

# Patients' anxiety and hope: predictors and adherence intentions in an acute care context

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## Abstract

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**Context** Good patient–provider interactions promote satisfaction with health care, adherence to treatment recommendations and improved health. However, little research has examined patients' emotions and how they relate to patients' experiences with health care and their adherence intentions in acute care settings.

**Objective** This study examined the predictors and consequences of two emotions pertinent to the uncertainty of acute health-care experiences: anxiety and hopefulness.

**Design** Patients who arrived at a general surgery clinic for an initial consultation were interviewed before and after the consultation. Prior to the consultation with a physician, patients completed baseline measures of their emotional state. Following the consultation, patients completed measures of understanding of the information provided by the surgeon, perceived control over treatment decisions, adherence intentions and emotional state.

**Results** Understanding and control predicted less anxiety and greater hopefulness, compared to baseline. Only hopefulness predicted adherence intentions. These relationships remained even after controlling for characteristics of the patients and interactions.

**Discussion** These findings identify aspects of psychosocial care that are critical for promoting positive (and mitigating negative) emotional states in patients. Even in a brief consultation in a clinic setting, physicians may be able to improve patients' emotional state by promoting a sense of control and clarifying information they convey, and patients' positive emotional states may be critical for raising adherence intentions.

The only recognizable feature of hope is action.  
–Grace Paley

Interactions between patients and physicians can be emotionally charged and marked by patient distress<sup>1,2</sup> and uncertainty.<sup>3</sup> Thus, it is unsurprising that a majority of patients want physicians to address psychosocial needs, including emotional issues, in addition to typical biological care.<sup>4</sup> Furthermore, patients' instincts about the importance of their emotional needs are well-founded. Physician–patient interactions that successfully provide psychosocial care promote numerous positive outcomes for patients, including improved immune functioning,<sup>5</sup> increased trust in patient–provider relationships,<sup>6</sup> and most relevant to the current study, increased adherence to recommendations.<sup>7</sup> The current study extends these findings by examining predictors and consequences of patients' emotions, namely anxiety and hope, in response to an interaction with a physician in an acute care context.

### Emotions in the health-care context

Fiske<sup>8</sup> noted that 'feeling is for doing', a now common phrase that encapsulates decades of research establishing the role of emotions as physiological responses evolved to motivate action.<sup>9</sup> For example, the adaptive function of anger is to prompt retaliation, and the function of fear is to motivate escape. Patients experience a wide range of emotions during health-care encounters,<sup>10,11</sup> including both positive and negative emotions, and these emotional responses may motivate patients towards particular behaviours. In this study, we investigated the relationship of patients' emotional responses to a health-care experience and a specific behavioural motivation: intentions to adhere to a physician's recommendations. For the purpose of this inquiry, we focus on two key emotions with unique and clear relevance to the context of health care: anxiety and hopefulness. We chose these emotions due to their particular relevance under conditions of uncertainty,<sup>12,13</sup> with anxiety representing a relatively negative orientation towards an uncertain future and hopefulness representing a relatively positive orientation.<sup>14</sup> By their very

nature, physician–patient interactions entail a degree of uncertainty for patients.<sup>3</sup> Put simply, if people are certain as to how best to respond to a health event or concern, they would have little need to visit a physician.

Anxiety-related emotions (nervousness, worry, etc.) are the most commonly reported emotions experienced by patients.<sup>4</sup> Anxiety or worry in a health-care context is a double-edged sword. Anxious patients have more difficulty understanding and remembering information conveyed by health-care providers,<sup>15</sup> and extreme anxiety can interfere with patients' decision-making ability.<sup>16</sup> On the other hand, worry can be a motivating force.<sup>17,18</sup> In contrast to previous studies, which linked worry about a specific health risk to preventive behaviour to reduce that risk (e.g. undergoing screening<sup>19</sup>), we examine dynamic changes in state anxiety in the context of a health-care encounter to provide novel insight into whether emotional fluctuations predict adherence intentions.

Hope also has received considerable attention in the health-care literature and for good reason: Hopefulness, at least measured as a dispositional variable, predicts a plethora of positive patient outcomes, including lower incidence of hypertension,<sup>20</sup> better immune functioning,<sup>21</sup> faster recovery from a number of illnesses<sup>22</sup> and adherence to treatment recommendations.<sup>23,24</sup> Our study takes a different approach in that we examine dynamic, state changes in hope in response to a health-care encounter rather than dispositional variation in hopefulness to assess the relationship between a transitory state of hopefulness and adherence intentions. Physicians cannot readily change patients' dispositional levels of hope, but assessing temporary fluctuations in hopefulness following a physician–patient interaction, as our study does, can provide key insights into the relationship between patients' emotional state and adherence to treatment recommendations.

