The value of nurses' tailored communication when discussing medicines: Exploring the relationship between satisfaction, beliefs and adherence

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ABSTRACT

Numerous studies of various populations and settings link patient–provider communication or beliefs to medication adherence. A better understanding of this interplay may help to improve patient-centred communication. To predict adherence, this study used the Beliefs about Medicines Questionnaire and indications of the quality of the nurse's communication in terms of patient satisfaction. Patient satisfaction with the information provided and the degree to which the information was tailored to them were related to adherence via the patient's beliefs. This study supports the argument that tailoring is an effective strategy for improving adherence via beliefs and can contribute to medical education and to adherence interventions.

INTRODUCTION

Appropriate intake of medication can reduce the probability of relapse for inflammatory bowel disease (IBD) patients (Ediger et al., 2007; Kane et al., 2003). Nonetheless, non-adherence rates of 20–40 per cent have been reported for long-term IBD therapies. Recent studies concluded that adherence is influenced in particular by patients' beliefs and misconceptions about the medication (Chummun and Bolan, 2013; Horne et al., 2013; Karamanidou et al., 2014). In other words, patients' willingness to start and continue taking prescribed medication is influenced by how patients judge their personal need for the treatment relative to their concerns about taking it (Clifford et al., 2008). Other scholars have emphasized the importance of patient-centred communication in relation to adherence. In the Netherlands, nurses have an important role in educating IBD patients about newly prescribed severe medication such as immunosuppressive and biological therapy. Zolnierek and Dimatteo (2009) demonstrated that patients of providers who communicate well are 19 per cent more adherent than patients whose providers do not communicate effectively. According to the National Institute for Clinical Excellence (NICE), providers should use an individualized communication style that enables patients to

discuss their beliefs (Nunes et al., 2009). An indication of the quality of an individualized communication style is the extent to which patients perceive that the communication has met their needs and the extent to which they are satisfied with the information provided (Horne et al., 2001).

Although the relationship between patient and provider has changed significantly in the last decades, no recent study has investigated the relationship between satisfaction with nurses' communication and adherence. Similarly, the role of beliefs in the relationship between satisfaction and adherence has not been investigated, although medical professionals are advised to discuss beliefs during consultation (Nunes et al., 2009). More information about the role of beliefs is needed to improve patient-centred communication tailored to the patients' needs. Therefore, this study explores whether patient satisfaction is related to adherence and whether this is mediated by the patients' beliefs.

THEORETICAL BACKGROUND

The role of beliefs in predicting adherence

In the past decade, substantial growth has occurred in research about adherence. This change is mainly due to an increasing awareness of the scope of the problem and the pervasiveness of non-adherence across different therapeutic fields (Vrijens et al., 2012). Because of its breadth, adherence should not be approached as a single behaviour. Instead, adherence should be perceived as a three-phase process: the initiation phase (the patient takes the first dose), the implementation phase (the patient's behaviour corresponds with the prescribed regimen) and discontinuation (the end of the regimen; Vrijens et al., 2012). Patients may develop beliefs about their medication that may influence the implementation phase, particularly during the initiation phase.

The importance of positive beliefs towards a desired behaviour has been emphasized in several health psychology theories such as the theory of planned behaviour (Ajzen, 1991) and the health belief model (Becker, 1974). However, none of these models seems to universally explain medication adherence (Horne and Weinman, 1998). Research in adherence strongly suggests that the salient beliefs relating to patients' medication decisions can be grouped into two categories: perceptions of necessity or personal need for treatment and concerns about potential adverse effects (Horne and Weinman, 1999). The Necessity–Concerns Framework (NCF) assumes that patients' perceptions of their medication can be categorized as beliefs about the necessity of taking the medication and concerns about taking it (Clifford et al., 2008). A meta-analysis of 17 long-term conditions involving more than 10,000 patients revealed that the NCF has good exploratory value in predicting adherence, which makes it a useful framework (Horne et al., 2013). However, few of these studies have investigated patients' beliefs at initiation of the treatment. Once the treatment is initiated, patients must accept the fact that they are ill and need medication. The importance of understanding patients' beliefs in the initiation phase of the treatment in relation to medication adherence is essential to develop patient-centred interventions for optimizing clinical outcomes (Vrijens et al., 2012). Based on these previous studies of beliefs about medicines, we hypothesize that positive beliefs at initiation of the treatment are related to higher self-reported adherence (H1).

