

Internet and social media use among patients with colorectal diseases (ISMAEL): a nationwide survey

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Abstract

Aim Social media are used daily by both healthcare workers and patients. Online platforms have the potential to provide patients with useful information, increase their engagement and potentially revolutionize the patient–physician relationship. This survey aimed to evaluate the impact of the Internet and social media (I&SM) on patients affected by colorectal and proctological diseases to define a pathway to develop an evidence-based communications strategy.

Method A 31-item anonymous electronic questionnaire was designed. It consisted of different sections concerning demographics and education, reason for the visit, knowledge of the diseases, frequency of I&SM use and patients' opinions about physicians' websites.

Results Over a 5-month period, 37 centres and 105 surgeons took part in the survey, and a total of 5800 patients enrolled. Approximately half of them reported using the Internet daily, and 74.6% of the study population used it at least once per week. There was a correlation ($P < 0.001$) between those who used the Internet for work and those who had knowledge of both

symptoms and the likely diagnosis before consultation. Patients who used the Internet daily were more likely to request a consultation within 6 months of symptom onset ($P < 0.0001$). Patients with anorectal diseases were more likely to know about their disease and symptoms before the visit ($P < 0.001$).

Conclusion Colorectal patients use I&SM to look for health-related information mainly after their medical visit. Surgeons and hospital networks should plan a tailored strategy to increase patient engagement, delivering appropriate information on social media.

Keywords social media, colorectal patients, colorectal diseases, proctology, Internet, patient engagement, PPI

What does this paper add to the literature?

This work represents the largest survey concerning Internet and social media use among 5800 colorectal patients. It reports on patients' search for information on their diseases on the Internet and social media. These could be powerful tools to increase patient engagement and participation.

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Introduction

Around 57% of the global population uses the Internet [1]. In Italy, as in other industrialized countries, the percentage has reached 92%, with a 27% increase over the last year. The average time per day per person spent using the Internet and social media (I&SM) is 6 h and 4 min and 1 h 51 min, respectively [1].

Kaplan *et al.* [2] classified social media platforms into collaborative projects (e.g. Wikipedia), content communities (e.g. YouTube), social networking sites (e.g. Facebook, Twitter) and virtual games and social worlds (e.g. World of Warcraft, Second Life). Looking for information online has become one of the most popular activities today. Considering this high rate of engagement with I&SM use, it is understandable that about 80% of Americans seek health-related information online [3].

The spread of new-generation mobile devices has made I&SM accessible to everyone, including people from low-income areas [4]. According to a recent study involving 7446 participants, people checked Facebook about 14 times per day, spending more than 2 h and 30 min every day on their smartphones [5].

Online platforms have recently become an essential and useful tool in medical practice [6], leading to better self-management and self-care [7]. In fact, online health information may improve patient–physician relationships, increasing patient knowledge and engagement in the decision-making process [8] with a higher probability of a better health outcome [9]. Moreover, patient satisfaction throughout the healthcare journey can be evaluated through online platforms, thus improving the quality of the health system.

Interestingly, it is estimated that more than 1000 US hospitals use I&SM to engage with patients, and 57% of US consumers reported that this new approach increased their likelihood of using the services of those hospitals [10]. Physicians and patients have created virtual networks in which they can interact and share information through texts, images and videos [11]. However, the quality of the content shared, even via protected platforms, might be questionable [12].

Due to the close and mutual connection between online information and the healthcare system, I&SM as a modern driver of health information deserves further investigation to protect patient interests and preserve the reputation and professionalism of all physicians and healthcare providers [13]. To reach this goal, different societies have released guidelines after analysing the boundaries of professional use without any defined practical recommendation [14]. Therefore, the appropriate use of online platforms is mainly based on personal attitudes and common sense.

The aim of our survey was to evaluate the impact of I&SM on patients affected by colorectal and proctological diseases to define a pathway to develop a new, up-to-date and evidence-based communication strategy.

