



## ORIGINALES

### Logistic model of factors associated with Burnout Syndrome in health personnel

Modelo logístico de factores asociados al Síndrome de Burnout en el personal de salud

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#### ABSTRACT:

**Introduction:** Excessive workload in health personnel, due to the COVID-19 pandemic, has generated the presence of Burnout Syndrome. The purpose of this study was to determine a logistic model for the factors associated with the dimensions of Burnout Syndrome in health personnel during the COVID-19 pandemic in Trujillo - Peru.

**Method:** A cross-sectional, correlational design was applied. The standardized Maslach Burnout Inventory questionnaire was used and applied virtually. It measures emotional exhaustion, depersonalization and personal fulfillment. The sample consisted of 143 health professionals from the Trujillo Micro-network and Social Health Insurance establishments (ESSALUD).

**Results:** 24.5% of health professionals have a high level of emotional exhaustion, 27.3% a high level of depersonalization and 39.9% a low level of personal fulfillment. Marital status, family income, type of institution where they work, age and number of children are associated with the level of emotional exhaustion ( $p<0.05$ ). Gender, profession, type of institution, age and number of children are associated with the level of depersonalization ( $p<0.05$ ). The type of institution and age are associated with the level of personal fulfillment ( $p<0.05$ ).

**Conclusions:** The proposed ordinal logistic model indicates 69.2% success in emotional exhaustion level, 60.8% success for depersonalization level and 58.7% with the model for personal fulfillment level.

**Keywords:** Burnout syndrome, healthcare personnel, COVID-19 (Source: MeSH).

## RESUMEN:

**Introducción:** La carga de trabajo excesiva en el personal de salud, debido a la pandemia del COVID-19 ha generado la presencia del Síndrome de Burnout. El propósito de este estudio fue determinar un modelo logístico para los factores asociados a las dimensiones del Síndrome de Burnout en el personal de salud, durante la pandemia COVID-19, en Trujillo - Perú.

**Método:** Se aplicó un diseño transversal, correlacional; se utilizó el cuestionario estandarizado del inventario de Burnout de Maslach aplicado virtualmente, que mide: agotamiento emocional, despersonalización y realización personal, la muestra estuvo conformada por 143 profesionales de salud de los establecimientos de la Micro red de Trujillo y de El Seguro Social de Salud (ESSALUD),

**Resultados:** El 24,5% de profesionales de la salud tienen un nivel de agotamiento emocional alto, 27,3% nivel de despersonalización alto y 39,9% nivel de realización personal bajo. El estado civil, ingreso familiar, tipo de institución donde labora, la edad y el número de hijos se asocian al nivel de agotamiento emocional ( $p<0,05$ ). El sexo, la profesión, tipo de institución, edad y número de hijos se asocian al nivel de despersonalización ( $p<0,05$ ). El tipo de institución y la edad se asocian al nivel de realización personal ( $p<0,05$ ).

**Conclusiones:** El modelo logístico ordinal propuesto indica el 69,2% de éxito en nivel de agotamiento emocional, el 60,8% de éxito para el nivel de despersonalización y el 58,7% con el modelo para nivel de realización personal.

**Palabras clave:** Síndrome de Burnout, personal de salud, COVID-19 (*Fuente: MeSH*).

## INTRODUCTION

The COVID-19 pandemic has caused an increasing burden on medical services in both developed and developing countries. The shortage of human and non-human resources for patient care resulted in a marked increase in the workload of health professionals. This could lead to an increase in mental health problems in health care personnel <sup>(1)</sup>.

Burnout syndrome is a multifactorial pathology (physical, psychological and emotional), resulting from chronic work-related stress, and is manifested in 3 dimensions: emotional exhaustion, depersonalization and personal fulfillment <sup>(2-4)</sup>.

Emotional exhaustion is a negative emotional reaction to work as a consequence of prolonged exposure to a stressful work environment <sup>(5)</sup>. Depersonalization is a psychological state in which the professional can generate attitudes of indifference, egocentrism, demotivation, among others. Personal fulfillment consists of a decrease or even loss of self-esteem at work <sup>(6)</sup>.

