

# The impact of source and consumption of news on mental distress among inflammatory bowel disease patients during the COVID-19 pandemic

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## Abstract

**Background:** We sought to understand the trends in media use, and how consumption and source affected mental health of persons with inflammatory bowel disease during the early parts of the pandemic. Dissemination of news during the coronavirus disease 2019 (COVID-19) pandemic was integral to educating the public but also could be harmful if constantly consumed, leading to worsening anxiety.

**Methods:** We performed a survey study in autumn 2020 during the second wave of COVID-19 in Manitoba. The survey included questions on consumption of COVID-19 news, along with validated measures of perceived stress, generalized anxiety, health anxiety, and depression. We used multivariable logistic regression analysis to assess trusted sources of news as a predictor of clinically significant mental health symptoms.

**Results:** Of the 2940 participants in the registry, 1384 (47.1%) persons responded. The most trusted sources of news were television (64.2%), internet (46.1%), newspaper (27.6%), friends/family (21.7%), social media (16.9%), and radio (16.6%). Those who trusted social media had higher odds of depression (aOR 1.52, 95%CI 1.04-2.22), and perceived stress (aOR 2.56, 95%CI 1.09-2.21). Persons who reported extreme difficulty limiting their time-consuming news about COVID-19 and who spent more than 1 h daily consuming information on COVID-19 both had increased odds of any clinically significant mental health symptoms.

**Conclusions:** It is unknown if consumption of COVID-19 news led to heightened mental health symptoms or if increasing anxieties and concerns led to consuming more news. Further research is needed to assess whether these elevated mental health symptoms led to worse disease outcomes.

**Key words:** COVID-19; IBD; mental health; survey.

## Introduction

The COVID-19 pandemic has globally impacted public health and the world economy, and has led to increasing mental health symptoms, the latter thought to be due in part to periods of quarantining, restrictions, and other non-pharmaceutical interventions used to curb ongoing transmission of the virus.<sup>1</sup> Psychological distress, depression, and anxiety escalated significantly during the first wave of the COVID-19 pandemic compared with baseline rates,<sup>2</sup> and remained elevated in subsequent waves, especially for vulnerable groups including young adults, women, and racialized individuals.<sup>3,4</sup> In particular, it is known that individuals with chronic diseases, such as persons with inflammatory bowel disease (IBD) have an increased risk of mental health disorders compared to those without IBD,<sup>5-7</sup> which was further exacerbated during the

pandemic.<sup>8</sup> Poor mental health is associated with an exacerbation of one's disease.<sup>7,9,10</sup>

During the COVID-19 pandemic, the distribution of news and information was integral in educating the public, such as the use of precautionary measures (e.g., sanitizer, masks) to combat infection. It further served to disseminate the increasing knowledge of the disease and its impacts expeditiously. However, despite the benefits of dissemination and knowledge acquisition, the constant barrage of news can be harmful, compounded by a rise in false and misleading information.<sup>11-13</sup> During the COVID-19 pandemic the news was changing nearly daily and was easily accessible, especially on television, the internet, and social media, which possibly led to an even greater effect on mental health symptoms. The excessive consumption of factual information can also be

problematic as people constantly seek out health information, and reassurance through news consumption, further contributing to one's anxiety.<sup>14,15</sup> Information seeking is correlated with increased health anxiety,<sup>16</sup> also termed 'cyberchondria'. A survey of college students between April and December 2020 revealed that greater exposure to news regarding COVID-19 was associated with increased worry about the pandemic, which in turn was associated with greater hopelessness and general worry.<sup>17</sup>

With constant access to social media and the distribution of news, the effect on mental health is important to understand for this and other pandemics. Specifically, it is critical to identify how the distribution of information is best achieved, balancing information dissemination without inciting heightened anxiety. The impact of health-related news consumption, more recently "cyberchondria," on mental health may be particularly important for individuals with chronic disease, such as those with IBD, who already have an elevated risk of mental health difficulties which are associated with poorer disease outcomes.<sup>18</sup> We, therefore, conducted a survey of persons with IBD within Manitoba, Canada, to understand (1) trends in media use among those with and without clinically significant mental health symptoms, and (2) how the consumption and source, of news during the COVID-19 pandemic affected mental health.

