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# Satisfaction with telemedicine-delivered inflammatory bowel disease care depends on disease activity, personality and economic factors

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## ABSTRACT

**Objective** Patients with inflammatory bowel disease (IBD) traditionally receive follow-up care at face-to-face outpatient clinics. During the COVID-19 pandemic, gastroenterology societies recommended IBD clinics to be carried out remotely where possible using telephone or telemedicine-delivered virtual clinics. Previous studies have demonstrated patient satisfaction with virtual clinics but few studies have examined factors that impact satisfaction or assessed patient's personal perception of the virtual clinic experience.

**Design/method** Patients who had their IBD clinic appointment changed from face-to-face to telephone virtual clinic completed a questionnaire relating to their clinical experience and preference for future care. Qualitative data were also collected and evaluated using content analysis to identify major themes associated with the patient experience.

**Results** 141 patients were included for analysis. The virtual clinic satisfaction questionnaire was found to be valid while patients expressed high-satisfaction levels with virtual clinics (median satisfaction score 18, range 0–20). Multivariate analysis identified open personality type ( $p=0.004$ ), short disease duration ( $p=0.047$ ) and higher cost to attend clinic ( $p=0.047$ ) as predictors of high-satisfaction levels, with active disease ( $p=0.035$ ) and an agreeable personality type ( $p=0.042$ ) associated with low satisfaction levels. Content analysis of the qualitative data identified three major themes connected to virtual clinic convenience, lack of physical interaction and disease activity.

**Conclusion** Patients expressed high levels of satisfaction with telemedicine-delivered IBD clinics, with most wishing to continue their use. Personality type should be recognised as an

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ While previous studies have demonstrated high levels of patient satisfaction with virtual inflammatory bowel disease (IBD) clinics, few have explored the factors important in determining satisfaction or examined patients' personal perceptions of virtual clinics.

## WHAT THIS STUDY ADDS

⇒ This study validated a simple satisfaction questionnaire for virtual clinics, used qualitative data to assess the impact of virtual clinics on patients and identified disease activity, patient personality type and cost to attend as the strongest predictors of virtual clinical satisfaction.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The study findings emphasise the need to consider patient factors in addition to disease-related factors in the provision of telemedicine-delivered IBD care. The satisfaction questionnaire and qualitative data provide a methodological framework for future virtual clinic research.

important variable affecting clinical satisfaction, in addition to socioeconomic and disease-related factors.

## INTRODUCTION

Patients with inflammatory bowel disease (IBD) traditionally receive outpatient care at face-to-face clinic visits. The coronavirus disease 2019 (COVID-19) pandemic has led to widespread changes in health-care delivery. Infection control measures, hospital reconfigurations and staff



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redeployments have resulted in reduced in-person patient attendances. During the first wave in early 2020, national gastroenterology societies advised the use of telemedicine facilities for outpatient care while reserving face-to-face appointments for patients with newly diagnosed IBD and those experiencing disease flares.<sup>12</sup> A study of over 800 IBD healthcare providers in 56 different countries showed that 75% of outpatient IBD clinical episodes were delivered in a face-to-face setting prior to the COVID-19 pandemic, dropping to less than 25% during the COVID-19 pandemic, the majority delivered via telephone.<sup>3</sup>

Prior to the COVID-19 pandemic, IBD telemedicine studies primarily focused on the effects on cost, healthcare utilisation and clinical outcomes and have demonstrated improved patient quality of life, significant cost savings and similar or improved clinical outcomes.<sup>4-5</sup> In a randomised controlled trial of over 900 patients with IBD, telemedicine was associated with a reduction in hospital admissions and outpatient visits compared with standard care, with no reduction in patient-reported quality of care.<sup>6</sup> Following the introduction of a virtual clinic for patients with IBD in Southampton, a quarter of all patients with IBD received their care remotely with high levels of patient satisfaction, reduced patient cost and the freeing up of 400 outpatient clinic appointments per annum.<sup>7</sup>

More recently, researchers have assessed patient satisfaction with remote clinics during the current COVID-19 pandemic. A 4-item survey of 171 patients with IBD following telephone consultation found that 93% were satisfied with such an arrangement while less than 20% would have preferred a face-to-face visit.<sup>8</sup> Goodsall *et al* found that 45% of 97 respondents would prefer telemedicine care with 16% preferring a face-to-face visit.<sup>9</sup> A further survey of 685 patients with IBD examining attitudes towards future care models indicated that face-to-face consultations were chosen as the most appropriate follow-up method for

patients experiencing a disease flare while telephone follow-up was more acceptable to those in remission.<sup>10</sup>

