Gastroenterology Report, 9(3), 2021, 205–211

doi: 10.1093/gastro/goab012
Advance Access Publication Date: 10 April 2021
Review

REVIEW

Psychosocio-economic impacts of COVID-19 on gastroenterology and endoscopy practice

Jing-Jing Shen*

Harvard College, Harvard University, Cambridge, MA, USA

*Corresponding author. 84 Pforzheimer Mail Center, 56 Linnaean St, Cambridge, MA 02138, USA. Email: jingjingshen@college.harvard.edu

Abstract

Beyond posing a major health crisis, the COVID-19 pandemic has inflicted profound psychological, social, and economic impacts on populations worldwide. Mass quarantines and social isolation have affected the mental health of the wider population, exacerbating other stressors, including fear of the virus and its repercussions, general uncertainty, and financial insecurity. The pandemic has challenged the broader delivery of healthcare—ranging from the need to triage limited hospital resources to balancing risk mitigation with maintaining medical care. Specific to gastroenterology, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has not only been associated with complicating extant medical conditions of the gastrointestinal (GI) tract, but has also forced a shift in the practice of gastroenterology by patients, families, and healthcare providers alike. The gastroenterology field has been required to adapt its practices to minimize the possibility of viral spread while still upholding patient care. Healthcare practitioners in GI have helped to treat COVID-19 patients, stratified inpatient and outpatient visits and procedures, and shifted to telemedicine. Still, as is the case with much of the general population, healthcare providers working in GI practice or endoscopy have faced personal and professional stressors, mental health difficulties, social isolation, financial pressures, and familial burdens—all of which can take a toll on practitioners and, by extension, the provision of GI care overall. This article will highlight how the COVID-19 pandemic has affected the psychological wellbeing, social engagement, and economic conditions of the public, healthcare providers, and GI professionals specifically. Recommendations for strategies that can continue GI services while maintaining safety for both caregivers and patients are put forth to help uphold critical GI care during this worldwide crisis.

Key words: COVID-19; SARS-CoV-2; psychosocial impact; social impact; economic impact; gastroenterology; endoscopy; healthcare professionals/providers; stress; telemedicine

Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has led to a global health emergency, mental health crisis, economic recession, in addition to widespread uncertainty throughout much of the population. The ongoing proliferation of the virus has dramatically affected decisions as to how to provide, manage, and adapt healthcare. During the pandemic, hospitals exceeding their capacity and mass quarantine measures have forced healthcare providers to triage resources and care between COVID-19 and other medical conditions. SARS-CoV-2 has been linked to worsened gastrointestinal (GI) outcomes and has also indirectly shaped the psychosocio-economic dimensions of gastroenterology and GI endoscopy. The practice of gastroenterology and GI endoscopy has confronted significant challenges involving patients, families, and

Submitted: 13 September 2020; **Revised:** 31 December 2020; **Accepted:** 22 January 2021

healthcare providers themselves. To reduce the possibility of viral transmission and promote community safety, caregivers have been forced to stratify GI-related outpatient visits, emergency-room or hospital admissions, and GI procedures based on the risk of COVID-19 and underlying medical conditions, and many have adopted virtual visits. In addition, similarly to much of the public, gastroenterologists, GI endoscopists, and other healthcare providers in GI have been beset by mental health issues relating to workplace and personal stresses, social obstacles surrounding maintaining connectivity with others, financial difficulties associated with salary cuts and job insecurity, among numerous other struggles.

This review article will evaluate how the COVID-19 pandemic has affected the psychological, social, and economic aspects of gastroenterological care. The article analyses the various consequences of COVID-19 on mental wellbeing, social interactions, and economic considerations as they relate to the public broadly and the specific provision of GI services, treatment, and endoscopic procedures. Furthermore, the article offers recommendations on how to optimize GI care alongside patient and caregiver wellbeing to maintain gastrointestinal health and physician–patient engagement even in the midst of a global health emergency.

Psychological impacts of COVID-19

General psychological impacts

Before the incidence and spread of SARS-CoV-2, mental health was a prevalent yet still under-examined issue. Mental health issues comprise approximately one-third of health challenges among adults worldwide [1–3]. These detrimental effects on psychological health can be exacerbated, especially during epidemics and pandemics. Several factors can influence a given individual's psychological responses to disease outbreaks, including their perceived susceptibility to the illness, personal tolerance of uncertainty, and other underlying mental health issues [4]. These psychological difficulties, prominently stress-related disorders, can carry a wide range of significant outcomes, including reduced productivity at work or unemployment; marital, parenting, and domestic problems; substance abuse; homelessness; as well as suicides [5, 6].

