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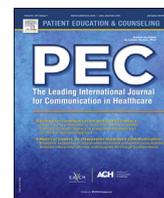
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# Talking about Dr. Google: Communication strategies used by nurse practitioners and patients with inflammatory bowel disease in the Netherlands to discuss online health information

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## ABSTRACT

**Objective:** This study explores how patients with Inflammatory Bowel Disease (IBD) and nurse practitioners (NPs) in the Netherlands communicate about online health information-seeking.

**Methods:** We analyzed 165 consultations of patients at the start of maintenance treatment using grounded theory. Consultations in which the words; internet, website, Google, Googled, webpages, online (forum/blog/platform) or a website was mentioned, were included. Segments were identified and analyzed that represented a discussion about online health information-seeking ( $n = 87$ ). We coded the initiator, initiation and reaction communication strategy.

**Results:** Half of the sample was female, most patients were moderately to highly educated and aged on average 48 years. One third of the consultations included a discussion about online health information-seeking. Seventeen communication initiation and reactions strategies were identified. Patients and NPs were equally as likely to initiate a neutral discussion about online health information-seeking. Patients repeatedly reacted with disclosing their concerns. NPs responded by taking patients' online health information-seeking seriously or affirming patients' beliefs.

**Conclusion:** This exploration makes a unique contribution by demonstrating that NPs particularly adopt a patient-centered communication style while communicating about patients' online health information-seeking.

**Practice implications:** Results of this study could guide interventions to train providers in talking about patients' online health information-seeking.

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## 1. Introduction

Patients with Inflammatory Bowel Disease (IBD) who are starting with immunosuppressive therapy or biologicals report many information needs [1,2]. Patients try to fulfill these needs mostly by seeking information at their healthcare provider (38 %) and on the internet (36 %) [2–4]. The internet has given patients direct access to abundant health-related information [5]. As a consequence, more patients are turning to the internet for health information [6–8]. A Dutch survey showed that the number of patients who engage in online health information-seeking has increased from 49.2 % in 2012 to 67.1 % in 2018 [9]. As access to the

internet increases and the availability of online health information further expands, it is likely that these percentages will continue to increase [10].

Patients who engage in online health information-seeking change the dynamic within the consultation and thereby the patient-provider communication. This, in turn, can positively influence both the course of the patient-provider relationship and patient outcomes [11,12]. By using the internet, patients improve the management around their health, make optimal use of the limited time available, ask more questions, obtain a second opinion, are more knowledgeable and empowered [11,13,14]. Notwithstanding the benefits of online health information-seeking, concerns have been raised about the use of this type of information. Patients are not always aware of the poor quality of some online sources and are at risk of acting on wrong or incomplete information [15]. This might negatively affect patient outcomes. For example, if online self-diagnosis contradicts the

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providers' diagnosis, patients' trust in their provider reduces [16]. This, in turn, may result in higher concerns and poor treatment adherence [17,18].

Adequate patient-provider communication has the potential to reduce possible detrimental effects of online health information-seeking [12,16]. As such, it is important to understand how patients and providers discuss online health information. A few researchers have examined how patients and providers make decisions about whether or not to start a discussion about online health information-seeking, how patients introduce the information, and best practices for providers in responding to patients' health information-seeking [12,14,19–22]. These studies showed that patients report a variety of strategies to initiate a discussion about online health information-seeking with most patients introducing online health information-seeking as a fact or a question [12,19]. Research also identified different communication strategies that providers report to use when responding to patients' initiations [19,20,22] and demonstrated that how a provider responds to the patient can either positively or negatively affect patient outcomes [19]. These communication strategies vary from a provider-centered to a more patient-centered communication style.

Although these studies provide valuable insights into how patients introduce online health information-seeking and how their provider reacts, most of them 1) rely on retrospectively, self-reported data and, 2) neglect to explore how providers start a discussion about online health information-seeking and how patients respond to this attempt. Self-reported measurements are affected by favorable recall bias and forgetfulness which might lead to an over or underestimation of the usage of certain communication strategies during the consultation [21,23]. The aim of this study is therefore to advance our understanding of how online health information-seeking is discussed by patients and nurse practitioners (NPs) by analyzing audio recordings of interactions and attending to the provider's role in starting a discussion.

