

Exploring the validity of “Twitter” polls in describing practice patterns for the treatment of Rectal Cancer

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Abstract

Introduction: Traditional surveys (including phone, mail and online) can be valuable tools to obtain information from specific communities. Social media, especially Twitter, is being increasingly adopted for knowledge dissemination and research purposes. Twitter polls are a unique feature which allows for rapid response to questions posed. We hypothesized that Twitter poll results will be similar to those obtained through traditional survey techniques. The objective was to determine the validity of Twitter polls in describing practice patterns for the treatment of rectal cancer.

Methods: A Survey on the management of rectal cancer was designed using Delphi methodology. Surgeons were contacted through major colorectal societies to participate in an online survey. The same set of questions were periodically posted by influencers on Twitter polls and the results were compared.

Results: A total of 753 surgeons participated in the online survey. Individual participation in Twitter ranged from 162 to 463 entries. There was good and moderate agreement between the two methods for the most popular choice (9/10) and the least popular choice (5/10) respectively.

Discussion: It is possible that polls available via social media can provide a low-cost alternative and an efficient method to describe practice patterns in the treatment of rectal cancer. This is the first study comparing Twitter polls with a traditional survey method in medical research.

Conclusions: There is viable opportunity to perform valuable research through social media, however further refinement is required. These results can potentially be transferable to other areas of medicine.

Introduction

Historically, medical research surveys have been conducted through face-to-face interviews, paper-based questionnaires or telephone interviews. Literature suggests these methods can be considered equivalent, with paper-based surveys being less costly than in person interviews (1). All survey data have inherent limitations due to the methodology, including indirect measure of attitudes and behaviors, especially when self-reporting occurs, since participants tend to over-estimate their own expertise or try to minimize embarrassment. (2). In addition, survey data are limited by low response rates, delayed results and even difficulty in accessing a desired population. Further burdens of accurate and efficient survey data include increased cost, need to train personnel and time-consuming nature compound the burden of accurate and efficient survey data (3) (4).

Despite this, surveys still remain an important alternative to gather valuable data that may be unobtainable using other methods. A well-designed survey can provide powerful information which can guide future research, influence clinical practice and even steer the development and provision of wide range programs and clinical services. (2). Collected data are as useful as they can convey information accurately and consistently. This is why a validated survey instrument becomes so relevant to the questionnaire design. (3)

With the increasing use of hand-held devices and personal computers, online platforms have provided an alternative method to access and survey a pre-identified population. This approach has the potential to be faster, less expensive and perhaps more accurate than the traditional designs. Additionally, newer platforms offer a facile process of data collection, decrease cost, flexible and easy customization, and the ability to obtain partial vs total analysis as an integrated feature. At present, there is a multitude of online services available to develop and distribute surveys, and most are free or inexpensive to use (for example, www.snapsurveys.com, www.surveymonkey.com, and www.keysurvey.com). Currently, universities and healthcare institutions access those platforms or have developed their own for research purposes.

Twitter was created in 2006, currently it has over 330 million users around the world, generating over 500 million tweets per day. There are 68 million users in the United States which

correspond to 21% of Twitter all users, with the remaining 79% distributed across other countries. Many Twitter users are healthcare providers (5). Innumerable communities exist within Twitter, those are commonly promoted by the use of “hashtags” which delineate topics for discussion on common interests with continuous exchange of information and almost immediate feedback (6). The Twitter platform provides any user with the ability to generate simple polls, those can include up to four options for other users to vote on. The duration of the poll can be determined and at the end users can see the final results. To date, there is limited evidence of the accuracy or efficacy of using social media (SoMe) to conduct medical research surveys (7). It is unknown who engages with Twitter Surveys or whether the results are reflective of the population being assessed. There are generic stats on who engages on this platform, for instance the large majority of tweets come from a small minority of tweeters , 80% of tweets in the US are generated by 10% of users, at the same time 45% of users have at least a college degree , and 71% of Americans use it as their news source. (8)

Considering how popular this platform is amongst physicians, we hypothesize that Twitter polls provide an efficient and reflective alternative to other survey methods. Our objective is to assess this hypothesis, by evaluating responses to currently controversial components of rectal cancer care, understanding that we are more interested in the comparison than the actual answers related to the questions themselves.

