




Surgical challenges and research priorities in the era of the COVID-19 pandemic: EAES membership survey

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Abstract

Background Healthcare systems and general surgeons are being challenged by the current pandemic. The European Association for Endoscopic Surgery (EAES) aimed to evaluate surgeons' experiences and perspectives, to identify gaps in knowledge, to record shortcomings in resources and to register research priorities.

Methods An ad hoc web-based survey of EAES members and affiliates was developed by the EAES Research Committee. The questionnaire consisted of 69 items divided into the following sections: (I) demographics, (II) institutional burdens and management strategies, and (III) analysis of resource, knowledge, and evidence gaps. Descriptive statistics were summarized as frequencies, medians, ranges, and interquartile ranges, as appropriate.

Results The survey took place between March 25th and April 16th with a total of 550 surgeons from 79 countries. Eighty-one percent had to postpone elective cases or suspend their practice and 35% assumed roles not related to their primary expertise. One-fourth of respondents reported having encountered abdominal pathologies in COVID-19-positive patients, most frequently acute appendicitis (47% of respondents). The effect of protective measures in surgical or endoscopic procedures on infected patients, the effect of endoscopic surgery on infected patients, and the infectivity of positive patients undergoing laparoscopic surgery were prioritized as knowledge gaps and research priorities.

Conclusions Perspectives and priorities of EAES members in the era of the pandemic are hereto summarized. Research evidence is urgently needed to effectively respond to challenges arisen from the pandemic.

Keywords COVID-19 · Pandemic · Laparoscopy · Surgical challenges

The COVID-19 pandemic has strongly influenced healthcare systems worldwide. The rapid spread of the coronavirus required adjustment and rearrangement of healthcare services within a short period of time [1]. These changes, along with public health, social, and economic factors, have greatly affected surgical practice [2].

Surgeons were called to change their practice and assume extended roles, often not related to their primary expertise.

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Furthermore, healthcare professionals have faced challenges on a social, personal, and psychological level. In this period of social introversion, the medical community was called to address these challenges according to professional and scientific principles. Among the initial abundance of empiric and often conflicting recommendations [3, 4], national and institutional protocols on surgical practice [5, 6], and the profound lack of research evidence, the surgical community was called to address functional, practice, and research challenges.

The European Association for Endoscopic Surgery (EAES) has identified a lack of systematic register of these challenges. The EAES Research Committee therefore aimed to evaluate the current situation as experienced by our members, to identify gaps in knowledge, to record shortcomings

in resources and to register research priorities through a web-based survey of EAES members and affiliates.

Methods

Study group

The study group consisted of members of the EAES Research Committee, an international panel of surgeons from 10 European countries. The steering group consisted of two Committee members (EL, MM) and the Committee chair (NKF) acted as coordinator.

Survey instrument

The study group nominated candidate questions through email communication and the steering group shortlisted questions and refined the questionnaire through feedback of all Committee members.

The questionnaire consisted of 69 items (Online Appendix) divided into the following sections:

- (I) Participant demographics.
- (II) Burden of the pandemic in participants' institutions and management strategies/protocols.
- (III) Analysis of resource, knowledge, and evidence gaps.

The survey questions were organized into closed-ended questions with unordered choices, open-ended questions, and partially closed-ended questions, as considered appropriate. To assess knowledge gaps and research priorities, a 5-point Likert scale was used, 5 indicating the highest score.

Sampling plan and invitation

The 3500 EAES members were invited to participate in the survey through:

- (I) Email invitation of EAES members and affiliated individuals.
- (II) The EAES Email Newsletter sent to EAES members and affiliated individuals.
- (III) Social media (Facebook, Twitter).

Two separate invitations were sent on March 25th and on April 16th. Participants were informed that data are anonymized and confidential, and were provided a web link directing to the survey instrument. Consent was implied upon acceptance to participate. The survey was hosted by

SurveyMonkey, a secure web-based survey platform. Participants were required to respond to all questions for their responses to be registered.