## 2. Method

### 2.1. Participants and procedure

This qualitative study was part of a larger research project that tested a theoretical and evidence-based intervention to improve adherence to newly prescribed medication, i.e. immunosuppressive and biological therapy, in patients with IBD in the Netherlands. During a consultation of approximately 30 NPs inform patients about their newly prescribed treatment as part of usual care. More than half of the Dutch hospitals, both academic and peripheral hospitals, have NPs working within IBD. According to the Dutch guidelines, NPs should pay extra attention to medication use and the risks of the treatment, when particular if the patient is starting with immunosuppressive or biological therapy [24]. Our total sample consisted of 165 recorded patient-NPs consultations, which were held between 2009 and 2014. The consultations were taped in six hospitals in the Netherlands. To have a representative dataset, we included both academic ( $n = 3$ ) and peripheral ( $n = 3$ ) hospitals. Participants took part on a voluntary basis, granted permission to tape and analyze the consultations and signed an informed consent form.

Before the consultation, patients completed a questionnaire containing informed consent and questions about demographic and health characteristics. Second, the consultations were recorded on video or audio. The researcher started the recording and left the room. Although some NPs expressed feeling stressed at the beginning of the study because of the recordings, all NPs

described the included consultations as typical consultations reflecting an average situation.

The Health Ethical Committee granted permission for this study, which was supplemented with local feasibility statements (trial number NTR2892).

### 2.2. Analysis

Using grounded theory [25], consultations were coded and analyzed in Atlas.ti version 8. Consultations in which (any combination of) the words; internet, website, Google, Googled, webpages, online (forum, blog, platform) or a name of a website was mentioned by either the patient or the NP, were included in the analysis ( $n = 58$ ). In each transcript, segments were identified that represented a discussion about online health information-seeking and only these were coded ( $n = 87$ ).

In the first step, two researchers (AL, RS) with expertise on patient-nurse communication and qualitative research read the transcripts to identify those segments in which online health information-seeking was discussed. They iteratively started coding resulting in 73 different codes with a corresponding codebook. For all segments the following aspects were coded: 1) initiator of the discussion; *patient* or *NP*, 2) communication strategy to initiate a discussion about the online health information-seeking, 3) communication strategy used to respond to the initiation. In the second step, three members of the research team (RS, AL, and BS) discussed the codes in detail to arrive at a final list of higher-level codes, which were then applied to the transcripts [25]. We coded the initiations and responses on topic level. Only codes that were used at least five times were included in the final codebook. This resulted in 17 different codes (see Table 1 for the codebook). In total, 20 % of the transcripts were independently double-coded (AL and BS) for quality assurance at this stage of analysis. This second coder was trained extensively. During the training, consensus about discrepantly-coded segments was achieved after a discussion among the two coders. Intercoder reliability was good: 82 % agreement, Cohen's kappa = .746 (for initiator 94 % agreement, Cohen's kappa = .872, for initiation strategy 79 % agreement and Cohen's kappa = .727 and for reaction strategy 74 % agreement and Cohen's kappa = .639).

## 3. Results

The patient sample of consultations that was included in the final analysis consisted of 33 women (57 %) and 25 men (43 %). Their mean age was 48 years old, and most patients were moderately to highly educated. The majority of patients had been diagnosed with Crohn's disease ( $n = 34$ ; 59 %) (see Table 2 for all patient characteristics).

Eight NPs participated in this study. NPs were all female and on average 50 years old. They were working as a NP for on average 17 years (Range 4–39) at the time of the study.

