

Open Access

Clinical Gastroenterology and Gastrointestinal Endoscopy Practices during the Coronavirus Disease 2019 Pandemic in Indonesia: An Online Nationwide Survey

Ahmad Fariz Malvi Zamzam Zein¹, Rabbinu Rangga Pribadi², Uswatun Khasanah³, Muhammad Begawan Bestari⁴ and Ari Fahrial Syam²

¹Department of Internal Medicine, Faculty of Medicine, Universitas Swadaya Gunung Jati-Waled General Hospital, Cirebon, ²Division of Gastroenterology, Department of Internal Medicine, Faculty of Medicine, Universitas Indonesia-Cipto Mangunkusumo National General Hospital, Jakarta, ³Department of Biostatistics and Epidemiology, Faculty of Medicine, Universitas Swadaya Gunung Jati, Cirebon, ⁴Division of Gastroenterohepatology, Department of Internal Medicine, Faculty of Medicine, Universitas Padjadjaran-Hasan Sadikin Hospital, Bandung, Indonesia

Background/Aims: The coronavirus disease 2019 (COVID-19) pandemic has necessitated modifications to allow the safe practice of clinical gastroenterology and gastrointestinal endoscopy. This study aimed to investigate the characteristics of clinical gastroenterology and gastrointestinal endoscopy practices during the COVID-19 pandemic in Indonesia.

Methods: This cross-sectional study enrolled physician members of the Indonesian Society for Digestive Endoscopy. We used an online self-administered questionnaire disseminated via social media. The 32-item survey determined the baseline characteristics of the participants, characteristics of clinical gastroenterology and gastrointestinal endoscopy practices, involvement of the physicians in the management of COVID-19, and overall impact of the pandemic on practice. All collected data were analyzed using descriptive statistics.

Results: The 200 participants in this study had a median age of 50 (34–76) years. Modifications in clinical gastroenterology practice were frequently reported in the outpatient (95.5%) and inpatient (100%) settings. All participants reported changes in the gastrointestinal endoscopy practice patterns. Of the participants, 86.0% were working in high-risk zones, and several of them reported inadequate protective personal equipment (34.0%). The median overall impact score of the pandemic on practice was 9 (2–10).

Conclusions: Physicians practicing clinical gastroenterology and gastrointestinal endoscopy in Indonesia work in high-risk settings. Modifications in clinical gastroenterology and gastrointestinal endoscopy practices are prevalent during the COVID-19 pandemic.

Clin Endosc 2021;54:348-355

Key Words: Clinical; COVID-19; Gastroenterology; Gastrointestinal endoscopy; Practice

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is a rapidly evolving

global challenge. It has been declared a worldwide pandemic, posing a severe threat to public safety and health.¹ Health-care systems face the challenge of providing care under the emerging burden of increasing number of patients with COVID-19 and communities at a high risk of the disease. Furthermore, health-care services, health-care facilities, and health-care providers are engaged in activities with a high risk of transmission.²

COVID-19, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, is a human-to-human transmitted disease that spreads mainly through droplets, close contact, and likely airborne transmission. Furthermore, studies have reported that SARS-CoV-2 ribonucleic acid has

Received: August 6, 2020 **Revised:** October 28, 2020
Accepted: November 29, 2020

Correspondence: Ahmad Fariz Malvi Zamzam Zein
Department of Internal Medicine, Faculty of Medicine, Universitas Swadaya Gunung Jati-Waled General Hospital, Jalan Taman Pemuda 2 Kompleks Stadion Bima, Kesambi, Kota Cirebon, West Java 45132, Indonesia
Tel: +62-231-483928, **Fax:** +62-231-488923, **E-mail:** fariz_zein_dr@yahoo.com
ORCID: <https://orcid.org/0000-0001-7821-3813>