## Methods

Participants of the population-based University of Manitoba IBD Research Registry (UMIBDRR)<sup>19</sup> with current contact information ( $N = 2940$ ) were invited to take part in a survey (Supplemental Table S2) regarding their behaviours and experiences during the early months of the COVID-19 pandemic. The survey was sent in October–November 2020, just prior to and during the second pandemic wave in Manitoba. Local restrictions were implemented in November 2020 which included: social distancing, wearing masks, social contacts being restricted to only households, not allowing social gatherings, grocery stores, and pharmacies could remain open at 25% capacity, closing of gyms and fitness centres, closing of museums, galleries, movie theatres, casinos, libraries, and sports facilities, and allowing restaurants to be open for takeout or delivery only.<sup>20</sup>

More than half of adults with IBD in Manitoba are enrolled in the UMIBDRR, which is periodically refreshed and has been found to be representative of the population.<sup>9,21</sup> A letter of introduction, consent form, and paper survey were mailed to registry participants, with the option to complete and return the survey via the mail, or by accessing an online link to complete the survey through the REDcap platform. A \$10 gift card for a province-wide grocery store was included with the surveys as an honorarium for respondents. Using a modified Dillman method<sup>22</sup> we sent email or letter reminders, depending on available contact information, to those who had not responded at 2 and 4 weeks. This study was approved by the Research Ethics Board at the University of Manitoba.

## Measures

The survey included background sociodemographic and disease information including age, gender (male, female, gender diverse, transgender, or prefer not to answer), IBD phenotype

(Crohn's disease (CD), or ulcerative colitis (UC)), medication use including therapies used to treat IBD, date of IBD diagnosis, and IBD disease duration.

The survey inquired as to which was the respondent's most trusted news source regarding the COVID-19 pandemic, with more than one answer allowed. Options included radio, television, websites, social media, and newspapers. They were also asked how many minutes per day they spent, on average, consuming information on COVID-19, as well as if they actively tried to limit consuming information on COVID-19.

The survey also included validated measures of mental distress, assessing perceived stress, health anxiety, depression, and generalized anxiety.

The Perceived Stress Scale-10 (PSS-10)<sup>23</sup> is a well-established measure of perceived stress. The 10-item measure asks about stress in the past month, using response options from 0 (never) to 4 (very often). Higher scores indicate greater stress, with a score of >13 indicating elevated (moderate to high) stress.<sup>23</sup>

The Short Health Anxiety Inventory-14 (SHAI-14)<sup>24</sup> is used as a screening tool for health anxiety. This 14-item measure asks about health-related anxieties over the prior week, with responses ranging from 0 to 3. Higher scores indicate greater health anxiety, with a score greater than 17 indicating significantly elevated health anxiety.<sup>25</sup>

The Patient Health Questionnaire-9 (PHQ-9)<sup>26</sup> is a brief screening measure evaluating depression. This 9-item measure asks about depression in the prior 2 weeks, with answers ranging from 0 (not at all) to 3 (nearly every day). A score of greater than 9 indicates symptoms (moderate, moderately severe, or severe) of depression.<sup>26</sup>

The Generalized Anxiety Disorder-7 (GAD-7)<sup>27,28</sup> is a screening tool measuring generalized anxiety. This 7-item measure asks about anxiety in the prior 2 weeks, ranging from 0 (never) to 3 (nearly every day). A score of greater than 9 indicated symptoms suggestive of generalized anxiety disorder.<sup>28</sup>

## Outcomes and Predictors

Our main outcome was any clinically significant mental health symptoms, including elevated stress, health anxiety, depression, and/or generalized anxiety, among survey respondents.

Predictors of any clinically significant mental health symptoms included one's most trusted source of news for COVID-19 (more than one answer allowed), including radio, television, websites, social media, newspapers, and friends/family, as well as if they spent more than one hour per day consuming information on COVID-19 related news, and efforts required to limit consumption of this news.