The relationship between satisfaction and adherence

Education about the prescribed medication is particularly important because it may lead to an increase in knowledge and a decrease in misunderstandings about the necessity or possible side effects of the medication (Tarn et al., 2006). Education results in significant improvements in adherence if information is communicated effectively (Linn et al., 2012; Zolnierek and Dimatteo, 2009). The National Prescribing Centre (NPC) and NICE published guidelines on how to support adherence through communication (Nunes et al., 2009). An indication of the quality of the providers' communication is the extent to which patients are satisfied with the information provided (Horne et al., 2001).

Although previous studies have confirmed the relationship between satisfaction with communication and adherence, satisfaction has not been measured in a consistent manner. Some qualitative studies have investigated the relationship between patient satisfaction and adherence (Roberts, 2000), but they were unable to specify a possible relationship between satisfaction and adherence. Other studies measured patient satisfaction with the visit (Korsch et al., 1968) and treatment (Bultman and Svarstad, 2000) and related this to adherence. Sherbourne et al. (1992) measured satisfaction by the interpersonal qualities of the provider and measured patients' general tendency to adhere to medical recommendations. Considering the results of these studies, exploring whether patients' satisfaction with their providers' communication is related to adherence would be interesting.

The NICE guidelines suggest that communication about treatment and care should be tailored to patients' individual needs and preferences (Nunes et al., 2009). Although tailoring has been advocated as a promising strategy to improve adherence, few studies have investigated the effect of tailoring on improving adherence. Research indicates that adequately addressing needs is expected to lead to higher levels of satisfaction (Hack et al., 2005) and subsequently adherence (Ownby et al., 2012). Although unrelated to patient–provider communication, a recent study revealed that sending messages only when needed improved adherence (Vervloet et al., 2012). Although tailored interventions are not equivalent to tailored communication, it is reasonable to assume that tailoring communication to patients' needs and personal situation can be effective in improving adherence. However, little evidence exists about this relation. We, however, expect that higher satisfaction with the nurses' communication and the degree to which patients are satisfied about the extent to which the information is tailored are related to higher self-reported adherence (H2).

The mediating role of beliefs in predicting adherence

In addition to the importance of tailoring information to the patients' needs, the NPC and NICE guidelines stipulate that providers should be aware of patients' beliefs about their prescribed medication. Nurses may have a key role in understanding and addressing patients' beliefs, particularly during consultations about medication (Latter et al., 2007). Providing information about the pros and cons of taking medication is recommended in helping patients to overcome uncertainties about their risks and confirm the necessity that they take the medication (Chummun and Bolan, 2013).

Given the assumed relationships between satisfaction and adherence and between beliefs and adherence, testing a model that considers both communication and beliefs, such as the common-sense model of self-regulation (CSM-SR), seems logical. According to this model, adherence can be considered a way of coping with

an illness. Optimal adherence is more likely if patients perceive that the advice to take the medication 'makes sense' and if it is consistent with their personal beliefs and experiences with the disease or medication (Leventhal et al., 1992). Research about nurse–patient communication has indicated that a tailored communication style is expected to lead to more positive beliefs about medication (Linn et al., 2012). However, this study did not consider the effect of patient satisfaction in relation to patients' beliefs. We therefore hypothesize that patients who are satisfied with their providers' communication will hold more positive beliefs about the medication (H3). Because robust empirical evidence indicates that beliefs have a direct effect on adherence and there is no consensus about the direct effect of satisfaction about communication on adherence, beliefs should be taken into account when exploring the relationship between satisfaction and adherence. Based on the CSM-SR and previous research, we expect that the relationship between patient satisfaction and adherence is mediated by medication beliefs (H4).