### 3.1. Initiator of the discussion

The discussion of online health information-seeking was evenly initiated by the patient ( $n = 42$ ) and the NP ( $n = 42$ ). In almost half of the consultations ( $n = 23$ ) the internet was mentioned multiple times (range 2–3). To illustrate, in some consultations, the patient first initiated a discussion about online health information-seeking at the beginning of the consultation and later in the consultation a NP referred to a website while explaining a treatment. Thus, these segments were characterized by two different distinct topics/strategies. Online health information-seeking was discussed in consultations of six NPs (see Table 3 for more detailed information about the differences among the NPs).

**Table 1**  
Codebook Communication strategies used by NPs and patients with IBD in the Netherlands to Discuss Online Health Information.

Category <sup>1</sup>	Definition	Examples	N (%)
<b>Discussions about online health information-seeking initiated by patients</b>			
<b>Patient's initiation strategies</b>			
Making a general statement	Patient introduces her/his health information-seeking in a neutral way either by explicitly stating that they have used the internet, or implicitly without specifying the source. In these statements no reference is being made to any content-related information.	"I have looked online" "I've read so much about it"	n = 19 (43 %)
Raising concerns	The patient initiates the online health information-seeking by raising concerns that arose from the information she/he read online. These concerns include uncertainty about the (effectiveness of the) treatment based on what they read online (e.g., or concerns about what they found online about their medication).	"I looked online and now I have my doubts about the treatment" "I was not happy about it at all"	n = 8 (18 %)
Asking questions	The patient starts a discussion about online health information by asking a question about the online health information. The aim of these questions is either to clarify information or validate their findings with the nurse.	"I read on the internet that [medication A] seems to work faster than [medication B]?"	n = 7 (16 %)
Citing specific information	The patient cites what she/he has found on the internet. The patient cites the online health information to draw a conclusion or to justify their arguments.	"[Medication A] is often your last escape and according to the internet this is a "bottom up approach""	n = 5 (11 %)
Dismissing	Patient puts the online health information into perspective by indicating that although the online health information was disturbing or negative, she/he dismissed it as invalid.	"There are so many ghost stories" "Because you only see the complaints on the internet about the same thing [ . . . ] and you do not see positive things"	n = 5 (11 %)
<b>Nurses reaction strategies</b>			
Taking patients' online health information-seeking seriously	The nurse explores what the patient found online (sources used, content encountered) either because she needs some clarification about the content or because she wants to know the source after patients' initiation. Also, within this category, the nurse could respond with an approval or reacts substantively after patients' initiation.	"Where did you read that?" "Yes, and what have you found? I am always very curious about that!" Patient: "Online I read that this [medication] will eventually replace [name medication]?" Nurse: " <u>No, not in your case.</u> "	n = 20 (43 %)
Affirming patients' beliefs	The nurse confirms the patient's concerns after the patient's initiation/ acknowledges that there are horror stories online. Thus, the nurse responds to the concerns the patient expresses or the attempts to trivialize the information.	Patient: "Because you only see the complaints on the internet about the same thing [ . . . ] and you do not see positive things." Nurse: " <u>No only the bad stories are on the internet, but we have many positive reactions</u> ".	n = 11 (24 %)
Ignoring	The nurse ignores patients' initiation to talk about the online health information-seeking by giving general information about the medication or by not responding to a question of a patient in which (s)he asks for reliable websites.	Patient: "I read a little bit on the Internet." [ . . . ] "To a little too uh . . ." Nurse: " <u>Ok what do you want me to start with?</u> "	n = 6 (13 %)
Minimal encouragement	The nurse responds (minimally) to the explicit initiation of the patient.	"hmm", "yes" "ok"	n = 5 (11 %)
Correcting	The nurse emphasizes that online health information-seeking does not necessarily provide the right information after the patient's initiation.	"What you might have seen when looking online is that this medication is also used for cancer treatment. Only in higher doses, so that explains the negative experiences"	n = 5 (11 %)
<b>Discussions about online health information-seeking initiated by nurses</b>			
<b>Nurse's initiation strategies</b>			
Exploring	The nurse explores whether (and what) the patient searched online before the consultation, either by generally asking if the patient searched for more information or by explicitly asking whether the patients searched online.	"Have you heard anything about it?" "Have you read something?"	n = 21 (50 %)
Warning	The nurse warns the patient about the dangers of encountering biased information (e.g., horror stories) or information that is not applicable to the individual situation of the patient.	"If you google, you will be super scared" "Immunosuppressive medication is also prescribed for other health conditions in a higher dose (i.e., cancer)"	n = 13 (31 %)
Encouraging	The nurse points to the usefulness of the internet or refers the patient to a website.	"The internet is very useful, isn't it?" "You can seek for more information on <a href="http://www.crohn.nl">www.crohn.nl</a> ")	n = 8 (19 %)
<b>Patient's reaction strategies</b>			
Disclosing internet use	The patient neutrally admits that she/he (has not) used the internet after the nurses' exploration.	Nurse: "Have you checked the internet this week?" Patient: " <u>I only read the information leaflet and some information online</u> "	n = 15 (40 %)
Reacting minimally	The patient reacts with a minimal reaction after nurses' initiation.	"hmm" "yes"	n = 9 (24 %)
Expressing concerns	The patient responds to the nurses' initiation with a concern, for instance by mentioning how disturbing the online health information was to her/him.	"Yes, all the dirt can be found online" "Some of these online patient platforms are said to be secretly funded by the pharmaceutical industry. So therefore I am always a bit . . ."	n = 8 (21 %)
Substantive reaction	The patients quotes what she/he found online or asks questions based on what she/he found online after nurses' initiation.	Nurse: "In response to [ . . . ] and what you have read on the internet, do you have questions for me?" Patient: " <u>How serious is the alcohol restriction?</u> "	n = 6 (16 %)