The uncertainty and lethality of the COVID-19 pandemic, combined with strict government lockdowns and mandated social-distancing requirements, have contributed to significant adverse psychological consequences on the population. Pandemics have been previously associated with increased stress and anxiety in the general public, both of which have been reported during the current SARS-CoV2 outbreak. Generally, outbreaks of readily communicable diseases have been linked to symptoms of anxiety, panic, depression, trauma, and psychosis [7–9]. This worry is evident: a recent US survey among 775 adults found that 55% of respondents believed COVID-19 has adversely affected their mental wellbeing, while 71% feared potential negative ramifications of isolation on their mental health [10].

Psychological impacts on patients with GI disorders

Specific to patients with GI disorders, SARS-CoV-2 has also been found to worsen their psychological state and their gastrointestinal disease symptoms. SARS-CoV-2 has worsened the anxiety levels of some inflammatory bowel disease (IBD) patients. Additionally, the COVID-19 pandemic has contributed to a less optimistic attitude among some patients with IBD, which can contribute to the recurrent symptoms of IBD [11]. One survey found that IBD patients tended to express additional concern about the possibility of COVID-19 worsening their IBD symptoms, with 56% of respondents worried that they would experience a flare of IBD if they contracted the virus [12].

Psychological impacts on healthcare providers in gastroenterology

Besides posing challenges to the general public and patients with underlying health conditions—including gastrointestinal diseases—in particular, SARS-CoV-2 has especially affected frontline healthcare workers who continue caring for patients while trying to avoid the disease themselves. The virus and pandemic have led to challenges to conventional healthcare, with key implications for gastroenterology practice as well. Gastroenterologists and GI endoscopists, including trainees in the field, have faced medical, economic, social, and psychological challenges, including redeployment to emergency rooms or intensive care units, a long hiatus from their internal medicine training, forced change in practice patterns (e.g. conversion from in-person visits to telemedicine, delayed or canceled procedures), and rapidly changing regulations. Healthcare workers generally are a demographic particularly prone to both the virus and its psychological consequences. A survey in China reported that, compared to nonmedical healthcare workers, workers in medical health demonstrated higher rates of anxiety, insomnia, depression, and obsessive–compulsive symptoms due to the pandemic [13]. In April of 2020, the tragic suicide of a prominent New York City emergency-room doctor who treated many COVID-19 patients was reported, underscoring the immense stress and emotional turmoil that the pandemic has wreaked on healthcare providers [14]. Another survey found that, during this pandemic, many healthcare providers have been demonstrating stress-associated symptoms ranging from anxiety to sleep disturbances to depression [15]. Stress on these medical professionals can originate from numerous sources. A shortage of personal protective equipment (PPE), laboratory tests, and ventilators combined with burnout from long shifts and hospitals surpassing capacity can intensify feelings of frustration with employers or government efforts to contain the pandemic [16–18]. Emergency medical services may also confront limited options for transportation facilities as a result of lockdowns [19].

Gastroenterologists and GI endoscopists also face a high risk for COVID-19 in their practice. GI endoscopists along with endoscopy personnel involved in the endoscopic procedures are at particular risk of COVID-19 [20–22]. The functional receptor of SARS-CoV-2, angiotensin-converting enzyme 2 (ACE2), is expressed at a level ~100 times higher in the GI tract compared to that in the respiratory system, placing the digestive system at particular risk for invasion by SARS-CoV-2 [23]. GI patients with COVID-19 may not demonstrate respiratory symptoms even while COVID-19 can affect all organs of the digestive system [24], marking the GI tract as a potential infection pathway for the virus. In turn, medical staff whom GI patients contact during their visits may be at an increased risk of contracting the virus. Adding to concerns regarding infection from work, in the short or long term, members of the GI team may also struggle with uncertainty surrounding their careers, work–life balance, and the safety of themselves and their families. A recent 2020 survey found that 81% of respondents in a GI endoscopy unit experienced some psychological symptoms, with 58% feeling

anxiety about infecting their family, 56.0% feeling stress, 47% feeling anxious for themselves, and 27% confronting insomnia or difficulty in sleeping [25]. In general, healthcare practice in during a pandemic is associated with elevated levels of fear and anxiety. A survey of Canadian endoscopists found that 79% (26 out of 34 respondents) experienced some anxiety and 31% (10 out of 34 respondents) experienced some burnout. Additionally, newly trained endoscopists are frequently required to learn how to perform diagnostic and therapeutic procedures under an accelerated time frame [26]. Other endoscopists may worry about learning new ventilator- and dialysis-management skills not traditionally associated with GI practices and possessing minimal control over their assigned hours. Such aspects of continuing healthcare practices in a pandemic can contribute to burnout. To address these difficulties, gastroenterologists, GI endoscopists, and advanced-care providers in GI all require enhanced communication and coping strategies during and after the pandemic.