Methods

In order to compare results between a traditional online survey and the Twitter polls the authors developed a series of questions and clinical scenarios related to the more contentious aspects of rectal cancer care. The content and the wording was discussed and refined by the authors using multiple rounds of the Delphi methodology under the premise of including controversial and interesting subjects. It was predetermined that only 10 questions would be included in the survey to maximize engagement and minimize participant attrition. After this process, the final content and design of the questions were agreed by the authors (Appendix A). Questions included designed clinical scenarios with multiple choice options to explore the tendencies in the

management of patients with rectal cancer and the minimal volume of cases deemed necessary by surgeons and institutions to offer rectal cancer care. Subsequently we engaged a number of colorectal surgery professional societies from multiple countries across the world to request dissemination of the online link. www.SurveyMonkey.com.

The following relevant societies accepted to invite their membership; The American Society of Colon & Rectal surgeons, The Association of Coloproctology of Great Britain & Ireland, The European Society of Coloproctology, The Canadian Society of Colon & Rectal surgeons, The Colorectal Surgical Society of Australia and New Zealand, La Sociedad Argentina de Coloproctologia, Sociedade Brasileira de Coloproctologia, La Sociedad Colombiana de Coloproctologia, La Sociedad Espanola de Coloproctologia, and The Mediterranean society of Coloproctology. After the leadership of the participating societies approved the distribution of the survey link we refrained from promoting the survey on any social media platform during the entire period of study.

The link was open from June 6th 2019 to September 16th 2019. Half way through the study period, the participating societies were asked to remind their members to take part in the survey, compliance of which was variable among the different societies.

One month after the link survey was closed, the second phase of the study was initiated by posting one question at a time, on predetermined intervals of 48 hours between each question. Each question was posted by @juliomayol, who has the largest number of followers amongst the authors, and voted/retweeted by the others members of the study. During the Twitter phase the authors were careful not to mention or provide hints related to the nature of the study in order to prevent behavior modification. Due to the limited number of questions, specific surgical practice information of the respondents was not collected.

Results from the different survey techniques were collated and compared. Descriptive statistics were utilized. Differences in proportions for each of the 10 questions between the two methods were reported. Bar-plots (Fig.2) were used to graphically display the correlation of the preferred answers between the two platforms. Ethical approval was obtained at the institution of the corresponding author where data were received, compiled and analyzed.

Results

For the online survey we obtained participation from 753 individuals, response rate ranged between 746 to 753 with some questions being skipped by the participants. We identified responses from 60 different countries. The average time required to complete the survey was 4 minutes and 8 seconds. There were two appreciable peaks of participation, the first one on July 1 with 177 entries and a second one on August 12 with 234 responses, both of which followed specific actions, first launching the survey and subsequently the reminder to the societies membership respectively. (Figure 1).

Twitter entries showed significant disparities with a wide range of engagement from one question to another. The total duration of this phase was only 20 days. The maximum number of responses was generated by question # 5 and the lowest was obtained from question # 2 with 463 and 162 voters respectively. The 10 original tweets of the survey generated a total of 47,236 impressions, 1339 interactions and 2904 votes.

A total of 52% of the respondents from online and 49% from Twitter, considered 20 cases per year as the minimum number necessary to adequately understand management options and proficiently perform surgery on patients with rectal cancer. There were 316 votes from the Twitter poll. For question 2 the preferred option was again similar in both platforms; when asked about the number of rectal cancer cases necessary to be a high-volume center; 43% in the online survey and 41% in the Twitter arm selected at least 40 cases per year. For this question 162 votes were entered via Twitter, as mentioned above this question had the lowest participation rate on the Twitter arm.