<sup>1</sup> Only codes that were used at least 5 times were included in the final protocol.

**Table 2**  
Patient characteristics.

Patient characteristics		N = 58	%
Gender	Female	33	57%
Age	M (SD)	48	
Type of Disease	Crohn's disease	34	59 %
	Colitis Ulcerosa	20	35%
	Unknown	2	6%
Diagnosed in years	M(SD)	10	
	Range		40
Educational level	Low	6	10 %
	Moderate	22	39%
	High	28	48%
	Unknown	2	3%

### 3.2. Discussions about online health information-seeking initiated by patients

#### 3.2.1. Patients' initiation strategies

In total, five patient initiation categories were found in our data; 1) making a general statement, 2) raising concerns, 3) asking questions, 4) citing specific information and 5) dismissing (see Table 1).

The most frequently used communication strategy to initiate a discussion was “making a general statement” in which patients made it clear that they searched for information. Within this category patients either referred to their information-seeking behavior about the prescribed treatment without mentioning the information source, or referred explicitly to their online health information-seeking about the prescribed treatment. When introducing it without explicitly mentioning the source, they used this strategy as a springboard to talk about what they found online later during the consultation. Mostly patients explicitly initiated a discussion about their online health information-seeking. These initiations were characterized by statements that they went online without referring to any content-related information. For example, when the NP began to explain the treatment, the patient stated that (s)he already went online to seek for information about the prescribed treatment.

Two other frequently used strategies were “raising concerns” and “asking questions”. When patients began a discussion with raising concerns, they mentioned that they were unsure about the treatment based on what they had read online. Sometimes they expressed concerns about the horror stories they read. Another strategy “asking questions” was found when patients started a discussion by asking a question about what they found online. The aim of these questions was either to clarify information or validate their findings with the NP. When patients were using the category “citing specific information”, they cited online health information

to draw a conclusion or to justify their arguments. When patients were using the “dismissing” strategy, they indicated that although the information they found online was disturbing or negative, they were able to put it into perspective.

#### 3.2.2. NPs' reaction strategies

In total, five different reaction strategies by NPs to patients' initiations were found in our data; taking patients' online health information-seeking seriously ( $n = 20$ ), affirming patients' beliefs ( $n = 11$ ), ignoring ( $n = 6$ ), encouraging minimally ( $n = 5$ ) and correcting ( $n = 5$ ). NPs varied in how often they initiated a discussion about online health information (see Table 3).