### Predictors of patients' emotions

Given our focus on emotions pertinent to the uncertainty inherent to health-care experiences,

we focused on two predictors of patients' emotions also related to uncertainty. Specifically, we examined the extent to which patients' self-reported comprehension of the information provided by the physician and their sense of control over their treatment predicted feelings of anxiety and hopefulness.

Increasing patients' knowledge tends to decrease their anxiety about their care. For example, patients who read clear, understandable consent forms or who view informational videos about medical procedures report feeling less anxious than patients who do not receive such information or who receive information that leaves them confused or under informed.<sup>25</sup> Similarly, patients who report a stronger sense of control over their treatment also report feeling more hopeful.<sup>26</sup> Despite these seemingly clear links between patients' understanding of medical information and a sense of control on the one hand and anxiety and hope on the other, the research on these topics has been limited to chronic, primary and preventive care contexts. Lacking are studies examining patients' emotions in health-care settings in which the degree of uncertainty is particularly high due to unfamiliarity with the physical location, physician and anticipated procedure. Thus, our study extends previous findings on the relationships between understanding, control and patients' emotions by addressing just such a setting: a general surgery clinic.

## Overview and hypotheses

Our primary hypotheses were that patients who reported better understanding of information the physician provided and a greater sense of control over their treatment would report less anxiety and more hopefulness immediately following an interaction with a physician, controlling for baseline emotions prior to the interaction. We also assessed surgeon ratings of patients' health status and severity of the health condition(s) as exploratory predictors of patients' emotions. Finally, we hypothesized that patients who felt more anxious and more hopeful following the interaction would report

greater intentions to adhere to treatment recommendations.

## Method

### Participants

A total of eight physicians (all male) and 383 patients from the general surgery clinic at a county hospital consented to participate in this study. Patients were ethnically and socioeconomically diverse (see Table 1 for full demographic information).

### Procedures

#### *Eligibility, recruitment and consent procedures*

Patients were eligible for the study if they were between the ages of 18 and 90 and scheduled for a consultation regarding the possibility of outpatient surgery. All materials were available in English and Spanish. Researchers approached

**Table 1** Sample characteristics (patients)

Characteristics	Patient sample ( <i>n</i> = 383)
% Female	50.8%
Mean age (SD)	44.7 (12.4)
Education	–
Did not complete high school	31%
Completed high school	53%
Completed college (2- or 4-year)	16%
Health insurance	–
HMO/PPO	5%
MediCal or Medicare	14%
Local low-income programme	63%
No coverage	18%
Employed	31%
Mean English fluency (1–10 scale)	7.7 (SD: 3.7)
Mean health literacy (1–10 scale)	7.1 (SD: 3.4)
Ethnicity: Hispanic/Latino	55%
Surgery type	–
Hernia repair, all types	39%
Gallbladder removal	21%
Cyst or mass removal	14%
Colostomy or port management	7%
Biopsy, all types	6%
Breast (other)	6%
Rectal/anal surgery, all types	7%

eligible patients for recruitment shortly after they arrived at the clinic, and patients who expressed interest were escorted to a private area where they received information about the study and provided consent. All physicians seeing patients at the clinic during data collection consented to participate. Although detailed information is unavailable regarding the number of patients who were approached but declined to participate, typical reasons provided for non-participation were insufficient time, discomfort or pain and disinterest.

#### *Data collection*

The data presented in this study are part of a larger study on patients' experiences with surgery. For the purpose of this study, three questionnaires from the larger study are relevant: a pre-consultation survey completed before patients interacted with the physician, a post-consultation survey completed after patients interacted with the physician, and a brief post-consultation survey completed by the relevant attending surgeon. All consent and data collection procedures were approved by both the hospital IRB and the IRB associated with the university affiliate of the primary investigator.

