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Gist and verbatim communication concerning medication risks/benefits

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Abstract

Objectives—To describe the information about medication risks/benefits that rheumatologists provide during patient office visits, the gist that patients with rheumatoid arthritis (RA) extract from the information provided, and the relationship between communication and medication satisfaction.

Methods—Data from 169 RA patients were analyzed. Each participant had up to three visits audiotaped. Four RA patients coded the audiotapes using a Gist Coding Scheme and research assistants coded the audiotapes using a Verbatim Coding Scheme.

Results—When extracting gist from the information discussed during visits, patient coders distinguished between discussion concerning the possibility of medication side effects versus expression of significant safety concerns. Among patients in the best health, nearly 80% reported being totally satisfied with their medications when the physician communicated the gist that the medication was effective, compared to approximately 50% when this gist was not communicated.

Conclusion—Study findings underscore the multidimensional nature of medication risk communication and the importance of communication concerning medication effectiveness/need.

Practice implications—Health care providers should ensure that patients understand that medication self-management practices can minimize potential risks. Communicating simple gist messages may increase patient satisfaction, especially messages about benefits for well-managed patients. Optimal communication also requires shared understanding of desired therapeutic outcomes.

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Conflict of interest

The authors of this manuscript have no potential conflicts of interest to disclose.

Keywords

Rheumatoid arthritis; Risk communication; Medications; Patientprovider communication

1. Introduction

Rheumatoid arthritis (RA) is an incurable, systemic, autoimmune disorder affecting approximately 0.5–1% of adults in developed countries worldwide [1]. Despite advances in therapy, RA often leads to progressive joint destruction and significant functional impairment, affecting patients' ability to work and perform social roles [2]. The inflammation caused by RA can also damage internal organs, leading to premature mortality [3,4]. Current guidelines call for aggressive treatment of early RA with disease-modifying drugs (DMARDs) to control inflammation and pain, minimize joint damage, and prevent loss of function [5,6].

Although individuals with RA have a variety of treatment options available to them, the potential benefits associated with different options are accompanied by serious risks [7,8]. Principles of informed consent, informed and shared decision-making, and professional ethics emphasize the importance of patients' understanding the risks and benefits of all treatment options [9–12]. Nonetheless, research also suggests that many RA patients have a poor understanding of their medications [13,14], suggesting that current efforts to educate patients about medication risks/benefits are suboptimal.

Most patients view their physician as their primary and most trusted source of information about medications [15,16]. Several studies have used audio or videotapes of patient office visits to examine the information that physicians provide when prescribing medications [17–21]. Findings from these studies suggest that most discussion is limited to identifying the medication and providing instructions pertaining to medication use (e.g., dosage). Discussion of medication benefits and potential side-effects occurs less frequently. Makoul, Arntson, and Schofield also found that both physicians and patients tend to overestimate the information provided [17]. Thus, patients may leave visits with an "illusion of competence," unaware of their knowledge deficits.

In contrast to previous research that has focused on the verbatim information that physicians provide concerning medication risks and benefits, the research described in this paper was designed to advance understanding of how patients extract meaning from the information provided by physicians. The study was guided by *fuzzy-trace theory,* a dual-process model of memory, judgment, and decision making that has been used to study how both children and adults make decisions that involve risk [22]. Briefly, *fuzzy-trace theory* posits that, when an individual is exposed to a meaningful stimulus (e.g., a statement made by one's physician), two types of representations of the stimulus are encoded in memory, a verbatim representation and one or more gist representations. Verbatim representations capture the specific wording and/or numbers as stated. Gist representations capture the bottom-line meaning of the statement, including its emotional meaning. People may form multiple gist representations in response to the same information. For example, when told that a medication has a 10% chance of causing liver toxicity, a patient might represent this

information in memory as some risk (as opposed to no risk) and as a high (as opposed to low) risk. However, individuals may also fail to understand the information provided or make inappropriate inferences—leading to gist representations that are in conflict with factual information. For example, if a physician does not discuss any potential risks when prescribing a medication, a patient might infer that the medication has no risks, leading to the formation of inaccurate gist representations [23]. These representations support both judgments (e.g., perceived risk, satisfaction) and decisions (e.g., medication adherence).

In this paper, we examine the gist that can be extracted from the information that physicians provide concerning medications risks/benefits. We also examine the relationship between verbatim/gist communication and patient satisfaction with their current RA medication regimen. Satisfaction is an important mediator that links patient-provider communication to treatment adherence and health outcomes [24]. Finally, we also evaluate the following hypotheses:

1. Better health status will be associated with greater medication satisfaction;
2. Controlling for health status,
    a. Gist communication emphasizing medication effectiveness (i.e., benefits) will be associated with greater satisfaction;
    b. Gist communication emphasizing medication risks will be associated with lower satisfaction; and
3. The relationship between medication satisfaction and gist communication will be greatest when patients view their current health status favorably.