The combination of routine telemedicine, virtual meetings, and social distancing can foster a feeling of isolation. Compounded with insufficient rest and frequent overwork, performance pressure in the hospital work environment, and prolonged contact with suffering and death, including caring for COVID-19-positive colleagues, this isolation can exacerbate the anxiety felt by healthcare workers regarding their competence and confidence [27–30]. Additionally, a fear of contracting COVID-19, forcibly needing to communicate bad news to the loved ones of hospitalized patients, and a sense of helplessness through being required to stay at home due to quarantine orders or witnessing pain in COVID-19 patients, all exact a toll on healthcare providers. Often, healthcare professionals may leave their homes to reside elsewhere in order to avoid potentially spreading the virus to family members, and this isolation from family can be another source of difficulty, loneliness, and stress. These mental health stressors carry critical impacts on the quality of healthcare. Mental health and psychosocial issues have been correlated with reduced compliance with safety practices, which could contribute to higher infection rates, accelerating and further worsening the spread of COVID-19. Already, higher rates of absenteeism, leaves, and resignations have been reported [31].

Psychology-based interventions and community solutions for the general public

Despite the increased prevalence of psychological issues as a direct and indirect result of the COVID-19 virus, innovative psychological solutions have been pursued and proposed thus far. Even though in-person appointments may be limited due to lockdowns and physical-distancing requirements, some clinics have emphasized the assignment of appointments at prescheduled times to limit interpersonal contact in waiting rooms. To further bolster the delivery of efficient care, cases are triaged through communication over the phone to stratify appointments on the basis of urgency. These measures can be incorporated into GI practice in order to limit the spread of the virus while still streamlining the provision of care and treatment [32].

Telepsychiatry

Moreover, psychological care has experienced a shift to digital delivery. Although in-person psychology appointments are severely restricted due to social distancing and lockdowns, telepsychiatry has emerged as a promising means to continue healthcare delivery and uphold caregiver wellbeing, which can be beneficial for GI healthcare providers. Stress and grief counseling, interventions, mindfulness lessons, and youth education are available online [33–36]. In Italy, the #psicologionline search engine developed by the National Council of the Order of Psychologists offers citizens a means of finding their closest psychologist or psychotherapist so that they can schedule a free ‘teleconsultation’. Digital psychiatry can encompass computer-based technologies for assessing emotions, performing cognitive–behavioral therapy and offering resilience practices [37], which may be useful for regions suffering from insufficient access to physical psychiatric services. Other resilience directives have included patient education, the dissemination of relaxation techniques, and the promotion of home self-care, to improve self-perception in stressful situations [38, 39]. Support and monitoring have been explored through psychological crisis intervention and psychological first aid, which seek to stratify psychological cases and offer listening, evaluation, and care, and these options could be especially valuable for GI practitioners who are under intense pressure and stress [40].

Online consultations, through phone or video calls, have provided patients with prescriptions for and alterations to medications. In Italy, virtual visits have facilitated continued communication with individuals living alone in Italy, and remote counseling has served patients in households prone to conflict [41]. Similarly, in China, nurses have organized support networks through free applications such as WeChat. There do remain questions surrounding how telepsychiatry may be monitored, given that there is as of yet no regulatory authority on the ethics of telepsychiatry, but this remains to be an important area for future consideration, and the practice of telepsychiatry could be beneficial to GI practitioners, too [42–44].

Strategies to promote psychological wellbeing for healthcare providers

To address these psychological challenges faced by healthcare professionals, several healthcare systems have proposed support networks, mental health monitoring, outreach, work breaks, and life assistance. The Mount Sinai Health System in New York City, NY, formed a specialized task force in March 2020 that developed a needs-assessment model for three essential priorities: daily needs, communications, and psychosocial support. The initiative maintains virtual support groups that connect employees to psychologists and social workers, one-to-one counseling and 24/7 crisis management, deployment of mental health professionals to units, and the provision of self-care resources like yoga and music therapy [17]. Building on of these efforts, the mental health of healthcare providers can be continually tracked through mental health indicators integrated into health-management information systems. Frontline workers should be trained to monitor their own wellbeing and pinpoint signs of stress and burnout from work [18]. The availability of publicly funded mental health therapy, psychological hotlines, on-demand mental health teams, and clinical screening for mental health conditions can all combine to promote crisis interventions and overall support to healthcare workers [45]. Overall, screening for mental health issues remains necessary. Specifically, these strategies can be implemented in practice to support GI workers and their wellbeing.