#### Measures

Due to the time constraints of surveying a patient population in the fast-paced environment of a surgery clinic and the relatively low English fluency level of the diverse patient population sampled, we selected single-item questions adapted from well-validated measures<sup>27–29</sup> for the pre- and post-consultation surveys. For brevity, we describe here only the measures pertinent to the goals of this study. The patients' pre-consultation survey contained one item each measuring baseline emotions ('How nervous do you feel right now?' 'How hopeful do you feel right now?'; 1 = *not at all nervous/hopeful*, 10 = *extremely nervous/hopeful*; see 27 for similar measures). This survey also requested demographic information, including gender, age, educational attainment, current employment status, ethnicity and health literacy

('How confident are you filling out medical forms by yourself?' 1 = *not at all confident*, 10 = *very confident*; 28–29).

The post-consultation survey prompted patients to indicate the extent to which they understood the physician ('Do you feel like you understood what the doctor(s) told you today?' 1 = *not at all*, 10 = *completely*), their sense of control over treatment ('How much control do you feel like you have over the decisions about your treatment?' 1 = *a little control*, 10 = *total control*), adherence intentions ('How likely are you to do exactly what the doctor(s) you saw today suggested?' 1 = *definitely not*, 10 = *definitely will*). The post-consultation survey assessed patient emotions using the same prompts as in the pre-consultation survey.

Finally, the surgeon who conducted the consultation completed a brief questionnaire immediately after leaving the patient's examination room. Pertinent to this study are two items the surgeons completed: an assessment of the patient's health ('patient's current health'; 1 = *extremely sick*, 7 = *extremely healthy*) and an assessment of the severity of the patient's health condition ('severity of patient's health condition that led to the recommendation of surgery'; 1 = *very mild*, 7 = *very severe*).

## Results

### Patients' emotions following a consultation

Two paired-samples *t*-tests assessed patients' emotion change from baseline (pre-consultation) to the post-consultation assessment. In general, patients reported feeling less anxious and more hopeful at the conclusion of their visit ( $P$ s < 0.0001; see Table 2).

### Patient characteristics

Prior to testing our hypotheses, we first examined the relationships between patient characteristics and patients' emotions, controlling for emotions at baseline. First, we conducted multiple regression procedures predicting anxiety

**Table 2** Emotion change from pre- to post-consultation

	Pre-consultation <i>M</i> (SD)	Post-consultation <i>M</i> (SD)	d.f.	<i>t</i>	<i>P</i>	<i>r</i> <sub>es</sub>
Anxious	4.29 (3.3)	2.79 (2.7)	339	-8.18	<0.0001	0.44
Hopeful	7.95 (2.7)	8.64 (2.3)	339	4.39	<0.0001	0.24

and hope following the consultation from age, educational attainment and health literacy, controlling for baseline anxiety or hope. Only two of these continuous demographic variables predicted patients' emotional responses to the consultation: older patients became relatively more nervous (or experienced a smaller decrease in nervousness) following the consultation,  $\beta = 0.11$  (95% confidence interval: 0.01, 0.21),  $P = 0.03$ , and more educated patients became relatively less hopeful following the consultation (or experienced a smaller increase in hopefulness),  $\beta = -0.12$  (95% confidence interval: -0.23, -0.01),  $P = 0.05$ .

We then conducted  $2 \times 2$  mixed model ANOVA procedures in which measurement point (baseline vs. post-consultation) was a within-subjects predictor and categorical demographic variables (gender, ethnicity or employment status) were the between-subjects predictors in separate analyses for each demographic variable and each emotion (anxiety and hope). A significant interaction term would indicate a relationship between the demographic variable and patients' emotional responses, controlling for baseline emotions. No interaction term was significant, all  $F$ s < 1.40, all  $P$ s > 0.23.

Finally, we conducted multiple regression procedures predicting anxiety and hope following the consultation from the surgeon's rating of patients' health and the severity of the patient's condition (using separate models for health and severity), controlling for baseline anxiety or hope. Healthier patients became relatively more hopeful following the consultation,  $\beta = 0.13$ ,  $P = 0.01$ , and patients with less severe conditions became relatively less nervous,  $\beta = 0.11$ ,  $P = 0.04$ . Patients' health did not predict post-consultation nervousness,  $\beta = -0.09$ ,  $P = 0.09$ , nor did the severity of the patient's condition predict hopefulness,  $\beta = 0.05$ ,  $P = 0.31$ .

### Predictors of patients' emotion

To examine the relationship between our proposed predictors and patients' emotions, we conducted multiple regression analyses predicting post-consultation emotions from understanding and perceived control (separately) while controlling for pre-consultation emotions (see Table 3 for standardized betas and confidence intervals).