© This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

been detected in feces, raising the possibility of fecal-oral transmission. Aerosol-generating procedures (AGPs) are also a contributing factor in the transmission of COVID-19. The routes of transmission need to be carefully considered when providing health-care services, including in clinical gastroenterology (CGE) and gastrointestinal endoscopy (GIE) practices.^{1,3-7}

Some guidelines have proposed modifications to CGE and GIE practices, including the development of risk assessments and stratification of patients, standard operating procedures for COVID-19 prevention and control, appropriate selection and use of protective personal equipment (PPE), and restriction of indications.^{3,5,6,8-10} The Indonesian Society for Digestive Endoscopy (ISDE) released guidelines with similar recommendations to enable physicians to safely practice CGE and GIE. There has been a notable decline (>50%) in GIE procedures during the COVID-19 pandemic (March–June 2020) compared with the pre-pandemic period (November 2019–February 2020) in the Center of Digestive Endoscopy in Cipto Mangunkusumo National General Hospital, Jakarta, Indonesia. However, to our knowledge, the extent of the impact of the COVID-19 pandemic on CGE and GIE practices in Indonesia has not been investigated. This study aimed to investigate the characteristics of CGE and GIE practices in Indonesia during the COVID-19 pandemic.

MATERIALS AND METHODS

Study design and study sample

We conducted a cross-sectional study using an online survey instrument to gather responses from physicians practicing CGE and GIE in Indonesia. This study was conducted from May 11 to June 30, 2020. We recruited all physician members of the ISDE. A purposive sampling method was used in this study.

Study tool

The instrument used in this study was a 32-item survey questionnaire for determining the baseline characteristics of the participants, modifications to CGE and GIE practices, physician risk, involvement of the physicians in the management of COVID-19, and impact of the pandemic on professional practice. The baseline characteristics included demographic information (sex, age), workplace of GIE procedures, and qualification (competence, work experience in years, learning source).

CGE practice modifications were identified according to change in outpatient settings, change in inpatient settings, and

difficulty in performing clinical research. The GIE practice modifications were evaluated according to the performance of GIE, modifications in GIE practice patterns, change in the indications of GIE, availability of PPE, adequacy of PPE usage, and modification in staff in the endoscopy unit. Adequate PPE comprised an N95 mask, goggles or a face shield, a head cap, gloves, and a surgical gown. Modification in staff in the endoscopy unit referred to any alterations in staff members, type of staff, or work shifts. Physician risk identification consisted of identifying the risk according to symptoms, contact history, travel history, working at/living in a high-risk zone, self-diagnostic tests, and performing GIE on suspected or confirmed COVID-19 patients. Involvement in the management of COVID-19 constituted serving a role in a physician team for suspected or confirmed COVID-19 patients or in a taskforce for COVID-19. The impact of the pandemic on professional practice was assessed using one Likert item question weighted 1–10, according to the physicians' subjective impressions.

Data collection and statistical analysis

The formulated questionnaire was administered through the digital platform Google Forms. The Google Forms link was disseminated through messenger applications such as *WhatsApp*, *Telegram*, and *Line* to groups related to the ISDE membership communication network. The participants' responses were initially collected as Google Forms data, which were subsequently extracted into a spreadsheet file and exported to Microsoft Excel for cleaning and coding. The cleaned data were exported to IBM SPSS Statistics 23.0 (IBM Corp., Armonk, NY, USA).

Numerical data are summarized as means and standard deviations or medians and ranges, as appropriate. Categorical data are summarized as frequencies and proportions.

Ethical considerations

This study was approved by the Medical Research Ethics Committee at the Faculty of Medicine, Universitas Swadaya Gunung Jati, Cirebon, Jawa Barat, Indonesia (registration no. 46/EC/FKUGJ/V/2020). The submission of the answered survey questionnaire constituted consent to participate in this study. Privacy and confidentiality were ensured.

RESULTS

Baseline characteristics of the participants

Of the 569 registered ISDE members, 200 physicians were recruited for this study. The participants were from all 22 ISDE branches (Table 1). Their baseline characteristics are shown in

Table 2. The participants had a median age of 50.00 (34–76) years and showed a male predominance (74.0%).