The most often used reaction strategy employed by NPs was “taking patients' online health information-seeking seriously”. Within this category NPs approved patients' online health information-seeking and considered it as a starting point to either understand the patients' point of view about the prescribed treatment or to explore what the patient found online. This category was often found after patients' neutral statement that (s) he used the internet, when (s)he asked questions, cited information or expressed concerns.

Within the “affirming patients' beliefs” strategy the NP confirmed the patient's concerns that had been expressed by the patient, agreed when the patient was trivializing the online information. Within the “ignoring” strategy the NP refrained to react to patients' initiation to talk about the information (s)he found online. This was done by giving general information about the medication or not responding to a question of a patient that was related to their online health information-seeking. This strategy repeatedly co-occurred with the patient initiation strategy “neutral statement”. Two other strategies we found in our data were “minimal encouragement” and “correcting”. When NPs were using the minimal encouragement strategy, they used a minimal reaction (e.g. hmmm) or encouragement after the patient's attempt to neutrally start a discussion about their health information-seeking. This was often done to encourage the patient to talk further about their online health information-seeking. Last, the “correcting” strategy mainly focused on countering the beliefs held after patients' online health information-seeking behavior or correcting the information found online.

### 3.3. Discussions about online health information-seeking initiated by NPs

#### 3.3.1. NPs' initiation strategies

In total, three NP initiation strategies were found in the data; exploring ( $n = 21$ ), warning ( $n = 13$ ) and encouraging ( $n = 8$ ).

When NPs initiated a discussion, half of the time the NP generally explored whether and what the patient searched online in the context of the consultation (e.g., the prescription of new medication). In some cases, the NPs did not explicitly mention the internet, but generally explored patients' information-seeking behavior about the prescribed treatment. This exploration could be

**Table 3**  
Number of conversations about online health information-seeking initiated by NPs when consulting with patients with IBD in the Netherlands.

Nurse	Number of consultations taped	Number of consultations in which the internet is discussed	Number of initiations	Median (range)	IQR
1	17	4 (23 %)	1 (25 %)	0 (0–1)	.75
2	10	1 (10 %)	1 (100 %)	1 (0–1)	0
3	16	3 (18 %)	0 (0 %)	0 (0–0)	0
4	15	6 (40 %)	5 (83 %)	1 (0–1)	.25
5	15	8 (53 %)	7 (88 %)	1 (0–2)	.75
6	50	20 (40 %)	16 (80 %)	1 (0–2)	.50
7	32	14 (44 %)	5 (36 %)	0 (0–2)	1.00
8	25	1 (4 %)	0 (0 %)	0 (0–0)	0

either neutrally or biased. When the NP introduced the internet in a biased way, the NP started a conversation by asking whether the patient was concerned about what they found.

Another category found was the communication strategy “warning”. If the NP started a discussion with a warning, she warned the patient and/or argued the danger of online health information-seeking. Another strategy that was found was “encouraging”. When the NP used this strategy, the NP started the discussion by encouraging the patient to go online, by emphasizing the practicality of the internet or by referring the patient to a(n) (accurate) website.

### 3.3.2. Patients' reaction strategies

In total, four different reaction strategies by patients to NPs' initiations were found in our data, namely disclosing internet use ( $n = 15$ ), expressing concerns ( $n = 9$ ), reacting minimally ( $n = 8$ ) and reacting substantively ( $n = 6$ ).

The reaction strategy that was most often found was “disclosing internet use”. In this category, patient often answered a question about their online health information-seeking in a neutral way. This category was often found after NPs' exploration. Two other frequently used strategies were “reacting minimally” and “expressing concerns”. When patients were using a minimal reaction strategy, they frequently used this after NPs' attempt to warn the patient. For example, a NP warned the patient about the possibility to encounter information that might scare them after which the patient reacted with “hmmm”. When patients responded to the NPs initiation with a concern, some patients disclosed how disturbing the online health information was to her/him. A few patients mentioned that they prefer not to go online anymore or that they were questioning the credibility of the information. In some cases, patients “reacted substantively” by citing online health information or asking questions based on what they found. This category was regularly found after NPs who explored or warned the patient.