Studies in different parts of the world show that this health problem has a worldwide incidence. Thus, in a study carried out among health personnel in Spain, 38.9% reported high levels of depersonalization, 43.3% indicated that they might need psychological treatment in the future, and 85.4% said that the lack of personal protective equipment (PPE) resulted in increased stress and anxiety. The binary logistic model analyzed determined that variables such as professional category and the subjective perception of needing psychological or psychiatric treatment in the future are those associated with emotional exhaustion <sup>(7)</sup>.

In Turkey, it was shown that there were no significant differences between the levels of emotional exhaustion according to gender and marital status. However, in the age variable there were, as older physicians were those who had higher levels of burnout compared to younger ones. The level of personal fulfillment of physicians who voluntarily chose their profession was higher than those who did not, and physicians

who actively fought the pandemic had a lower level of total burnout than those who were not active <sup>(8)</sup>.

In China, two studies were found: one of them reported that the anxiety rate of health personnel was higher in women than in men; however, it was lower among physicians than in nurses <sup>(9)</sup>. In the other study, a positive correlation between occupational stress and burnout was observed in surgical nurses, who had high scores. In addition, they were identified as risk factors for quality of life <sup>(10)</sup>.

In Canada and South Korea, they determined that the presence of Burnout, among other job demands, influences intentions to leave the job and is related to health problems <sup>(11,12)</sup>.

In Chile, 169 public health professionals were analyzed, resulting in 10.7% of them with high levels of Burnout, 88.8% at Medium/Moderate level, with the highest scores in the dimension of personal fulfillment and emotional exhaustion <sup>(13)</sup>.

In Peru, a study found that professional burnout in physicians and nurses in 7 cities reached 5.5% prevalence; the associated factors were: having a medical profession, being male, having family separation, being dissatisfied with their work schedule, having an aggravated or work-related illness, and working in level III health facilities <sup>(14)</sup>. Another study carried out in Peru (Arequipa), confirms that nurses present Burnout Syndrome at considerable levels, and this is associated with the length of service they have been providing <sup>(15)</sup>.

The above reflects the importance of establishing a logistic regression for a better understanding of the factors that come together to explain Burnout Syndrome in healthcare professionals.

The general objective of the present study was to determine a logistic model for the factors associated with the dimensions of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic in Trujillo, Peru.

The specific objectives were to identify social factors such as gender, age, marital status, number of children, family income, specialty, profession, and length of service associated with the dimensions of Burnout Syndrome; to identify demographic factors such as type of institution, category of health facility associated with the dimensions of Burnout Syndrome; to identify whether presenting chronic illness is associated with the dimensions of Burnout Syndrome and, finally, to estimate the degree of fit of the model to predict the dimensions of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic in Trujillo - Peru.

## **MATERIAL AND METHOD**

The type of study was quantitative with a cross-sectional, correlational design <sup>(16)</sup>.

The population consisted of health professionals such as physicians, nurses, nutritionists and medical technologists, who are treating COVID-19 patients in the facilities of the Micro network of Trujillo and the Social Security Healthcare Network (ESSALUD) in the city of Trujillo. The data were collected from June to August 2021.

To determine the number of professionals, the data provided by the Ministry of Health in the La Libertad region were taken into account; however, as the work was carried out with professionals from the city of Trujillo (which belongs to this region), an unknown population was considered for the sample estimation, with a confidence of 95%, 8% error and a prevalence of Burnout Syndrome of 50%, obtaining a sample of 143 health professionals. For the estimation of the number of health professionals, it was considered proportional to the population of health workers according to specialty at the regional level and taking into account the accessibility of the information, the sampling was taken by convenience, obtaining a sample of 76 physicians, 36 nurses, 22 nutritionists and 9 technologists <sup>(17)</sup>.

All healthcare workers from the healthcare facilities who agreed to participate in the study and who had direct contact with the COVID-19 patients were included. Likewise, when performing the quality control of the information obtained, forms with errors and incomplete were excluded.