METHODS

Design

Between December 2008 and March 2012, IBD patients and eight nurses from six hospitals in the Netherlands were recruited. To be eligible for this study, patients had to meet the following inclusion criteria: (1) diagnosed with Crohn's disease or ulcerative colitis according to classical clinical, endoscopic, radiographic and/or path histological criteria as determined by an experienced gastroenterologist; (2) going to begin immunosuppressive or biological therapy (i.e. Azathioprine, 6-mercaptopurine, Infliximab, Methotrexate, 6-thioguanine and Adalimumab) for the first time and (3) being able to read and write in Dutch. All patients gave written informed consent. The Medical Ethical Committee granted permission for this study (Trial No. NTR2892), which was supplemented with local feasibility statements.

Patients were surveyed approximately 3 weeks after their consultation. Because immunosuppressive and biological therapies weaken the immune system and there is an increased risk of infection and reactivation of latent tuberculosis, patients must be checked for viruses before starting their medication, which may take some time. Thus, to ensure that patients had actually started their medication, questionnaires were administered 3 weeks after the consultation.

Measurements

Adherence. Self-reported medication adherence was measured with the 5-item Medication Adherence Report Scale (MARS; $\alpha = .58$) (Ediger et al., 2007; Horne and Weinman, 2002). The MARS has been used in a variety of illness populations (Grunfeld et al., 2005; Horne and Weinman, 2002), including IBD (Horne et al., 2009). For example, one scale item reads, 'Some people forget to take their medicines. How often does this happen to you?'. Item responses are scored on a five-point scale where 1 = 'never' and 5 = 'very often'. Items were recoded and totalled to create a cumulative score, with a maximum score of 25 indicating complete adherence. Consistent with previous research, responses on the MARS were skewed towards higher level of adherence, and therefore, adherence was recoded into a dichotomous variable (0 = not fully adherent and 1 = fully adherent (George et al., 2005)). We used a score of 25 to identify fully adherent patients, and a score lower than 25 was used to identify not fully adherent patients.

The Beliefs about Medicines Questionnaire

The Beliefs about Medicines Questionnaire (BMQ-Specific) was used to assess patients' beliefs towards immunosuppressive or biologic therapy (Horne et al., 1999). The BMQ-Specific was administered during telephone interviews when patients started taking their medication. The BMQ-Specific consists of two subscales: a 5-item necessity scale measuring patients' beliefs about the *necessity* of taking the medication (α = .77) and a 5-item concerns scale measuring patients' *concerns* about the potential adverse consequences of taking the medication (α = .68). An example of the necessity scale is 'My health at present depends on my medication'. An example of the concerns scale is 'I sometimes worry about becoming too dependent on my medication'. Patients were able to indicate their level of agreement on a 5-point Likert-type scale ranging from 1 = 'strongly disagree' to 5 = 'strongly agree'. Higher scores on the scales indicate stronger beliefs. The patients' scores on each scale were totalled, resulting in a scale ranging from 5 to 25 for necessity and concerns (Clifford et al., 2008; Horne et al., 1999, 2009; Menckeberg et al., 2008).

A necessity–concerns differential (NCD) was calculated for each patient by subtracting his or her concerns score from his or her necessity score, resulting in a range from −20 to 20. The NCD provides a numerical assessment of how patients judge their perceived need for treatment, relative to their concerns. Positive scores indicate that necessity was valued higher than concerns, and negative scores indicate that concerns were rated higher than perceived need (Clifford et al., 2008; Horne et al., 1999; Menckeberg et al., 2008).

Patient satisfaction

We used an existing scale that measured the quality of care through extensively assessing patient satisfaction by measuring patient satisfaction with the general information, support regarding medication use and affective communication (Hendriks et al., 2005). The possible answers ranged from 1 = 'poor ' to 4 = 'very good'. Thus, a higher score on these scales indicated that a patient was more satisfied. An example of the scale is 'The nurse informs me about the potential side effects' (12 items, α = .87). An example of the support regarding medication use scale is 'The nurse discusses whether the treatment is effective' (7 items, α = .72). An example of the affective communication scale is 'The nurse takes me seriously' (9 items, α = .88).

