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## Impact of the COVID-19 pandemic on digestive endoscopists: an Ibero-American study

Robin German Prieto-Ortiz<sup>1</sup>, Camilo de Jesús Blanco-Avellaneda<sup>2</sup>, Ricardo Cepeda-Vásquez<sup>3</sup>, Diana Yanira Chimbi Rojas<sup>4</sup>, Jhon Edison Prieto-Ortiz<sup>5</sup>, Leticia Moreira-Ruíz<sup>6</sup>, Lázaro Antonio Arango-Molano<sup>7</sup>.

1. Gastroenterology and Digestive Endoscopy Specialist, Centro de Enfermedades Hepáticas y Digestivas CEHYD. Bogotá D.C., Colombia.
2. Endoscopy and Gastrointestinal Surgery Specialist, Unidad de Videoendoscopia del Restrepo Ltda. Bogotá D.C., Colombia.
3. Internal Medicine and Gastroenterology Specialist, Organización Keralty. Bogotá D.C., Colombia.
4. Registered Nurse, Epidemiologist, Subred Integrada de Servicios de Salud Sur. Bogotá D.C., Colombia.
5. Gastroenterology and Hepatology Specialist, Centro de Enfermedades Hepáticas y Digestivas CEHYD. Bogotá D.C., Colombia.
6. Gastroenterologist, Gastroenterology Service, Hospital Clínic, Barcelona, España.
7. Gastrointestinal Surgery and Digestive Endoscopy Specialist. Unión de Cirujanos, Oncólogos de Occidente, Universidad de Caldas, Manizales. Colombia.

Corresponding author:

Robin Germán Prieto Ortiz

Calle 127 No 19 A 28, Doctor's office: 412, Acomédica I building

Bogotá D.C., Colombia

rgprietoo@hotmail.com

## Abstract

**Introduction.** The COVID-19 pandemic has seriously affected the world population, and has put health personnel on the spotlight for they are the ones tasked with its management. Given their important role in the current health crisis, physicians have been heavily affected in terms of their professional practice, financial condition, and physical and mental health. The objective of this study was to determine the consequences of the COVID-19 pandemic in Colombian endoscopists and make a comparison with endoscopists from South America and from Spain.

**Methodology.** In June 2021, an electronic survey was administered to 292 endoscopists from Colombia, South America and Spain to determine the impact of the pandemic on their professional practice, economic situation, physical and mental health, and the training of the residents they were in charge of. Participants were recruited through convenience sampling.

**Results.** A reduction in the number of endoscopic procedures was reported by 69.9% of the respondents, and 72.3% of endoscopists in Colombia stated their income had decreased. Regarding the doctor-patient relationship, 43.8% of the respondents believed it had worsened. In addition, 70.9% reported having experienced emotional state changes, especially those related to feeling sad or depressed, and 56.5% expressed that the pandemic had negatively affected the training of residents. Finally, 24.7% endoscopists tested positive for COVID-19, and 19.2% reported the death of a family member due to COVID-19.

**Conclusion.** The COVID-19 pandemic has had a negative impact on the professional practice, financial situation and physical and mental health of Ibero-American endoscopists. These problems must be identified in a timely manner to develop and implement strategies aimed at preventing their occurrence.

**Keywords:** Pandemic. COVID-19. Endoscopists. Infection. Physical health. Mental health.

## Introduction

The COVID-19 pandemic is currently the seven deadliest pandemics in the history of mankind (1). Since it was declared a pandemic by the World Health Organization (WHO) (2), the number of endoscopic procedures has decreased significantly due to compliance of endoscopists with the recommendations made by several medical associations to slow down the spread of the SARS-CoV-2 virus (3-8). The current pandemic has had occupational, economic, academic, and physical and mental health implications for both the general population and specifically endoscopists (9-12).

The main goal of this study was to determine the professional, socioeconomic, physical and mental health consequences of the COVID-19 pandemic in three groups of endoscopists by comparing the results obtained in Colombian endoscopists with those of endoscopists from countries with similar economic conditions and health systems (South America) and with those of endoscopists from a first-world country (Spain), and evaluating a possible relationship between said implications and the outcomes derived from the pandemic in this population.