No formal sample size calculation was performed due to time constraints and in order for the survey to be launched within reasonable time under consideration of the urgency of the situation and the need to make results made available in a timely manner.

Stratification, clustering and validity

No relevant actions were taken for the above reasons.

Statistical analysis

A tallied summary of the results for each question was generated. Data were analyzed using descriptive statistics (SPSS™ v20.0, IBM®, US). Frequencies were presented as % percentages and continuous variables were presented as medians, ranges, and interquartile ranges. Summary survey responses were presented regularly to the EAES Research Committee and to the EAES Executive Board to adjust its strategic plan and address priorities.

Results

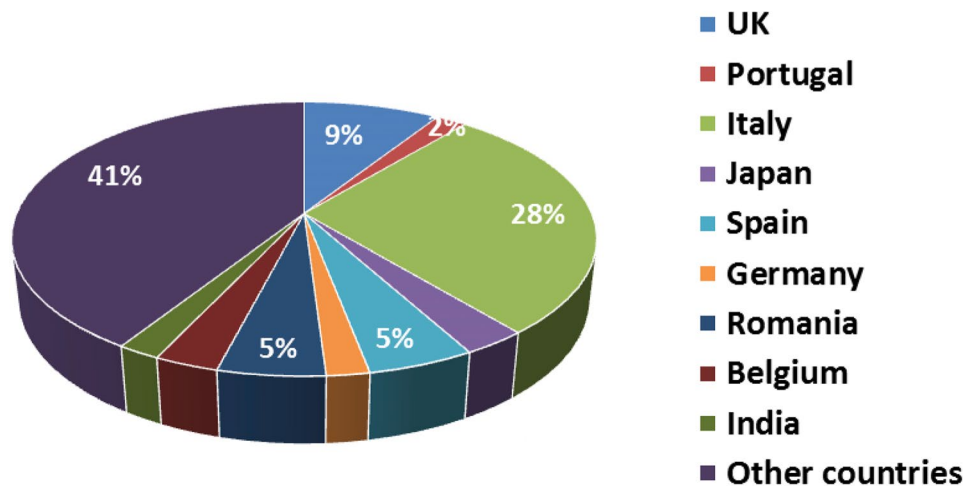
Sample characteristics

The survey took place between March 25th and April 16th. A total of 550 surgeons (16%) from 79 countries participated. The majority of participants were based in Europe (Italy, 29%; United Kingdom, 9%; Romania, 5%). There was representation from most European countries, although the number of participants from individual countries was variable (median 3; range 1–149; interquartile range 1–5). Geographical distribution of surveyed surgeons is shown in Fig. 1.

Sixty-five percent reported practicing gastrointestinal surgery in general, 15% oncological surgery and 10% upper gastrointestinal surgery. More than half reported working in academic hospitals (59%), followed by local (26%) and private hospitals (12%).

Assessment of the current situation

Eight percent of the surgeons surveyed, maintained normal surgical practice for both elective and emergency surgery, 58% cancelled elective non-cancer surgery and 23% cancelled all elective surgery. One-third (35%) of the

Fig. 1 Geographically distribution of surveyed surgeons

participants have been asked to help out in other specialties; out of those, 46% were asked to help in the emergency department and 62% did not receive relevant training.

Most respondents (85%) reported that their institution performed COVID-19 tests in patients with suspected symptoms; out of those, 61% reported that the tests were performed upon admission and 37% on the ward after admission. A dedicated ward for COVID-19-positive patients was reported by 82% to be available and COVID-19-positive surgical patients had to be admitted in such ward in 69%.

Half (47%) of the surgeons reported their hospital having treated COVID-19-positive patients with a median number of 50 (range 1–1800, interquartile range 10–160). Emergency surgery in COVID-19-positive patients was reported having been performed by 118 respondents, with a median of 3 patients (interquartile range 1–5). Out of those, 41% reported using minimally invasive surgery, with a median of 3 (range 1–43, interquartile range 1–5) (Table 1).

