-haul symptom and 6.4% experiencing more than one symptom. This research also showed that the long-haul effects of COVID affected almost all domains of Quality of Life except the environmental one. Age, gender, and marital status were covariates for the association between long-haul COVID and The Quality of Life.

Conclusion

Due to the long-haul COVID effect on the decline in Quality of Life, the continuation of health services after discharge from the hospital is an important program to prevent it.

Introduction

Long-Haul COVID, also known as post-COVID syndrome, post-acute sequelae of COVID 19 (PASC), or chronic COVID 19 syndrome (CCS), is a condition characterized by long-haul term sequelae appearing or persisting after the typical convalescence period of COVID-19.[1] Long-haul COVID can affect nearly every organ system with a wide range of symptoms are commonly discussed, including fatigue, headaches, shortness of breath, anosmia, parosmia, muscle weakness, low fever and cognitive dysfunction. sequelae, nervous system and neurocognitive disorders, mental health disorders, metabolic disorders, cardiovascular disorders, gastrointestinal disorders, malaise, fatigue, musculoskeletal pain, and anemia. [2][3][4][5]

The long-haul COVID tends to occur more frequently in survivors who have more severe symptoms during infection.[7] The effectiveness of treatment measures to treat this condition is still being sought. These conditions can be associated with health-related quality of life have become an important issue in medical and psychological research. WHO defines quality of life as individuals' perceptions of their position in life in the context of the culture and value systems in which they live, as well as in relation to their goals, expectations, standards, and concerns.[8] WHO has assessed the quality of life through the WHOQOL-100 questionnaire which is a multidimensional evaluation of individuals' perceptions of their health status, psychosocial status, and other aspects of their lives. [9] Subsequently, WHO created a simplified version of WHOQOL-100 called the WHOQOL-BREF.[10] The WHOQOL-BREF questionnaire can be completed independently by the respondent or with the assistance of a trained interviewer.[8][10]

WHOQOL-BREF demonstrated good discriminant validity, content validity, internal consistency, and retest reliability, and was highly correlated with WHOQOL-100 domain scores. [10], [11][12] The Indonesian version of the WHOQOL-BREF instrument showed a near-perfect match of the two general items and good agreement of the four domains. Therefore it can be concluded that the WHOQOL-BREF is a consistent and stable instrument to measure the quality of life of Indonesian people in general. [13] [14][15].

Therefore, further in-depth studies are needed to examine the health problems in COVID 19 patients who have been declared cured after being discharged from the hospital. Thus, this research has aimed to identify the effect of Long-Haul COVID symptoms on the Quality of Life of Recovered Patients in Hospitals in Jakarta. It is expected that the results of this research could be used to strengthen post-hospitalization supervision for recovered patients.

Research Method

The research related to the long-haul COVID had passed an ethical permit and data collection permit from the DKI Health Office for 6 months. The research was conducted in DKI Jakarta, the capital of Indonesia and the center of the COVID 19 spread in Indonesia. Due to conditions that did not allow for the data to be collected directly, data collection was conducted online using a database from reports of COVID 19 patients from various hospitals and health centers. The respondents were randomly selected from a list of COVID 19 patients who had recovered. This list was provided by the Provincial Health Office of DKI Jakarta. Several difficulties, such as a slow pace of data collection, as some patients who had recovered from COVID 19 refused to fill out online surveys, were encountered during the implementation. Eventually, only 281 respondents were obtained. The database of COVID 19 patient reports from various hospitals and health centers were also not well organized and some of the data reported were incomplete. After data cleaning and making sure that the respondents met the inclusion criteria (aged 18 or more, were hospitalized patients, and interviewed a minimum of 28 days after hospitalized COVID 19 positive) and properly filled out the form, the total number of respondents was 172.

There are many terms to describe the symptoms of The Long-Haul COVID and how to assess them too. Long-Haul COVID, as the main independent variable in this study, followed the term with a history of confirmed SARS-CoV-2 infection, at an interview at least 28 days after completion of hospitalization for COVID 19 positive patients with symptoms who did not have the experience before becoming sick. Other independent variables, including gender, age, length of treatment, length from onset to interview, marital status, occupation, and respirator use, were determined as covariates. The WHOQOL-BREF, was utilized to measure the dependent variable of this research: Quality of Life.