In addition, we asked patients to assess the extent to which communication was tailored to the patients' personal situation on a scale of 1–10 (i.e. 'If you should grade the nurse's communication on a scale from 1 to 10, where 1 indicates very poor and where 10 indicates very excellent, what grade would you give the nurse regarding the extent to which the communication was tailored to your personal situation?').

Demographic characteristics

Participants were asked to specify their age, gender, education and type of disease.

Statistical analyses

The number of missing variables was minimal because questionnaires were checked immediately after being completed. Missing values on items that were part of a (sub)scale were substituted according to the 'mean value of valid sub-tests principle' (only if 25% or less of the items of the (sub)scale had missing values). Mean scores and standard deviation (*SD*) for the BMQ-Specific, the NCD, the satisfaction scales

and the MARS were calculated. Separate logistic regressions were conducted to examine the relationship between the NCD as the independent variable and self-reported adherence as the dependent variable (H1) as well as the relationship between the satisfaction subscales and the perceived extent to which communication was tailored as independent variables and self-reported adherence as the dependent variable (H2). Four separate multiple regressions were conducted with the satisfaction subscales and the perceived extent to which the communication was tailored to the patients' needs as independent variables and the NCD as dependent variable (H3). The mediated effect between patient satisfaction and self-reported adherence via medication beliefs (NCD) was tested using Hayes' PROCESS macro (Hayes, 2012) (H4). Several variables were used as control variables, including gender, age and education level. Controlling for these variables did not alter the effects of patient satisfaction on medication beliefs or adherence.

RESULTS

Non-response
Of the 118 eligible patients, 19 (16.10%) refused to participate in the study: 7 refused because of privacy reasons, 5 felt too sick or too tired and 7 felt overwhelmed or were too busy. Thus, a total of 99 (83.89%) patients agreed to participate and filled out the questionnaire at the start of their treatment.[1]

Sample characteristics
The characteristics of the patients are presented in Table 1. Less than two-third (62.62%) of the sample was female, 68 patients (68.68%) were diagnosed with Crohn's disease and 30 patients (31.32%) were diagnosed with ulcerative colitis. The mean age was 41.66 years ($SD = 14.87$ years), and more than one-third of the patients were moderately educated (38.39%).

[TABLE 1]

Adherence
In total, 30.30 per cent of the patients were not fully adherent, and 69.70 per cent were considered fully adherent. Forgetfulness was the most salient barrier to adherence, with 28.28 per cent of patients indicating that they sometimes or often forget to take the medication.

Medication beliefs
In general, patients perceived some concerns about their medication ($M = 13.97$, $SD = 3.62$). On the concerns scale, patients agreed most strongly with the item 'I sometimes worry about the long-term effects of my medication' ($M = 3.56$, $SD = 1.13$), and patients disagreed most strongly with the item 'I sometimes worry about becoming too dependent on my medicine' ($M = 2.31$, $SD = 1.03$). On average, patients believed that taking the medication was necessary ($M = 18.58$, $SD = 3.26$). On the necessity scale, patients agreed most strongly with the item 'My medication protects me from getting worse' ($M = 3.85$, $SD = 0.74$) and disagreed most strongly with the item: 'My life would be impossible without my medicine' ($M = 3.61$, $SD = 0.98$). According to the NCD, patients generally thought that the benefits of taking the medication outweighed the costs ($M = 4.61$, $SD = 4.51$).

Patient satisfaction

Most patients were satisfied with the general information ($M = 3.65$, $SD = 0.45$, range 1–4), the medication use support ($M = 3.48$, $SD = 0.47$, range 1–4) and the affective communication provided by the nurses ($M = 3.75$, $SD = 0.41$, range 1–4). When grading the extent to which the nurses' communication was tailored to their personal situation on a scale from 1 to 10, patients rated the consultation a 7.9 ($SD = 1.11$).