Method

The Young Group of the Italian Society of Colorectal Surgery (Y-SICCR) [15,16] designed a 31-item

anonymous questionnaire containing four sections (Appendix S2). The first four questions (Q1–Q4) referred to demographics (age, gender, country location) and education received. Q5, Q6, Q9 and Q10–Q13 addressed the reason for the visit and knowledge about the disease. Seven questions focused on frequency, reason for and amount of I&SM use (Q7, Q8, Q14–Q18). Q19–Q21 investigated the use of Twitter (whether the person had already heard about Twitter and hashtags). Finally, the last 10 questions assessed patients' opinions about personal websites belonging to any specialists (Q22–Q31).

The questionnaire consisted of six pages. A Google form with all 31 items was created, and the online survey was first tested on the members of Y-SICCR.

All members of the Italian Society of Colorectal Surgery (SICCR) were invited to join the survey through a formal e-mail that included the topic of the survey and the appropriate link to fill out the questionnaire. A reminder was e-mailed to nonresponders 2, 3 and 4 weeks after the initial mailing. A maximum of three investigators from each centre, with one investigator being older than 40 years of age and two younger than 40, were included as collaborators.

Survey participation was voluntary, and the questionnaire was anonymous. No institutional review board approval was required and no incentives were offered. An ideal number of respondents of between 50 and 200 for each centre was established.

Between 1 March and 31 July 2018 the questionnaire was administered to all patients referred to the outpatient clinic of colorectal centres belonging to the SICCR who participated in the survey. The questionnaire was distributed to patients by the investigators who were in charge of ensuring that the patients filled in all questions explaining, if necessary, the meaning of the questions. The purpose of the questionnaire was explained to each patient through a brief introduction, which reported in detail the role of the SICCR and the aim of the survey. Patients were also made aware of the presence of a section on the SICCR website (<http://www.siccr.org/informazioni-per-i-pazienti/>) dedicated to patients suffering from colorectal diseases. Once data collection was finished, all the answers were uploaded into a dedicated form using the Google Modules tool (<https://gsuite.google.com/>, Google, Mountain View, California, USA) and then downloaded by the coordinators to be analysed.

Results of the survey were reported according to the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) guidelines [17].

Statistical analysis

Categorical data were described by number and percentage and quantitative data by median and range. To evaluate the normality of the distributions of quantitative data, the Kolmogorov–Smirnov test was performed. The chi-square test and Spearman’s correlation analysis were applied (as univariate analysis) to compare qualitative and quantitative variables, respectively. The Mann–Whitney test (two-tailed) was used to compare qualitative (two categories) variables with quantitative ones. Multivariate binary logistic regression was performed to correlate the explanatory variables with disorders (anorectal or abdominal). Furthermore, the odds ratios (ORs) with 95% confidence intervals (CIs) and regression coefficients were calculated. Differences were considered significant at $P < 0.001$. This P -value was chosen because of the sample size. All analyses were carried out using SPSS v.25 (IBM Corporation, North Castle Drive, New York, USA).

Results

Over a 5-month period, 37 centres and 105 surgeons joined the survey with a total of 5800 enrolled patients (Figure S1).

Demographics and education (Q1–Q4)

Patients’ demographic characteristics with distribution by age, gender and country are shown in Table 1. More than half of the respondents were men ($n = 3117$; 53.7%) and the majority had a high level of education ($n = 3237$; 56% tertiary and postgraduate).

Reason for the visit and knowledge of the disease (Q5, Q6, Q9–Q13)

The reasons for seeking coloproctological advice were anorectal (74.6%; $n = 4324$) and abdominal (25.4%; $n = 1476$) diseases. The main diagnoses of all patients are shown in Figure 1.

Almost 31% ($n = 1776$) of the patients complained of haemorrhoidal disease, whereas 20.3% ($n = 1175$) had anal abscess/fistula or anal fissure and 15.1% ($n = 875$) were diagnosed with colorectal cancer.

Regarding knowledge of the disease, 72.7% ($n = 4217$) of the patients declared that they were aware of the disease prior to the consultation. Before looking for a specialist visit, almost two-thirds knew about their disease from general practitioners ($n = 3603$; 63%) and only 4.4% ($n = 255$) gathered online information. Notably, 54.8% ($n = 3177$) of the

Table 1 Patients’ demographic characteristics.