The four major domains assessed in the WHOQOL-BREF can be described as: 1. Physical Domain Score with 7 items, 2. Psychological health with 6 items, 3. Social relationships with 3 items (Personal relationships; Sexual activity; Social support) and 4 Environmental health with 8 items. The responses to the questions are on a 1-5 Likert scale where 1 represents "disagree" or "not at all" and 5 represents "completely agree" or "extremely".

Result

Based on data from 172 participants in this research, table 1 shows the mean length of treatment (days) was 15.17 ± 8 , while the mean length of the gap from baseline to interview (days) was 109.22 ± 69.71 . Out of four quality of life domains, the lowest mean score was identified in the physical domain with 69.31 ± 12.31 , while the highest score was indicated at the social domain with the mean of 78.29 ± 16.08 . The mean score of the psychological and the environmental domain were 74.89 ± 11.70 and 73.60 ± 13.30 , respectively.

Demographic characteristics

Table 2 describes the demographic characteristics of participants in this research. The proportion of males (48.3%) and females (51.7%) in this research tended to be equal. The majority of participants were aged 18-39 years (58.1%), married or living with partners (66.9%), and working in the private sector (55.2%). Out of 172 participants, only 20 (11.6%) used respiratory aids during their COVID-19 treatment. Among all participants, almost one-third (30.2%) experienced long-haul symptoms of COVID symptoms, with 23.8% were having one symptom, and 6.4% were having two or more symptoms.

Further information on long-haul COVID are seen in Table 3. From eleven (11) symptoms that were collected, most of the participants experienced fatigue (16.3%), chest pain (7%), coughing (4.1%), breathing trouble (2.9%), as well as digestive disorder and headache (2.3%). There were one to two participants who experienced other symptoms such as ageusia, anosmia, memory loss, nausea, and joint pain.

Table 4 presents a comparison of the average scores for each quality of life domain according to socio-demography, treatment history, and having Long-Haul COVID symptoms. The Comparison of the average of scores domains in Quality of life can be described that there was a difference in the average score of the social domain male higher rather than female groups (p-value 0.03). In the 18-39 year age group, the average psychological domain score was higher than the 40-year-old age group or older (p-value 0.03). On the marital status of the participants, those who were married or living with a partner had a higher average psychological domain score than those from the single or divorced group (p-value 0.007). On the variable duration of treatment, there was no significant difference in the average in all domains of Quality of Life. However, regarding the use of breathing during COVID-19 treatment, the two Quality of Life domains (Psychological and Environmental) have a significant average difference with p-values of 0.01 and 0.02, respectively. The other variables were not proven to be significant.

In Table 5, the Quality of Life variable was categorized into two categories (good and poor), as the scores were not normally distributed. Table 5 shows female participants, those aged 40 years or more, divorced/single participants, and unemployed participants tend to have a poorer quality of life in the physical domain. People with two or more symptoms of Long-Haul COVID also tended to have a poor quality of life in the physical domain compared to those without long-haul symptoms (OR=2.54, 95% CI = 0.68 - 9.46).

In the psychological domain, participants aged 40 years or more and participants with 14 or more days of treatment were two-fold more at risk to experience poor quality of life compared to their counterparts. Participants with two or more Long-Haul COVID symptoms also tended to have a higher risk for poorer quality of health in the psychological domain, with an odds ratio of 2.44 (95% CI = 0.46 - 12.89), compared to those who showed no symptoms.

In the social domain, people with one Long-Haul COVID symptoms have a higher risk, by almost two times, compared to those with no symptoms (OR = 1.97, 95%CI = 0.79 - 4.92). In contradictory, Long-Haul COVID symptoms tended to be protective against the poor quality of life compared to those with no symptoms, in terms of the environmental domain. Thus, these initial results need to be analyzed further using multivariate analysis, as seen in Table 6. Multivariate analysis with four models was presented in this research. In which, each model has one dependent variable from each domain of the Quality of Life.

After adjusted with other variables, people with Long-Haul COVID tend to be at a greater risk to have a poor quality of life in the physical domain, psychological domain, and social domain with an odds ratio of 1.93 (95% CI = 0.88 - 4.23), 2.62 (95% CI = 0.96 - 7.14), and 2.09 (95% CI = 0.85 - 5.12), respectively. With an odd ratio of 0.99, the effect of Long-Haul COVID symptoms could not be concluded in the environmental domain.

