

Situación laboral en personas con Long-COVID: Análisis de factores sociodemográficos y clínicos asociados

Employment status in Long-COVID patients: An analysis of associated socio-demographic and clinical factors

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Resumen

Introducción: La sintomatología característica del síndrome de Long-COVID afecta al funcionamiento físico y cognitivo de las personas que lo padecen, creando desafíos a la hora de regresar a su puesto de trabajo habitual. El objetivo del presente estudio fue profundizar en la comprensión acerca de la situación laboral de las personas que padecen este síndrome y sus factores sociodemográficos y clínicos asociados. **Material y métodos:** Se realizó un estudio transversal con la participación de 83 pacientes con diagnóstico de Long-COVID, mayores de 18 años y atendidos desde Atención Primaria de Salud en la Comunidad Autónoma de Aragón. La variable principal de estudio fue la situación laboral de los participantes, además de recogerse datos sociodemográficos y clínicos mediante la realización de una entrevista estructurada. Posteriormente se realizó un análisis estadístico descriptivo, de correlación y de regresión mediante el programa SPSS Statistics. **Resultados:** De los 83 participantes del estudio, un 55,4% se encontraba en situación laboral activa, y un 44,6% en situación

de incapacidad laboral temporal. Un mayor número de síntomas persistentes y pertenecer al género masculino fueron factores predictores de una mayor probabilidad de encontrarse en situación de incapacidad laboral temporal. **Discusión:** Un gran porcentaje de personas con Long-COVID se encuentran de baja o incapacidad laboral temporal, lo que la necesidad de elaborar programas de prevención y actuación desde equipos de atención sociosanitaria con el objetivo de estas personas no pierdan su empleo de manera temporal o definitiva o, si esto ya ha sucedido, recuperen su situación laboral previa cuanto antes.

Palabras clave: Long-COVID; incapacidad laboral temporal; Atención Primaria de Salud; género; estudio cuantitativo.

Abstract

Introduction: The characteristic symptomatology of Long-COVID syndrome affects the physical and cognitive functioning of people who suffer from it, creating challenges when returning to their usual job. The objective of this study was to deepen the understanding of the employment status of people with this syndrome and its associated sociodemographic and clinical factors. **Material and methods:** A cross-sectional study was carried out with the participation of 83 patients diagnosed with Long-COVID, over 18 years of age and attended by Primary Health Care in the Autonomous Community of Aragon. The main study variable was the employment status of the participants, in addition to collecting sociodemographic and clinical data through a structured interview. Subsequently, a descriptive, correlation and regression statistical analysis was performed using the SPSS Statistics program. **Results:** Of the 83 study participants, 55.4% were in an active employment situation, and 44.6% in a situation of temporary incapacity for work. A greater number of persistent symptoms and belonging to the male gender were predictors of a greater probability of being in a situation of temporary incapacity for work. **Discussion:** A large percentage of people with Long-COVID are on sick leave or temporary incapacity for work, which makes it necessary to develop prevention and action programs from socio-health care teams with the aim of these people not losing their jobs temporarily or permanently or, if this has already happened, return to their previous work situation as soon as possible.

Keywords: Long-COVID; temporary incapacity for work; Primary Health Care; gender; quantitative study.

INTRODUCTION

Most people infected with COVID-19 recover within a few weeks of infection. However, since the start of the pandemic, a notable percentage of patients have reported the persistence of multiple symptoms, even weeks after contracting the illness, regardless of the initial severity of the disease. In May 2020, the term "Long COVID" or "persistent COVID" was coined in reference to this condition (Castanares-Zapatero et al., 2022), with multiple definitions arising in reference to the same. In October 2021, the World Health Organization (WHO) proposed the term "post-COVID-19 condition", defined as persistent symptoms that cannot be explained by an alternative diagnosis, and that typically occur 3 months after the onset of the confirmed (via suspicion or test) SARS-CoV-2 infection and persist for at least two months (Ceban et al., 2022).

At least 203 symptoms of this disease have been recorded (Davis et al., 2021). These symptoms are more frequent in middle-aged women, around the age of 40, having no relevant prior health issues (López-Sampalo et al., 2022). The most common symptoms include: general malaise, dyspnea, fatigue, muscle weakness, headache, neurocognitive conditions, and irritability, stress, frustration, or confusion (Rodriguez-Sanchez et al., 2022).