Sixty percent reported applying measures for minimally invasive surgery when operating on COVID-19-positive patients; 62% of those used a CO₂ filter. Two-thirds (66%) reported using standard operating procedures for COVID-19-positive patients in their institution, including operating-room-related (70%) and perioperative care (58%). Seventy-five percent of participants reported a reduced incidence of acute surgical conditions compared to the pre-pandemic era.

One-fourth (27%) of respondents reported having encountered COVID-19-positive patients with abdominal pathologies, most frequently acute appendicitis (47% of respondents). Eighteen percent reported having encountered more complications with COVID-19-positive patients, primarily respiratory (71% of respondents) and infective complications (18% of respondents).

Assessment of gaps

Respondents have prioritized gaps in the area of surgical procedures and protective measures (median 4, IQR 3–5; on a 5-point Likert scale); virus-specific parameters (median 4, IQR 3–4); service redistribution (median 3, IQR 3–4); and diagnostic modalities for COVID-19-positive patients (median 3, IQR 3–4) (Fig. 2).

With regard to current gaps in resource management and protective equipment, respondents prioritized operating room protective measures (median 4, IQR 3–5), endoscopy protective measures (median 4, IQR 3–5), filtering face piece (FFP) masks (median 4, IQR 3–5) and protective materials/equipment (median 4, IQR 3–5), own recyclable protective measures (median 4, IQR 3–5), redirection of surgical staff (median 3.5, IQR 3–5), and surgical staff training (median 3, IQR 3–4) (Fig. 3). Thirty-five percent of respondents reported enrolling COVID-19-positive surgical patients to a registry. Out of those who did not, 83% would be willing to enroll patients to an international dedicated registry.

Research gaps in the fields of the safety of surgery when using usual protective measures (median 4, IQR 3–5), the safety of minimally invasive surgery in COVID-19-positive patients (median 4, IQR 3–5), the effect and safety of pneumoperitoneum in COVID-19-positive patients (median 4, IQR 3–5), postoperative care of in COVID-19-positive patients (median 4, IQR 3–5), and the effects of conversion from minimally invasive to open surgery in COVID-19-positive patients (median 3, IQR 3–5) were prioritized (Fig. 4).

Personal psychological support was not prioritized high among respondents with a median score of 2 (IQR 1–3) (Fig. 5), whereas 68% reported no peer support in their

Table 1 Numbers of patients Covid-19+ treated so far

Question	Surveyed surgeons		Total patients	Median	Geographical distribution
	N	%			
Treated patients	261	47	37,630	50 (1–1800)	Italy 44% Spain 28% UK 7% Singapore 4% Germani 3% Philippines 3% Belgium 2% Portugal 1% Netherlands 1% Other countries with less-than—1% 0, 2%
Patients in ITU	231	42	6053	14 (1–400)	Italy 54% Spain 18% UK 10% Belgium 2% France 2% Singapore 2% Netherlands 2% Germany 1% Other countries with less-than—1% 1%
Patients underwent emergency	118	21	1464	3 (1–1000)	Italy 79% UK 6% Singapore 2% France 1% Romania 1% Other countries with less-than—1% 1, 4%
Patients operated on using MIS	50	9	191	2 (1–43)	Italy 44% Spain 30% UK 10% Bulgaria 5% Belgium 3% Colombia 1% Other countries with less-than—1% 3%
Patients decreased	176	32	9317	8 (1–3100)	Indonesia 33% Italy 24% Ukraine 15% UK 14% Switzerland 2% Poland 1% Other countries with less-than—1% 0, 30%

institution. Psychologists to provide staff support in relation to the pandemic were reported by 57% to be available in their institution and 56% reportedly had access to this service.