The professional background of the participants was also evaluated. Internal medicine specialists with competence in basic GIE comprised the majority of the participants in this study. Almost all participants (97.5%) adhered to national guidelines and were members of national professional associations. The most frequent workplace for performing GIE was a private non-teaching hospital.

Modifications to clinical gastroenterology practice

The modifications to CGE practice patterns are shown in Table 3. The changes in the outpatient setting included reductions in working hours (70.0%), number of attended patients

(63.5%), and duration of consultations (44.0%). All participants reported changes in the inpatient setting of CGE practice. Teleconsultation was more frequently used in the outpatient setting than in the inpatient setting (40.0% vs. 14.5%). Difficulties in performing clinical research were reported by 70.5% of the participants in the study.

Modifications to GIE practice

The modifications to GIE practice patterns are shown in Table 4. In this study, all participants reported changes in GIE practice patterns, with more than half (56.5%) ceasing their GIE practice. The indications for GIE during the study were upper gastrointestinal bleeding (73.5%), gastrointestinal symptoms with alarm signs (60.5%), and lower gastrointestinal bleeding (57.5%).

We also evaluated the use of PPE during GIE. Face shield was the most frequently used PPE during upper GIE. Furthermore, 56.0% of the participants wore coveralls and 70.0% wore an N95 mask during upper GIE. During lower GIE, most participants (89.0%) wore a face shield, 33.0% wore coveralls, and 52.0% wore an N95 mask.

Table 1. Distribution of Participants Based on Indonesian Society for Digestive Endoscopy Branches

No.	ISDE regional branch	Participants per branch (n)	Total members per branch (n)
1	Papua	2	2
2	Maluku	1	1
3	Mataram	2	8
4	Manado	2	9
5	Makassar	2	18
6	Denpasar	7	21
7	Samarinda	5	11
8	Banjarmasin	5	6
9	Kalimantan Barat	2	7
10	Surabaya	21	70
11	Malang	5	12
12	Surakarta	5	25
13	Semarang	8	32
14	Yogyakarta	9	28
15	Bandung	32	37
16	Jakarta	53	159
17	Lampung	3	8
18	Padang	5	13
19	Pekanbaru	11	23
20	Palembang	6	24
21	Medan	9	40
22	Banda Aceh	5	15
	Total	200	569

ISDE, Indonesian Society for Digestive Endoscopy.

Physician risk identification

The investigation of physician risk identification is shown in Table 5. Most participants (86.0%) worked in high-risk zones. More than one-third of the participants reported inadequate PPE for daily practice.

Participants' involvement in the management of COVID-19

The majority (60%) of the participants worked at a referral hospital. The workplaces of most participants ($n=186$, 93.0%) had a local taskforce for COVID-19. As shown in Table 6, the participants' involvement in the management of COVID-19 constituted serving a role in a physician team for COVID-19 (68.5%) and in a taskforce for COVID-19 at any level (98.0%).

Overall impact of the COVID-19 pandemic on professional practice

The score of the overall impact of the COVID-19 pandemic on professional practice was 9 (2–10). Nearly one-half of the participants (43.0%) reported a score of 10 for the overall impact of the pandemic on professional practice.

Table 2. Baseline Characteristic of the Participants

Characteristics		Frequency (n)	Percent (%)
Age, yr	• <60	171	85.5
	• >60	29	14.5
Sex	• Male	148	74.0
	• Female	52	26.0
Competence	• Consultant of gastroenterology and hepatology	59	29.5
	• Fellow of gastroenterology and hepatology	15	7.5
	• Fellow of pediatric gastroenterology	1	0.5
	• Internal medicine specialist with competence in basic GIE	125	62.5
Work experience, yr	• <5	65	32.5
	• 5–10	69	34.5
	• >10	66	33.0
Learning source	• ISDE/ISG/InaASL	195	97.5
	• APAGE	5	2.5
	• ASGE	2	1.0
	• ESGE	2	1.0
Workplace	• Government teaching hospital	68	34.0
	• Government non-teaching hospital	41	20.5
	• Private teaching hospital	10	5.0
	• Private non-teaching hospital	79	39.5
	• Others	2	1.0