For healthcare providers, encouraging rest periods, task-sharing, and task rotations among colleagues may also help to preserve mental health [46]. Similar to support groups and

networks, clear interpersonal communication can bolster mental health, too. For example, the Mount Sinai Health System task force consolidates messages throughout the healthcare system into a 'daily communique' that allows streamlined, ready access to information by employees. Brief email updates, weekly conference calls, and virtual town halls allow healthcare providers to remain engaged and informed while minimizing stress levels. Furthermore, 'wellness messages' offering stress-management strategies coupled with messages of gratitude can serve to maintain a sense of value among healthcare professionals, including GI healthcare providers, supporting their mental wellbeing [17].

Social impacts of COVID-19

Aside from the psychological consequences of COVID-19 on the general public and healthcare practitioners, in particular, the pandemic has extensive social implications as well. Social distancing and quarantines have limited in-person contact, but continued support networks, communications, and virtual-based initiatives have emerged to maintain connectedness.

Several interventions aimed to improve psychological resilience and health center on group efforts. Group counseling, support groups, and assisted mourning were described as promising efforts [47]. One meta-analysis demonstrated that telecommuters who engaged in remote work for >2.5 days per week would experience worsened relationships with their colleagues, which may be attributed to the tradeoff between longer working hours vs time for activities at home. As such, the establishment of a firm boundary between work and home life can assist with mental wellbeing during remote work, which can apply to GI healthcare workers as well [31].

Economic impacts of COVID-19

The pandemic has jeopardized economic facets of daily life for many, raising concerns about employment security, transportation, food needs, housing, and childcare. Each of these worries can intensify psychological health and social relationship issues in turn.

Livelihoods have been upended by the pandemic and mandated quarantines. Unemployment levels across the globe have risen and many businesses have permanently shut down. The loss of jobs and uncertainty regarding job security through layoffs, furloughs, and salary cuts can worsen mental health difficulties—a phenomenon that has an especially noteworthy effect on daily-wage workers and small businesses [18]. For workers who have retained their jobs and for others whose daily excursions require travel, transportation may still pose a significant difficulty. Due to physical-distancing requirements, public transport and shared rides have been labeled as risky and have been discouraged. At the same time, single-passenger rides can be costly. To alleviate the transportation burden on its employees, the Mount Sinai Health System has offered free parking, bike rentals, and car rentals at a reduced or no cost—an initiative that may be adopted more broadly to assist individuals financially [17].

During the pandemic, the practice of GI, in particular, has also confronted economic difficulties. Given that most (>85%) GI endoscopy procedures are elective, and that many clinics and hospitals have resorted to only providing urgent endoscopies, >80% of all GI procedures have been reduced, contributing to the financial struggles of GI practitioners and their practices [48]. Reasons for patient deferrals of elective procedures—surgical or endoscopic—include fear of infection with COVID-19 to their own financial concerns [49]. Additionally, N95 masks recommended for use by GI staff during endoscopy can be expensive. Likewise, other infrastructural adjustments to accommodate infection risks from COVID-19, such as negative-pressure rooms, special corridors for movement, the expanded spacing of recovery beds, and reception-area seating, have also contributed to a loss in generated revenue. The maintenance of additional staff to provide sanitation and screening efforts can further elevate the cost imposed onto GI practice [49]. By April of 2020, while private hospital chains have witnessed revenue losses of 50%–60%, those of private diagnostic chains have fallen by 70%–80% [50]. Although increased cash flows may be able to ease the economic burden on hospitals to some degree, most hospitals only possess limited cash flow, which emphasizes the severity of the pandemic's financial impact.