Most research on COVID-19 has focused on analyzing its nature, symptoms, therapeutic interventions, vaccine effectiveness, etc. Studies on the ongoing impact of Long COVID on the quality of life of affected patients are quite limited (Jandhyala, 2021). Scientific evidence suggests that individuals suffering from Long COVID may experience a significant reduction in quality of life, at least temporarily, resulting in a potentially disabling condition (Aiyegbusi et al., 2021; Hereth et al., 2022). Work is one of the main dimensions influencing quality of life. The limited evidence available on the repercussions of Long COVID in the socio-labor sphere suggests a temporary or permanent inability to resume normal work activity, having clear implications on labor productivity and increasing long-term cost-effectiveness (Rajan et al., 2021). Some of the persistent symptoms mentioned above may become highly limiting, affecting physical and cognitive functioning and creating challenges when returning to work (Davis et al., 2021; Westerlind et al., 2021; Brehon et al., 2022; Ziauddeen et al., 2022).

Employment is an essential aspect of adult life, providing not only economic income, but also a sense of commitment, identification with a social role, and physical and mental stimulation (Noh et al., 2015). Real and perceived employability has even been proposed as a useful concept in health promotion, at both an individual and organizational level (Berntson & Marklund, 2007).

On the other hand, the inability to work has negative effects on the state of health (Boot et al., 2011), resulting in a higher probability of suffering from mental health issues (Nystuen et al., 2016) and other

consequences such as inactivity, social isolation, lower self-confidence and even an increased risk of suicide (Vingård et al., 2016). Individuals who cannot work tend to experience declines in their health-related quality of life, which potentially interferes with the disease recovery process (Bernklev et al., 2006; Sörensen et al., 2008). Furthermore, these effects and consequences could extend sick leave time, considerably increasing the risk of becoming unemployed (Madan et al., 2021).

Studies on the impact of Long COVID on the work area are necessary to implement strategies encouraging the return to work by these individuals, which may be similar to programs that have already been created for other chronic conditions (Godeau et al., 2021).

Therefore, the objective of this study was to further the understanding of the employment situation of Long COVID patients and the sociodemographic and clinical factors associated with it, within the context of a sample of primary healthcare (PHC) patients from the autonomous community of Aragon.

MATERIAL AND METHODS

Study design

This cross-sectional study is based on the analysis of sociodemographic and clinical data. It was framed within a randomized clinical trial: "*Analysis of the symptoms and quality of life of people diagnosed with Long COVID-19, and effectiveness of the Recommendations for Health Assets from PHC*" (ref. ISRCTN91104012), approved in mid-2021.

Participants and procedure

The study population consisted of 83 patients diagnosed with Long COVID, over the age of 18, attended by primary healthcare (PHC) services of the autonomous community of Aragon (Spain). Given the main focus of the study, the sample only included actively employed individuals or those experiencing temporary leave situations. Patients with any other type of employment situation (retirement, permanent work disability, or unemployment) were excluded from the study.

This research has used the same exclusion criteria established for the clinical trial: not having had a positive COVID-19 diagnostic test performed at least 3 months previously; having a diagnosis of severe, uncontrolled illness; having a significant risk of suicide; being in a state of pregnancy or period of lactation; participating in a clinical trial over the past six months; engaging in rehabilitative or psychotherapeutic treatment structured by health professionals; and the presence of any medical, psychological or social problems that could significantly interfere with the patient's participation in the study.

A necessary sample size of 78 subjects was estimated. Initially, there were 100 potential participants, of whom 20 were men and 80 were women. However, 17 of these patients were excluded given that

their work situation did not correspond to the inclusion criteria mentioned above. Finally, the sample consisted of 83 patients.

Recruitment took place between October 2021 and February 2022, until reaching the necessary sample size. Recruitment was carried out mainly by PHC health professionals, in collaboration with the project, within a PHC consultation setting in which potential patients were recruited as potential study participants. Members of the Long COVID Association of Aragon also participated.