It is clear that the use of telemedicine-delivered IBD care has increased dramatically since the COVID-19 pandemic and that the potential clinical and economic benefits for both patient and provider are significant. While many patients with IBD report approval for virtual gastroenterology clinics as a result of a single 'overall satisfaction' question,<sup>11</sup> a more comprehensive satisfaction measure has not been developed. In addition, factors associated with virtual clinic satisfaction have not been determined. The aims of this study therefore were to construct and validate a satisfaction scale for IBD virtual clinics, to examine patients with IBD's satisfaction of telemedicine and to identify factors that impact satisfaction to help identify those most suitable to receive remotely delivered care. We also explored additional qualitative factors that patients stated were important when considering virtual clinic acceptance.

## MATERIALS AND METHODS

### Satisfaction survey and questionnaire

A team of researchers, gastroenterologists, IBD nurse specialists, psychologists and patients designed the clinic satisfaction survey. The survey tool (figure 1) followed a standard format and the questions were planned to be simple and unambiguous. The 5-point Likert scale items were scored from 0 to 4, giving a total ranging from 0 to 20. Demographic and clinical data were also collected. Disease activity was measured using the short Mayo score and short Crohn's Disease Activity Index. Personality was assessed using the Big Five Inventory-10.<sup>12</sup> Two free-text questions relating to the perceived advantages and disadvantages of virtual clinics were included for qualitative assessment.

### Patient recruitment

Patients attending virtual clinics between April and October 2020 were recruited to the study in St Vincent's University Hospital, Dublin, Ireland. Prior to

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I felt there was enough time spent with my doctor at the virtual clinic visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt that the physician understood my disease state	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt that I clearly understood the follow-up plan after the virtual clinic visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I felt that there was no drop in the overall quality of care after the virtual clinic visit compared with seeing a doctor in the clinic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall, I was happy with the virtual clinic visit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1 Virtual clinic satisfaction questionnaire.

the COVID-19 pandemic, follow-up care was provided via face-to-face clinic visits. Following the outbreak, IBD clinic appointments were changed from face-to-face visits to telephone virtual clinics after triage by the IBD medical and nursing team, in line with national and international recommendations.<sup>1 2</sup> Telephone consultations were performed by gastroenterology consultants and registrars. An IBD nurse specialist phoned subjects following their virtual clinic appointment to invite them to take part in the study. Patients were asked to complete the anonymous questionnaire

using an online Qualtrics survey form (Qualtrics, Provo, Utah, USA) or via postal questionnaire.

### Statistical analysis

Principal component analysis was employed to assess the structure and content validity of the satisfaction survey. Internal consistency of baseline scores was determined using Cronbach's alpha ( $\alpha$ ) coefficient. A Cronbach's  $\alpha$  level above 0.7 was used as a cut-off to indicate high levels of consistency.

**Table 1** Baseline characteristics of 141 subjects with univariate and multivariate analysis of factors associated with virtual clinic satisfaction

	Univariate analysis			Multivariate analysis	
	Patient satisfaction		P value	RR (95% CI)	P value
	Low (n=68)	High (n=73)			
Constant				0.15	0.334
Age (years)	46 (43.1–49.6)	44 (40.4–47.1)	0.264*	0.98 (0.95 to 1.02)	0.983
Gender					
Female	37 (49)	39 (51)	0.906†	1	–
Male	31 (48)	34 (52)		0.75 (0.31 to 1.80)	0.520
Disease					
Crohn's disease	37 (51)	35 (49)		1	–
Ulcerative colitis	31 (45)	38 (55)	0.443†	1.97 (0.83 to 4.70)	0.126
Disease duration (years)	15 (12.3–17.1)	11 (9.1–12.2)	<b>0.005*</b>	0.95 (0.90 to 0.99)	<b>0.047</b>
Disease activity					
Inactive	44 (44)	57 (56)		1	–
Active	24 (60)	16 (40)	0.078†	0.36 (0.14 to 0.93)	<b>0.035</b>
Occupation					
Student/retired/unemployed	15 (52)	14 (48)		1	–
Employed/homemaker	53 (47)	59 (53)	0.672†	0.37 (0.12 to 1.18)	0.094
Work and transport cost§					0.128
≤€10	33 (57)	25 (43)		1	–
€10–19	21 (50)	21 (50)		1.84 (0.66 to 5.13)	0.246
≥€20	14 (35)	26 (65)	<b>0.037‡</b>	3.55 (1.02 to 12.40)	<b>0.047</b>
Total travel distance to clinic					0.365
≤10 kilometres	25 (57)	19 (43)		1	–
11–49 kilometres	27 (45)	33 (55)		1.99 (0.77 to 5.17)	0.158
≥50 kilometres	16 (43)	21 (57)	0.212‡	1.59 (0.42 to 6.01)	0.491
Personality trait (range 1–10)					
Extroversion	6.9 (6.4–7.5)	7.0 (6.6–7.5)	0.826*	1.08 (0.87 to 1.34)	0.500
Agreeableness	8.0 (7.6–8.4)	7.6 (7.2–8.1)	0.206*	0.78 (0.61 to 0.99)	<b>0.042</b>
Conscientiousness	8.2 (7.7–8.7)	8.7 (8.4–9.1)	0.113*	1.27 (0.97 to 1.66)	0.088
Neuroticism	6.1 (5.6–6.5)	5.9 (5.3–6.5)	0.599*	1.02 (0.84 to 1.24)	0.841
Openness	6.5 (6.1–6.9)	7.4 (7–7.8)	<b>0.001*</b>	1.48 (1.13 to 1.93)	<b>0.004</b>