Hospital and outpatient employees, including those working in GI practice and GI endoscopy, also must manage concerns with food, residence, housing, monthly pay, as well as childcare. A shortage of basic supplies at home, including food, can pose a strain on healthcare workers [51]. The Mount Sinai Health System has implemented initiatives that bring free and reduced-cost meals to hospital units to ensure adequate nourishment of healthcare providers during their shifts [17]. Access to healthy meals may help to alleviate the financial burdens and stresses of purchasing food on already taxed healthcare workers [31]. Other sources of distress on healthcare providers may come from the forced evacuation from rental facilities or stresses originating from loan-payment requirements [52]. The Mount Sinai Health System has implemented on-site call rooms, offsite housing, and partnerships with local hotels to offer residences to employees at a lowered rate to assist healthcare professionals in their housing situations. Healthcare professionals may also worry about caring for their children; hospitals that provide childcare centers for their employees may greatly assist these parents [17]. With the recent shift of schools to remote learning, parents may worry not only about their own jobs, but also about their children's education [52]. The provision of learning resources and activities for parents and children to engage in together may help the former to maintain their relationships and performance at work.

GI healthcare workers also possess concerns surrounding employment, income, and physical and mental health. Gastroenterologists and GI endoscopists may worry about redeployment, job security, as well as reduced income due to the economic recession. Even though virtual consultations, like daily telemedicine, can permit GI healthcare providers to work from home, these remote visits may still induce feelings of fatigue and claustrophobia. With worries from redeployment and job security to reduced income and the economic recession, GI practitioners and other healthcare providers are presented with numerous economic challenges.

Management

To curtail the detrimental medical, psychological, social, and economic impacts of COVID-19 on patients, families, and GI healthcare providers, various measures can be taken. The high numbers of hospitalized COVID-19 patients despite the limited availability of physicians, space, and resources have required risk-stratification measures for GI patients who have competing needs. GI units have been converted into units to treat the influx of COVID-19 patients, and members of GI teams have been reassigned to COVID-19 management, both of which limit the

unit space and personnel available for GI care. Additionally, many GI divisions have been forced to reduce their workload to lower the risk of spreading COVID-19. For example, a survey conducted in Italy found that 118 of 121 (86.8%) surveyed GI divisions have undergone some clinical rearrangement in their daily operations [53]. In any case, over half of medical professional respondents to one survey (54%) reported that their decision to delay GI endoscopies was associated with a shortage of PPE during the early phase of the pandemic, underscoring the need for adequate supplies and equipment for GI procedures to safely continue during the pandemic [54]. During the procedure, adequate risk-mitigation strategies should be continued. Based on the risk status of the patient, members of the unit team should wear gloves, protective eyewear, waterproof gowns, and shoe covers in addition to the aforementioned respiratory masks. If possible, endoscopies should be performed in a negative-pressure room, and separate pre- and post-procedure recovery areas should be designated. Following the endoscopy, the unit should be thoroughly cleaned with virucidal agents. Any waste and procedure devices should be shipped to high-risk waste-management facilities. Patients should be traced and monitored for 7–14 days for possible COVID-19 infection [55].

To minimize the further proliferation of COVID-19 and maintain safety for patients and healthcare providers, the provision of GI care must be carefully considered. As a result of the lower capacity for GI care due to the reassignment of GI space and staff to COVID-19 management, elective endoscopies and non-urgent surgeries may need to be postponed [55, 56]. Still, the deferral of GI examinations, diagnoses, and procedures could contribute not only to higher long-term morbidity and mortality rates, but also to a precarious patient backlog [57]. For instance, postponing endoscopies for patients with IBD could augment the future risk for colitis-associated neoplasia [55]. So far, patients who are likely to be most severely affected by a delay in diagnosis and treatment have been prioritized, such as patients receiving positive results for fecal occult blood tests or those with colon cancer [56, 57].

As for maintaining safety during clinical practice and GI endoscopy, several options should be considered. In lieu of clinic visit and GI procedures, virtual options for care delivery, including telephone consults, virtual visits, and web applications to monitor disease activity, may serve as useful temporary substitutes [57, 58]. In the meantime, proactive measures may be taken, such as the use of probiotics to prevent secondary bacterial infections from COVID-19 [55]. With regard to urgent GI procedures that cannot be delayed, endoscopies should be performed to minimize the risk of COVID-19 and the exacerbation of underlying GI diseases. These procedures may include endoscopies to address life-threatening conditions, gastrointestinal bleedings, or the need for immunosuppression [57]. For any of these situations, endoscopy-unit staff should be sufficiently trained in hygiene practices, contamination prevention, and appropriate use of PPE. Prior to the procedure, unit members should be able to assess both themselves and incoming patients for symptoms of COVID-19 and be able to engage in COVID-19-related interventions like isolation and testing of possibly infected individuals should the need arise [55]. The time patients spend in waiting rooms should be minimized and access for accompanying persons should be restricted to lower the risk of COVID-19 infection [54]. Patients should be subject to temperature measurement and also questioned for their symptoms, potential contact with infected individuals, travel history, and prior test results. Patients should enter the unit wearing a surgical mask and/or face shield, as well as gloves if deemed appropriate. Meanwhile, healthcare workers should wear N95, N99, FFP2, or PAPR masks for optimized protection [55–57]. Efforts should be made to maintain a 1- to 2-meter distance or erect a physical barrier between the patient and caregiver(s) [55].