Sociodemographic and clinical data were obtained directly from information provided by the patients during their initial interview, collected in an ad-hoc questionnaire. Prior to data collection, informed consent was obtained from all participants. An individual appointment was subsequently arranged. All data was processed according to the current regulations on data protection (Organic Law 3/2018, of December 5, Protection of Personal Data and guarantee of digital rights).

Study variables

The main study variable was the employment status of the Long COVID patients, considered to be either: active employment status or on temporary leave.

The following secondary study variables were collected:

- Sociodemographic variables: sex (male/female/other), age (number), marital status (married or with a partner/single, separated, divorced or widowed), area of residence (rural/urban), education (without studies or with primary/secondary education or university studies), and personal economic situation (<2000/>2000).

- Clinical variables related to Long COVID-19: The number of symptoms was collected for each participant. According to a previous bibliographic review (Greenhalgh et al., 2020; NHS, 2022.; Vaes et al., 2020), residual symptoms included: gastrointestinal symptoms, full or partial alteration of smell, full or partial alteration of taste, eye problems (diopter increase, dry eyes, conjunctivitis, blurred vision), tiredness or fatigue, cough, fever (over 38°C), low-grade fever (37°C - 38°C), chills or shaking without fever, bruising, myalgia, headache, sore throat, dyspnea, somnolence, dizziness, tachycardia, orthostatic hypotension, arthralgia, chest pain, back pain (cervical, thoracic or lumbar), neurological symptoms (tingling, spasms, etc.), memory loss, foggy mental illness, lack of attention and ability to concentrate, loss of libido or erectile dysfunction, menstrual cycle alterations, urinary symptoms (infections, overactive bladder), hair loss and other seemingly residual symptoms.

Statistical analysis

Statistical analyses were performed using the IBM SPSS Statistics version 22.0.0 software and Microsoft Excel. First, sample distribution was analyzed using non-parametric statistics, obtaining Shapiro-Wilk statistic values of less than 0.05 for all variables except for the number of symptoms.

Subsequently, a descriptive analysis was performed: for the continuous variables, median and interquartile range were used; for categorical variables, frequencies and percentages were used. A bivariate analysis was also conducted. Employment status was analyzed as a categorical qualitative variable (employee or temporary work incapacity). The Spearman's Rho statistic was used to evaluate correlations between actively employed and temporarily disabled patients and the other categorical variables. A bivariate analysis of continuous variables was performed using the Mann-Whitney U test. Then, a logistic regression model was developed to analyze the factors related to the situation of temporary work incapacity. Independent variables were added to the regression model and a final model was obtained. Sex, marital status, education, economic level, and number of persistent symptoms were entered into the model. All significance levels were established at 0.05.

Ethical considerations

The Clinical Research Ethics Committee of Aragon (CEICA) granted ethical approval to conduct this study (PI21/139 and PI21/454). The procedures contemplated for the creation of this work complied with the ethical standards of CEICA and the Declaration of Helsinki of 1975. All participating subjects signed an informed consent form. Their data were anonymized and were only used for study purposes.

RESULTS

A total of 83 individuals suffering from Long COVID participated in the study. They were actively employed (55.4%) or in a situation of temporary work incapacity (44.6%). Of these participants, 65 were women (78.3%) and 18 men (21.7%). The median age was 46 years (IQR 9 years, range: 34-63). **Table 1** presents a description of the entire sample. The participant profile tended to be female, around 46 years of age, living in an urban area, married or with a stable partner, and having secondary or university studies. Greater variability existed in terms of their employment situation, economic income, and number of symptoms. They tended to be actively employed, with an income of less than €2,000/month and having a median of 16 persistent symptoms.

Table 1

Description of the sociodemographic and clinical variables of the total sample.