Discussion

This EAES-sponsored survey found that 81% of surgeons had to postpone non-urgent cases or suspend their practice and more than one-third assumed other functional roles within their institution. Furthermore, nearly 70% reported

that COVID-19-positive surgical patients had to be transferred to a dedicated ward. Among other, these findings suggest tremendous changes in institutional infrastructures and surgical practices with potential implications to the quality of surgical services.

In addition, the results of this survey suggest substantial uncertainty with regard to potential risks of surgery in infected patients and the potential effect of protective measures. Practice recommendations were issued in the early phase of the pandemic in the West; however, they lacked background research evidence, and they were conflicting or were being updated within a short period of time.

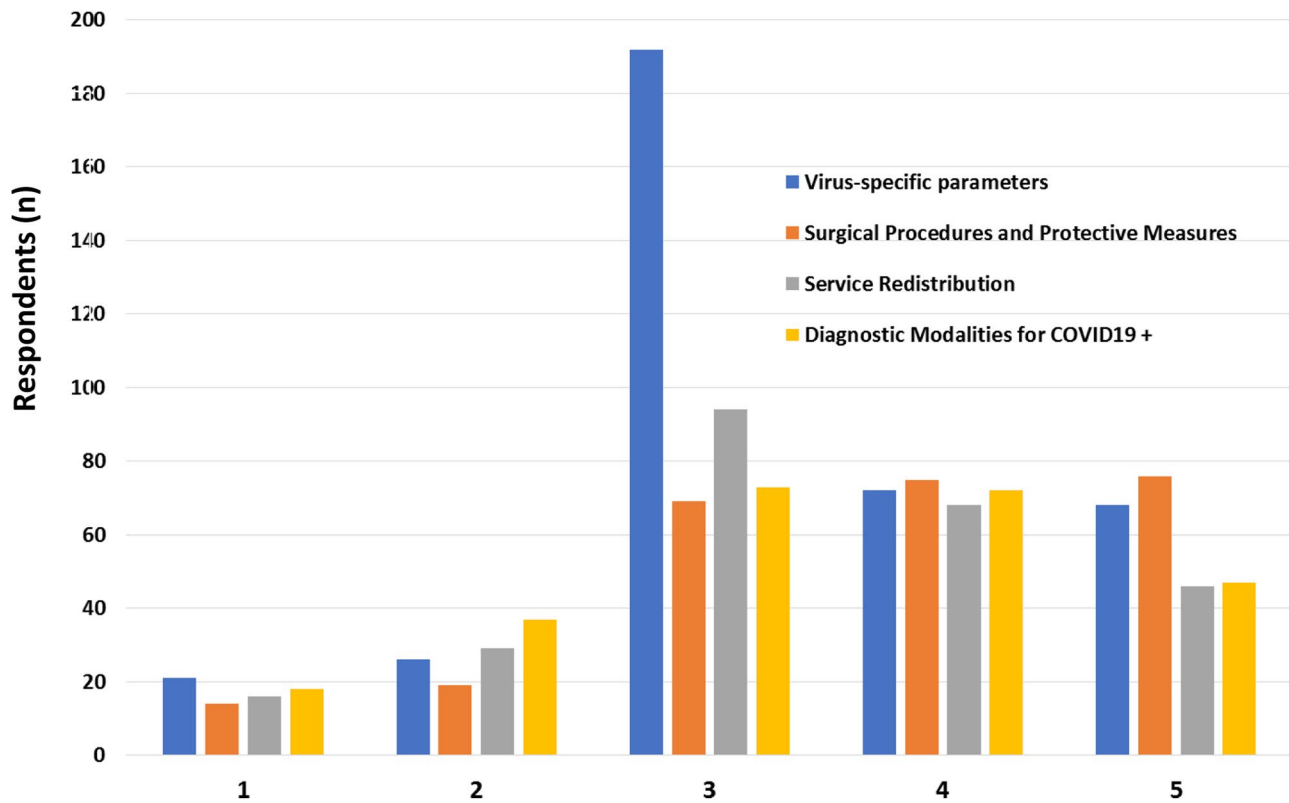


Fig. 2 Gaps prioritization (grade 1–5, 5 the maximum) in the area of surgical procedures and protective measures

Anecdotal data suggest variable directives by policymakers among European countries, based on unknown, trivial, or no background evidence supporting their putative effect. Notably, the safety of minimally invasive surgery has been questioned and directives have banned laparoscopic surgery in several countries.