Overall, although the public and GI healthcare providers in particular have encountered various physical, psychological, social, and economic challenges during this pandemic, there are strategies that can maintain and promote their wellbeing. Mental health counseling is suggested for patients recovering from long-term illness as well as GI healthcare providers who are enduring prolonged clinical tasks. In addition, counseling for the social and economic hardship faced by patients and healthcare providers is recommended.

Conclusions

The SARS-CoV-2 pandemic has imposed psychological, social, and economic effects on the general public as well as GI community as the illness continues its global proliferation. Healthcare providers, including GI practitioners, have become especially susceptible to the virus and its other widespread repercussions on livelihoods and lives. The psychosocio-economic reverberations of the virus on patients, GI and endoscopy healthcare providers, other healthcare providers, and the overall population must be considered in order to maintain the delivery of safe healthcare. In the practice of GI care, to curb the spread of the virus, improve healthcare outcomes, and uphold community safety, the issues surrounding mental health, social connectivity, and economic burdens on patients, gastroenterologists, endoscopists, and GI staff alike must be addressed. Are we, the GI community, ready to confront the medical, psychological, social, and economic challenges in the next phase and aftermath of the ongoing COVID-19 pandemic?

Funding

None.

Conflict of Interest

None declared.

References

1. Lake J, Turner MS. Urgent need for improved mental health care and a more collaborative model of care. *Perm J* 2017;**21**: 17–24.
2. Rehm J, Shield KD. Global burden of disease and the impact of mental and addictive disorders. *Curr Psychiatry Rep* 2019; **21**:10.
3. Kessler RC, Angermeyer M, Anthony JC *et al*. Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative. *World Psychiatry* 2007;**6**:168–76.
4. Taylor S. *The Psychology of Pandemics: Preparing for the Next Global Outbreak of Infectious Disease*. Newcastle-upon-Tyne: Cambridge Scholars Publisher, 2019.
5. Tanielian T, Jaycox LH, Adamson DM, *et al*. *Invisible Wounds of War: Psychological and Cognitive Injuries, Their Consequences, and Services to Assist Recovery*. 2020 [cited 2020 Dec 31] https://www.rand.org/pubs/monographs/MG720.html.
6. Weehuizen RM. *Mental Capital: The Economic Significance of Mental Health*. 2020 [cited 2020 Dec 31]. https://cris.maastrich