## Statistical analysis

Descriptive statistics were presented as means and standard deviations (SD), and percentages. For bivariate analyses, we used the Student's *t*-test for continuous variables and Fisher's exact and chi-square tests for categorical variables, where appropriate. To assess the association between predictors of perceived stress, health anxiety, depression, and generalized anxiety, we used both univariate and multivariable logistic regression analysis. The multivariable models were adjusted for age (17-64, 65+), gender, IBD phenotype (CD vs UC),

disease duration of IBD in years (0-10, 11-30, 30+), and use of any immune-modifying therapy (including corticosteroids, azathioprine/6-mercaptopurine, methotrexate, advanced therapies including infliximab, adalimumab, vedolizumab, ustekinumab, or tofacitinib). For this study, age was dichotomized as 17-64 years old and 65 years old or older because of the increased risk of serious effects of COVID-19 with increasing age.<sup>29</sup>

A *P*-value of <0.05 was considered to be statistically significant. All data analyses were performed using SAS Software (version 9.4).

## Results

Of the 2940 participants in the registry, 1384 (47.1%) persons responded to the survey. Characteristics of respondents from the IBD Registry, were similar to non-respondents, (Supplementary Table S1), except those who participated in the study were more likely to be female, and married. Mean age and IBD phenotype were similar between the 2 groups. In all, 26.4% of respondents had high school equivalent education, 29.0% had a college.

Among all respondents, the most trusted sources of news in descending order were television (64.2%), internet (46.1%), newspaper (27.6%), friends/family (21.7%), social media (16.9%), and radio (16.6%). Those who were 65 years old or older trusted television (80.1%), newspaper (43.5%), and internet (30.6%) the most, and trusted social media (9.1%) the least. Among those who were younger than 65 years old, the most trusted news sources were television (55.7%), internet (54.6%), and social media (21.2%), and trusted radio the least (13.8%). Among respondents with a high school education or less (*n* = 420), television was the most trusted news source

(72.6%), with social media (17.1%), and radio the least most trusted (16.0%). Among those with a college or other degree (*n* = 482), television was again the most trusted (68.3%), with family/friends (19.9%), social media (17.6%), and radio (16.0%) the least most trusted. Among those with an undergraduate degree or greater (*n* = 448), websites (58.7%), and television (53.8%) were the most trusted, with radio (18.3%), friends/family (17.2%), and social media (16.5%) the least most trusted.

Persons with any clinically significant mental health symptoms were more likely to trust social media than those without a mental health disorder (GAD: 25.6% vs 15.8%, *P* = 0.003; depression: 24.2% vs 15.5%, *P* < 0.01; health anxiety: 22.2% vs 15.8%, *P* = 0.02; and perceived stress: 20.4% vs 11.0%, *P* < 0.001) (Figure 1). Those with GAD were less likely to trust television than those without GAD (55.1% vs 65.4%, *P* = 0.01), and more likely to trust websites (50.6% vs 45.5%, *P* = 0.003). Persons with elevated health anxiety (29.2% vs 21.3%, *P* = 0.01) or depression (29.5% vs 19.4%, *P* < 0.01) were less likely to trust newspapers, compared to those without health anxiety, and depression, respectively.

On adjusted multivariate analysis, those who trusted social media had higher odds of depression (aOR 1.52, 95%CI 1.04-2.22), perceived stress (aOR 2.56, 95%CI 1.09-2.21), and GAD (aOR 1.53, 95%CI 1.00-2.35), along with any clinically significant mental health symptoms (aOR 1.43, 95%CI 1.00-2.05) (Table 1). Those who trusted newspapers had decreased odds of depression (aOR 0.58, 95%CI 0.39-0.86), and or GAD (aOR 0.63, 95%CI 0.39-1.00). No variables were statistically significant for those who most trusted family members or friends, and were therefore not included in the table.