For data collection, the technique used was the survey and the instrument was a questionnaire, which was made up of 2 parts <sup>(16)</sup>. The first part asked about social factors such as gender, age, marital status, number of children, family income, specialty, profession and time in service of the participants; demographic factors such as type of institution, category of health facility (according to the classification of the Ministry of Health) <sup>(17)</sup> and whether the patient has any comorbidity.

The second part included the Maslach Burnout Inventory (MBI-HSS), which contains 22 items and is composed of three subscales: emotional exhaustion, depersonalization and personal fulfillment; the response options range from 0 (never) to 6 (every day). This questionnaire has been adapted to Spanish and validated by Gil-Monte and Peiró (1999), who explored the three-factor structure of the scale, with a total variance of 43% and factor loads greater than 0.40; The reliability by the Alpha index was greater than 0.70. In addition, psychometric evidence in Chilean professionals confirmed the 3-dimensional structure, with fit indexes higher than 0.90, factor loads higher than 0.47 and Alpha indexes between 0.72 and 0.86 <sup>(18)</sup>.

For the statistical analysis, the Excel program was first used to prepare the database, which was then exported to the SPSS version 27 statistical program. A descriptive bivariate analysis was applied to the variables entered and inferential statistics using statistical tests such as Chi-Square or equivalent association tests for qualitative variables. Also, taking into account that the dependent variable is ordinal, the ordinal logistic models were used (prior verification of the assumptions), determining whether the model found is significant. After that, the variables that entered the model were analyzed, identifying the R2 determination coefficients, as well as the correct forecast percentage <sup>(19,20)</sup>.

This research was approved by the ethics committee of the Faculty of Health Sciences of the Universidad César Vallejo (Report 009-CE-FCS-UCV-21), and the identity of the workers surveyed was kept anonymous. Each participant gave informed consent prior to the application of the questionnaire.

## RESULTS

**Table 1:** Factors associated with the level of Emotional Exhaustion of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic, Trujillo - Peru

Factors		Level of Emotional Exhaustion						Total		Sig.
		Low		Middle		High				
		N	%	n	%	n	%	n	%	
Gender	Female	63	70,8%	13	68,4%	23	65,7%	99	69,2%	0,856
	Male	26	29,2%	6	31,6%	12	34,3%	44	30,8%	
N° of children	No children	17	19,1%	10	52,6%	19	54,3%	46	32,2%	0,000 <sup>a</sup>
	1 to 2 children	54	60,7%	7	36,8%	14	40,0%	75	52,4%	
	3 children or more	18	20,2%	2	10,5%	2	5,7%	22	15,4%	
	Mean ± DS	(1,6 ± 1,2)		(0,9 ± 1,2)		(0,9 ± 1,2)		(1,3 ± 1,2)		
Age	< 35 years old	19	21,3%	13	68,4%	14	40,0%	46	32,2%	0,001 <sup>a</sup>
	35 -59 years	60	67,4%	6	31,6%	20	57,1%	86	60,1%	
	60 years and older	10	11,2%	0	0,0%	1	2,9%	11	7,7%	
	Mean ± DS	(45 ± 10,8)		(35,5 ± 7,7)		(38 ± 8,9)		(42 ± 10,7)		
Marital Status	Married/ cohabiting partner	65	73.00%	4	21,1%	16	45,7%	85	59,4%	0,000 <sup>a</sup>
	Separated/ Divorced	5	5,6%	4	21,1%	0	0.00%	9	6,3%	
	Single	18	20,2%	11	57,9%	19	54,3%	48	33,6%	
	Widowed	1	1,1%	0	0.00%	0	0.00%	1	0,7%	
Family income	Less than S/3000	16	18.00%	5	26,3%	0	0.00%	21	14,7%	0,000
	From S/3000 to S/6000	31	34,8%	13	68,4%	21	60.00%	65	45,5%	
	Over S/6000	42	47,2%	1	5,3%	14	40.00%	57	39,9%	
Profession	Physician	47	52,8%	3	15,8%	26	74,3%	76	53,1%	0,377
	Nurse	23	25,8%	10	52,6%	3	8,6%	36	25,2%	
	Nutritionist	14	15,7%	2	10,5%	6	17,1%	22	15,4%	
	Medical technologist	5	5,6%	4	21,1%	0	0.00%	9	6,3%	
Specialization	No	24	27.00%	8	42,1%	12	34,3%	44	30,8%	0,377
	Yes	65	73.00%	11	57,9%	23	65,7%	99	69,2%	
Service time during the pandemic	<6 months	14	15,7%	5	26,3%	2	5,7%	21	14,7%	0,360
	> 6 months	75	84,3%	14	73,7%	33	94,3%	122	85,3%	
Type of institution	Private	15	16,9%	4	21,1%	6	17,1%	25	17,5%	0,008
	Public	74	83,1%	15	78,9%	29	82,9%	118	82,5%	
Category of health facility	Level I – Level II	45	50,6%	8	42,1%	15	42,9%	68	47,6%	0,066 <sup>a</sup>
	Level III or higher	38	42,7%	11	57,9%	18	51,4%	67	46,9%	
	No, it is private	6	6,7%	0	0.00%	2	5,7%	8	5,6%	
Chronic disease	No	69	77,5%	18	94,7%	27	77,1%	114	79,7%	0,898
	Yes	20	22,5%	1	5,3%	8	22,9%	29	20,3%	
Total		89	100%	19	100%	35	100%	143	100%	
% Column		62.2%		13.3%		24.5%				