Discussion

The limitations of this research

The limitation of this research is that the symptoms reported by the subjects were obtained through online questionnaires due to the government fieldwork. Therefore, these symptoms are subjective according to the perception of each individual. This research has a large proportion in the relatively young age group (under 40 years). Thus, persistent variation in symptoms according to age remains unknown. Notwithstanding that the patients are young and have a

lower epidemiological propensity for chronic diseases and other degenerative symptoms, the symptoms of those who complain have a lower risk of the consequences of the chronic disease.

The strength of this research

Many people experience prolonged symptoms, poor health, and reduced function for months, even though they are not hospitalized for SARS-CoV-2 infection. This study explores the health condition of COVID 19 patients after discharge from the hospital and emphasizes the need for post-hospital surveillance as a necessity, as well as building sustainable health services as a recovery response from a quality of life perspective.

Long-Haul COVID and Quality of life

Quality of life is currently defined as a multidimensional concept consisting of a number of domains that people consider and evaluate differently according to the importance they attach to each domain in their lives.[17] In the condition of post-covid patients, it is interesting to explore the relationship with the four domains in the WHOQOL BREF as Quality of Life instrument. [8][This is important to clarify the post-hospital care steps that should be taken in upholding complete health related to the quality of life.

Furthermore, based on Epidemiological and immunological-based studies of recovered COVID 19 patients, it can be utilized to monitor their health status for possible future complications.[2][16] Observational investigations in larger cohorts will help us understand the deep prognosis and pathogenesis of COVID 19 disease. Studies of this kind will help uncover whether patients recovering from COVID 19 require post-acute care to recover from further infection or multi-organ damage.[18] SARS-CoV-2 mainly affects people who are immunocompromised and have previous medical conditions (problems related to the lungs, kidneys, heart, and digestive tract).[19][20] Our research showed that almost one-third (30.2%) experienced long-haul symptoms of COVID 19, with 23.8% experiencing one symptom and 6.4% experiencing two or more symptoms, in which most of them have experienced fatigue, chest pain, coughing, breathing trouble, digestive disorder and headache (16.3%; 7%; 4.1%; 2.9%; 2.3%), respectively.

Further, after the Quality of Life variable was categorized into two categories (good and poor), it was implied how the long-haul symptoms affect all domains, except for the environmental one. It was found that those who had remote covid symptoms and had more than one symptom are at approximately double the risk of having poor quality of life compared with those without symptoms. In addition, the risk of having a bad quality of life varied greatly depending on the predominance. However, the increasing risk of having poor quality of life from the use of respirators is seen in none of the domains. Respondents aged 40 years or over are more at risk of having poor quality of life in physical and psychological aspects of Quality of Life. In addition, women and unmarried or divorced respondents are also at risk of having poor quality of life in the physical domain. Length of stay of more than 14 days also renders poor Quality of Life in the psychological domain. In the social domain, unmarried or divorced status, as well as the type of work seems to affect the risk of having poor quality of life. In the environmental domain, women respondents, those with single or divorced status, and those with a length of stay of more than 14 days are at risk of having a bad quality of life.

Results of multivariate analysis implied that Long-Haul COVID patients tend to have a greater risk of having poor Quality of Life in the physical domain, psychological domain, and social domain with odds ratios of 1.93 (95% CI = 0.88 - 4.23), 2.62 (95% CI = 0.96 - 7.14), and 2.09 (95% CI = 0.85 - 5, 12). The environmental domain has an odd ratio of 0.99, which seems to be a protective effect for poor Quality of Life. The significant impact of the emergence of Long-Haul COVID on recovered patients confirmed the association between the Long-Haul COVID and the WHOQOL-BREF Quality of LIFE domains. [21] The findings are essential to clarify the necessary steps for post-hospital care that need to be taken to create a whole and quality-related health[22][23].

Conclusion

Those who have recovered from COVID-19 still have health problems such as long-haul COVID 19 symptoms. Many of them are also related to the reduction of the quality of life domain. If left untreated, they will continue to experience long-term health complications. Therefore, robust post-hospital surveillance is needed to identify the need for related health services.

Declarations

Ethics approval and consent to participate

This study obtained ethical clearance from Universitas Indonesia's Ethics Committee, with Ethical Approval number: 593/UN2.F10.D11/PPM.00.02/2020

Patient consent for publication

Informed consent

Informed consent was given in the beginning of the questionnaire, in which participants agreed or declined to take part in the study.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. The contact to request is to the corresponding author dini05@ui.ac.id.