As hypothesized, patients' understanding of the information by the physician predicted both hope and anxiety,  $P$ s < 0.05, controlling for baseline emotions. Patients who felt that they understood the information better reported greater hope and less anxiety. Patients' sense of control over their treatment also predicted both hope and anxiety,  $P$ s < 0.002, controlling for baseline emotions. Patients who felt a greater sense of control reported greater hope and less anxiety.

In the interest of thoroughness, we conducted analyses to examine the possibility that variability in patients' health and the severity of their condition might account for the relationship between understanding and control and their emotional response to the consultation. To test this possibility, we conducted multiple regression procedures predicting post-consultation emotions from understanding and perceived control (separately), controlling for the surgeon's health and severity ratings. All relationships between understanding, perceived control and post-consultation emotions remained significant even after controlling for health and severity, all  $\beta$ s > 0.10, all  $P$ s < 0.04.

### Adherence intentions

Finally, we examined the relationship between patients' emotions and their intentions to adhere to treatment recommendations. To examine this question, we conducted multiple

	Anxious		Hopeful	
	$\beta$	95% CI	$\beta$	95% CI
Understanding	-0.10*	-0.19, -0.01	0.31*	0.21, 0.40
Perceived control	-0.15*	-0.25, -0.06	0.30*	0.20, 0.40
Current health (surgeon-rated)	-0.08	-0.18, 0.01	0.13	0.03, 0.24
Severity (surgeon-rated)	0.11*	0.01, 0.21	0.05	-0.05, 0.16
Adherence intentions	0.01	-0.11, 0.13	0.27*	0.16, 0.38

\* $P < 0.05$ .

**Table 3** Standardized betas and confidence intervals representing relationships with post-consultation emotions, controlling for pre-consultation emotions

regression analyses for each emotion, predicting adherence intentions from post-consultation emotions and controlling for baseline emotions (Table 3). Anxiety did not predict adherence intentions,  $P = 0.88$ . However, hopefulness was a strong predictor of adherence intentions,  $P < 0.0001$ , such that patients who reported greater hopefulness also reported stronger adherence intentions.

We again sought to rule out the possibility that the relationship between post-consultation hopefulness and adherence intentions might be explained by variability in patients' health and the severity of their condition. We conducted a multiple regression analysis predicting adherence intentions from post-consultation hopefulness, controlling for baseline hopefulness, health and severity. The relationship between hopefulness and adherence intentions remained significant,  $\beta = 0.29$ ,  $P < 0.0001$ .

## Discussion

The current study explored patients' emotional reactions to a health-care interaction. We sampled an ethnically- and socioeconomically-diverse population of newly referred patients attending a surgical clinic for a preoperative consultation. Generally, patients experienced a reduction in anxiety and an increase in hope after their interaction with the physician. A comparison of the effect sizes in Table 2 reveals that although both emotional responses were fairly strong, the reduction in anxiety was nearly twice as strong as the increase in hope. Despite several potential barriers to positive emotional reactions (new physician, unfamiliar location, vulnerable patient population and

potentially frightening or embarrassing surgical procedures), patients generally felt better after talking to their physician.

Beyond the broad and positive changes in patients' emotions in our study, we found evidence for two important features of patients' subjective experience that predict their emotional reactions following a health-care experience. Patients who felt that they understood the information conveyed by the physician and who felt a greater sense of control over treatment decisions became less anxious and more hopeful following their consultation. Although all relationships were statistically significant, we would note that the relationships with increases in hope were far stronger (three times stronger in the case of understanding, twice as strong for perceived control) than those with decreases in anxiety.

For patients, these findings suggest that engaging with a physician promotes positive emotional responses even in brief and focused consultations (most conversations in our study lasted only a few minutes). For physicians, our findings provide two possible ways to encourage positive emotional responses in their patients: encouraging comprehension and promoting a sense of control over treatment decisions. Fortunately, researchers have identified a number of ways to improve patients' understanding of complex health information,<sup>30-32</sup> and physicians are increasingly adopting a shared-decision-making approach to patient care.<sup>33,34</sup>

We also examined how emotional reactions to a health-care experience relate to patients' intentions to adhere to treatment recommendations. We hypothesized that experiencing anxiety or hope in response to the consultation

would be associated with an increase in patients' intentions to adhere to their physician's recommendations. To be clear, although these hypotheses are largely (if inconsistently) supported by previous research, they are novel. Unlike previous studies, which have examined relationships between disease-specific worry and preventive behaviour, our study examined state anxiety in response to a specific health-care consultation. Similarly, although studies have established a link between dispositional hopefulness and adherence, our study is the first we know of to examine state hopefulness (controlling for baseline state hope, thus minimizing the viability of a dispositional explanation) as a predictor of adherence intentions. To be clear, we did not assess dispositional hopefulness *per se*; rather, by controlling for baseline levels of state hope, we statistically mitigated the influence of generally hopefulness on adherence intentions.