2. Methods

2.1. Data source

Data were collected between 2003 and 2007 as part of a National Institute on Aging funded study entitled, *Older Adults and Drug Decisions: Collaboration & Outcomes.* The *Older Adults* study used a randomized controlled trial design to evaluate an intervention that encouraged patients to talk to their doctor about their most important health concerns. Participants were recruited from rheumatology practices in Wisconsin and North Carolina. The study was limited to patients who: had a physician-confirmed diagnosis of RA; had no known terminal illnesses; could speak English; and were mentally competent. Clinic staff identified eligible patients prior to their next office visit. At the visit, a research assistant explained the study to the patient and obtained written, informed consent. After providing informed consent at baseline, each participant's visit was audiotaped. Immediately following the visit, patients completed an interview and brief questionnaire. These data collection procedures were repeated at follow-up office visits approximately 6 and 12 months after baseline.

2.2. Procedures

2.2.1. Measures created via content analysis of audiotaped office visits—The audiotapes were transcribed to facilitate content analysis. All coding was then conducted

using only the transcripts. Two separate coding schemes were developed and used to analyze the transcripts. Because both coding schemes have been described in previous publications [25,26], only a brief overview is provided below. Because verbatim content is literal but gist content reflects interpretation, research assistants performed verbatim coding and RA patient-coders (who had the experience needed to interpret the information rheumatologists provided) performed gist coding. Whether these patient-coders interpreted information in a way that roughly approximated the interpretations of study participants is an empirical question that can be evaluated, in part, by whether coded gist predicts the judgments made by study participants.

Verbatim coding scheme: *The Verbatim Coding Scheme* captured the specific medication risks that the rheumatologist discussed during each visit and, for each risk, whether the following risk dimensions were discussed: probability of occurrence, potential severity/impact, strategies to minimize risk, strategies to monitor risk, what to do if the risk occurs, time course (e.g., when the risk is most likely to occur), whether potential harm would be permanent or temporary, and therapeutic alternatives with different risk profiles [26]. Data were aggregated across risks so that each observation in the analytic dataset corresponded to a specific medication discussed at a specific patient visit. Each dimension was coded as "1" if it had been mentioned for any risk associated with the medication. Otherwise, the dimension was coded as "0." Two aggregate scores were also created by: (1) summing the number of medication risks discussed and (2) computing the average number of dimensions discussed per risk.

Gist coding scheme: *The Gist Coding Scheme* was designed to capture the gist of information concerning medication risks and benefits that patients are likely to extract from the information that rheumatologists provide during office visits [25]. Four patients with RA worked with the lead author to develop this coding scheme by reviewing a subset of the transcripts and identifying, from the patient perspective, the important medication-related themes that emerged. The final coding scheme included the following gist themes: *The medicine has some serious side-effects, The medicine is less safe than other medicines, The rheumatologist is concerned about the safety of the medicine for this patient, The patient can use the medicine as long as therapy is monitored carefully, The medicine is helping the patient a lot, and The patient needs the medicine a lot.* Working independently, the four patient coders used the Gist Coding Scheme to code each transcript. Because some transcripts contained brief mention of several medications, coders were instructed to identify those medications that, in their judgment, were discussed most during the visit and were limited to coding no more than two medications/visit.

Ratings were combined across coders to create a final dataset where each observation corresponded to a specific medication discussed at a specific visit. In this dataset, each gist theme variable was coded as "1" if: (1) two or three coders had coded the theme and all agreed that it had been expressed or (2) four coders had coded the theme and at least three of the coders agreed that it had been expressed. Otherwise, the gist theme variable was coded as "0".

We examined correlations among the six gist theme variables to determine if a smaller number of composite variables could be identified. Two of the gist theme variables, *The medicine is helping the patient a lot* and *The patient needs the medicine a lot*, were strongly correlated. Therefore, a composite variable, labeled Medication is Effective, was created and set to "1" if either of these themes was mentioned; otherwise, it was set to "0". The internal consistency of this measure, assessed by the Kuder–Richardson Formula 20, ranged from 0.96 to 0.97 across the three visits. Three other themes strongly correlated with one another: *The medicine has some serious side-effects, The medicine is less safe than other medicines,* and *The rheumatologist is concerned about the safety of the medicine for this patient.* Therefore, a second composite variable, labeled *Medication Has Risks*, was created and set to "1" if any of these themes was mentioned; otherwise, it was set to "0." The internal consistency of this measure ranged from 0.76 to 0.79 across visits. Correlations between the two composite variables ranged from −0.11 to −0.28 across the three visits. *The remaining individual gist theme variable, The patient can use the medicine as long as therapy is monitored carefully,* exhibited relatively low correlations with the other gist themes, ranging from −0.15 to 0.22 across the three visits.

2.2.2. Measures obtained from patient interviews and questionnaires—Health status

was assessed by a composite measure that included: the pain, tension, and mood subscales (total of 14 items) from the Arthritis Impact Measurement Scales 2 [27]; an item that asked patients to rate their pain during the previous 24 h on a visual analog scale with endpoints labeled, 0 = *No pain,* 10 = *Worst pain ever;* and an item that asked patients to rate their health on a 5-point scale ranging from 1 = *Poor* to 5 = *Excellent*. The individual items were reverse scored as needed so that higher values would correspond to better health status and standardized (mean = 0; standard deviation = 1). Unweighted item scores were summed to yield the final composite measure. Cronbach's alpha for this measure exceeded 0.90 at all visits.