Substantial uncertainty with regard to operating and endoscopy room protective measures has been documented, whereas research in this field was prioritized. Indeed, the transmission potential of COVID-19 has not been addressed by animal studies and very limited evidence refers to patients with HIV, hepatitis, SARS, and MERS. It would be probably not appropriate to extrapolate this indirect evidence and assume similar effects for SARS-CoV-2.

Rearrangement of functions among healthcare staff and the reported lack of training to serve in alternate functions may constitute a threat to the quality of healthcare services. Further emphasis on training prior to assumption of functions would be a prudent practice. The current situation suggests an urgent need to exchange information on the outcomes of surgery in infected patients.

The vast majority of respondents would be willing to provide local data to a registry; however, 65% do not provide any data resulting in waste of valuable scientific information at a time when it is critically needed. International and inter-society collaboration and promotion of existing registries would allow centralization of data for research purposes.

Survey participants have prioritized the scientific need to investigate the effect of laparoscopy and pneumoperitoneum on COVID-19-positive patients, and the postoperative management of these patients. Under consideration of the crucial need for research evidence, it would be reasonable to make registry data available to multiple research groups, allowing simultaneous conduction of exploratory analyses to address research questions.

Limitations

A limitation of this study was the response rate of 16%, which may undermine generalizability and be prone to response bias. The response rate, however, is comparable with previous surgical society membership surveys [7–9]. One inherent limitations of surveys in general are recall and