tuniversity.nl/en/publications/mental-capital-the-economic-significance-of-mental-health.
7. World Health Organization. Mental Health and Psychosocial Considerations during the COVID-19 Outbreak. 2020 [cited 2020 Dec 31]. https://apps.who.int/iris/bitstream/handle/10665/331490/WHO-2019-nCoV-MentalHealth-2020.1-eng.pdf.
8. Taylor MR, Agho KE, Stevens GJ *et al.* Factors influencing psychological distress during a disease epidemic: data from Australia's first outbreak of equine influenza. *BMC Public Health* 2008;**8**:347.
9. Tucci V, Moukaddam N, Meadows J *et al.* The forgotten plague: psychiatric manifestations of ebola, zika, and emerging infectious diseases. *J Glob Infect Dis* 2017;**9**:151–6.
10. World Health Organization. Mental Health and COVID-19. 2020 [cited 2020 Dec 31]. https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/technical- guidance/mental-health-and-covid-19.
11. Wang HG, Xie R, Ma TH *et al.* Excessive anxiety in IBD patients is unnecessary for COVID-19. *Clin Res Hepatol Gastroenterol* 2020;**44**:e121–2.
12. Goodsall TM, Han S, Bryant RV. Understanding attitudes, concerns, and health behaviors of patients with inflammatory bowel disease during the coronavirus disease 2019 pandemic. *J Gastroenterol Hepatol* 2020; 1–6. 10.1111/jgh.15299.
13. Zhang WR, Wang K, Yin L *et al.* Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychother Psychosom* 2020;**89**:242–50.
14. Watkins A, Rothfeld M, Rashbaum WK, *et al.* Doctor who treated virus patients dies by suicide. *The New York Times*, 2020 [cited 2020 Dec 31]. https://www.nytimes.com/2020/04/27/nyregion/new-york-city-doctor-suicide-coronavirus.html.
15. Perlis RH. Exercising heart and head in managing coronavirus disease 2019 in Wuhan. *JAMA Netw Open* 2020;**3**:e204006.
16. Conversano C, Marchi L, Miniati M. Psychological distress among healthcare professionals involved in the COVID-19 emergency: vulnerability and resilience factors. *Clin Neuropsychiatry* 2020;**17**:94–6.
17. Ripp J, Peccoralo L, Charney D. Attending to the emotional well-being of the health care workforce in a New York City health system during the COVID-19 pandemic. *Acad Med* 2020;**95**:1136–9.
18. Otu A, Charles CH, Yaya S. Mental health and psychosocial well-being during the COVID-19 pandemic: the invisible elephant in the room. *Int J Mental Health Sys* 2020;**14**: 1–5.
19. Lockdown woes: 70-year-old Kerala Woman Dies after Karnataka Refuses Entry to Her Ambulance at Border. The New Indian Express, 2020. https://www.newindianexpress.com/states/kerala/2020/mar/29/lockdown-woes-70-year-old-kerala-woman-dies-after-karnataka-refuses-entry-to-her-ambulance-at-borde-2123047.html.
20. Hussain A, Singhal T, El-Hasani S. Extent of infectious SARS-CoV-2 aerosolisation as a result of oesophagogastroduodenoscopy or colonoscopy. *Br J Hosp Med (Lond)* 2020;**81**: 1–7.
21. Sethi A, Swaminath A, Latorre M *et al.*; New York Society for Gastrointestinal Endoscopy. Donning a new approach to the practice of gastroenterology: perspectives from the COVID-19 pandemic epicenter. *Clin Gastroenterol Hepatol* 2020;**18**: 1673–81.
22. Gralnek IM, Hassan C, Dinis-Ribeiro M. COVID-19 and endoscopy: implications for healthcare and digestive cancer screening. *Nat Rev Gastroenterol Hepatol* 2020;**17**:444–6.
23. Ma C, Cong Y, Zhang H. COVID-19 and the digestive system. *Am J Gastroenterol* 2020;**115**:1003–6.
24. Mao R, Qiu Y, He JS *et al.* Manifestations and prognosis of gastrointestinal and liver involvement in patients with COVID-19: a systematic review and meta-analysis. *Lancet Gastroenterol Hepatol* 2020;**5**:667–78.
25. Moraveji S, Thaker AM, Muthusamy VR *et al.* Protocols, personal protective equipment use, and psychological/financial stressors in endoscopy units during the COVID-19 pandemic: a large survey of hospital-based and ambulatory endoscopy centers in the United States. *Gastroenterology* 2020;**159**:1568–70.e5.
26. Khan R, Tandon P, Scaffidi MA *et al.* COVID-19 and Canadian gastroenterology trainees. *J Can Assoc Gastroenterol* 2020; 1–7. 10.1093/jcag/gwaa034.
27. Lai J, Ma S, Wang Y *et al.* Factors associated with mental health outcomes among health care workers exposed to coronavirus disease 2019. *JAMA Netw Open* 2020;**3**:e203976.
28. Kang L, Li Y, Hu S *et al.* The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry* 2020;**7**:e14.
29. Maunder R, Hunter J, Vincent L *et al.* The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ* 2003;**168**:1245–51.
30. Fukuti P, Uchôa CLM, Mazzoco MF *et al.* How institutions can protect the mental health and psychosocial well-being of their healthcare workers in the current COVID-19 pandemic. *Clinics (Sao Paulo)* 2020;**75**:e1963.
31. Dubey S, Biswas P, Ghosh R *et al.* Psychosocial impact of COVID-19: diabetes & metabolic syndrome. *Clin Res Rev* 2020;**14**:779–88.
32. Percudani M, Corradin M, Moreno M *et al.* Mental health services in Lombardy during COVID-19 outbreak. *Psychiatry Res* 2020;**288**:112980.
33. Yang Y, Li W, Zhang Q *et al.* Mental health services for older adults in China during the COVID-19 outbreak. *Lancet Psychiatry* 2020;**7**:e19.
34. Johnson HL, Ling CG, McBee EC. Multi-disciplinary care for the elderly in disasters: an integrative review. *Prehosp Disaster Med* 2015;**30**:72–9.
35. Sun S, Lin D, Operario D. Need for a population health approach to understand and address psychosocial consequences of COVID-19. *Psychol Trauma* 2020;**12**:S25–7.
36. Newman E, Pfefferbaum B, Kirlic N *et al.* Meta-analytic review of psychological interventions for children survivors of natural and man-made disasters. *Curr Psychiatry Rep* 2014;**16**:462.
37. Ćosić K, Popović S, Šarlija M *et al.* Impact of human disasters and COVID-19 pandemic on mental health: potential of digital psychiatry. *Psychiatr Danub* 2020;**32**:25–31.
38. Almeida-Leite CM, Stuginski-Barbosa J, Conti PCR. How psychosocial and economic impacts of COVID-19 pandemic can interfere on bruxism and temporomandibular disorders? *J Appl Oral Sci* 2020;**28**:e20200263.
39. Webb L. COVID-19 lockdown: a perfect storm for older people's mental health. *J Psychiatr Ment Health Nurs* 2020, 10.1111/jpm.12644.
40. Mukhtar S. Psychological health during the coronavirus disease 2019 pandemic outbreak. *Int J Soc Psychiatry* 2020;**66**: 512–6.
41. de Girolamo G, Cerveri G, Clerici M *et al.* Mental health in the coronavirus disease 2019 emergency: the Italian response. *JAMA Psychiatry* 2020;**77**:974–6.