### **Methodology**

Cross-sectional analytical study. An electronic survey was used to determine the impact of the COVID-19 pandemic on the professional practice, economic situation, and physical and mental health of endoscopists from Colombia, South America (Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, Peru, Uruguay, Venezuela) and Spain, as well as on the training of the residents they were in charge of. Participants were recruited by means of convenience sampling.

The survey, which was created in Google Forms, consisted of 23 questions and was divided into five sections: demographic information (5 questions), SARS-COV-2 infection and prevention measures (6 questions), occupational information (8 questions), academic information (2 questions), and physical and mental health information (2 question). The instrument is available at <https://tinyurl.com/awv7xysx>.

The survey was made available through the social networks of ACED (Colombian Association of Digestive Endoscopy) and the Spanish Association of Gastroenterology websites. It remained open for completion from June 1 to June 30, 2021, and only one

response per respondent was accepted; data anonymity was also ensured. The classification of participants into each of the three groups was achieved by making mandatory for each respondent to state their country of residence. Taking into account that in Colombia and South America health care is provided in various contexts (health insurance companies, private consultations, state institutions), while in Spain the State is the main responsible for health care provision, there were no restrictions regarding the work setting of respondents.

Data processing was performed in the Microsoft Excel software. Comparative tables were created using the data obtained in each group. Likewise, data were described using absolute and relative frequencies. A bivariate and a multivariate analysis were performed, and measures of association (relative risk) were calculated.

## **Results**

A total of 292 responses were included: 101 participants (34.6%) were from Colombia, 127 (43.5%) from South America, and 64 (21.9%) from Spain. Men (n=195) were predominant (66.8% vs. 33.2%). A decrease in the number of endoscopic procedures was reported by 69.9% of the respondents, being this result more frequent in Colombian (77.2%) and South American (78.0%) endoscopists than in those living in Spain (42.2%). Regarding the doctor-patient relationship, 43.8% of the respondents believed it had worsened and 44.5%, that it had remained the same (Table 1).

Regarding their income, 72.3% of Colombian endoscopists reported it had decreased, and a similar frequency was observed in the South American group (69.3%); however, only 14.1% of the participants living in Spain reported having experienced such reduction. In addition, an increase in the costs of the supplies necessary for the operation of endoscopy units was reported by 62.5%, 71.7% and 21.9% of the respondents from Colombia, South America and Spain, respectively (Table 2).

In relation to the effects of the COVID-19 pandemic, 56.5% of the respondents believed that it has had a negative impact on the training of residents. In addition, 54% participants stated that online training resources do not compensate for face-to-face academic training, which was affected by the reduction in the number of endoscopic procedures;

however, such resources should continue to be used as an academic tool according to 56.6% of the respondents.

At the beginning of the pandemic, 96.6% participants complied with infection prevention protocols; somehow, 15 months later, at the time of completing the survey, only 90% did it, being this reduction more significant in the Spanish endoscopists groups (98.4% vs. 73.4%). Regarding SARS-CoV-2 infection rates, 24.7% of the respondents had had COVID-19, being more frequent in the South American endoscopists group (30.7%), and of these, 23.6% reported having some type of sequelae. Finally, 19.2% of participants reported the death of a family member due to causes related with the pandemic (Table 3). Most participants (70.9%) reported having experienced changes in their emotional state as a consequence of the pandemic. Feeling sad or depressed was the most frequent mental health symptom (69.2%), but other symptoms such as irritability, work-related concerns, economic concerns and concerns about the academic training of their students were also observed in more than half of them. In addition, all endoscopists expressed being worried about the negative consequences for their patients' health of being unable to perform endoscopic procedures and reach a diagnosis in a timely manner (Table 4). When the relative risk was assessed, it was found that Colombian (RR=2.7) and South American (RR=3.2) endoscopists were more than two times more likely to experience emotional problems as a result of the pandemic than endoscopists from Spain (RR=1.28).

## **Discussion**

**Work-related and economic effects of the COVID-19 pandemic.** The pandemic has caused a significant reduction in the number of endoscopic procedures worldwide (13,14), which is similar to what was described in the present study by most of the respondents working in Colombia and South America. In this regard, according to a study in which a survey was administered to 163 endoscopists in 48 countries, a decrease in the number of procedures performed was experienced in 99% of the endoscopy units where they were working, and in fact, 4 units (2.4%) stopped performing them at all (15).