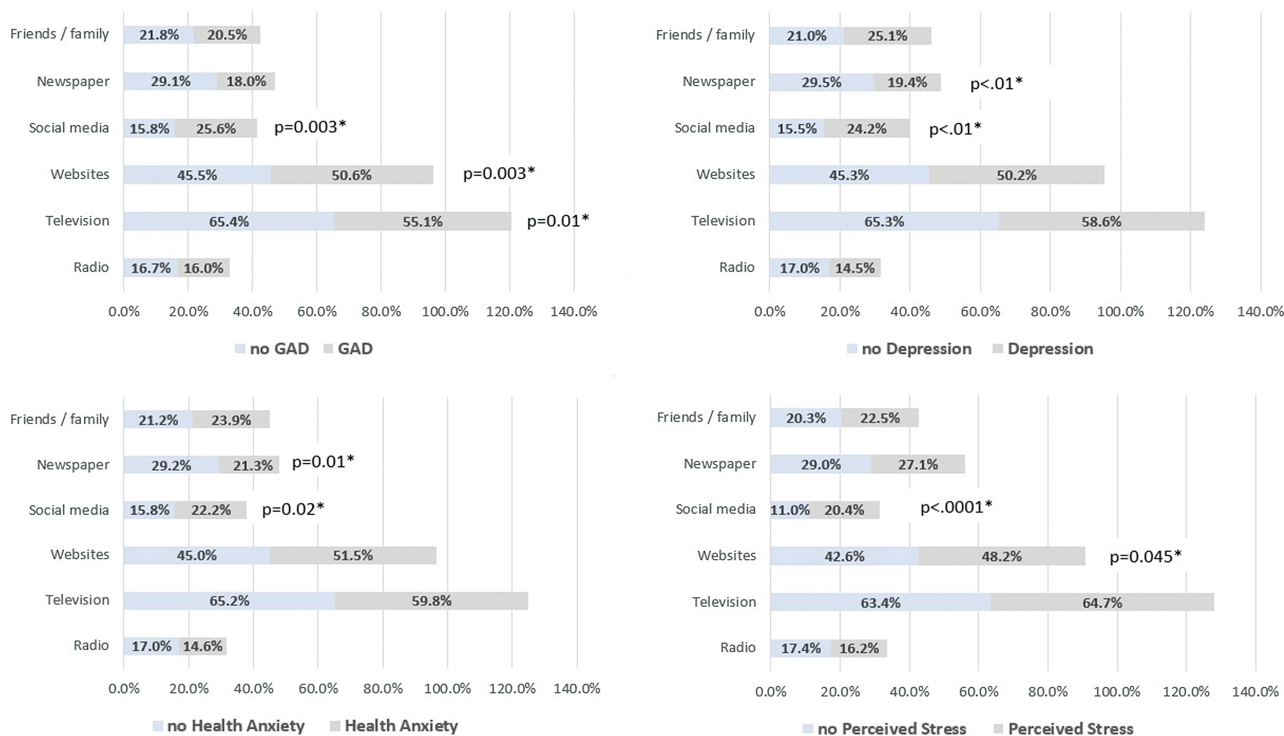


Figure 1. Most trusted source of news for persons with and without generalized anxiety disorder (GAD), depression, health anxiety, and perceived stress.

**Table 1.** Multivariable logistic regression analysis for elevated mental health symptoms (GAD, depression, health anxiety and perceived stress)

	GAD <sup>1</sup> (GAD-7 scale > 9) (N = 145)	Depression (PHQ-9 scale > 9) <sup>2</sup> (N = 209)	Health anxiety (SHAI14 scale > 17) <sup>2</sup> (N = 221)	Perceived stress (PSS10 scale > 13) <sup>2</sup> (N = 805)	Any elevated mental health symptoms <sup>2</sup> (N = 844)
<b>Most trusted source for news regarding COVID-19</b>					
Television	0.69 (0.48-1.01)				
Websites				0.89 (0.69-1.15)	0.93 (0.72-1.21)
Social media	<b>1.53 (1.00-2.35)</b>	<b>1.52 (1.04-2.22)</b>	1.38 (0.95-2.00)		
Newspapers	<b>0.63 (0.39-1.00)</b>	<b>0.58 (0.39-0.86)</b>	0.72 (0.50-1.04)	<b>1.56 (1.09-2.21)</b>	<b>1.43 (1.00-2.05)</b>
<b>How difficult has it been to limit time spent watching news/internet about COVID-19</b>					
Extremely difficult vs moderately / not at all	<b>2.16 (1.44-3.26)</b>	<b>1.81 (1.25-2.62)</b>	<b>1.58 (1.10-2.27)</b>	<b>2.13 (1.45-3.13)</b>	<b>2.17 (1.45-3.25)</b>
>1 hour consuming information of covid-19		1.21 (0.86-1.69)	1.26 (0.91-1.74)	1.27 (0.96-1.69)	<b>1.38 (1.03-1.85)</b>

<sup>1</sup>N = 1268 observations used in the full model.

<sup>2</sup>N = 1252 observations used in the full model.

Bold = statistically significant at  $P \leq 0.05$ .