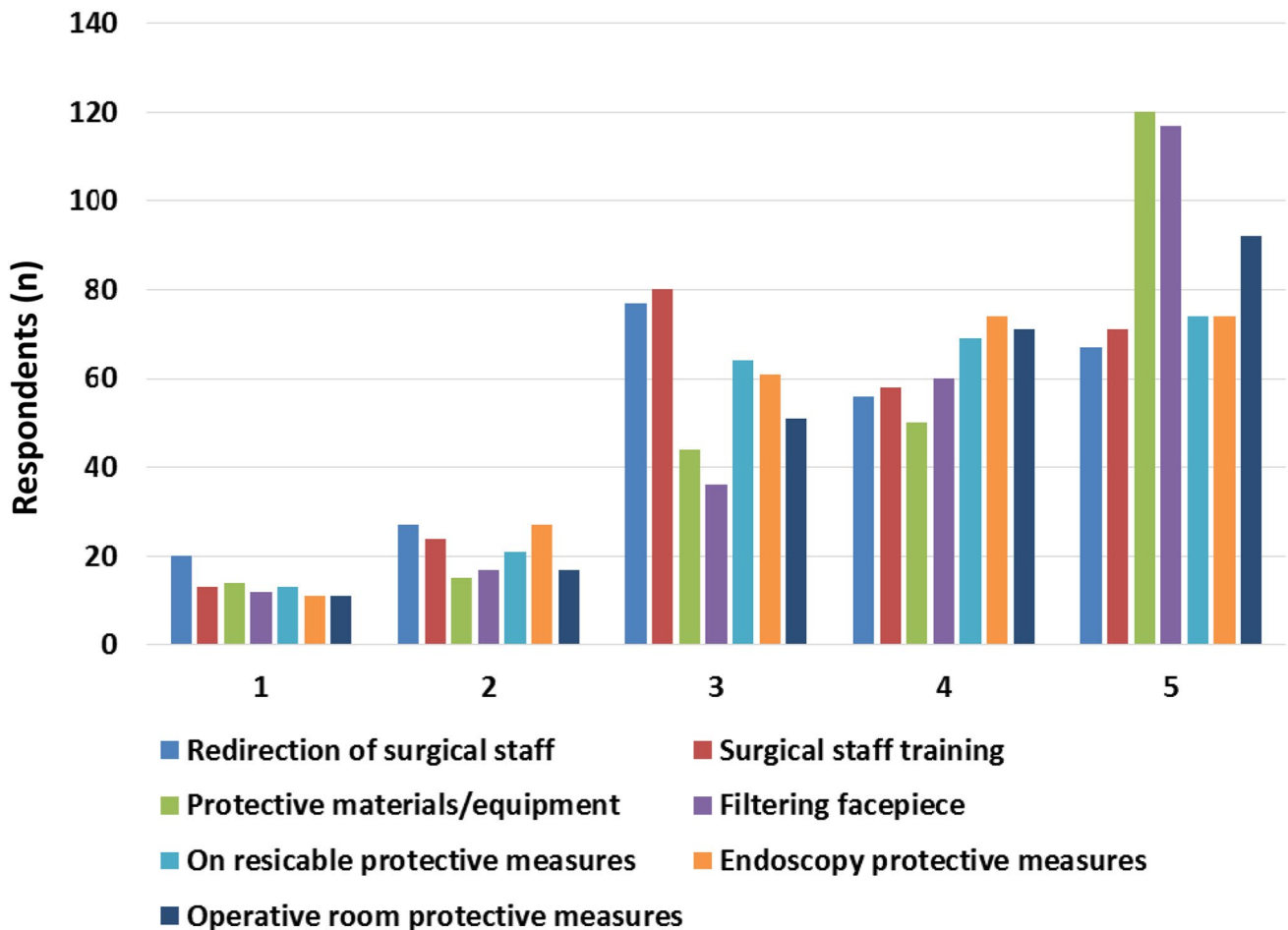


Fig. 3 Gaps prioritization (grade 1–5, 5 the maximum) in the area of resource management and protective equipment

selection bias of the responders, it carries the risk of the problems of personal inhibitions, indifference and unawareness of the nature of the problem which may affect the accuracy of the data.

While an argument could be made that a Delphi exercise would have been appropriate, we felt an initial broad grassroots approach would be more informative than an expert consultation. This project was developed within a few weeks in response to an urgent situation challenging surgeons on a global level and one may argue a repeat survey will be required to capture the members' views at the end of the pandemic.

Conclusion

This paper summarizes the current situation, perspectives and priorities of EAES members in the era of the COVID-19 pandemic. Stepwise approach to identify and generate evidence as a response to this global challenge is a prudent strategic goal and objective of the EAES community.