Question 3, regarding which rectal cancer cases should be presented at multidisciplinary tumor board (MTB), was also met with a nearly identical response for the preferred choice; 80% and 81% for the online and the Twitter surveys respectively felt all rectal cancer cases should be discussed at this forum. For this question 345 individual participated via Twitter. A topic that continues to gain interest is the use of watch and wait (W&W) in the management of rectal cancer. The most popular answer choice for question 4 in both groups had 34% and 29 % of voters support, representing those who use it regularly in their practice. There were a total of 188 Twitter respondents.

The next few questions represented clinical scenarios, number 5 presented a patient with a low rectal tumor with poor differentiation, and with apparent clinical response. 54% of the online respondents indicated they would perform a low anterior resection (LAR) as originally planned, similar to the 58% of the 463 Twitter voters, with the highest number of Twitter participants as previously mentioned.

Next was question 6 with a case of a 65 years old obese male with a T2N0 rectal cancer at 6 cm from the verge, requiring surgery. The options given concerned the surgical approach. The most popular choice for both arms was conventional laparoscopy, with 40% of the online survey participants and 43% of the 360 Twitter voters choosing the same answer. Number 7 was the next clinical scenario. This was a 52 years old female with a normal body mass index and a rectal cancer in the mid/upper rectum who underwent laparoscopic surgery. The question inquired about whether a diverting stoma would be installed. The preferred option was the same for both arms, with 40% of the online group and 52% of the Twitter group choosing a “No” answer from a total of 316 participants.

Question 8 explored the perceived distance surgeons would feel is safe for a distal margin. Answers were very diverse for both groups. Interestingly 46% of the online participants considered that over a 1 cm is required whereas 29 % of 248 Twitter users considered that 2mm was the minimum distance for a safe distal margin.

The clinical scenario given in question #9 was a 59 years old male with a posterior T3bN1 low rectal cancer, with evidence of extramural vascular invasion (EMVI). The patient expressed an interest in sphincteric preservation. 58 % of the online participants said they would perform a LAR, similar to the 52 % of the 341 Twitter participants said they would also perform a LAR. The final question explored on the use of total neoadjuvant therapy (TNT) versus split neoadjuvant therapy in a 54 years old male with a locally advanced tumor with features of aggressiveness. The online group indicated that 66% would favor TNT. The Twitter group mirrored this response with 64% of 165 users indicating usage of TNT. Agreement between the most and least popular choices for the study was 90% and 50% respectively. A comparison of answers in both groups is presented in table 1.

Discussion

This study found that survey results had important similarities despite of using two different methods, with good agreement between the top choices (9 of the 10 questions having the same option as the top choice). This is an important finding considering how frequently physicians in all specialties use Twitter and other platforms to obtain relevant information related to the management of their patients. Agreement for the least popular choices was moderate (5 of the 10 questions having the same option). In addition research related to the utility of SoMe for medical research continue to expand, to our knowledge this current study constitutes, the first project related to healthcare delivery to ever compare the utility of Twitter polls with an on-line survey. Regardless of method of distribution, the key step in designing a survey is to pose clear questions. Asking too many questions and/or posing unclear questions reduces the response rate and thus the power of the study (9).

Questions were carefully designed using the Delphi methodology amongst the authors. We considered the content of the question needed to be relevant and interesting in order to generate engagement from the surveyed. However, it is important that for the primary objective of this study the questions themselves were less important than the actual correlation of the results between the two methods. We found that in nine of the 10 questions, the most popular choice on each question was the same, with very similar proportions despite the fact that for the online survey a total of 753 entries were recorded, when using this method it was certain that responses came from surgeons affiliated to well established colorectal societies. Less agreement (5 of 10) was identified when comparing the least preferred option for each question. In the current study, we were unable to determine differences in the type of practice such as academic vs community surgery because when the survey questions were disseminated via Twitter they were accessible to anyone with a Twitter handle and therefore it was impossible to determine any demographic information from the participants. It is relevant to mention the existence of virtual communities in Twitter and groups of interest (10). In our case, all the tweets and initial re-tweets were sent to target users who belong to rectal cancer surgical communities and the authors are colorectal surgeons who use Twitter frequently to exchange scientific medical information.