Although past research has identified a link between anxiety and preventive health behaviour,<sup>35,36</sup> our findings suggest that anxiety in the context of acute, clinic-based care does not predict adherence intentions. Instead, only hope emerged as a predictor of adherence intentions. In fact, the relationship between anxiety and adherence intentions was near zero, compared to a relatively strong and reliable relationship with hope. One explanation for this finding is that an important goal for physicians is to motivate patients to adhere to their recommendations,<sup>37–39</sup> and physicians who focus on the potential for successful treatment tend to be effective at promoting hope in their patients.<sup>40</sup> Perhaps, patients in our study who believed that with the physician's help they could anticipate a healthier future, and thus felt more hopeful, were more motivated to follow the physician's instructions. Of course, although hope may be motivating, inappropriate hopefulness can also set patients up for disappointment if things do not turn out as hoped.<sup>41–43</sup> In ideal interactions, physicians would balance the goal of promoting patients' hope with the goal of honesty and realistic expectations.<sup>22,39,40,44</sup>

Examining emotional fluctuations in hope and anxiety in an underserved population in an understudied context (i.e. surgical consultations) provides a notable contribution to the literature, but the study was limited in several ways. First, due to time constraints, patients completed single-items measures of their emotional states as opposed to more exhaustive measures of state anxiety and hope. However, single-item measures of emotion have excellent face validity, and participants easily comprehend these measures.<sup>45</sup>

Second, although we made significant efforts to recruit all eligible patients during the study period, some patients inevitably declined to participate. Thus, the patients in our sample may be unrepresentative of the full patient population. For example, patients in our sample may have been unusually agreeable, unusually interested in research or unusually satisfied (or dissatisfied) with their care at the facility.

Third, our approach may have elicited socially desirable responses from the patients (e.g. providing higher ratings of hopefulness and adherence and lower ratings of nervousness than were truthful), which would limit the validity of our findings. To minimize the possibility of this effect, research assistants informed patients that they were not affiliated with the hospital and encouraged patients to be open and honest about their feelings regarding the hospital and its staff, whether positive or negative, but patients may nonetheless have tailored their responses based on their beliefs about the goals of the study.

Finally, we have presented our findings with a degree of presumption about causal order. Our hypotheses identify understanding and perceived control as predictors of patients' emotional responses to health-care experiences, and we identify adherence intentions as a consequence of these emotional responses. Although the nature of our study sheds some light on causal direction (e.g. by reducing the effect of general emotionality as a confounding factor), the possibility remains that patients who became more hopeful and less nervous in turn felt a stronger sense of understanding and

control or that patients who developed an intention to adhere in turn felt more hopeful.

Our study sheds light on patients' experiences with an understudied but common type of health-care encounter (surgical consultations) in a common but understudied health-care setting (clinic-based care). Researchers have focused largely on the primary care setting to the detriment of our knowledge about patient emotions in surgical settings.<sup>46</sup> Given the stressful, and often uncertain, nature of surgical consultations,<sup>47</sup> we argue that more research should examine the unique relationship between patients and their surgeons.

We further argue that the short-term, state emotional responses experienced by patients in our study have implications for important patient outcomes, most notably adherence intentions, but the long-term consequences of these emotional reactions remains unexplored. For example, if the patient loses hope in the days and weeks following the consultation, we anticipate that adherence intentions would diminish as well. Alternatively, physicians who interact with patients on a regular basis may be able to 'boost' patients' hopefulness over repeated consultations, thus solidifying the motivational benefits of a hopeful state of mind. Of course, a limitation of our study, and one common to many studies examining treatment adherence,<sup>48</sup> is that we are unable to report how successfully the patients in this study actually adhered to the treatment recommendations offered by the physicians. Our study provides an initial picture of the dynamics of patients' emotions in a surgical context, and future research can use our findings as a starting point for studies targeting changes in patients' emotions in a variety of surgical contexts and across a longer time period.

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