Competing interests

The authors declare that there are no competing interests.

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Authors' contributions

The conceptualized design of the study was IT. IT, MM, DAKS and CPE collected the data, contributed to the analysis of the data, and interpreted the results. IT, MM, and CPE prepared the draft of the manuscript. IT was a major contributor in writing the manuscript, especially in methodology, discussion, and conclusion. All authors read and approved the final manuscript.

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Abbreviations

Long-Haul COVID, also known as post-COVID-19 syndrome, post-acute sequelae of COVID-19 (PASC), or chronic COVID syndrome (CCS).

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Tables

Table 1. Descriptive statistics of Length of Treatment, Length from Onset to Interview, Quality of Life domains,

Variable	Mean	SD	Min.	Max.
Length of Treatment (day)	15,17	8,00	7	42
Length from Onset to Interview (day)	109,22	69,72	29	309
WHOQOL Physical Domain Score	69,31	12,31	35,71	100
WHOQOL Psychological Domain Score	74,44	11,60	45,83	100
WHOQOL Social Domain Score	78,29	16,08	16,67	100
WHOQOL Environmental Domain Score	73,62	13,53	43,75	100

Table 2. The Demographic characteristics, History of treatments and The Long-Haul COVID 19

No	Variables	Frequencies (%)
1	Gender	
	Male	83 (48.3%)
	Female	89 (51.7%)
2	Age Group	
	18 – 39 years old	100 (58.1%)
	≥ 40 years old	72 (41.9%)
3	Marital Status	
	Married/Living with Partner	115 (66.9%)
	Divorced/ Single	57 (33.1%)
4	Occupation	
	Civil Servant & Police & Army	41 (23.8%)
	Private Sector	95 (55.2%)
	Unemployed	36 (20.9%)
5	Length of Treatment	
	≤ 13 days (<2 weeks)	71 (41.3%)
	≥ 14 days (≥2 weeks)	101 (58.7%)
6	Respiratory Used	
	No	152 (88.4%)
	Yes	20 (11.6%)
7	Length from Onset (to Interview)	
	≤ 3 months	92 (53.5%)
	>3 months	80 (46.5%)
8	Long-Haul COVID 19	
	No	120 (69.8%)
	Yes	52 (30.2%)
9	Number of Long-Haul COVID 19	
	No	120 (69.8%)
	1 Symptom	41 (23.8%)
	> 1 Symptom	11 (6.4%)

Table 3. The list of The Long-Haul COVID 19 symptoms

No	Variables	Frequencies (%)
1	Coughing	
	No	165 (95.9%)
	Yes	7 (4.1%)
2	Digestive Disorder	
	No	168 (97.7%)
	Yes	4 (2.3%)
3	Ageusia	
	No	169 (98.3%)
	Yes	3 (1.7%)
4	Anosmia	
	No	170 (98.8%)
	Yes	2 (1.2%)
5	Headache	
	No	168 (97.7%)
	Yes	4 (2.3%)
6	Memory Loss	
	No	171 (99.4%)
	Yes	1 (0.6%)
7	Nausea	
	No	170 (98.8%)
	Yes	2 (1.2%)
8	Joint Pain	
	No	171 (99.4%)
	Yes	1 (0.6%)
9	Fatigue	
	No	144 (83.7%)
	Yes	28 (16.3%)
10	Breathing Trouble	
	No	167 (97.1%)
	Yes	5 (2.9%)
11	ChestPain	
	No	160 (93.0%)
	Yes	12 (7.0%)

Table 4. The quality of life domain scores for sociodemographic and health-related predictors