Variable	<i>n</i> (%)
(Q1) Age (years)	
<18	148 (2.6)
18–35	1082 (18.7)
35–50	1456 (25.1)
50–70	2066 (35.6)
>70	1048 (18.1)
(Q2) Gender	
Male	3117 (53.7)
Female	2683 (46.3)
(Q3) Country distribution	
North	2187 (37.7)
Centre	1668 (28.8)
South	1634 (28.2)
Islands	311 (5.4)
(Q4) Education	
None	187 (3.2)
Primary	743 (12.8)
Secondary	1623 (28)
Tertiary	2078 (35.8)
Postgraduate	1169 (20.2)
Total	5800 (100)

respondents referred to a period of less than 6 months between the onset of symptoms and the visit (Table 2).

Frequency, reason for and amount of I&SM use (Q7, Q8, Q14–Q18)

More than half ($n = 2941$; 50.7%) of the patients claimed to use the Internet daily and 74.6% of the entire population used it at least once per week ($n = 4326$) (Table 3). Only 23.3% of respondents stated that they used the Internet for professional reasons, while 17.5% ($n = 1014$) used it for personal interests, including healthcare. However, more than a third used it for other purposes (34%), such as social reasons and entertainment.

Regarding the online search for healthcare information, 57.5% of respondents stated that they used the Internet to obtain more details about their disease after they were diagnosed. Among these patients, 68.8% used Google, followed by specialized and university websites, visited by 9.3% and 8.6% of respondents, respectively. YouTube and Facebook were used by around 5.6%, with Twitter being the least used at only 1.7%. Regarding the use of social media among Internet users, Facebook was the most used (51.7%), followed by Google Plus (12.5%), LinkedIn (10.8%), YouTube (9.6%) and Twitter (9.0%). Social media were used at least once per

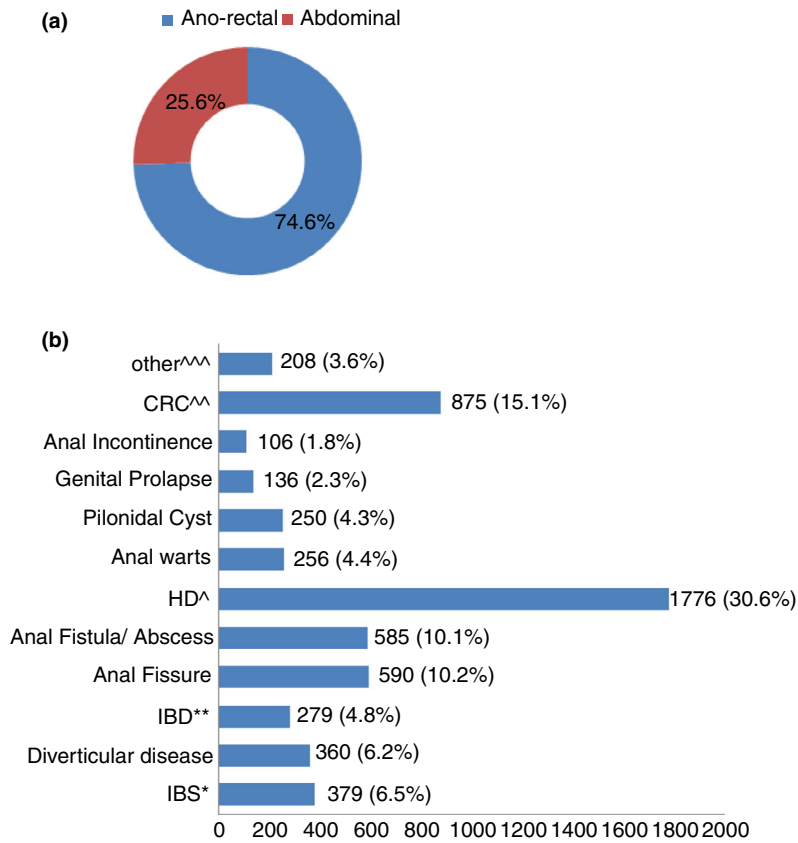


Figure 1 Diagnosis of participating patients: (a) type of disorder (Q5); (b) distribution according to the disease (Q6). *Irritable Bowel Syndrome; **Inflammatory Bowel Disease; ^Hemorrhoidal Disease; ^^Colo-Rectal Cancer; ^^Other includes: 1.6% different combination of single diseases, 1% Constipation, 0.8% Colonic Polyps, 0.2% none reported.

week by 59.8%, with 38.4% of people declaring daily use (Table 4).