If we explore the answers in detail there are discrepancies. For the most part the preferred choices are very similar except for question number 8. This question concerned what distance constitutes a safe distal margin. The online group preference was for > 1 cm, whereas in Twitter preferences were distributed almost homogeneously for all choices. For the top choice on almost all questions we identified a strong correlation between the two methods, the proportions and preferences are graphically depicted in figure 2.

Data management continues to rapidly evolve and digitalization advances, the integration of social media outlets (SoMe) presents a myriad of opportunities, which can significantly accelerate the exchange of knowledge. Many individuals, including politicians, athletes and celebrities, have used SoMe for promotional purposes, while others use SoMe for entertainment and education. (11) More recently SoMe has become an important source of dissemination and exchange of information among physicians and Twitter has become increasingly popular among healthcare professionals (6)

The real influence and impact of SoMe in medicine is not completely understood and it possibly never will since it continues to change and evolve in a very rapid fashion. SoMe interactions have flattened hierarchies, allowing direct communication among the ranks, e.g. mentee and mentor; trainee and a highly reputed specialist. It has also eliminated the geographical barriers in a novel fashion.

Historically, surveying physicians has a lower response rate than the rest of the population. (12). However, it is possible that Twitter polls maybe an efficient method to obtain information from clinicians regarding their preferences and medical practices. For instance, in our project Twitter users saw the posted questions more than 47 k times. This would be impossible by any traditional method. Postings generated discussions as some participants considered some subjects would have obvious answers, therefore questioning the value of the question. The discrepancies in results and the immediate discussion demonstrated that no topic is beyond doubt. A good illustration was the question asking if all cases should be presented at MTB where one comment was “ all of them, that should not even be a question”. Interestingly 20% of the participants in both arms did not consider this to be the case, but perhaps a very important phenomenon was a real time discussion that was generated on a subject that seemed very obvious and completely settled.

Digital platforms can provide enhanced methods for exchange and dissemination of information and thus constitute a potentially important facet of medical research. Twitter polls, are commonly used to pose clinical or academic questions about opinions or trends on the best possible treatments or options regarding clinical scenarios or theoretic concepts. Those polls as opposed to conventional surveys can reach audiences very rapidly and generate almost immediate results.

There are however limitations as Twitter polls are open to the general public and anyone can actually participate. This phenomenon can skew the results however most of the questions are posted for virtual communities that are likely self-selected and may have virtual boundaries established by the predefined interest of person or entity posting the question. At this time Twitter polls are limited in terms of the number of characters that can be used to post or formulate a question, 280 in total and only 4 options can be integrated into the construction of each individual poll. We theorized that answers between these two methods (SurveyMonkey and Twitter) targeting colorectal surgeons with the same set of questions on both arms would not be very different, they were not identical with 90 and 50% agreement for the most and least popular choice respectively (Table 1). The immediacy of the results in our Twitter poll was a clear advantage in addition to the ability to create discussion in real time. Another potential advantage is the results on Twitter can be instantly shared with the participants, which can generate further discussion.

Conclusions

Surveys remain as valuable methods to obtain information from samples of specific population. Twitter is a very popular SoMe platform among the medical community. Some of the advantages include the possibility of almost immediate interaction and the ‘flattening of traditional hierarchies’. This platform offers the possibility of conducting polls, and thus is frequently used by clinicians to exchange information. Based upon this study, Twitter polls and surveys may make potentially important contributions to scientific enquiry.