More than 70% of participants from Colombia and South America reported their income had decreased up to 75%; however, in the case of endoscopists working in Spain, only 14%

of them reported having experienced such decrease. In addition, according to 57.5% of the respondents, the costs of the supplies required for the operation of endoscopy units increased during the pandemic, being this finding more frequent in the Colombian and the South American endoscopists groups.

Worldwide, unemployment rates have increased and even some companies have closed down due to the pandemic. In addition, the need to use PPE and making infrastructure adjustments to reduce the risk of SARS-CoV-2 infection in healthcare settings has contributed to the reduction of the revenue resulting from healthcare provision-related activities; in fact, in the United States, some private hospitals have reported their income has decreased by 50 to 60%, while in the case of some institutions dedicated only to the performance of diagnostic procedures, such reduction reaches up to 80% (16).

Regarding the doctor-patient relationship, almost half (44.5%) of participants in the present study believed that it had not changed at all, while 43.8%, that in fact it had worsened. In particular, in the Spanish group, the proportion of endoscopist who believed this relationship had worsened was much higher.

**Impact of the COVID-19 pandemic on the training of residents.** Regarding the impact of the pandemic on the training of residents, 56.5% of the respondents believed that it has been negatively affected and 86% stated that the reduction in the number of endoscopic procedures has had a negative impact on it; somehow, 56.6% stated that the online resources implemented during the pandemic should be continue to be used as educational tools.

Worldwide, universities and higher education institutions offering health sciences training programs have been seriously affected by the decrease in the number of procedures as a result of the pandemic (17). In this regard, one study that evaluated the number of procedures performed by gastroenterology residents per year found a notable reduction between 2019 and 2020 (372 vs. 113) (18). Given the control and prevention measures implemented worldwide to slow down the spread of COVID-19, including social distancing and human mobility restrictions, several educational methods based on online resources have been used to continue the training of healthcare personnel, especially the use of

social networks and online learning platforms (19-20); likewise, medical associations have made contributions to this end by creating and making available learning material in their websites. This way, provided the current situation, the training model of healthcare personnel that was based on the performance of a high volume of procedures has been adapted to using new educational models such as Internet-based learning (21).

**Compliance with biosafety measures.** In the present study, 96.6% of the respondents complied with the PPE use protocols at the beginning of the pandemic; however, at the time of completing the survey, this proportion had decreased, especially in endoscopists residing in Spain; on the contrary, the majority of respondents from South America (93.7%) and Colombia (96%) continued to comply with all PPE use protocols.

In this regard, according to a study conducted in Spain, health staff still used PPE in 72 of the endoscopy units evaluated (89.2%), and in six of nine university hospitals, patient screening for COVID-18 was limited to an epidemiological questionnaire or body temperature measurement, and RT-PCR tests were performed in only four institutions (22).

**SARS-CoV-2 infection rates and health status.** The overall prevalence of COVID-19 in the sample was 24.7%, being higher in South America (30.7%) and lower in Colombia (17.8%). Of the 72 endoscopists who had COVID-19, 17 reported having some type of sequelae. In this sense, a study conducted in France found that only 12.8% of endoscopists had had a confirmatory PCR test for SARS-CoV-2, a percentage that corresponded to only one third of the physicians who experienced COVID-19 symptoms, a situation that could be explained by the availability of confirmatory tests in the country at that time (23).

Several strategies aimed at reducing the risk of infection in health personnel have been developed (24), including home care (25), telemedicine, which has increased by 260.7% during the pandemic (14), and the reduction of face-to-face medical visits (26). Despite all these measures, high SARS-CoV-2 infection and hospitalization requirement rates have been reported in healthcare staff (27).

Several studies have described a high rate of infection in health personnel. In Spain, approximately 40.900 COVID-19 cases in healthcare staff were reported during the first

months of the pandemic (28). In Colombia, as of July 6, 2021, 61.261 health workers had had COVID-19 and 301 had died from it, being auxiliary nurses the most affected, followed by physicians (10.246 cases) (29).

A study conducted in Spain, found that 172 physicians (10.6%) had been infected or were currently infected at the time of the study, and that, of these, 73.3% were professional physicians and 26.7%, residents. In addition, according to this study, 19 of these physicians required hospitalization and 1 died (22).