42. Corruble E. A viewpoint from Paris on the COVID-19 pandemic: a necessary turn to telepsychiatry. *J Clin Psychiatry* 2020;**81**:20com13361.
43. Knopf A. Addiction telemedicine comes into its own with COVID-19. *Alcoholism Drug Abuse Weekly* 2020;**32**:5–6.
44. Hara R, Sujit J. Mobile telepsychiatry in India. *World Psychiatry* 2013;**12**:84.
45. Dong L, Bouey J. Public mental health crisis during covid-19 pandemic, China. *Emerg Infect Dis* 2020;**26**:1616–8.
46. Semrau M, Alem A, Ayuso-Mateos JL *et al*. Strengthening mental health systems in low- and middle-income countries: recommendations from the Emerald programme. *BJPsych Open* 2019;**5**:e73.
47. Adams JG, Walls RM. Supporting the health care workforce during the COVID-19 global epidemic. *Jama* 2020;**323**: 1439–40.
48. Dhawan P. COVID-19 pandemic brings gastrointestinal endoscopy practice to its knees— financially! *J Dig Endosc* 2020; **11**:81–2.
49. Patel DA, Shah CN. Navigating through the financial crisis that may occur during and after the COVID-19 pandemic for gastroenterologists. *J Dig Endosc* 2020;**11**: 76–80.
50. Coronavirus Government Response Tracker. 2020 [cited 2020 Dec 31]. https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker.
51. Mackolil J, Mackolil J. Addressing psychosocial problems associated with the COVID-19 lockdown. *Asian J Psychiatr* 2020; **51**:102156.
52. De Sousa A, Mohandas E, Javed A. Psychological interventions during COVID-19: challenges for low and middle income countries. *Asian J Psychiatr* 2020;**51**:102128.
53. Maida M, Sferraz E, Ricciardiello L *et al*.; Italian Society of Gastroenterology (SIGE). Impact of the COVID-19 pandemic on gastroenterology divisions in Italy: a national survey. *Dig Liver Dis* 2020;**52**:808–15.
54. Gralnek IM, Hassan C, Beilenhoff U *et al*. ESGE and ESGENA Position Statement on gastrointestinal endoscopy and the COVID-19 pandemic. *Endoscopy* 2020;**52**:483–90.
55. Su S, Shen J, Zhu L *et al*. Involvement of digestive system in COVID-19: manifestations, pathology, management and challenges. *Therap Adv Gastroenterol* 2020;**13**:17562848209 34626.
56. Ke J, Lan N, Wang T *et al*. Strategies and recommendations for the management of gastrointestinal surgery during the COVID-19 pandemic: experience shared by Chinese surgeons. *Gastroenterol Rep (Oxf)* 2020;**8**:137–74.
57. Holtmann G, Quigley EM, Shah A *et al*. "It ain't over. till it's over!": risk-mitigation strategies for patients with gastrointestinal diseases in the aftermath of the COVID-19 pandemic. *J Gastroenterol Hepatol* 2020;**35**:1117–23.
58. Kennedy NA, Jones GR, Lamb CA *et al*. British Society of Gastroenterology guidance for management of inflammatory bowel disease during the COVID-19 pandemic. *Gut* 2020;**69**: 984–90.