Dummy variables for the multivariate analysis included female gender, Crohn's disease, inactive disease, student/retired/unemployed subjects, cost less than €10 and travel distance less than 10 kilometres. Continuous data in the univariate analysis are presented as means and 95% CIs and categorical data as numbers and percentages. Virtual clinic satisfaction scores were categorised around the median (median score 18, range 0–20). Bold p values indicate statistical significance.

\*Student's t-test.  
† $\chi^2$  test.  
‡ $\chi^2$  test for trend.  
§Data missing for one patient.  
RR, relative risk.

For presentation purposes, virtual clinic satisfaction scores were categorised around the median. Categorical and continuous variables were analysed using the  $\chi^2$  test and Student's t-test as appropriate. A multivariate binary logistic regression model was used to correct for confounding and their association with virtual clinic satisfaction. Statistical calculations were performed using the statistical package for the social sciences (V.26; SPSS, Chicago, Illinois, USA).

Qualitative data were evaluated using content analysis. Manual inductive coding was performed to identify major themes which were categorised into a hierarchical coding frame.<sup>13</sup> Some responses had a single code ('What I didn't like was no examination [code 2c]'), whereas others could be categorised into multiple groups ('I think it's a great way of having a consultation if your disease is inactive [3a] as it saves time [1e] and money [1d]'). Many responses were non-specific ('I finally got answers'; 'There was no caller ID so I didn't know who was calling'), and these were excluded from the final coding model.

## RESULTS

### Baseline details

One hundred and sixty-four patients completed the study (152 online and 12 paper questionnaire) including 23 incomplete responses, with the remaining 141 included for analysis. Demographic and clinical characteristics are shown in [table 1](#).

### Virtual clinic satisfaction survey tool: factor analysis and internal consistency

Following scree plot examination of eigenvalues, a single factor solution emerged with an eigenvalue of 4.0, explaining 79.8% of total variance, and with all five question items correlating ( $\geq 0.4$ ) with the principal component. This single factor represents the construct 'Satisfaction with virtual clinics'. Internal consistency of the questions was demonstrated with a Cronbach's  $\alpha$  of 0.93.

### Virtual clinic satisfaction and preference for future follow-up

The median satisfaction score for virtual clinics was 18 (range 0–20). In a univariate analysis, virtual clinic satisfaction was associated with a shorter disease duration ( $p=0.005$ ), higher cost to attend the clinic in person ( $p=0.037$ ) and an open personality type ( $p=0.001$ ) ([table 1](#)). In the multivariate analysis, low satisfaction levels were associated with both active disease ( $p=0.035$ ) and an agreeable personality type ( $p=0.042$ ), while shorter disease duration ( $p=0.047$ ), high visit costs ( $p=0.047$ ) and open personality type ( $p=0.004$ ) remained significantly associated with high-satisfaction levels ([table 1](#)). Ninety-eight subjects (70%) stated a preference for a virtual clinic visit in the future if their disease were inactive, 91 (65%) favoured a face-to-face visit if their disease were active and 117

(83%) wanted a choice between virtual or face-to-face clinics.

### Qualitative analysis

Twenty-eight patients (20%) did not make any qualitative statement while 113 patients (80%) made 275 statements regarding their virtual clinic visit in response to two open-ended questions. Content analysis identified three major themes ([table 2](#)) with 36% of statements referring to the convenience of the virtual clinic, 10% referring to the disadvantages and 7% referencing a preference for face-to-face assessment if their disease were active.