Variables	Total sample
Sex, N (%)	
Male	18 (21.7%)
Female	65 (78.3%)
Age, Me (RIC)	
	46 (9)
Occupational status, N (%)	

Active employment status	46 (55.4%)
Temporary work incapacity	37 (44.6%)
Residence area, N (%)	
Rural	14 (17.1%)
Urban	68 (82.9%)
Marital status, N (%)	
Married or in a couple	60 (72.3%)
Single, separated, widowed	23 (27.7%)
Educational level, N (%)	
No studies or primary studies	5 (6.0%)
Secondary or university studies	78 (94.0%)
Economic income, N (%)	
Less than or equal to 2000€/month	46 (55.4%)
More than 2000€/month	37 (44.6%)
No. of persistent symptoms, Me (RIC)	16 (7)

N: Population size; Me: Median; IQR: Interquartile Range

Table 2 presents the bivariate analysis related to employment status (employee and temporary work incapacity) and the sociodemographic and clinical variables collected. A relationship clearly existed between employment status and sex. Males had a larger possibility of being in a situation of temporary work incapacity. Having a larger number of persistent symptoms was also found to be related to this employment situation.

Table 2

Comparison of the current employment situation and the sociodemographic and clinical variables of the study participants.

Variables	Employee (N=46)	Temporary work incapacity (N=47)	P-value
Sex, N (%)			
Male	5 (27.77%)	13 (72.22%)	0.008
Female	41 (63.07%)	24 (36.92%)	
Age*, Me (RIC)	46 (8.25)	47 (12.5)	0.483
Marital status, N (%)			
Married or in a couple	33 (55%)	27 (45%)	0.901
Single, separated, widowed	13 (56.52%)	10 (43.47%)	
Residence area, N (%)			
Rural	8 (57.14%)	6 (42.85%)	0.852
Urban	37 (54.41%)	31 (45.58%)	
Educational level, N (%)			

No studies or primary studies	1 (20%)	4 (80%)	0.100
Secondary or university studies	45 (57.69%)	33 (42.30%)	
Economic income, N (%)			
Less than or equal to 2000€/month	22 (47.82%)	24 (53.17%)	0.121
More than 2000€/month	24 (64.86%)	13 (35.13%)	
No. of persistent symptoms*, Me (RIC)	15 (9.25)	18 (6)	0.016

Chi-Square test for categorical qualitative variables (sex, marital status, housing area, educational level, economic situation); *Mann Whitney U test for continuous quantitative variables (age and number of symptoms)

As for the logistic regression model, the results are presented in **Table 3**. Gender and number of symptoms were significant variables when in a situation of temporary sick leave. A higher number of persistent symptoms and being male were predictors of having a greater probability of being in a situation of temporary work incapacity.

Table 3

Logistic regression model on the temporary incapacity work situation.

Temporary work incapacity	B	Exp (B) Odds ratio	Confidence interval 95%		p-value
			inferior	Superior	
Male sex	1.771	5.878	1.570	22.012	0.009
Female sex	Ref				
Number of persistent symptoms less than or equal to 16	-1.812	0.163	0.050	0.528	0.002
Number of persistent symptoms greater than 16	Ref				

DISCUSSION

To the best of our knowledge, this is the first study considering the employment situation of patients suffering from Long COVID in Spain, and the sociodemographic and clinical factors associated with this situation. Recent scientific evidence on this novel syndrome suggests that the typical clinical profile of this population differs depending on the individual (Michelen et al., 2021). This suggests that its impact on roles and life will also be different for each person, and may have repercussions at the family, social and work levels (Sociedad Española de Médicos Generales y de Familia [SEMG] & Colectivo de pacientes Long Covid ACTS., 2020). As for work, it is important to determine how this pathogen may affect it and what factors may be linked to affectation. This will permit interdisciplinary socio-healthcare teams to help prevent work modification or loss, and develop action programs so that these individuals can return to their work and recover their prior employment status as quickly as possible.

The results of our study suggest that many participants (almost half) were in a situation of temporary work incapacity. This confirms the existence of a negative modification of the employment status of individuals suffering from this pathology, as corroborated by other studies (Rajan, Khunti, Alwan, Steves, Greenhalgh, et al., 2021; Tíscar-González et al., 2022; van Kessel et al., 2022). However, we should not assume that individuals who do return to their jobs do so at 100% of their capacities or at their pre-illness level; or that their jobs were subsequently adapted to their limitations. Other studies have confirmed a reduction in the ability to perform work activities at the same level as prior to contracting the disease (Davis et al., 2021; Westerlind et al., 2021).