Persons who reported extreme difficulty limiting their time-consuming news about COVID-19 had increased odds of any probable mental health condition (aOR 2.17, 95%CI 1.45-3.25), including each of GAD (aOR 2.16, 95%CI 1.44-3.26), depression (aOR 1.81, 95%CI 1.25-2.62), health anxiety (aOR 1.58, 95%CI 1.10-2.27), and/or perceived stress (aOR 2.13, 95%CI 1.45-3.13). Those who spent more than 1 hour consuming information per day on COVID-19 also had elevated odds of any mental health symptom (aOR 1.38, 95%CI 1.03-1.85).

## Discussion

In our study, we found that COVID-19 news consumption was associated with elevated rates of mental health symptoms. Further, those with heightened mental health symptoms were more likely to trust social media, than those without. Meanwhile, those who trusted newspapers the most had decreased odds of depression and GAD. While consumption of distressing news during the COVID-19 pandemic was shown to have negative effects on mental health,<sup>17</sup> in our study the type of media people trusted was differentially associated with mental health symptoms. This is however not causative and purely an association, and therefore it is difficult to know whether increased news consumption led to increased mental health symptoms, or vice versa.

It is well known that social media can be divisive, and recent studies have shown that social media can also have a negative impact on mental health.<sup>30</sup> One survey study in the United States revealed that TV news watching was associated with decreased suicidal ideation, whereas online news consumption was associated with increased suicidal ideation.<sup>31</sup> While our study did not assess suicidal ideation, those who

trusted social media had increased odds of any mental health symptoms including each of GAD, depression, health anxiety, and perceived stress.

Our study also revealed that those who consumed more than 1 hour of news every day of COVID-19 during the first wave of the pandemic had an increased odds of mental health symptoms. This aligns with prior studies showing greater media consumption on COVID-19 is associated with increased psychological distress.<sup>32</sup> Further, increased consumption of news regarding COVID-19 was associated with decreased mental health, according to a systematic review.<sup>33</sup> We also showed that those who found it difficult to limit time spent consuming news about COVID-19 had increased mental health symptoms. No other literature exists on those who tried to limit their news consumption, although perhaps those who tried to limit their news consumption had higher anxieties towards the pandemic, and hence found it difficult to decrease time-consuming pandemic-related news due to a constant anxiety or fear surrounding the pandemic. A survey of medical students found that anxiety and depression influenced their obsession with COVID-19, and reassurance-seeking behaviours (for example media searching) mediated the effects of depression or anxiety.<sup>34</sup> It is possible that reassurance-seeking behaviours, such as online searching or social media use, are often not enough or reassuring and so these people get immersed in a cycle of constantly searching online, leading to an increase in fears or anxiety.

We have previously reported that during the early phase of the COVID-19 pandemic, persons with IBD were significantly distressed about access to needed care (eg, primary care provider, IBD medications) and were especially concerned about their family's health, getting infected with COVID-19, and having an IBD flare.<sup>35,36</sup> In the early months of the pandemic, when there was little reliable information about the interaction of diseases and immune modifying therapies with

COVID-19, individuals with IBD had elevated fear of worse outcomes if they were to get COVID-19 because of their IBD disease activity or their concomitant IBD therapy,<sup>37,38</sup> although at that informative and reliable data were limited. More recent evidence indicated only corticosteroids were associated with worse outcomes.<sup>39</sup>

Cyberchondria is a behaviour where one is constantly searching online for medical information which is associated with elevated health anxiety, and we feel this was prevalent in our study. IBD providers including gastroenterologists and nurse practitioners should assess for mental health symptoms at every visit, and should also inquire about news gathering be it from the internet or social media to avoid worsening health anxiety, especially at times when misinformation, such as COVID-19, is rampant. Tools to help reduce stress and anxiety, be it through anti-depressive therapies or psychological treatments with a mental health provider or digital applications can help reduce cyberchondria,<sup>40</sup> although with the rise in social media, especially in younger persons, it may be hard to contain in future health pandemics. Our study did not directly ask respondents whether their news consumption affected their mental health and this is a limitation. Tools have emerged to quantify cyberchondria including short surveys<sup>41,42</sup> which can be helpful in quantifying cyberchondria, and future studies are needed to further assess how cyberchondria will affect the mental health symptoms of persons with chronic illnesses such as IBD, and how this may affect long-term outcomes in the age of social media.