## DISCUSSION

This is the first study to assess demographic, clinical, therapeutic and patient personality factors associated with satisfaction with virtual IBD clinics. Additionally, we developed and validated a simple virtual clinic satisfaction tool, while also using a mixed-methods approach to identify patients' perceived views on such clinics. As with previous studies,<sup>8–11</sup> we found high-satisfaction levels for virtual clinics and a preference for face-to-face care if disease were active and virtual care if in remission.

The survey tool, assessing patients' satisfaction with various aspects of the virtual visit, appeared valid and consistent, but it is probable that future iterations would benefit from incorporating the results of the mixed-methods analysis. This indicated that the main advantages of virtual visits were socioeconomic in nature, while the main disadvantages related to a lack of physical interaction.

Virtual clinic satisfaction was associated with higher costs to attend clinic, inversely with disease duration

**Table 2** Qualitative coding scheme of 275 statements relating to virtual clinic visits

Code	Response category	No. responses, %
<b>1</b>	<b>Advantages of virtual clinic</b>	
1a	Not missing work	5 (2)
1b	No waiting	14 (5)
1c	No travel	28 (10)
1d	Cost saving	5 (2)
1e	Time saving	24 (9)
1f	Convenience in general	21 (8)
<b>2</b>	<b>Disadvantages of virtual clinic</b>	
2a	Unable to have blood taken	5 (2)
2b	Miss face-to-face/virtual too impersonal	15 (5)
2c	Miss physical examination	8 (3)
<b>3</b>	<b>Disease activity as a decision factor</b>	
3a	Prefer face-to-face if disease active	18 (7)
Note that the number of coded responses does not total 275 nor do the percentages total 100 as some statements were non-specific and did not contribute to a major theme while some responses were coded in more than one category.		



and with perceived disease activity. Interestingly, satisfaction appeared closely associated with personality type. The 'openness to experience' personality trait is characterised by an active imagination, preference for variety and intellectual curiosity,<sup>14</sup> and this trait was a strong predictor of virtual clinic satisfaction. In contrast, in the multivariate analysis, the 'agreeableness' trait, incorporating kindness, warmth, sympathy and cooperation was associated with relatively low levels of satisfaction, perhaps indicating the need for more personal interactions with healthcare staff in these subjects.

Our findings are novel and suggest that patient personality type, which may be overlooked, could be an important factor when choosing the most appropriate method of care delivery. A small number of studies have previously examined the extent to which patient personality is associated with satisfaction with medical care and demonstrated a positive association between the 'agreeableness trait' and satisfaction.<sup>15–17</sup> However, none of these studies assessed the effect of personality on telemedicine-delivered care, while one study examined only inpatient rather than outpatient care. Nonetheless, in identifying 'agreeableness' as significantly impacting satisfaction with care, our study appears to replicate previous findings.

We suggest asking patients their personal preference and offering them a choice of clinic type as a practical way of applying our findings to clinical practice and accounting for personality and cost factors. Those patients with inactive disease and who are agreeable to telemedicine-delivered care could be triaged to virtual clinics, with face-to-face visits reserved for those with active disease or who have expressed a preference for a physical appointment.

This study has limitations. It was cross-sectional in nature and, therefore, unable to assess the impact of telemedicine on clinical outcomes. Additionally, disease activity was patient-reported rather than physician-reported due to the anonymous nature of the study, while the survey tool has only undergone preliminary validation. Data pertaining to the grade of physician providing virtual clinic care was not recorded which could have affected patient satisfaction. Data was unavailable for patients who failed to answer their virtual clinic phone call or for those who declined to take part in the study which could be a potential source of selection bias. The study did not have a comparator group of patients attending face-to-face clinics, and so the results are not generalisable to this cohort. Nevertheless, it is the first attempt to develop a satisfaction scale for virtual clinics and also the first report on satisfaction-related variables. Response bias was minimised by using an anonymous survey form, while the demographics of the subjects studied, of whom 28% rated their disease as active, likely reflects populations seen in other hospital outpatient care settings.

In summary, most subjects express high-satisfaction levels with telemedicine-delivered IBD clinics, with personality type being an important variable affecting satisfaction, in addition to disease activity and cost. We suggest offering patients with IBD a choice of clinic type going forward, while maintaining and expanding the use of telemedicine as the COVID-19 pandemic subsides. Virtual clinics could be augmented with objective measures of disease activity, including faecal calprotectin, and the continued use of remote care would likely result in patient, socioeconomic and environmental benefits.

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**Competing interests** None declared.

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**Ethics approval** This study involves human participants and was approved by St. Vincent's Hospital Group Research Ethics Committee. Participants gave informed consent to participate in the study before taking part.

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**Data availability statement** Data are available upon reasonable request. The data underlying this article will be shared on reasonable request to the corresponding author.

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