APAGE, Asian Pacific Association of Gastroenterology; ASGE, American Society for Gastrointestinal Endoscopy; ESGE, European Society of Gastrointestinal Endoscopy; GIE, gastrointestinal endoscopy; InaASL, Indonesian Association for the Study of the Liver; ISDE, Indonesian Society for Digestive Endoscopy; ISG, Indonesian Society of Gastroenterology.

Table 3. Modifications to Clinical Gastroenterology Practice during the Study

Patterns of clinical gastroenterology practice		Frequency (n)	Percent (%)
Outpatient setting	• Reduction of consultation duration	88	44.0
	• Reduction of working hours	140	70.0
	• Reduction of the number of attended patients	127	63.5
	• Restriction of the workplace	32	16.0
	• Cessation of face-to-face consultation	18	9.0
	• Utilization of teleconsultation via <i>WhatsApp</i> , <i>Telegram</i> , <i>Line</i> , or SMS messaging	32	16.0
	• Utilization of teleconsultation via a hospital-recommended application	48	24.0
	• No modification	9	4.5
Inpatient setting	• Limitation of visit duration	94	47.0
	• Reduction of working days	45	22.5
	• Limitation of the number of hospitalized patients	68	34.0
	• Limitation of the workplace	22	11.0
	• Cessation of visits	15	7.5
	• Utilization of teleconsultation via <i>WhatsApp</i> , <i>Telegram</i> , <i>Line</i> , or SMS messaging	12	6.0
	• Utilization of teleconsultation via a hospital-recommended application	17	8.5
	• No modification	0	0
Difficulty in performing clinical research	• Yes	141	70.5
	• No	59	29.5

SMS, short message service.

Table 4. Modifications to Gastrointestinal Endoscopy Practice during the Study

Patterns of GIE practice		Frequency (n)	Percent (%)
Changes in GIE practice patterns	• Limitation of GIE duration	13	6.5
	• Reduction of working days	26	13.0
	• Limitation of the number of attended patients	71	35.5
	• Partial cessation of elective GIE	47	23.5
	• Cessation of all GIE	113	56.5
	• No modification	0	0
Indications of GIE during the study	• Gastrointestinal symptom(s) without alarm sign(s)	11	5.5
	• Gastrointestinal symptom(s) with alarm sign(s)	121	60.5
	• Upper gastrointestinal obstruction	49	24.5
	• Lower gastrointestinal obstruction	44	22.0
	• Screening for colorectal cancer	20	10.0
	• Cancer staging	3	1.5
	• Polypectomy	7	3.5
	• Screening for hepatocellular carcinoma or liver cirrhosis	45	22.5
	• Hematemesis and/or melena	147	73.5
	• Hematochezia	115	57.5
	• Obstructive jaundice	25	12.5
PPE during upper GIE	• Face shield	195	97.5
	• Head cap	162	81.0
	• Goggles	129	64.5
	• N95 mask	140	70.0
	• Surgical mask	115	57.5
	• Coveralls	96	48.0
	• Surgical gown	112	56.0
	• Double gloves	137	68.5
	• Single glove	45	22.5
	• Boot	164	82.0
	• Shoe cover	67	33.5
PPE during lower GIE	• Face shield	178	89.0
	• Head cap	158	79.0
	• Goggles	115	57.5
	• N95 mask	104	52.0
	• Surgical mask	91	45.5
	• Coveralls	66	33.0
	• Surgical gown	82	41.0
	• Double gloves	104	52.0
	• Single glove	23	11.5
	• Boot	85	42.5
	• Shoe cover	44	22.0
Modification in GIE unit staff	• Yes	28	14.0
	• No	172	86.0

GIE, gastrointestinal endoscopy; PPE, protective personal equipment.