## 4. Discussion

### 4.1. Discussion

This observational qualitative study aimed to advance our understanding of how online health information-seeking was discussed by patients and NPs during consultations in the Netherlands. Our study demonstrates that the internet is becoming integrated in the consultation by showing that if online health information-seeking was discussed, both patients and NPs were equally likely to start this discussion. Patients and NPs often started a discussion about patients' online health information-seeking using a general strategy, rather than with a specific strategy. This might be due to more providers being trained to discuss online health information-seeking as well as the increasing amount of patients who use the internet. As the internet is being used more often, medical students are currently trained to create a working relationship that allows patients, who went online, to “thrive and to make a positive contribution to their care” [p. 315, 26].

By analyzing recordings of patient-NP consultations, we demonstrated that only one-third of these consultations include a discussion about online health information-seeking. Studies reporting these percentages generally used a broad time frame (i.e., by asking patients whether they have ever discussed their online health information-seeking with their provider) [27]. Additionally, they used self-reported questionnaires or interviews to assess if patients discussed their online health information-seeking [e.g., 6,7,28,29]. Self-reported measurements are affected by recall bias on the part of the patient, especially in health-related issues [23]. Using these methods might have led to an over

underestimation of whether online health information-seeking was discussed during a consultation. Information on if, and how often patients discuss online health information-seeking with their provider is fundamental if we want to understand how the internet affects patient-provider communication. By using 1) a specific consultation as a point of time to study and 2) recordings of these consultations instead of a survey, this study provides a more accurate view on if and how often patients and providers discuss online health information-seeking.

Many IBD patients experience a large information deficit [30]. Patients' needs that are left unfulfilled after a consultation with a provider partly explains why patients use the internet as a source of information [31]. However, previous research indicates that internet use can increase feelings of anxiety and uncertainty [32,33]. Especially patients who start taking medication might be vulnerable to these unwarranted concerns [34]. A recent study analyzing websites that provide information about immunosuppressive medication and biologicals prescribed for IBD concluded that these websites have educational opportunities, but can also misguide patients [34]. Our results suggested that IBD patients who discuss online health information-seeking use a consultation as an opportunity to discuss their concerns about what they found online. Previous research in patient-provider communication has shown that nurses are able to reduce patients' concerns, if addressed adequately [35,36]. Our results show that NPs, in turn, are using the consultation to warn patients for these potential downsides or to repair the information by countering false beliefs. Whether these strategies are effective in reducing patients' concerns should be further explored.

The communication strategies as identified in our study (i.e., taking patients' online health information-seeking seriously, affirming patients' beliefs or employing a minimal encouragement strategy) are previously identified as key functions of patient-centered care [37]. By using these communication strategies, patients may feel known and respected [38]. To date, only a few studies have explored whether, and which of these communication strategies relate to important patient outcomes such as satisfaction and adherence. Results of these studies demonstrated that showing interest and validating patients' online health information-seeking relate to higher patient satisfaction [19,39]. A possible explanation might be that patients expect their provider to acknowledge, discuss, explain and/or contextualize the online information. When a provider is meeting their expectations, this results in a higher satisfaction [14]. We also found that patients used the internet to ask questions during their consultation or to justify their argumentation. This improves their participation during the consultation, helps them to put relevant issues on the agenda and tailor the consultation to their needs [8]. Future research should gain more insight into which initiations lead to positive and which lead to negative responses by adopting sequence analysis techniques. Researchers could also experimentally disentangle the effects of using different communication strategies to discuss patients' online health information-seeking on patient outcomes. Results can be used to further inform guidelines in which communication strategies are described that should be employed by providers to discuss online health information-seeking.