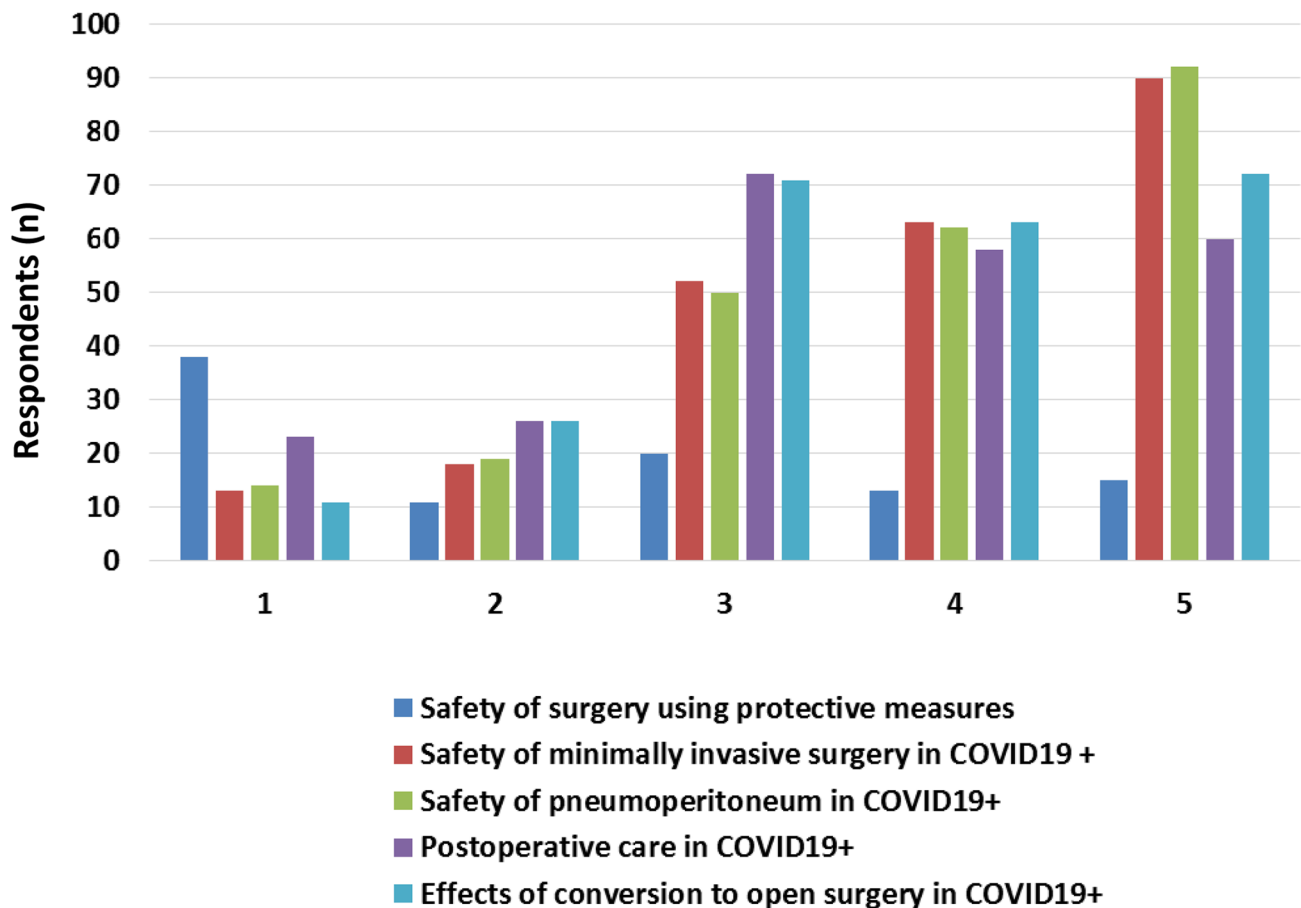


Fig. 4 Gaps prioritization (grade 1–5, 5 the maximum) in the area of the safety of surgery and minimally invasive surgery

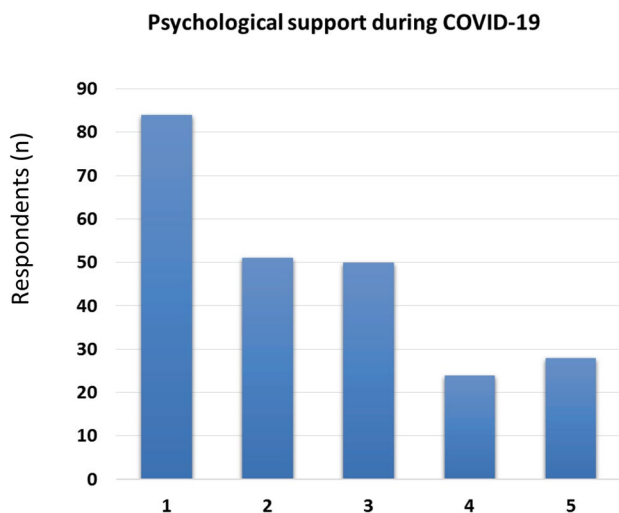


Fig. 5 Gap prioritization (grade 1–5, 5 the maximum) in the area of psychological support

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Compliance with ethical standards

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