Table 5. Physician Risk Identification

Risk identification		Frequency (n)	Percent (%)
Risk identification according to symptom(s)	• Yes	3	1.5
	• No	197	98.5
Risk identification according to contact history	• Yes	15	7.5
	• No	185	92.5
Risk identification according to travel history	• Yes	43	21.5
	• No	157	78.5
Risk identification according to exposure to high-risk zones	• Yes	172	86.0
	• No	28	14.0
Self-detection with antibody-based testing	• Yes	127	63.5
	• No	73	36.5
Self-detection with RT-PCR-based testing	• Yes	59	29.5
	• No	141	70.5
Availability of adequate PPE	• Yes	132	66.0
	• No	68	34.0
Performing GIE on suspected/confirmed COVID-19 patients	• Yes	15	7.5
	• No	185	92.5

COVID-19, coronavirus disease 2019; GIE, gastrointestinal endoscopy; PPE, protective personal equipment; RT-PCR, reverse transcriptase polymerase chain reaction.

Table 6. Participants' Involvement in the Management of Coronavirus Disease 2019

Type of involvement		Frequency (n)	Percent (%)
COVID-19 physician team	• Yes	137	68.5
	• No	63	31.5
COVID-19 task force	• Yes (taskforce at a hospital)	107	53.5
	• Yes (task force in a professional organization)	90	45.0
	• Yes (government task force)	3	1.5
	• No	4	2.0

COVID-19, coronavirus disease 2019.

DISCUSSION

The COVID-19 pandemic has placed a high level of burden on health-care systems in every country worldwide. The challenge involves delivering high-risk health-care services with a small number of evidence-based medicine options and limited facilities. This issue has threatened health-care systems in terms of the provision of safe and effective health-care services. In the field of gastroenterology, the pandemic has led some professional organizations to introduce guidelines or recommendations on modifications to CGE and GIE practices. This study demonstrated that the COVID-19 pandemic has had a

considerable overall impact on physicians practicing CGE and GIE in Indonesia.

The response rate of the survey based on the number of participants was 35.14%. However, as the response rate based on ISDE regional branches was 100%, we concluded that the survey provided representative data on the status of CGE and GIE practices in Indonesia.

This study found a high number of modifications to CGE practice. Most physicians made changes in the outpatient setting, including reducing the working hours, limiting the number of attended patients, and limiting the duration of consultations. Furthermore, all physicians made changes in

the inpatient setting, including limiting the duration of visits, limiting the number of hospitalized patients, and reducing the number of working days. We also noted that telemedicine, especially teleconsultation, was one of the methods used for delivering a modified CGE service during the COVID-19 pandemic. Forbes et al.¹¹ reported similar strategies for changes in CGE practice in response to the COVID-19 pandemic. They also demonstrated that implementing telemedicine was the most favorable method in CGE practice. Furthermore, Shah et al.⁸ suggested telemedicine as a solution for CGE practice issues in an outpatient setting. The challenge of telemedicine is its unavailability and the lack of experience of CGE practitioners, especially in health-care facilities with limited resources.

Owing to the risks of human-to-human transmission and AGP-related transmission, GIE practice has had to undergo considerable revisions during the COVID-19 pandemic. All physicians in this study had made changes to their GIE practice, and more than half of them ceased performing GIE during the pandemic. Forbes et al.¹¹ reported that approximately one-quarter of health-care institutions in North America continued performing GIE at normal volumes. Some guidelines recommended limiting GIE practice with strategies to address safety issues for patients and the endoscopy unit staff.¹²⁻¹⁵ The restriction of GIE practice by limiting the indications is highly recommended during the COVID-19 pandemic.^{2,5,6,9,12,14-16} In this study, the most frequent indications for GIE during the pandemic were upper gastrointestinal bleeding, gastrointestinal symptoms with alarm signs, and lower gastrointestinal bleeding. Galloro et al.¹⁵ noted that during the COVID-19 pandemic, GIE was indicated only for emergency situations (acute gastrointestinal bleeding, foreign body extraction, acute suppurative cholangitis) and cancer care.