Source: Maslach questionnaire database applied to healthcare personnel.

Note: The variables were entered into an ordinal logit model, ( $X^2 = 42.05$ ,  $p < 0.001$ ), Nagelkerke ( $R^2 = 0.30$ ) Cox and Snell ( $R^2 = 0.26$ ), and McFadden ( $R^2 = 0.16$ ).

<sup>a</sup> Gamma test was applied

In Table 1 we can see that the majority of health professionals have a low level of emotional exhaustion, 62.2%; however, there is a percentage of them who have a high level, 24.5%. Within the characteristics of the professionals with a high level of burnout we find, sex: female, marital status: single, family income: 3000 to 6000 soles,

profession: physicians, with specialization, more than 6 months of service, work in public institutions at level III or higher, do not have a chronic disease, have an average age of 38 years and have 1 child. In the bivariate analysis, there is statistical evidence to affirm that the number of children, age, marital status, family income and type of institution where they work are associated with the level of emotional exhaustion ( $p < 0.05$ ).

**Table 2:** Factors associated with the depersonalization level of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic, Trujillo – Peru

Variables		Level of Depersonalization						Total		Sig.
		Low		Middle		High				
		N	%	n	%	n	%	n	%	
Gender	Female	51	68,9%	26	86,7%	22	56,4%	99	69,2%	0,026
	Male	23	31,1%	4	13,3%	17	43,6%	44	30,8%	
N° of children	No children	19	25,7%	9	30,0%	18	46,2%	46	32,2%	0.004
	1 to 2 children	36	48,6%	20	66,7%	19	48,7%	75	52,4%	
	3 children or more	19	25,7%	1	3,3%	2	5,1%	22	15,4%	
	Mean ± DS	(1,7 ± 1,3)		(1,1 ± 1)		(0,9 ± 1,1)		(1,3 ± 1.2)		
Age	< 35 years old	18	24,3%	12	40,0%	16	41,0%	46	32,2%	0.011 <sup>a</sup>
	35 -59 years	47	63,5%	17	56,7%	22	56,4%	86	60,1%	
	60 years and older	9	12,2%	1	3,3%	1	2,6%	11	7,7%	
	Media ± DS	(45,8 ± 11)		(38,9 ± 9.3)		(37,2 ± 8.3)		(42 ± 10,7)		
Marital status	Married/ cohabiting partner	44	59,5%	18	60.00%	23	59.00%	85	59,4%	0,476 <sup>b</sup>
	Separated/ Divorced	7	9,5%	2	6,7%	0	0.00%	9	6,3%	
	Single	22	29,7%	10	33,3%	16	41.00%	48	33,6%	
	Widowed	1	1,4%	0	0.00%	0	0.00%	1	0,7%	
Family income	Less than S/3000	11	14,9%	5	16,7%	5	12,8%	21	14,7%	0,566
	From S/3000 to S/6000	34	45,9%	10	33,3%	21	53,8%	65	45,5%	
	Over S/6000	29	39,2%	15	50.00%	13	33,3%	57	39,9%	
Profession	Physician	30	40,5%	17	56,7%	29	74,4%	76	53,1%	0,049 <sup>b</sup>
	Nurse	23	31,1%	8	26,7%	5	12,8%	36	25,2%	
	Nutritionist	15	20,3%	4	13,3%	3	7,7%	22	15,4%	
	Medical technologist	6	8,1%	1	3,3%	2	5,1%	9	6,3%	
Specialization	No	17	23.00%	11	36,7%	16	41.00%	44	30,8%	0,104
	Yes	57	77.00%	19	63,3%	23	59.00%	99	69,2%	
Service time during the pandemic	<6 months	13	17,6%	2	6,7%	6	15,4%	21	14,7%	0,360
	> 6 months	61	82,4%	28	93,3%	33	84,6%	122	85,3%	
Type of institution	Private	9	12,2%	11	36,7%	5	12,8%	25	17,5%	0,008
	Public	65	87,8%	19	63,3%	34	87,2%	118	82,5%	
Category of health facility	Level I – Level II	32	43,2%	20	66,7%	16	41.00%	68	47,6%	0,066 <sup>b</sup>
	Level III or higher	39	52,7%	7	23,3%	21	53,8%	67	46,9%	
	No, it is private	3	4,1%	3	10.00%	2	5,1%	8	5,6%	
Chronic	No	58	78,4%	24	80.00%	32	82,1%	114	79,7%	0,898