**Impact of the pandemic on mental health.** Based on the results of the present study, endoscopists in Colombia and South America were more than two times more likely to develop mental health problems as a result of the pandemic compared to those in Spain. In addition, 69.2% of the respondents reported feeling sad or depressed, and other symptoms such as irritability, work-related concerns, economic concerns and concerns about the academic training of their students were also observed in more than half of participants. Finally, it is worth noting that all participants expressed being worried about the negative consequences for their patients' health of being unable to perform endoscopic procedures in a timely manner.

A systematic review and meta-analysis found that anxiety and depression rates increased in the general population during the initial phase of the pandemic, and that there were no significant differences with healthcare workers (30). This finding differs from most papers addressing this topic, which have described that the prevalence of emotional disorders is higher in health workers than in the general population. One narrative review found that factors such as the lack of PPE, burnout, frustration, job insecurity, social isolation, family estrangement, and discrimination by the general population due to their constant exposure to the virus, have a considerable impact on the mental health of healthcare workers, which makes them more likely to suffer from anxiety, depression, suicidal ideation, sleep disorders, and drug and alcohol addiction (31).

A systematic review found that anxiety occurred in 9 to 90% of health workers (median prevalence: 24%). In addition, it was found that depression prevalence ranged between 5-51% (ME=21%), sleep disorders between 34-65% (ME=37%), distress between 7-97%

(ME=37%), and that family or social support is the protective factor most commonly associated with reduced risk of developing mental health problems (32). Another study found that concern worsened in 30% of participants, fear in 15%, and anxiety in 12% (33). Financial difficulties significantly increased stress and anxiety, thus constituting an increased risk of developing mental disorders (34).

Another study reported that 95.2% of respondents felt that life would probably never be normal again, and that all participants said they feared both dying alone and being buried without religious burial rituals. In addition, according to said study, eight healthcare workers reported the death of a family member due to COVID-19 and feeling guilty for their death (35).

In our study, 86% of the respondents stated they had kept living together with their families during the pandemic. Furthermore, it is worth noting that a high percentage of endoscopists (19.2%) reported the death of a family member due to causes directly related to the COVID-19 pandemic, a finding that so far has not been described in the relevant literature.

The main limitation of this study is the relatively low number of surveys that were completed and thus considered for analysis, which, despite the almost mandatory adoption of online resources due to the current pandemic, is a frequent situation in this type of study. However, this is one of the first studies assessing the perceived impact of the COVID-19 pandemic in endoscopists.

### **Conclusions**

Based on the data obtained in each of the three groups of endoscopists, the reduction of both income and the number of endoscopic procedures was higher in Colombia and South America than in Spain. Besides, although a greater decrease in the proportion of participants who followed the PPE use protocols at the time of survey completion was observed in Spain, there were less COVID-19 cases in the group of endoscopists living in Spain than in the South American group, possibly due to the different times in which the COVID-19 outbreak, and thus, the pandemic, started in each region.

Constant surveillance of the physical and mental health status of healthcare personnel during the pandemic is recommended, as well as a comprehensive approach to this problem that also considers economic and work-related aspects.

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**Table 1.** Work-related effects of the COVID-19 pandemic in Ibero-American endoscopists.

	Colombia (n=101)		South America (n=127)		Spain (n=64)		Total (n=292)	
	n	%	n	%	n	%	n	%
<b>Number of endoscopic procedures</b>								
Increased	4	4.0	11	8.7	16	25.0	31	10.6
Decreased	78	77.2	99	78.0	27	42.2	204	69.9
Remained the same	19	18.8	17	13.3	21	32.8	57	19.5
<b>% Of decrease in the number of procedures</b>								
<25%	19	18.8	23	18.1	18	28.1	60	20.5
25-50%	42	41.5	51	40.2	7	10.9	100	34.3
50-75%	14	13.9	15	11.8	1	1.6	30	10.2
>75%	3	3.0	10	7.9	1	1.6	14	4.8
Not applicable	23	22.8	28	22.0	37	57.8	88	30.2
<b>Doctor-patient relationship</b>								
It worsened	47	46.5	39	30.7	42	65.6	128	43.8
It improved	10	9.9	19	15.0	4	6.3	33	11.4
It has not changed	44	43.6	68	53.5	18	28.1	130	44.5
Not applicable			1	0.8			1	0.3