In this study, more than one-third of physicians reported a lack of adequate PPE. Additionally, a respirator face mask was not generally reported to be used in upper and lower GIE practice. Appropriate PPE, comprising a face mask, goggles and/or a face shield, a head cap, a surgical gown, and gloves, should be available for all staff members involved in performing GIE.^{2,5,6,9,12,14-16} This precaution aims to reduce exposure to hazards or the transmission risk. Furthermore, the British Society of Gastroenterology emphasized that procedure deferral is necessary until appropriate PPE is available.⁹ A respirator face mask is one of the most important pieces of PPE in GIE practice. Some studies have recommended the use of an N95 face mask to achieve extremely efficient filtration of airborne particles to prevent COVID-19 transmission.^{2,5,6,9,12,14-16}

Physician risk identification is essential in performing safe health-care practices during the pandemic. This study demon-

strated that physicians practicing CGE and GIE mostly work in high-risk zones. Self-detection of infection, notably with reverse transcriptase polymerase chain reaction-based testing, seemingly indicated a limited coverage of risk mitigation for physicians. The preparedness of a GIE unit for patients with suspected or confirmed COVID-19 is an important issue. Only 7.5% of the GIE units in this study were prepared for performing GIE on suspected or confirmed COVID-19 patients, whereas the availability of adequate PPE was reported in only 66.0% of the GIE units. These conditions demonstrated that physicians practicing CGE and GIE in Indonesia are working in high-risk settings.

The limitations of this study included the fact that the online survey format contributed to potential recall bias and was dependent on the participants' honest responses. Moreover, we conducted this cross-sectional study during a relatively short period, and the small number of participants might limit the generalization of the results.

This study showed that the COVID-19 pandemic has had a considerable impact on CGE and GIE practices in Indonesia. Physicians practicing CGE and GIE in Indonesia are working in high-risk settings. Modifications to related clinical practice are necessary to provide health-care services while ensuring the safety of both patients and physicians during procedures. Most physicians in this study directly participated in the management of COVID-19 and were involved in a taskforce for COVID-19 at any level. Further studies are needed to investigate and stimulate innovations in CGE and GIE practices.

Conflicts of Interest

The authors have no potential conflicts of interest.

Funding

None.

Acknowledgments

The authors thank Shinta and Nuvia for their assistance, and the Indonesian Society of Digestive Endoscopy for their collaboration and cooperation in the enrollment of participants.

Author Contributions

Conceptualization: Ahmad Fariz Malvi Zamzam Zein, Rabbinu Rangga Pribadi, Muhammad Begawan Bestari, Ari Fahrial Syam
 Data curation: Uswatun Khasanah
 Formal analysis: AFMZZ, RRP, UK
 Funding acquisition: AFMZZ
 Investigation: AFMZZ, RRP, UK
 Methodology: UK
 Project administration: AFMZZ, RRP
 Resources: AFMZZ, RRP
 Software: UK
 Supervision: AFMZZ, MBB, AFS
 Validation: RRP, UK
 Visualization: RRP

Writing-original draft: AFMZZ, RRP, UK
 Writing-review&editing: AFMZZ, RRP, UK, MBB, AFS

ORCID

Ahmad Fariz Malvi Zamzam Zein: <https://orcid.org/0000-0001-7821-3813>
 Rabbinu Rangga Pribadi: <https://orcid.org/0000-0001-8450-4887>
 Uswatun Khasanah: <https://orcid.org/0000-0002-3320-3993>
 Muhammad Begawan Bestari: <https://orcid.org/0000-0002-6911-8213>
 Ari Fahrial Syam: <https://orcid.org/0000-0003-0041-3553>