Our study has several other limitations, including the cross-sectional nature of the survey. We cannot be certain to what degree mental health symptoms drove the type and amount of news consumption as opposed to the new consumption patterns driving mental health symptoms. We believe the relationship is bidirectional. The study evaluated patient experience at a critical time in the pandemic while information around personal risk was still evolving, access to health care was more challenging, and vaccinations and antiviral medication were thought to still be years away. All of that may have driven mental health symptoms upward and we cannot know to what degree that drove news consumption upward. A longitudinal approach would capture any changes over time regarding trusted media, coping approaches, and mental health concerns. Our study may have had selection bias as it is possible that respondents were more likely to suffer from mental health problems compared with non-respondents. The survey was further not validated to assess trusted news sources and consumption. We further do not know baseline rates of mental health symptoms in this cohort prior to the onset of the COVID-19 pandemic, though we have previously shown that these rates in Manitoba are higher compared to persons without IBD, hence one would expect these rates to increase during a significant stressor such as a global pandemic.<sup>5,7</sup> It is possible there was confusion between the terms internet and social media, as we implied that the internet referred to computer access like websites and podcasts, whereas social media implied Twitter, Instagram, and Facebook. We were also unable to assess who was delivering the news, as there could have been differences in a response to an article written by a medical professional as opposed to an editorial from one without any medical expertise. We did not assess disease activity at the time respondents took the survey which may have impacted news consumption and clinically significant mental

health symptoms. Our study design did not have a comparative non-IBD control group, and it is possible that elevated mental health concerns were more broadly experienced in the general population at similar rates to those with IBD, although individuals with IBD did have some unique challenges related to their disease.

Persons with IBD who had elevated mental health symptoms were more likely to use social media, though it is unknown if increasing anxieties and concerns led them to consume more online news, or if social media was the driver of elevated symptoms. Further research will be needed to assess whether this increase in mental health symptoms has led to worse disease outcomes.

## Supplementary data

Supplementary data are available at *Journal of the Canadian Association of Gastroenterology* online.

## Author Contributions

Seth R. Shaffer: study concept and design, analysis and interpretation of data; drafting of the manuscript; critical revision of the manuscript for important intellectual content; statistical analysis. Casandra Dolovich: analysis and interpretation of data; critical revision of the manuscript for important intellectual content; statistical analysis; technical, or material support; study supervision. Renee E.L. Gabalawy: analysis and interpretation of data; drafting of the manuscript; critical revision of the manuscript for important intellectual content.

Lesley Graff: study concept and design; analysis and interpretation of data; critical revision of the manuscript for important intellectual content. Harminder Singh: analysis and interpretation of data; critical revision of the manuscript for important intellectual content; technical, or material support. Gia L. Jackson: acquisition of data; Sydney Chochinov: acquisition of data; Souradet Shaw: study concept and design; acquisition of data; analysis and interpretation of data; critical revision of the manuscript for important intellectual content. Charles N. Bernstein: acquisition of funding, study concept and design; acquisition of data; analysis and interpretation of data; drafting of the manuscript; critical revision of the manuscript for important intellectual content; statistical analysis; technical, or material support; study supervision.

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## Conflict of Interest

Dr. Shaffer has served on advisory boards or consultant to Takeda Canada, Janssen Canada, Abbvie Canada, and Pfizer Canada. Dr. Bernstein has consulted to or served on advisory boards for Abbvie Canada, Amgen Canada, Bristol Myers Squibb Canada, JAMP Pharmaceuticals, Janssen Canada, Pfizer Canada, Sandoz Canada, Takeda, and has received unrestricted educational grants from Abbvie Canada, Janssen Canada, Pfizer Canada, Bristol Myers Squibb Canada, and Takeda Canada. He has been on the speaker's bureau of Abbvie Canada, Janssen Canada, Pfizer Canada, and Takeda

Canada. He has received research grants from Abbvie Canada, Amgen Canada, Pfizer Canada, and Sandoz Canada and contract grants from Janssen. Dr. Singh has been on advisory boards or consultant to Amgen Canada, Roche Canada, Sandoz Canada, Takeda Canada, Pendopharm, BMS, and Guardant Health, Inc.

## Data Availability

All data are incorporated into the article.

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