Table 1. Number of responses on each platform are at the top of the question, below is the comparative proportions of each answer. Most popular choices are highlighted in bold characters. Agreement for the most popular choice (*) is highlighted in blue. Agreement for the least popular choice (#) is highlighted in red.

1. What is the minimum annual number of TME operations to be considered a high volume rectal cancer surgeon?			
		Online survey 753	Twitter poll 316
a.	>10	23 %	13 %
b.	* >20	52 %	49 %
c.	>40	18 %	21 %
d.	>50	7 %	16 %
2. What is the minimum annual number of rectal cancers operated on to be considered a high volume rectal cancer centre?			
		750	162
a.	>20	23 %	27 %
b.	* >40	43 %	41 %
c.	>80	22 %	15 %
d.	>100	12 %	17 %
3. Which rectal cancer cases should be presented at multidisciplinary conference?			
		751	235
a.	* All	80 %	81 %
b.	Only advanced stages	3 %	6 %
c.	As per discretion of the treating surgeon/oncologist	17 %	13 %
d.	#None	0 %	0 %
4. Do you include watch & wait as part of your practice			
		752	188
a.	* Yes, it is standard at my center	34 %	29 %
b.	Never (not standard)	16 %	26 %
c.	Only as per patient request	33 %	21 %
d.	Poor surgical candidates	17 %	24 %
5. 57 yo female had a poorly differentiated rectal cancer at 4 cm , she underwent a long course of chemoradiation after 8 weeks she seems to have developed a complete clinical response, what option would you consider for her?			
		751	463
a.	* Carry on with LAR as planned	54 %	58 %
b.	Offer to enrol her on a W&W protocol	40 %	33 %
c.	Offer Transanal endoscopic surgery (TES)	4 %	5 %
d.	# Send her for a second opinion	2 %	4 %
6. A 65 yo obese male (BMI 35) has a T2N0 rectal cancer at 6 cm from the anal verge, without adverse features. What surgical approach would you choose for this case in your practice?			
		751	360
a.	# Open LAR	13 %	9 %
b.	* Laparoscopic LAR	40 %	43 %
c.	Robotic LAR	26 %	21 %
d.	TaTME LAR	21 %	24 %
7. A 52 yo female (BMI 25) undergoes a laparoscopic LAR for a T2N0 rectal cancer a 10 cm from the anal verge (No neoadjuvant therapy). Anastomosis is below peritoneal reflection. Would you create a diverting ileostomy			
		752	316
a.	Yes	26 %	25 %
b.	* No	40 %	52 %
c.	Only if leak test is (+)	30 %	21 %
d.	# Ghost ileostomy	2 %	4 %
8. What is the minimum acceptable distal margin following TME?			

		751	248
a.	Microscopically negative	12 %	24 %
b.	1-2 mm	19 %	26 %
c.	>2 mm	23 %	29 %
d.	>1cm	46 %	21 %

9. A 55 yo male with a posterior T3bN1 rectal CA at 4 cm from the anal verge, with evidence of EMVI , apparent complete response after neoadjuvant therapy is suggested. He is very anxious about his cancer prognosis but is also interested in sphincter preservation. What option would you recommend?			
		750	341
a.	* Low Anterior Resection	58 %	52 %
b.	Watch & Wait protocol	24 %	20 %
c.	Transanal endoscopic resection (TEMS/TAMIS)	7 %	16 %
d.	Abdominoperineal Resection	11 %	12 %

10. In a 54 yo male with a T2 N2 poorly differentiated mid rectal cancer with evidence of EMVI on MRI would total neoadjuvant therapy (TNT) rather than split chemoradiation be considered as an option in your practice?			
		746	165
a.	* Yes	66 %	64 %
b.	# No	34 %	36 %