disease	Yes	16	21,6%	6	20,00%	7	17,9%	29	20,3%
Total		74	100%	30	100%	39	100%	143	100%
% Column		51,7%		21%		27,3%			

Source: Maslach questionnaire database applied to healthcare personnel.

Note: Variables were entered into an ordinal logit model, ( $X^2 = 43.46$ ,  $p < 0.05$ ), Nagelkerke ( $R^2 = 0.30$ ) Cox and Snell ( $R^2 = 0.26$ ), and McFadden ( $R^2 = 0.15$ ).

<sup>a</sup> Gamma test was applied

<sup>b</sup> Cramer's V test was applied

In Table 2 we can see that the majority of health professionals have a low level of Burnout Syndrome depersonalization, 51.7%; however, there is a percentage of them who have a high level, 27.3%. Within the characteristics of the professionals with a high level of depersonalization we find, sex: female, marital status: married, family income: 3000 to 6000 soles, profession: physicians, with specialization, more than 6 months of service, work in public institutions at level III or higher, do not have a chronic disease, have an average age of 37 years and have 1 child. In the bivariate analysis, there is statistical evidence to affirm that gender, number of children, age, profession and type of institution are associated with the level of depersonalization ( $p < 0.05$ ).

**Table 3:** Factors associated with the level of personal fulfillment of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic, Trujillo - Peru.

Variables		Level of personal fulfillment						Total		Sig.
		Low		Middle		High				
		N	%	n	%	n	%	n	%	
Gender	Female	43	75,4%	23	79,3%	33	57,9%	99	69,2%	0,054
	Male	14	24,6%	6	20,7%	24	42,1%	44	30,8%	
N° of children	No children	20	35,1%	10	34,5%	16	28,1%	46	32,2%	0.599
	1 to 2 children	28	49,1%	17	58,6%	30	52,6%	75	52,4%	
	3 children or more	9	15,8%	2	6,9%	11	19,3%	22	15,4%	
	Mean ± DS	(1,2 ± 1,2)		(1,3 ± 1,2)		(1,5 ± 1,3)		(1,3 ± 1,2)		
Age	< 35 years old	23	40,4%	11	37,9%	12	21,1%	46	32,2%	0.006 <sup>a</sup>
	35 -59 years	32	56,1%	17	58,6%	37	64,9%	86	60,1%	
	60 years and older	2	3,5%	1	3,4%	8	14,0%	11	7,7%	
	Mean ± DS	(40,5 ± 11,2)		(39,8 ± 9,93)		(44,6 ± 10,1)		(42 ± 10,7)		
Marital status	Married/ cohabiting partner	30	52,6%	15	51,7%	40	70,2%	85	59,4%	0,441 <sup>b</sup>
	Separated/ Divorced	4	7.00%	2	6,9%	3	5,3%	9	6,3%	
	Single	22	38,6%	12	41,4%	14	24,6%	48	33,6%	
	Widowed	1	1,8%	0	0.00%	0	0.00%	1	0,7%	
Family income	Less than S/3000	11	19,3%	4	13,8%	6	10,5%	21	14,7%	0,518
	From S/ 3000 to S/ 6000	23	40,4%	16	55,2%	26	45,6%	65	45,5%	
	Over S/ 6000	23	40,4%	9	31.00%	25	43,9%	57	39,9%	
Profession	Physician	26	45,6%	16	55,2%	34	59,6%	76	53,1%	0,196 <sup>b</sup>
	Nurse	19	33,3%	6	20,7%	11	19,3%	36	25,2%	
	Nutritionist	11	19,3%	5	17,2%	6	10,5%	22	15,4%	
	Medical technologist	1	1,8%	2	6,9%	6	10,5%	9	6,3%	