The role of Twitter (Q19–Q21)

A total of 43.3% ($n = 2509$) of participants knew the meaning of the symbol ‘#’ (hashtag) on Twitter, and 4.2% (6.9% among social media users) used a specific ‘hashtag’ for searches on their disease (Table 4). However, none of them specified which one they were using. The hashtags are distributed as shown in Figure 2.

Patients’ opinions about websites owned by each specialist (Q22–Q31)

About 61% ($n = 3508$) and 52% ($n = 2998$), respectively, of patients stated that they would visit the doctor’s personal website and social media account (Table 5). They claimed being prone to use social media both to book a visit ($n = 1742$; 30%) and to communicate remotely ($n = 1757$; 30.3%) with the physician (Table 5). Regarding audio-visual information, 49.9% ($n = 2897$)

of patients would watch the physician’s YouTube channel. These results were consistent with the rate of patients who preferred being informed through videos ($n = 2989$; 51.5%) or through reading information ($n = 2811$; 48.5%).

The vast majority of participants reported that the reliability of a specialist cannot be deduced from social media ($n = 4804$; 82.8%), and the graphical features of personal websites did not influence their opinions about the specialist ($n = 4512$; 77.8%). Almost all respondents stated that information that can be obtained from the Internet was not sufficient to avoid a specialist consultation ($n = 5468$; 94.3%), and 87.4% ($n = 5069$) declared that they would not change their perception about the doctor merely after Internet consultation. Interestingly, 66% ($n = 3828$) of the whole cohort used I&SM to gather other details about their own disease (Table 5).

Additional analysis

In the univariate analysis, patients who used the Internet daily were more likely to request a consultation

Table 2 Disease and visit topics.

	<i>n</i> (%)
(Q9) Symptom knowledge before the visit	
No	1368 (23.6)
Yes	4432 (76.4)
(Q10) Disease knowledge before the visit	
No	1583 (27.3)
Yes	4217 (72.7)
(Q11) Time spent before the visit	
<6 months	3177 (54.8)
>6 months	2623 (45.2)
(Q12) How to know the disease	
Family doctor	3654 (63.0)
Relatives or friends	701 (12.1)
Personal knowledge	749 (12.9)
Internet	254 (4.4)
Specialist	442 (7.6)
(Q13) How to get a specialist evaluation	
General practitioner	3603 (62.1)
Relatives or friends	649 (11.2)
Personal knowledge	614 (10.6)
Internet	255 (4.4)
Specialist	277 (4.8)
Personal initiative	402 (6.9)

Table 3 Frequency and reasons for Internet use.

	<i>n</i> (%)
(Q7) Internet use last month	
No Internet	1474 (25.4)
Once a week	287 (4.9)
2–3 times per week	588 (10.1)
4–6 times per week	510 (8.8)
Daily	2941 (50.7)
(Q8) Main reason for Internet use	
No Internet	1461 (25.2)
Personal reasons (including healthcare)	1014 (17.5)
Work	1354 (23.3)
Social reasons	1594 (27.5)
Fun	377 (6.5)

within 6 months of the start their symptoms. They were more likely to possess knowledge of their symptoms and disease before the specialist visit (all $P < 0.0001$) (Table S1). This may reflect that, via I&SM use, these patients understood that they needed a specialist visit.

Patients who used the Internet for work were more likely to know both symptoms and the disease before the visit ($P < 0.001$). No correlations were found with the time interval between symptom onset and consultation (Table S2). Therefore, professional use of the

Internet may be associated with a higher likelihood of becoming aware of an underlying pathology via Internet-guided recognition and determination of symptoms.

Compared with patients with abdominal diseases, those with anorectal diseases were more likely to know both symptoms and disease before the visit (both $P < 0.001$) (Table S3).

Younger patients and those with higher education levels more frequently had Facebook and Twitter accounts and more frequently used I&SM during the 4 weeks before completing the questionnaire (all $P < 0.0001$) (Table S4).