Limitations of the current study include the context in which this study was conducted, the method and sample used. First of all, compared to other European countries, the Netherlands has the highest percentage of people who seek online for health related information [40]. This might indicate that online health information-seeking is quite accepted in the Netherlands and explains why we did not find many provider-centered communication strategies, which were previously identified in other another study [20]. Percentages of patients discussing online health information-

seeking with their providers vary between 6.9 % and 70 % among countries [7,41,42]. Thus, although the extent of the use of the internet in the Netherlands is somewhat more advanced than in the rest of the world [40], the results of our study seems to be representative to other developed countries. Second, the relative homogeneity of participants might have affected our results as well. Our data demonstrated that NPs often warn their patients about online information. Since this type of medication is also prescribed for other health conditions in a higher dose (i.e., cancer), it might be that particularly IBD patients starting with immunosuppressive medication or biologicals are a group at risk of finding information that might not be applicable to their personal situation. Thus, this specific context can explain why we frequently found “warning” as a strategy in our data. Additionally, the majority of patients included in this analysis was moderate to high educated. Patients with different levels of education use and (intend to) talk about online health information differently. For example, higher educated patients are considered more critical towards their providers [43,44]. This group is more likely to challenge their provider by discussing their online findings. Unlike higher education patients, lower educated patients are less likely to confirm their providers’ advice, or to seek online about alternatives [43]. Since not all strategies were used in all consultations, we had not enough statistical power to test for differences between patients. Likewise, we were not able to examine within NPs who contributed data with multiple patients, whether their style was consistent across encounters. Future research should further explore this topic. We only included patient-NP consultations; it might be interesting to further explore how physicians discuss patients’ online health information-seeking, particularly since previous research has shown that physicians are particularly negative about the internet [20].

We did not analyze which online health information patients encountered prior to the consultation. Information on the internet is provided through a variety of websites run by healthcare organizations, patient associations, pharmaceutical companies as well as patients contributing to blogs and discussion forums. These sources differ in function, content, credibility and needs fulfillment. For example, information found in a peer-reviewed journal might fulfill patients’ information needs while participating in a forum might fulfill patients’ need for support [45]. These sources might affect the communication differently and are expected to impact the interpretation of the message and possibly even future behavior [46]. Lastly, we only included consultations in which the internet was mentioned explicitly (i.e., we only analyzed consultations in which internet-related words were mentioned). Bylund and colleagues [12] found that around half of the patients introduce the internet without explicitly stating the source (i.e., implicit referrals). This means that the proportion of consultations in which the internet is discussed might be higher if both implicit and explicit references of internet sources are taken into account. Future research should include self-reported measures (i.e., interviews) and tape recordings of consultations to assess both implicit and explicit references of internet sources within different patient populations.

#### 4.2. Conclusion

The current study expands on previous research in this area by 1) analyzing recordings of consultations between IBD patients and NPs in the Netherlands about immunosuppressive medication/biologicals, 2) exploring if and how both patients and NPs initiate a discussion about online health information. The results of this study can be used to identify best practices for providers in responding to patients. Our results demonstrate that the internet is becoming integrated in the consultation and that NPs particularly

adopt a patient-centered communication style while communicating with patients about online health information-seeking.

#### 4.3. Practice implications

The outcomes of this study are relevant to both patients and health care providers. Previous research suggested that patients refrain from discussing online health information-seeking out of fear of the health care providers’ reaction [47]. With the internet becoming more and more integrated in patient-provider consultations [28] it seems that NPs are willing to discuss online health information-seeking with their patients. To date, health education has been slow to acknowledge that patients go online before a consultation. Given that exposure to inaccurate online health information is likely and talking about online health information is positively related to patient satisfaction and recall of information [41], it is vital that NPs talk more in-depth about online health information. The results of this study can be used to inform trainings or curricula to train NPs and other health care providers in their communication with online informed patients.

#### Author contributions

AL and JW were responsible for the funding acquisitions. AL, JW, BS and CB were responsible for the design of the study. AL and RS were responsible for the acquisition of data. AL, BS and RS analyzed and interpreted the data. AL was responsible for writing the manuscript, BS, CB, RS and JW critically revised the manuscript.

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