First: 6/26/2019 Zoom: 6/24/2019 to 9/16/2019

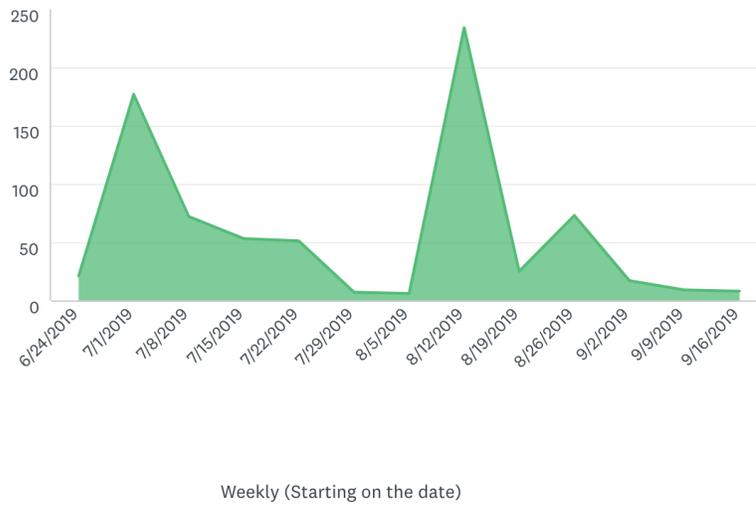


Figure 1. Trend responses by week. From June 24th to September 16/ 2019

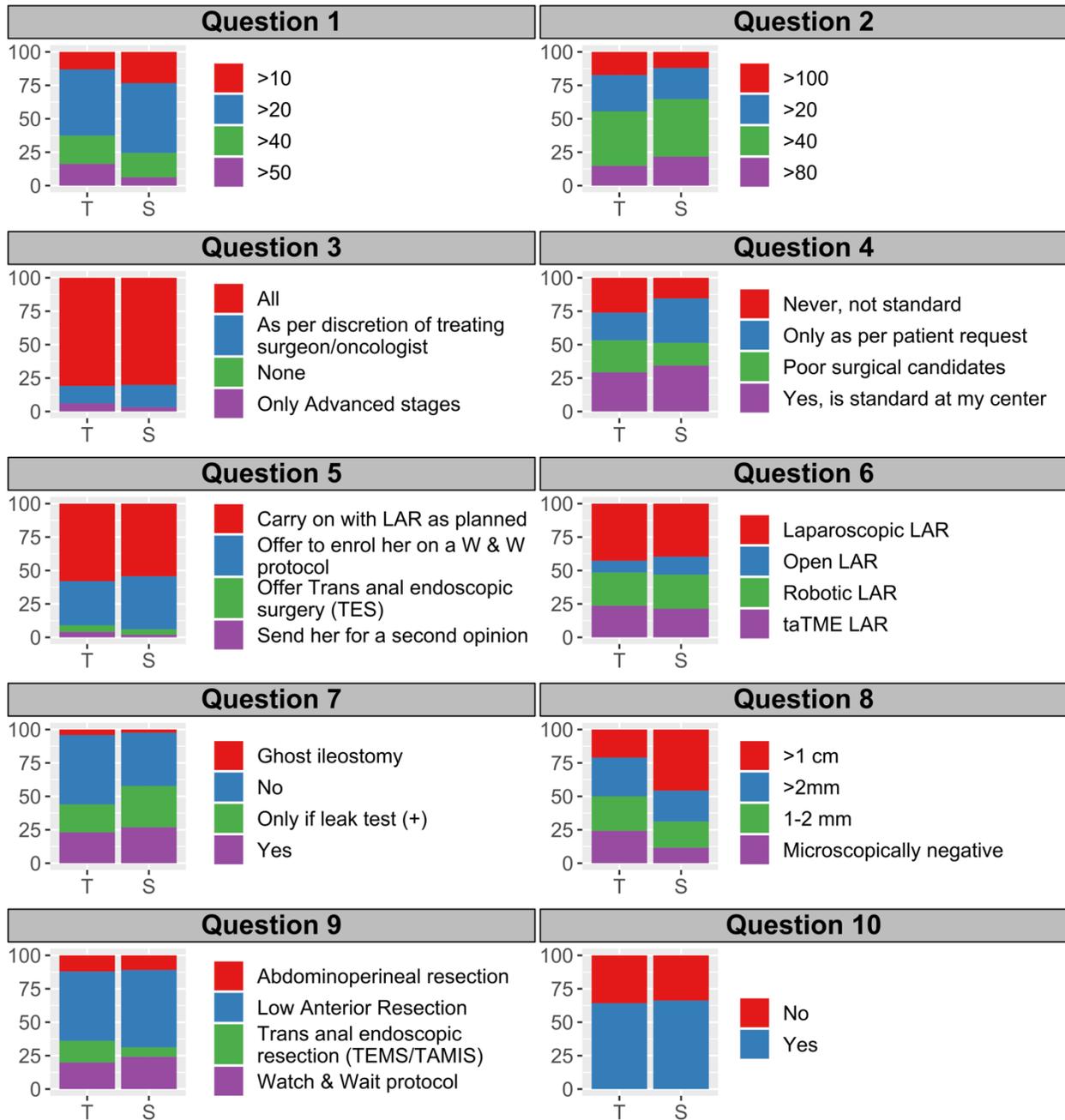


Fig.2 Graphical representation of the Twitter polls and their answers.

Appendix A

1. What is the minimum annual number of TME operations to be considered a high volume rectal cancer surgeon?
 - a. >10
 - b. >20
 - c. >40
 - d. >50

2. What is the minimum annual number of rectal cancers operated on to be considered a high volume rectal cancer centre?
 - a. >20
 - b. >40
 - c. >80
 - d. >100

3. Which rectal cancer cases should be presented at multidisciplinary conference?
 - a. All
 - b. Only advanced stages
 - c. As per discretion of the treating surgeon/oncologist
 - d. None

4. Do you include watch & wait as part of your practice
 - a. Yes, is standard at my center
 - b. Never (Not standard)
 - c. Only as per patient request
 - d. Poor surgical candidates

5. 57 yo female had a poorly differentiated rectal cancer at 4 cm , she underwent a long course of chemoradiation after 8 weeks she seems to have developed a complete clinical response, what option would you consider for her?
 - a. Carry on with LAR as planned
 - b. Offer to enrol her on a W&W protocol
 - c. Offer Transanal endoscopic surgery (TES)
 - d. Send her for a second opinion