In a multivariate analysis, suffering from an anorectal disease was associated with a higher rate of social media use (OR 1.352, 95% CI 1.137–1.608; $P = 0.0007$). Being a younger adult (>18 years old) (OR 1.309, 95% CI 1.214–1.411; $P < 0.0001$), a woman (OR 1.233, 95% CI 1.091–1.394; $P = 0.0008$), having awareness of the disease (OR 0.704, 95% CI 0.606–0.818; $P < 0.0001$) and coming from islands and southern Italy (OR 1.864, 95% CI 1.643–2.115; $P < 0.0001$) were associated with abdominal diseases (Table S5).

Discussion

There is evidence that I&SM are primary sources of health information for both doctors and patients [18]. However, a high degree of variability in I&SM use has been reported so far in patients affected by different diseases, ranging from 99.3% in gynaecological patients to 51% in patients with orthopaedic disorders [19]. Furthermore, while several studies [20–22] have been published concerning academic and professional use by colorectal surgeons, there is a lack of knowledge on I&SM use by colorectal patients.

Recently, in a monocentric study from Australia, Long *et al.* [23] examined the use of I&SM in 63 patients affected by colorectal diseases. Thirty-nine patients (62%) declared the use of I&SM for health purposes, with Wikipedia being the main source of information (75%). The use of I&SM to search for health information was associated with men aged between 30 and 39 years with a high level of education. However, the small sample size, single-centre design and absence of specific questions on social media use potentially led to biased results.

The current survey included 5800 patients. A total of 57.5% of respondents reported using I&SM with the aim of seeking health-related information, but only 17.5% declared that this was the main reason for their Internet use. Google and other search engines were the preferred means (68.8%) to look for health information,

Table 4 Internet and social media (SM) use.

	<i>n</i> (%)
(Q14) Use of the Internet and to obtain information?	
Yes	3337 (57.5)
No	2463 (42.5)
(Q15) Search sites	
No Internet	2189 (37.7)
Internet users	3611 (62.3)
Google	2486 (68.8)
Facebook	203 (5.6)
Twitter	62 (1.7)
YouTube	210 (5.8)
Specialist websites	337 (9.3)
University websites	313 (8.6)
Others	0 (0)
(Q16) Satisfied from Internet search	
Yes	2650 (45.7)
No	3150 (54.3)
(Q17) SM account among Internet users	
No Internet	2015 (34.7)
Internet users	3785 (65.3)
Google Plus	475 (12.5)
Facebook	1959 (51.7)
Twitter	342 (9.0)
YouTube	364 (9.6)
LinkedIn	409 (10.8)
My Space	48 (1.2)
Other*	188 (4.9)
(Q18) Frequency of SM usage	
No account	2046 (35.3)
Yes, but never used	283 (4.9)
Once per week	326 (5.6)
2–3 times per week	491 (8.5)
4–6 times per week	426 (7.3)
Daily	2228 (38.4)
(Q19) Meaning of # on Twitter	
Yes	2509 (43.3)
No	3291 (56.7)
(Q21) Hashtag use to search about the disease	
Yes	242 (4.2)
No	5558 (95.8)

*Instagram (4.6%) and WhatsApp (0.3%).

followed by specialist consultation (9.3%) and reading university websites (8.6%) (Table 4).

Only 4.4% declared that the main source of knowledge about their disease was social media. In a national survey of 3014 adults living in the United States, 59% declared that they had looked for health information on the Internet, and 35% of this subpopulation found a precise diagnosis that, interestingly, was not confirmed in 35% of cases by a specialist visit [24].

We found a significant correlation ($P < 0.0001$) between both Internet use in the last 4 weeks and use of a Facebook or Twitter account and demographic factors such as younger age and a higher level of education (Table S4). Indeed, this association between social media use and higher levels of education and younger age has been reported by many authors [25–28].

Facebook is the most important social network, with 2.50 billion active users [29], more than the population of China, the world's most populous country [30]. In our survey, Facebook was used by 51.7% of Internet users, followed by LinkedIn (10.8%) and Twitter (9.6%). These findings are convergent with other studies claiming Facebook to be the social media site most used for health purposes by patients [26,31,32]. However, risks such as manipulation of the virtual image, exaggeration of life experiences and misinformation need to be considered [10].