Effects of medication beliefs and satisfaction on adherence

H1 postulated that positive beliefs were positively related to higher self-reported adherence. The results indicated that the NCD was indeed significantly related to self-reported adherence confirming H1. H2 postulated that patient satisfaction was positively related to adherence. The results revealed that patient satisfaction with the general information, the medication use support, affective communication and the extent to which communication was tailored to patients were not related to adherence. Thus, H2 is not supported (see Table 2).

[TABLE 2]

The effects of satisfaction on medication beliefs

H3 postulated that patient satisfaction was positively related to the patients' beliefs.[2] Patient satisfaction with the general information was significantly related to beliefs about medication. Patient satisfaction regarding the perceived extent to which information was tailored to them was also significantly and positively related to beliefs towards medication. Patient satisfaction regarding support with medication use and nurses' affective communication were not related to beliefs. Therefore, H3 is partly confirmed (see Table 2).

The mediating role of beliefs in predicting adherence

H4 suggested that the relationship between patient satisfaction and adherence was mediated by patients' medication beliefs. Because only the relationship between beliefs and satisfaction with the general information and level of tailoredness and adherence was significant, we conducted two separate mediation analysis using satisfaction with the information and satisfaction with the extent to which information was tailored as dependent variables. The analysis indicated an indirect effect from satisfaction with the general information and the extent to which information was tailored to patients on self-reported adherence via the NCD. The effects of the relationship between satisfaction with the general information and the extent to which information was tailored to patients on self-reported medication adherence were mediated by patient beliefs ($b = .37$, standard error (SE) = .31, 95% confidence interval (CI) = [0.01, 1.32]) resp. ($b = .14$, $SE = .08$, 95% CI = [0.03, 0.36]), which confirms H4.

DISCUSSION

This study first examined the relationship between patients' beliefs at initiation of their treatment and satisfaction on adherence. Second, we investigated the relationship between patient satisfaction and beliefs, and third, we explored the mediating role of beliefs in prediction adherence. The results indicated that beliefs about medication at initiation of the treatment were positively related to adherence.

We did not find a relationship between patient satisfaction and adherence. Satisfaction with the information and the extent to which information was tailored to patients were positively related to patients' beliefs about their medication. The results also indicated that medication beliefs mediated the relationship between satisfaction and adherence.

Patients who were more positive about their medication were more likely to take their medication as prescribed. Similar results in IBD patients taking maintenance medication have been reported elsewhere (Horne et al., 2009). However, Horne and colleagues did not focus on one particular phase, such as initiation of the treatment. On the contrary, Ediger et al. (2007) found that IBD patients' beliefs were not related to adherence. A possible explanation may be that Ediger and colleagues used a 17-item version of the BMQ. This 17-item scale included more general beliefs about medication, whereas Horne and colleagues used the BMQ-Specific, which focused on concerns and beliefs about the need for taking current medication. Previous research has demonstrated that adherence is more closely related to specific beliefs than general beliefs (Horne et al., 1999).

Although evidence suggests that patient satisfaction with the providers' communication can be related to improved adherence (e.g. Bultman and Svarstad, 2000), we did not find a relationship between patient satisfaction and adherence. A reason for these different results may be that previous studies have not measured satisfaction in a consistent manner.

The relationship between satisfaction with the extent to which information was tailored to patients and adherence was mediated via patients' beliefs. This result emphasizes the importance of tailored communication in improving adherence via patients' beliefs. High-quality information, as perceived by the patient, can be beneficial in helping patients to overcome their concerns and recognize the necessity of the medication. Education about immunosuppressive or biological therapy often contains complex information, and nurses play an important role in educating IBD patients during prescribing consultations. This finding is consistent with previous research into tailoring communication and beliefs about medication. Although our study focused on the extent to which the communication was tailored to the patients' information needs and personal situation, another study found that communication styles tailored to patients' barriers to medication intake were associated with fewer barriers (Linn et al., 2012). This study is the first that specifically considered patient satisfaction with their nurses' communication when discussing their new treatment. We believe that interventions should tailor both content and communication strategies and that providers should learn to acknowledge the central role of beliefs in improving adherence.