Variables	Frequencies (%)	Mean ± SD[1]													
		Physical Domain Score				Psychological Domain Score				Social Domain Score				Environment	
		Score	95% CI		P value	Score	95% CI		P value	Score	95% CI		P value	Score	95% CI
			Lower	Upper			Lower	Upper			Lower	Upper			
Gender															
Male	83 (48.3%)	70.22 ± 11.99	67,60	72,84	0,35	74.99 ± 12.03	72,37	77,63	0,54	81.02 ± 15.30	77,68	84,37	0.03*	74.96 ± 12.67	72,37
Female	89 (51.7%)	68.46 ± 12.61	65,80	71,11		73.92 ± 11.23	71,56	76,29		75.75 ± 16.46	72,28	79,22		72.37 ± 14.23	69,11
Age Group															
18 – 39 years old	100 (58.1%)	70.86 ± 12.56	68,37	73,35	0,052	76.04 ± 11.41	73,78	78,31	0.03*	79.25 ± 16.65	75,95	82,55	0,36	73.72 ± 13.88	70,81
≥ 40 years old	72 (41.9%)	67.16 ± 11.71	64,41	69,91		72.22 ± 11.58	69,50	74,94		79.97 ± 15.29	73,37	80,56		73.48 ± 13.11	70,81
Marital Status															
Married/Living with Partner	115 (66.9%)	68.91 ± 11.59	66,77	71,05	0,55	73.26 ± 10.99	71,23	75,29	0,06	80.87 ± 13.87	78,31	83,43	0.007*	73.45 ± 12.74	70,81
Divorced/ Single	57 (33.1%)	70.11 ± 13.73	66,47	73,75		76.83 ± 12.50	73,51	80,14		73.10 ± 18.89	68,08	78,11		73.96 ± 15.11	69,11
Occupation															
Civil Servant & Police & Army	41 (23.8%)	68.90 ± 12.81	64,86	72,95	0,51	73.88 ± 10.91	70,44	77,32	0,94	81.71 ± 14.34	77,18	86,23	0,30	75.54 ± 13.96	70,81
Private Sector	95 (55.2%)	70.19 ± 11.39	67,87	72,51		74.65 ± 11.07	72,39	76,90		77.19 ± 15.95	73,94	80,44		72.47 ± 13.07	69,11
Unemployed	36 (20.9%)	67.46 ± 14.10	62,69	72,23		74.54 ± 13.86	69,85	79,23		77.31 ± 18.10	71,19	83,44		74.48 ± 14.28	69,11
Length of Treatment															
1-13 days (<2 weeks)	71 (41.3%)	69.67 ± 11.94	66,84	72,49	0,75	74.29 ± 10.08	71,91	76,68	0,89	80.16 ± 15.39	76,52	83,81	0,20	73.86 ± 12.92	70,81
≥ 14 days (≥2 weeks)	101 (58.7%)	69.06 ± 12.62	66,57	71,55		74.55 ± 12.61	72,06	77,03		76.98 ± 16.50	73,72	80,24		73.45 ± 14.00	70,81
Respiratory Used															
No	152 (88.4%)	68.75 ± 12.08	66,81	70,68	0,10	73.63 ± 11.46	71,79	75,47	0.01*	77.63 ± 16.62	74,97	80,30	0,14	72.78 ± 13.53	70,81
Yes	20 (11.6%)	73.57 ± 13.53	67,24	79,90		80.62 ± 11.00	75,47	85,77		83.33 ± 10.12	78,60	88,07		80.00 ± 11.97	74,23
Length from Onset (to Interview)															
≤ 3 months	92 (53.5%)	67.90 ± 12.14	65,38	70,41	0,11	73.41 ± 11.32	71,07	75,76	0,21	76.54 ± 14.40	73,56	79,52	0,12	72.86 ± 13.15	70,81
>3 months	80 (46.5%)	70.94 ± 12.38	68,18	73,69		75.62 ± 11.88	72,98	78,27		80.31 ± 17.70	76,37	84,25		74.49 ± 13.98	70,81
Long-Haul COVID 19															

No	120 (69.8%)	70.12 ± 12.41	67,88	72,36	0,19	74.99 ± 11.29	72,96	77,04	0,34	78.89 ± 15.84	76,03	81,75	0,46	73.52 ± 13.68	7
Yes	52 (30.2%)	67.44 ± 11.99	64,10	70,78		73.16 ± 12.30	69,73	76,58		76.92 ± 16.72	72,27	81,57		73.86 ± 13.29	70
Number of Long-Haul COVID 19															
No	120 (69.8%)	70.12 ± 12.41	67,88	72,36	0,37	74.99 ± 11.29	72,96	77,04	0,49	78.89 ± 15.84	76,03	81,75	0,70	73.52 ± 13.68	7
1 Symptom	41 (23.8%)	66.99 ± 10.91	63,54	70,43		72.56 ± 11.71	68,86	76,26		76.42 ± 16.86	71,10	81,75		72.64 ± 12.61	68
> 1 Symptom	11 (6.4%)	69.15 ± 15.91	58,46	79,85		75.38 ± 14.73	65,48	85,27		78.79 ± 16.82	67,49	90,09		78.41 ± 15.34	68