Specialization	No	20	35,1%	8	27,6%	16	28,1%	44	30,8%	0,66
	Yes	37	64,9%	21	72,4%	41	71,9%	99	69,2%	
Service time during the pandemic	<6 months	10	17,5%	3	10,3%	8	14,00%	21	14,7%	0,661
	> 6 months	47	82,5%	26	89,7%	49	86,00%	122	85,3%	
Type of institution	Private	6	10,5%	3	10,3%	16	28,1%	25	17,5%	0,025
	Public	51	89,5%	26	89,7%	41	71,9%	118	82,5%	
Category of health facility	Level I – Level II	30	52,6%	11	37,9%	27	47,4%	68	47,6%	0,182 <sup>b</sup>
	Level III or higher	26	45,6%	17	58,6%	24	42,1%	67	46,9%	
	No, it is private	1	1,8%	1	3,4%	6	10,5%	8	5,6%	
Chronic disease	No	42	73,7%	24	82,8%	48	84,2%	114	79,7%	0,339
	Yes	15	26,3%	5	17,2%	9	15,8%	29	20,3%	
Total		57	100%	29	100%	57	100%	143	100%	
% Column			39,9%		20,3%		39,9%			

Source: Maslach questionnaire database applied to healthcare personnel.

Note: Variables were entered into an ordinal logit model, ( $X^2 = 39.30$ ,  $p < 0.05$ ), Nagelkerke ( $R^2 = 0.273$ ) Cox and Snell ( $R^2 = 0.24$ ), and McFadden ( $R^2 = 0.13$ ).

<sup>a</sup> Gamma test was applied

<sup>b</sup> Cramer's V test was applied

Table 3 shows that 39.9% of health professionals have a low level of personal fulfillment of Burnout Syndrome. Within the characteristics of these professionals we find, gender: female, married, family income of 3000 soles or more, medical profession, with specialization, with more than 6 months of service during the pandemic, working in public institutions at level I and II, no chronic disease, with an average age of 40.5 and 1 child. In the bivariate analysis, there is statistical evidence to affirm that age and type of institution are associated with the level of personal fulfillment ( $p < 0.05$ ).

**Table 4:** Ordinal logistic regression model for the levels of Burnout Syndrome dimensions in healthcare personnel during the COVID-19 pandemic, Trujillo - Peru.