Going to work and having a job is a fundamental part of human life. Work provides structure to daily life, as well as a sense of value and social commitment, and is associated with increased social well-being. Therefore, the loss of the same has major repercussions, beyond mere economic insecurity (Modini et al., 2016).

Sick leave is intended to facilitate the recovery of work capacity. However, it may have negative and unexpected physical, emotional, and social effects on the individual (Floderus et al., 2005). The temporary or permanent loss of one's ability to work has consequences, mainly psychosocial ones, such as the loss of personal identity and self-esteem, lower social support, and anxious-depressive symptoms. Physical health may also be severely affected. Some studies have established a relationship with reduced immune function, and an increased risk of conditions such as headaches, musculoskeletal disorders, ulcers, increased blood pressure, or weight gain (Akhavan et al., 2004). Prolonged, this may even lead to permanent disabilities (Markussen, 2012).

Therefore, it may be concluded that if an individual loses the ability to work, even for a short period of time, or if they experience decreased labor productivity, their health and well-being may be negatively affected, potentially leading to a poorer disease prognosis.

Our study analyzed the clinical and sociodemographic factors potentially associated with a temporary work incapacity situation. As for the clinical factors analyzed, it was found that having a larger number of persistent symptoms was associated with an increased tendency to be in a temporary work incapacity situation. Other studies have referred to the disabling nature of Long COVID symptoms, which result in a limited ability to perform work and an accompanying loss of social identity (Herr et al., 2022).

In this study, we did not consider which symptoms may have the largest impact on the ability to work. However, Herr et al. (2022) suggested that fatigue and cognitive dysfunction are the most disabling symptoms with regard to work. A careful and individualized evaluation of each symptom is necessary, given the numerous potential aspects affecting this area (Hereth et al., 2022).

Most studies on Long COVID symptomatology and gender have confirmed that women tend to display more symptoms than men (Abdelhafiz et al., 2022; Torjesen, 2021). Based on the results of the analysis of associated clinical factors from our study, it may be predicted that women will have more limitations when returning to work.

However, the analysis of sociodemographic factors in this study, and the results of other research on this type of population, such as that of Westerlind et al. (2021), confirm that being male is a predictor of temporary work incapacity situations (Westerlind et al., 2021). This may be due to the fact that men tend to have a poorer perception of their health (Ruiz Pérez et al., 2007) or because gender-based job segregation continues to exist, leading men to select work involving greater physical effort, such as that of the construction industry, which may be more difficult to return to after a disease with limiting physical symptoms (Barbulescu & Bidwell, 2012; Hegewisch & Hartmann, 2014).

Strengths and limitations of the study

To date, no prior studies have examined the clinical and sociodemographic factors that predispose patients of Long COVID to request sick leave or be in temporary work incapacity situations. Therefore, this is a novel study that attempts to shed additional light on a disease that has yet to be studied in depth and which affects all of the vital spheres of the individual, including the work area. Study limitations include the fact that, in the analysis of clinical variables, the symptoms appearing with this pathology have yet to be examined in depth, but rather, they have been analyzed in general, considering the number of residual symptoms. It would be interesting for future lines of research to examine the individual symptoms, to determine which are the most predisposed to cause reduced labor productivity and temporary, or even permanent job loss. Another limitation of this work is that the study population focused only on the autonomous community of Aragon. Future research should consider the employment situation of patients with Long COVID by expanding this context or region of analysis.

CONCLUSIONS

To conclude, many individuals with Long COVID symptoms are on sick leave or in a temporary work incapacity situation. The sociodemographic and clinical factors appearing to favor this situation include being male and having a larger number of symptoms. It is important to consider these factors when creating social and healthcare prevention and action programs, to ensure that Long COVID patients do not temporarily or permanently lose their jobs. And, if they already have lost them, help them return to work as quickly as possible.

AVAILABILITY OF DATA AND MATERIALS

The datasets used and/or analysed during the current study are available from the corresponding author upon reasonable request.

DECLARATION OF INTEREST

No potential conflict of interest was reported by the authors.

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AUTHOR CONTRIBUTIONS

SL-H and MS-P drew up the research design and developed the study. SL-H wrote the manuscript. All authors participated in the review of the manuscript, approved the final manuscript to be published, and agreed to the journal's terms regarding copyright.

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