On the other hand, Twitter shows particular features in comparison with other social networks. The hashtags on Twitter are the main tools to link a 280-word message (tweet) to a topic, a conversation or virtual community [6]. Hashtags work as keywords, enabling multiple and unrestricted interactions among users with the chance for everyone to repost the message ('retweet'), thereby increasing its diffusion, as in the 'snowball effect' [33].

Hashtag campaigns to engage patients or healthcare providers, such as #Ilooklikeasurgeon, against sexual or racial stereotypes in surgery, and #LCSM (lung cancer social media) and #BCSM (breast cancer social media) focused on cancer patients have already been successful [34–36].

To our knowledge, this is the first attempt to evaluate what patients effectively know about the most popular hashtags among colorectal surgeons. Almost 43% of respondents were aware of the meaning and purpose of hashtags (Figure 2), with #colorectalsurgery [36] being the best known (46.2%) compared with #colorectalresearch [22] (35%) and #CRSTrials (18%). Although these hashtags are mainly designed to connect colorectal surgeons, they may also be considered for patient-focused initiatives; this was a specific aim of the #CRSTrials initiative.

YouTube was the preferred social media platform of only 9.6% of the patients (Table 4). Even if social networks remain the first option for health-related research, YouTube has to be considered a powerful platform, especially for health purposes. In fact, video may be even more effective than written texts, especially those involving patient witnesses on their first experience of a disease [37,38]. YouTube allows for a user-friendly approach to the sharing of information, especially for

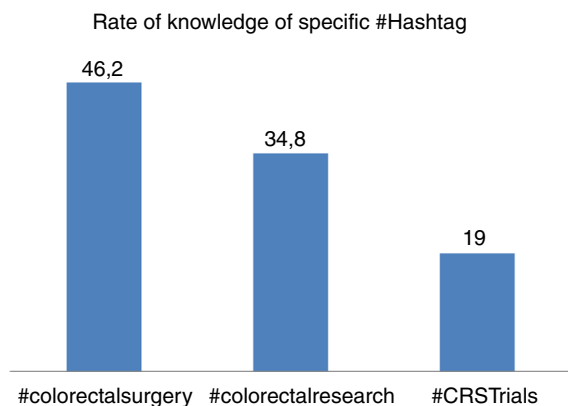


Figure 2 Rate of knowledge of specific #hashtags among those who answered that they knew the meaning of #hashtag on Twitter (Q20).

patients with low levels of education [10]. Furthermore, music and dance can be powerful tools for improving and enhancing the sharing of health information [10].

Patients with anorectal diseases more frequently present a better knowledge of their disease and related symptoms before the visit than patients with abdominal diseases ($P < 0.001$) (Table S3). This may be related to psychological distress due to alarming or annoying symptoms (e.g. bleeding, anal pain), the need for over-the-counter remedies to gain symptomatic control before the visit or different psychological features. Moreover, among these proctological patients, those who used the Internet daily not only demonstrated awareness of the disease before the medical visit but also reported a shorter time interval between the onset of symptoms and specialist consultation. This might suggest that patients who used I&SM and understood their symptoms were alarmed and booked a specialist visit earlier.

There is a universal agreement on the pivotal role that social media have on patient engagement [39]. In our study, 60% of the respondents visited surgeons' websites and 51.7% read their professional profiles. Nevertheless, they reported that online information did not influence their opinion on a doctor's reliability or their decision to undergo a visit with them (82% of respondents). This suggests a diffused awareness about the potential risks of unfiltered interpretation of information coming from I&SM. Indeed, the quality of health-related data on social media still represents a challenge [40]. Despite its public availability, the possibility of reaching a huge audience and swift and easy access, the use of I&SM has both benefits and risks. In 2002, Silberg *et al.* [41] proposed four standards to preserve the reliability of online information: authorship, attribution,

Table 5 Professionalism feedback.