Dimension	Model variables/categories		Estimation	Desv, Error	Wald	gl	Sig,	95% confidence interval	
								Lower limit	Upper limit
Level of emotional exhaustion	Dependent Variable	Low	11,94	2,12	31,83	1	0,00	7,79	16,09
		Middle	12,75	2,11	36,51	1	0,00	8,62	16,89
	Independent variable.	Age	-0,08	0,03	8,31	1	0,00	-0,13	-0,02
		Married/Cohabitant	12,97	0,54	583,63	1	0,00	11,92	14,02
		Separated/Divorced	13,22	0,93	200,49	1	0,00	11,39	15,05
Level of Depersonalization	Dependent Variable	Low	14,09	1,94	52,6	1	0,00	10,28	17,89
		Middle	15,26	1,94	61,69	1	0,00	11,45	19,07
	Independent variable.	Age	-0,05	0,02	4,53	1	0,03	-0,1	0,00
		Married/Cohabitant	15,6	0,5	956,65	1	0,00	14,61	16,59
		Separated/Divorced	14,57	1,03	200,75	1	0,00	12,55	16,58
Level of Personal fulfillment	Profession	Physician	2,43	0,92	6,96	1	0,01	0,63	4,24
	nt Dependent Variable	Low	17,24	1,88	84,53	1	0,00	13,57	20,92
		Middle	18,27	1,88	94,61	1	0,00	14,59	21,96



Independent variable.	Age	0,08	0,02	9,89	1	0,00	0,03	0,13
Marital status	Married/Cohabitant	17,53	0,48	1314,9	1	0,00	16,59	18,48
	Separated/Divorced	17,88	0,82	472,56	1	0,00	16,27	19,5
Profession	Nutritionist	-2,78	1,08	6,6	1	0,01	-4,9	-0,66
Type of Institution	Public	1,28	0,58	4,85	1	0,03	0,14	2,42
Chronic disease	No	1,13	0,4799	6	1	0,02	0,19	2,07

Source: Maslach questionnaire database applied to healthcare personnel.

The ordinal regression model, with logit link function, for the levels of the Burnout Syndrome dimensions, is shown in Table 4, after joint evaluation of the assumptions, the goodness-of-fit test and the R<sup>2</sup> coefficients of determination, shown in the previous tables. Here it was possible to determine that the models were significant, entering the variables age, marital status married/cohabitant, separated/divorced for the three dimensions; in the model of the depersonalization dimension, the medical profession is added and for the level of personal fulfillment, the nutritionist profession, type of public institution and no chronic disease are added.

**Table 5:** Predicted level of Burnout dimensions with ordinal regression models of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic, Trujillo - Peru.

Dimension	Observed level	Predicted level				Successful (%)
		Low	Middle	High	Total	
Level of Emotional Exhaustion	Low	81	0	8	89	91,0%
	Middle	13	0	6	19	0,0%
	High	17	0	18	35	51,4%
	Total	111	0	32	143	<b>69,2%</b>
Level of Depersonalization	Low	65	0	9	74	87,8%
	Middle	21	0	9	30	0,0%
	High	17	0	22	39	56,4%
	Total	103	0	40	143	<b>60,8%</b>
Level of personal fulfillment	Low	43	0	14	57	75,4%
	Middle	13	0	16	29	0,0%
	High	16	0	41	57	71,9%
	Total	72	0	71	143	<b>58,7%</b>

Source: Maslach questionnaire database applied to healthcare personnel

Table 5 relates the level of achievement predicted with the level of achievement observed in the Burnout Syndrome dimensions, elaborated using the forecast provided by SPSS, as in logistic regression, finding 69.2% success with the ordinal regression model in emotional exhaustion level, 60.8% success with the depersonalization level model and 58.7% with the personal fulfillment level model.

## DISCUSSION

The data collected in the research show that Burnout Syndrome in health professionals in the city of Trujillo-Peru, was evidenced in only 6.3% of them. However, when analyzing by dimensions, it can be seen that 24.5% have a high level of emotional exhaustion, coinciding with a study conducted in India, which points to burnout as an important occupational problem among health care professionals, especially during the COVID-19 pandemic <sup>(21)</sup>. A similar result was also found in a sample of health professionals in the city of Arequipa-Peru, where 5.6% of severe cases of Burnout Syndrome were found <sup>(22)</sup>.

Regarding the level of depersonalization, 27% of health personnel in Trujillo had a high level of depersonalization, something close to the study carried out in Cusco-Peru where this same level was found in 33.6% of the personnel in the emergency area of a public hospital <sup>(23)</sup>. Likewise, in Russia, 38% of health workers have become more insensitive towards people since they took this job during the pandemic <sup>(24)</sup>. Besides, the characteristics found of these professionals affected in this dimension of Burnout Syndrome coincide with a study in Ecuador, which indicates that most of them are doctors, married and work in public institutions <sup>(6)</sup>.