6. A 65 yo obese male (BMI 35) has a T2N0 rectal cancer at 6 cm from the anal verge, without adverse features. What surgical approach would you choose for this case in **your** practice
 - a. Open LAR
 - b. Laparoscopic LAR
 - c. Robotic LAR
 - d. TaTME LAR

7. A 52 yo female (BMI 25) undergoes a laparoscopic LAR for a T2N0 rectal cancer a 10 cm from the anal verge (No neoadjuvant therapy). Anastomosis is below peritoneal reflection. Would you create a diverting ileostomy?
 - a. Yes
 - b. No
 - c. Only if leak test is (+)
 - d. Ghost ileostomy

8. What is the minimum acceptable distal margin following TME?
 - a. Microscopically negative
 - b. 1-2 mm
 - c. >2 mm
 - d. >1 cm

9. A 55 yo male with a posterior T3bN1 rectal CA at 4 cm from the anal verge, with evidence of EMVI , apparent complete response after neoadjuvant therapy is suggested. He is very anxious about his cancer prognosis but is also interested in sphincter preservation. What option would you recommend?
 - a. Low Anterior resection
 - b. Watch & Wait protocol
 - c. Transanal endoscopic resection (TEMS/TAMIS)
 - d. Abdominoperineal resection

10. In a 54 yo male with a T2 N2 poorly differentiated mid rectal cancer with evidence of EMVI on MRI would total neoadjuvant therapy (TNT) rather than split chemoradiation be considered as an option in your practice?
 - a. Yes
 - b. No

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