	n (%)
(Q22) Would you visit your doctor's website?	
No	2292 (39.5)
Yes	3508 (60.5)
(Q23) Would you visit your doctor's SM professional profile?	
No	2802 (48.3)
Yes	2998 (51.7)
(Q24) How would you use it?	
I would not use it	1965 (33.9)
To get a visit	1742 (30.0)
To have direct communication	1757 (30.3)
To talk with other patients	336 (6.0)
(Q25) Would you check a YouTube informative video of your doctor?	
No	2903 (50.1)
Yes	2897 (49.9)
(Q26) Do you prefer reading or video to be informed?	
Video	2989 (51.5)
Reading	2811 (48.5)
(Q27) Can a doctor's reliability can be deduced from SM?	
No	4804 (82.8)
Yes	996 (17.2)
(Q28) Can graphical features of a personal website influence your opinion about a doctor?	
No	4512 (77.8)
Yes	1288 (22.2)
(Q29) Is information obtained using the Internet enough to avoid a medical visit?	
No	5468 (94.3)
Yes	332 (5.7)
(Q30) Have you ever changed idea about a doctor after Internet consultation?	
No	5069 (87.4)
Yes	731 (12.6)
(Q31) Would you use Internet to get more information about the disease?	
No	1972 (34.0)
Yes	3828 (66.0)

SM, social media.

disclosure and currency. However, the participation of physicians in online content shared on I&SM might still be suboptimal in colorectal surgery [12].

The findings of this study may be useful for hospital and surgical associations in planning strategies for patients on social media. For example, Facebook, YouTube and Twitter appear to be particularly used by patients as social media platforms and could be

considered at first in delivering educational projects or promoting patient engagement. Patients with proctological disorders seem more proactive in using social media for health purposes, and are a suitable category for engagement in studies on PROMS and awareness campaigns. Nearly half of the respondents were aware of the Twitter hashtags most used by colorectal surgeons and #colorectalsurgery. This suggests that surgeons who are active on social media should consider the potential impact of their social media messages on patients, even when not specifically addressed to them.

This study has some limitations. The major limitation was the impossibility of recording the number of patients who refused to complete the survey. Moreover, a selection bias due to reduced response by patients who were less confident with I&SM cannot be excluded. Since several studies [30] have already shown that, with the advent of broadband technologies, no major differences exist in Internet use by various ethnicities or those in different surroundings (rural versus urban), these data were not collected. With the closure of Google Plus on 2 April 2019 (used by 8.2% of the respondents), the overall impact and spread of this survey on social media might have been modified. The present study has several strengths and implications. ISMAEL represents the largest survey ever published in the literature about I&SM use among colorectal patients, providing baseline data on social media use by colorectal patients for future research. The multicentre design and homogeneous distribution of all participating centres from the whole country are major strengths of the survey.

Conclusion

Use of I&SM among colorectal patients is widespread. These patients seem to be among the more active groups in searching for health-related information online mainly after their medical visit. Surgeons and hospital networks should plan a tailored strategy to increase patient engagement and deliver appropriate information on social media. However, potential risks concerning privacy and misinformation may exist, which should be adequately addressed.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Author contributions

AS, FP and GG contributed equally to this work through substantial contributions to the conception and design of

the work, acquisition, analysis and interpretation of data for the work, draughting and revising the work critically for important intellectual content. Final approval of the version to be published. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy and integrity of any part of the work were appropriately investigated and resolved. VDeS contributed to acquisition, analysis and interpretation of data for the work, draughting and revising the work critically for important intellectual content. Final approval of the version to be published. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy and integrity of any part of the work were appropriately investigated and resolved. MM contributed to draughting the work and revised it critically for important intellectual content. Final approval of the version to be published. RM contributed to data interpretation and statistical analysis. GP, PC, EM, MM, GR and JM contributed equally to this work through substantial contributions towards the conception and design of the work. They also revised the work critically for important intellectual content. Final approval of the version to be published.

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Figure S1. Number of patients stratified according to the affiliated participating centres

Table S1. Comparison between frequency of Internet use in the last four weeks and knowledge of proctological disorders

Table S2. Comparison between ‘main reason for using the Internet’ and knowledge of proctological disorders

Table S3. Comparison between ‘reason for the visit’ and knowledge of proctological disorders

Table S4. Comparison between ‘factors associated with the use of Internet and social media’ and demographic factors

Table S5. Multivariate analysis (binary logistic regression). Dependent variable ‘reason of visit’: anorectal disorder versus abdominal disorder.

Appendix S1. ISMAEL Working Group.

Appendix S2. A nationwide survey on Internet and Social Media use Among patients with colorectal disease (ISMAEL)

ISMAEL working group

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