REFERENCES

1. Tang D, Comish P, Kang R. The hallmarks of COVID-19 disease. *PLoS Pathog* 2020;16:e1008536.
2. Libânio D, Bastos P, Pimentel-Nunes P. Safe and valuable endoscopy in the COVID era. *GE Port J Gastroenterol* 2020;27:219-223.
3. Tse F, Borgaonkar M, Leontiadis GI. COVID-19: advice from the Canadian Association of Gastroenterology for endoscopy facilities, as of March 16, 2020. *J Can Assoc Gastroenterol* 2020;3:147-149.
4. Onoyama T, Isomoto H. COVID-19 and gastrointestinal endoscopy: Importance of reducing SARS-CoV-2 infection risks of medical workers and preserving personal protective equipment resources. *Dig Endosc* 2020;32:732-735.
5. Perisetti A, Gajendran M, Boregowda U, Bansal P, Goyal H. COVID-19 and gastrointestinal endoscopies: current insights and emergent strategies. *Dig Endosc* 2020;32:715-722.
6. Ang TL. Gastrointestinal endoscopy during COVID-19 pandemic. *J Gastroenterol Hepatol* 2020;35:701-702.
7. Soetikno R, Teoh AYB, Kaltenbach T, et al. Considerations in performing endoscopy during the COVID-19 pandemic. *Gastrointest Endosc* 2020;92:176-183.
8. Shah R, Satyavada S, Ismail M, et al. COVID-19 pandemic through the lens of a gastroenterology fellow: looking for the silver lining. *Gastrointest Endosc* 2020;92:394-398.
9. Penman I, Edwards C, McKinlay A. BSG guidance on recommencing GI endoscopy in the deceleration & early recovery phases of the COVID-19 pandemic [Internet]. London: British Society of Gastroenterology; c2020 [updated 2020 Jun 3]. Available from: <https://www.bsg.org.uk/covid-19-advice/bsg-guidance-on-recommencing-gi-endoscopy-in-the-deceleration-early-recovery-phases-of-the-covid-19-pandemic/>.
10. Castro Filho EC, Castro R, Fernandes FF, Pereira G, Perazzo H. Gastrointestinal endoscopy during the COVID-19 pandemic: an updated review of guidelines and statements from international and national societies. *Gastrointest Endosc* 2020;92:440-445.e6.
11. Forbes N, Smith ZL, Spitzer RL, Keswani RN, Wani SB, Elmunzer BJ. Changes in gastroenterology and endoscopy practices in response to the coronavirus disease 2019 pandemic: results from a North American survey. *Gastroenterology* 2020;159:772-774.e13.
12. Gralnek IM, Hassan C, Beilenhoff U, et al. ESGE and ESGENA position statement on gastrointestinal endoscopy and the COVID-19 pandemic. *Endoscopy* 2020;52:483-490.
13. Penman I, Edwards C, Coleman M, McKinlay A. Endoscopy activity and COVID-19: BSG and JAG guidance [Internet]. London: British Society of Gastroenterology; c2020 [updated 2020 Apr 3]. Available from: <https://www.bsg.org.uk/covid-19-advice/endoscopy-activity-and-covid-19-bsg-and-jag-guidance/>.
14. Repici A, Maselli R, Colombo M, et al. Coronavirus (COVID-19) outbreak: what the department of endoscopy should know. *Gastrointest Endosc* 2020;92:192-197.
15. Galloro G, Pisani A, Zagari RM, et al. Safety in digestive endoscopy procedures in the covid era recommendations in progres of the italian society of digestive endoscopy. *Dig Liver Dis* 2020;52:800-807.
16. Liu XY, Cai MY, Wang P, Zhou PH. How to manage an endoscopy unit during a COVID-19 pandemic. *VideoGIE* 2020;5:229.