A limitation of this study is the method used for measuring adherence. Studies relying on self-reporting may have a tendency to err on the optimistic side with regard to adherence (Urquhart, 1994). Although self-reported measurements may be affected by recall and self-presentation bias, a meta-analysis indicated that self-reported adherence is likely to correlate with more accurate measurements, such as pill counts (Shi et al., 2010). Responses on the MARS were skewed towards higher level of adherence. Other studies using the MARS measure also revealed skewed distribution, often leading to dichotomizing adherers and non-adherers (Mahler et al., 2010). Cut-off points hereby varied from 20 (Ediger et al., 2007) to 25 (George et al., 2005). Future research should identify cut-off points that are relevant to maintain

clinically desired outcomes (Alsalman and Smith, 2013). Moreover, the use of objective measurements would support the validity of our findings.

Our results provide opportunities for practical recommendations on how to improve adherence. Outcomes of effective communication might be stronger if these needs and beliefs are adequately addressed. However, identifying the patient's needs and beliefs may be difficult, particularly if providers are not trained to detecting them. For providers to identify a patient's beliefs, it is important that they explore the patient's beliefs and respond appropriately. Although this approach seems logical, most studies indicate that this is often not the case (Latter et al., 2007; Linn et al., 2012). A recently developed intervention incorporates communication skills training and an online preparatory assessment, which assists providers with exploring, identifying and addressing patients' beliefs and in determining the most effective communication strategy to accommodate these specific beliefs (Linn et al., 2013). To conclude, providing patients with information they perceive to be tailored and high quality seems to be important in addressing patients' beliefs and subsequently improving adherence when treatment is initiated. This study supports the argument that tailoring is an effective strategy for improving adherence via beliefs and can contribute to medical education and to adherence interventions. By learning to tailor their information to patient beliefs, providers may increase the impact of communication on adherence.

NOTES
↵1. Non-participants did not differ in terms of age and gender from participating patients.
↵2. We lacked data on the satisfaction of 15 patients who were part of a pilot in which satisfaction was not measured. These patients did not differ in terms of age and gender from patients who completed all measurements. We repeated the analysis using the 84 patients (without the first 15 patients) who completed all measurements, and the results remained the same.

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TABLES

Table 1. Patient characteristics.

Patient characteristics		N = 99	%
Gender	Female	62	62.62
Age (years)	M (SD)	41.66 (14.87)	
	Range	20–82	
Type of disease	Crohn's disease	68	68.68
	Colitis ulcerosa	30	31.32
Diagnosed in years	M (SD)	10.98 (10.27)	
Educational level	Low	24	24.24
	Moderate	38	38.39
	Higher	37	37.37

SD: standard deviation.

Table 2. Overview of findings from separate regression models.

	Adherence[a]				Beliefs[b]			
	B	SE	Exp(B)	p	B	SE	β	p
Beliefs	0(0.17)	0(0.06)	1.19	.00				
Satisfaction information[c]	0(0.31)	0(0.54)	1.36	.565	**0.28**	**1.06**	**.28**	**.011**
Satisfaction about support medication	0(0.50)	0(0.52)	1.64	.338	0.99	1.05	.11	.344
Satisfaction about affective communication	0(–0.31)	0(0.69)	0.73	.654	1.04	1.20	.09	.386
Satisfaction about tailoring	0(0.16)	0(0.20)	1.17	.404	**0.86**	**0.40**	**.21**	**.035**

SE: standard error.
[a]0 = non-adherence and 1 = adherence.
[b]Positive scores indicate that necessity was valued higher than concerns.
[c]Due to missing data, this analysis was conducted with $n = 84$ patients.
Bold = significant result