It is important to mention that in the dimensions of exhaustion and depersonalization, the majority of healthcare professionals were found with more than 6 months of service, aged close to 40 years and working in public institutions of level III, similar to a study conducted in seven cities in Peru <sup>(14)</sup>. This would be supported by the fact that when COVID-19 cases reached their highest peak, these hospitals were the most overloaded, lacking the necessary implements to combat the pandemic, generating fatigue and demotivation in health professionals who faced this situation on a daily basis.

In the bivariate analysis, one of the characteristics associated with depersonalization is the profession, and a study conducted in Spain also confirms that doctors and nurses are at greater risk of suffering emotional exhaustion than other professionals, since they devote more time to patients performing the most elementary care with basic needs <sup>(7)</sup>. Other characteristics associated with depersonalization are age and female sex, similar to the study conducted in Brazil <sup>(25)</sup>, but different from the multiple linear regression study conducted on physicians residing in the United States, which concluded that being male is a characteristic that influences depersonalization <sup>(26)</sup>.

The findings also show that 40% of professionals have a low level of personal fulfillment, with characteristics similar to those found in studies carried out in Ecuador and Colombia, where most of the healthcare workers practice in public institutions and have more time of service. This could be explained by the fact that these professionals feel that the time devoted to their work does not meet their personal expectations and they are demotivated <sup>(6,27)</sup>.

The joint evaluation of the factors yielded significant models for the three dimensions ( $p < 0.05$ ). The level of emotional exhaustion is explained by age and marital status; age in the inverse sense would explain that younger professionals tend to have greater emotional exhaustion in Trujillo. The level of depersonalization is explained by age, marital status and the profession of physician, unlike the model proposed by a

study in Spain where the emotional exhaustion dimension is explained only by the profession of physician and nurse, so we agree on the need to consider specific mental health care services and crisis training to avoid possible psychological disorders <sup>(7)</sup>.

Personal fulfillment in the health professionals analyzed, according to the model, is explained by age, marital status: married/cohabiting, separated/divorced, profession: nutritionist, type of institution and not having a chronic disease. This can be explained by the fact that health professionals in this pandemic were affected, dedicating a large part of their time only to combat it, and in many cases with insufficient resources for individual protection, putting their personal and family health at risk. On the other hand, in the case of the nutritionists, it entered as an inverse factor in the model because these professionals had less exposure to working with COVID-19 patients, having remote work, generating low levels of personal fulfillment <sup>(28)</sup>.

In Chile they also worked on a linear regression model for Burnout Syndrome, entering variables such as intrinsic motivation and years of service and a multivariate logistic model, where age turned out to be a protective factor and having children a risk factor for this disease, coinciding in part with our results <sup>(13,29)</sup>.

The information obtained is of vital importance for the development of future protocols and training of healthcare personnel to deal with an emergency pandemic environment. In Trujillo-Peru, it is important to have the physical means for their protection, as well as updated and accurate information to avoid uncertainty, preventing mental health diseases in healthcare professionals.

The main limitation for the present study was to reach a larger sample size; however, robust statistical tests were used to allow the results to be generalizable at the population level and it was observed that an ordinal logistic regression model was determined for each of the dimensions of Burnout Syndrome. In addition, it is important to take into account the context of the difficulty in administering the questionnaire, considering it opportune to carry out this type of study at a historical moment such as the one in which we are facing this pandemic.

## CONCLUSIONS

Social factors associated with emotional exhaustion were found to be marital status, family income, age and number of children; gender, profession, age and number of children were found to be associated with depersonalization; and only age was associated with personal fulfillment.

Of the demographic factors, only the type of institution is associated with all three dimensions of Burnout Syndrome.

The presence or absence of chronic illness is not associated with any of the dimensions of Burnout Syndrome.

Regarding the multivariate analysis, the degree of adjustment of each of the models was significant for predicting the dimensions of Burnout Syndrome in healthcare personnel during the COVID-19 pandemic in Trujillo, Peru.

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