**Table 2.** Economic consequences of the COVID-19 pandemic in Ibero-American endoscopists.

<b>Colombia</b>		<b>South America</b>		<b>Spain</b>		<b>Total</b>		
<b>(n=101)</b>		<b>(n=127)</b>		<b>(n=64)</b>		<b>(n=292)</b>		
<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	<b>n</b>	<b>%</b>	
<b>Income</b>								
It increased	3	2.9	9	7.1	10	15.6	22	7.5
It decreased	73	72.3	88	69.3	9	14.1	170	58.2
It remains the same	25	24.8	30	23.6	45	70.3	100	34.3
<b>% of income decrease</b>								
<25%	22	21.8	27	21.3	7	10.9	56	19.1
25-50%	39	38.7	44	37	2	3.1	85	29.2
50-75%	11	10.8	11	8.7			22	7.5
>75%	1	1.0	6	4.7			7	2.4
Not applicable	28	27.7	39	28.3	55	86	122	41.8
<b>Costs of supplies</b>								
They decreased	4	4.0	12	9.4	2	3.1	18	6.2
They are the same	8	7.9	15	11.8	11	17.2	34	11.6
They increased <25%	25	24.8	35	27.6	8	12.5	68	23.3
They increased 25-50%	25	24.8	31	24.4	4	6.3	60	20.5
They increased 51-75%	8	7.9	15	11.8			23	7.9
They increased >75%	5	5.0	10	7.9	2	3.1	17	5.8
Not applicable	26	25.7	9	7.1	37	57.8	72	24.7

**Table 3.** Use of protective personal equipment (PPE) and COVID-19 infection rate in Ibero-American endoscopist.

Colombia (n=101)		South (n=127)		America Spain (n=64)		Total (n=292)		
n	%	n	%	n	%	n	%	
<b>Use of PPE at the beginning of the pandemic</b>								
Yes	99	98.0	120	94.5	63	98.4	282	96.6
No	2	2.0	7	5.5	1	1.6	10	3.4
<b>Use of PPE at the time of survey completion?</b>								
Yes	97	96.0	119	93.7	47	73.4	263	90.0
No	4	4.0	8	6.3	17	26.6	29	10.0
<b>Did you test positive for COVID-19?</b>								
No	83	82.2	88	69.3	49	76.6	220	75.3
Yes	18	17.8	39	30.7	15	23.4	72	24.7
<b>Do you have COVID-19 sequelae</b>								
(n)	18		39		15		72	
No	15	83.3	29	74.4	11	73.3	55	76.4
Yes	3	16.7	10	25.6	4	26.7	17	23.6
<b>Did any of your family members died from COVID-19?</b>								
No	81	80.2	99	78.0	55	85.9	235	80.5

Yes	20	19.8	27	21.3	9	14.1	56	19.2
Not applicable	0	0.0	1	0.7	0	0.0	1	0.3

**Table 4.** Impact of the COVID-19 pandemic on the emotional state of Ibero-American endoscopists.

	Colombia (n=101)		South America (n=127)		Spain (n=64)		Total (n=292)	
	n	%	n	%	n	%	n	%
<b>Have you experienced changes in your emotional state?</b>								
Yes	74	73.3	97	76.4	36	56.3	207	70.9
No	27	26.7	30	23.6	28	43.7	85	29.1
<b>Do you feel...</b>								
Irritable	52	51.5	62	48.8	33	51.6	147	50.3
Sad o depressed	68	67.3	91	71.7	43	67.2	202	69.2
Are you worried about your employment status?	71	70.3	77	60.6	13	20.3	161	55.1
Are you worried about your economic condition?	70	69.3	83	65.4	11	17.2	164	56.2
Are you worried about the training of the students you are in charge of?	56	55.4	91	71.7	31	48.4	178	61.0

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**Are you worried  
about the negative  
impact on your  
patients' health of  
delaying or being  
unable to perform  
endoscopic  
procedures?**

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Yes	101	100.0	127	100.0	64	100.0	292	100.0
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Accepted Article