Table 5. The association of quality of life domain category related by sociodemographic and health-related predictors

Variables	Frequencies (%)	Physical Domain Category		OR (95%CI)	Psychological Domain Category		OR (95%CI)	Social Domain Category		OR (95%CI)	Environmental Domain Category	
		Bad (%)	Good (%)		Bad (%)	Good (%)		Bad (%)	Good (%)		Bad (%)	Good (%)
Gender												
Male	83 (48.3%)	15 (18.1%)	68 (81.9%)	1 (Ref)	9 (10.8%)	74 (89.2%)	1 (Ref)	8 (9.6%)	75 (90.4%)	1 (Ref)	11 (13.3%)	72 (86.7%)
Female	89 (51.7%)	22 (24.7%)	67 (75.3%)	1.49 (0.71 - 3.11)	10 (11.2%)	79 (88.8%)	1.04 (0.40 - 2.70)	18 (20.2%)	71 (79.8%)	2.38 (0.97 - 5.81)	23 (25.8%)	66 (74.2%)
Age Group (2 categories)												
18 - 39 years old	100 (58.1%)	18 (18.0%)	82 (82.0%)	1 (Ref)	7 (7.0%)	93 (93.0%)	1 (Ref)	16 (16.0%)	84 (84.0%)	1 (Ref)	21 (21.0%)	79 (79.0%)
≥ 40 years old	72 (41.9%)	19 (26.4%)	53 (73.6%)	1.63 (0.79 - 3.39)	12 (16.7%)	60 (83.3%)	2.66 (0.99 - 7.13)	10 (13.9%)	62 (86.1%)	0.85 (0.36 - 1.99)	13 (18.1%)	59 (81.9%)
Marital Status												
Married/Living with Partner	115 (66.9%)	22 (19.1%)	93 (90.3%)	1 (Ref)	14 (12.2%)	101 (87.8%)	1 (Ref)	12 (10.4%)	103 (89.6%)	1 (Ref)	19 (16.5%)	96 (83.5%)
Divorced/ Single	57 (33.1%)	15 (26.3%)	42 (73.7%)	1.51 (0.71 - 3.20)	5 (8.8%)	52 (91.2%)	0.69 (0.24 - 2.03)	14 (24.6%)	43 (75.4%)	2.79 (1.19 - 6.53)	15 (26.3%)	42 (73.7%)
Occupation												
Civil Servant & Police & Army	41 (23.8%)	10 (24.4%)	31 (75.6%)	1 (Ref)	5 (12.2%)	36 (87.8%)	1 (Ref)	5 (12.2%)	36 (87.8%)	1 (Ref)	8 (19.5%)	33 (80.5%)
Private Sector	95 (55.2%)	16 (16.8%)	79 (83.2%)	0.63 (0.26 - 1.53)	10 (10.5%)	85 (89.5%)	0.85 (0.27 - 2.65)	15 (15.8%)	80 (84.2%)	1.35 (0.46 - 3.99)	19 (20.0%)	76 (80.0%)
Unemployed	36 (20.9%)	11 (30.6%)	25 (69.4%)	1.36 (0.50 - 3.73)	4 (11.1%)	32 (88.9%)	0.90 (0.22 - 3.64)	6 (16.7%)	30 (83.3%)	1.44 (0.40 - 5.19)	7 (19.4%)	29 (80.6%)
Length of Care/Treatment												
1-13 days (<2 weeks)	71 (41.3%)	14 (19.7%)	57 (80.3%)	1 (Ref)	5 (7.0%)	66 (93.0%)	1 (Ref)	10 (14.1%)	61 (85.9%)	1 (Ref)	11 (15.5%)	60 (84.5%)
≥ 14 days (≥2 weeks)	101 (58.7%)	23 (22.8%)	78 (77.2%)	1.20 (0.57 - 2.53)	14 (13.9%)	87 (86.1%)	2.12 (0.73 - 6.19)	16 (15.8%)	85 (84.2%)	1.15 (0.49 - 2.70)	23 (22.8%)	78 (77.2%)
Respiratory Used												
No	152 (88.4%)	34 (22.4%)	118 (77.6%)	1 (Ref)	18 (11.8%)	134 (88.2%)	1 (Ref)	26 (17.1%)	126 (82.9%)	1 (Ref)	33 (21.7%)	119 (78.3%)
Yes	20 (11.6%)	3 (15.0%)	17 (85.0%)	0.61 (0.17 - 2.21)	1 (5.0%)	19 (95.0%)	0.39 (0.05 - 3.11)	0 (0.0%)	20 (100.0%)	-	1 (5.0%)	19 (95.0%)
Length from Onset (to Interview)												
≤ 3 months	92 (53.5%)	25 (27.2%)	67 (72.8%)	1 (Ref)	11 (12.0%)	81 (88.0%)	1 (Ref)	16 (17.4%)	76 (82.6%)	1 (Ref)	18 (19.6%)	74 (80.4%)
>3 months	80 (46.5%)	12 (15.0%)	68 (85.0%)	0.47 (0.22 - 1.02)	8 (10.0%)	72 (90.0%)	0.82 (0.31 - 2.15)	10 (12.5%)	70 (87.5%)	0.68 (0.29 - 1.59)	16 (20.0%)	64 (80.0%)
Long Covid												
No	120 (69.8%)	22 (18.3%)	98 (81.7%)	1 (Ref)	10 (8.3%)	110 (91.7%)	1 (Ref)	15 (12.5%)	105 (87.5%)	1 (Ref)	24 (20.0%)	96 (80.0%)
Yes	52 (30.2%)	15 (28.8%)	37 (71.2%)	1.81 (0.85 - 3.85)	9 (17.3%)	43 (82.7%)	2.30 (0.87 - 6.06)	11 (21.2%)	41 (78.8%)	1.88 (0.80 - 4.43)	10 (19.2%)	42 (80.8%)
Number of												

Long Covid												
No	120 (69.8%)	22 (18.3%)	98 (81.7%)	1 (Ref)	10 (8.3%)	110 (91.7%)	1 (Ref)	15 (12.5%)	105 (87.5%)	1 (Ref)	24 (20.0%)	96 (80.0%)
1 Symptom	41 (23.8%)	11 (26.8%)	30 (73.2%)	1.63 (0.71 - 3.75)	7 (17.1%)	34 (82.9%)	2.26 (0.80 - 6.40)	9 (22.0%)	32 (78.0%)	1.97 (0.79 - 4.92)	8 (19.5%)	33 (80.5%)
> 1 Symptom	11 (6.4%)	4 (36.4%)	7 (63.6%)	2.54 (0.68 - 9.46)	2 (18.2%)	9 (81.8%)	2.44 (0.46 - 12.89)	2 (18.2%)	9 (81.8%)	1.56 (0.31 - 7.90)	2 (18.2%)	9 (81.8%)

Table 6. Results of Multivariable analysis of Quality of Life Domains and Gender, Age Group, Marital Status, Occupation and Having Long-Haul COVID 19

No	Variables	Physical Domain	Psychological Domain	Social Domain	Environmental Domain
		AOR (95% CI)	AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
1	Gender (Female/ Male)	1.50 (0.66 - 3.39)	1.70 (0.55 - 5.22)	2.30 (0.88 - 6.05)	2.23 (0.95 - 5.22)
2	Age Group ($\geq$ 40 years old/ 18-39 years old)	1.85 (0.79 - 4.35)	3.68 (1.17 - 11.61)	1.26 (0.45 - 3.50)	1.14 (0.46 - 2.80)
3	Marital Status (Divorced & Single/ Married & Living With Partner)	1.55 (0.68 - 3.53)	0.80 (0.24 - 2.63)	2.48 (0.99 - 6.18)	1.63 (0.72 - 3.71)
4a	Occupation (Private Sector / Civil Servant & Police & Army)	0.62 (0.24 - 1.56)	0.94 (0.29 - 3.10)	1.28 (0.41 - 4.00)	0.98 (0.38 - 2.56)
4b	Occupation (Unemployed / Civil Servant & Police & Army)	0.91 (0.29 - 2.89)	0.55 (0.11 - 2.77)	0.90 (0.21 - 3.96)	0.70 (0.19 - 2.53)
5	Long-Haul COVID 19 (Yes/ No)	1.93 (0.88 - 4.23)	2.62 (0.96 - 7.14)	2.09 (0.85 - 5.12)	0.99 (0.43 - 2.30)