Medication satisfaction was assessed after each office visit via interview by asking patients: *"How satisfied are you with the medicines you are supposed to take until your next visit?"* Responses were recorded on a 5-point response scale where,1 = *Not at all*, 2 = *A little,* 3 = *Somewhat,* 4 = *Very,* and 5 = *Totally.* Because over 50% of participants reported being *Totally Satisfied,* this variable was dichotomized as 0 = *Not totally satisfied* and 1 = *Totally satisfied.*

Medication regimen changes: Following each visit, patients were asked if they had discussed any changes in their medication regimen during the visit. This variable was coded as 1 if changes had been discussed; otherwise, it was coded as 0. Patients were also asked if any new medications had been prescribed at the visit. This variable was coded as 1 if a new medication was prescribed; otherwise, it was coded as 0.

Sociodemographic characteristics: Patient gender, age, race (0 = Non-white, 1 = White), and education (0 = High school graduation or less, 1 = Education beyond high school), marital status, and income were assessed at baseline.

2.3. Data analyses

All analyses were performed using PC-SAS [28]. Together, the patient coders coded a total of 2076 medications. However, there was wide variability among the coders in terms of the specific medications coded and the gist themes extracted [25]. Therefore, to create reliable gist theme measures, medications coded by only one coder were eliminated and a variable indexing inter-rater agreement was created for each gist theme. This variable was set to "1" if: (1) two or three coders had coded the medication and all agreed that the theme either had or had not been expressed or (2) four coders had coded the medication and at least three of the coders agreed that the theme either had or had not been expressed. Otherwise, the agreement variable was set to "0". A measure of Gist Clarity was then created by computing the average level of inter-rater agreement across the six gist themes. This variable ranged from 0% to 100%. The dataset was restricted to 428 medications with Gist Clarity scores of at least 75%.

Descriptive statistics were used to summarize the characteristics of study participants and the types of communication concerning medication risks/benefits that occurred during visits. Phi coefficients were used to examine bivariate relationships between the verbatim and gist communication variables. However, statistical significance was evaluated using generalized estimating equations (GEE) because the dataset included multiple observations per participant [29]. In the GEE analyses, observations were clustered by patient. The GEE models specified an exchangeable working correlation matrix which assumes that all within cluster correlations are equal.

GEE was also used to test the hypothesized relationships between medication satisfaction and (a) health status and (b) the gist communication variables. In these analyses, observations were aggregated by office visit and the gist communication variables were coded as present if they had been coded as present for any of the medications discussed during the visit. A 6-step hierarchical logistic regression model predicting medication satisfaction was used. Variables were added to the model in the following order, Step 1: sociodemographic characteristics, Step 2: health status, Step 3: medication regimen change variables, Step 4: verbatim communication variables, Step 5: gist communication variables, and Step 6: 2-way interaction terms representing the interaction between the gist communication variables and health status. Only the composite verbatim and gist variables were included in the model to reduce complexity and avoid potential problems due to multicollinearity. The model used an exchangeable correlation matrix with observations clustered by patient. Observations with missing values were excluded from the hierarchical regression and assumed to be missing at random. Statistical significance was evaluated with alpha set at 0.05.

3. Results

3.1. Characteristics of study participants

Data from 169 participants were included in the restricted dataset. The mean age (SD) of participants was 61.3 years (SD = 10.0). Most were married (66.7%), white (92.2%), females (79.9%), and in Stage II (56.6%) of the ACR revised criteria for the classification of

global functional status [30]. Median income was $40,000–$59,000 (US) and 38.2% of participants had no education beyond high school. Participants were seen by a total of 13 rheumatologists. Mean rheumatologist age was 47.6 years (SD = 7.3). Most were white (84.6%) and nearly half (46.2%) were female.

3.2. Medications discussed

A total of 427 medications discussed during the visits were coded. Most of the medications discussed were DMARDs. These included: biologics (n = 111), methotrexate (n = 83), hydroxychloroquine (n = 22), and leflunomide (n = 18). Other commonly discussed medications were: prednisone (n = 67), nonsteroidal anti-inflammatories (n = 46), and narcotic analgesics (n = 13).

3.3. Gist themes and verbatim information discussed

As shown in Table 1, the gist themes most commonly extracted by the patient coders were: *The patient needs the medicine* and *The medicine is helping the patient.* The *Verbatim Coding Scheme* revealed that an average of 1.46 (SD = 1.71) risks were discussed per medication and that 0.96 (SD = 2.02) dimensions were discussed per medication risk. The most commonly discussed risk dimensions involved things the patient could do to minimize risk and procedures to monitor therapy to detect early warning signs of a problem.

3.4. Relationship between verbatim and gist communication variables

As shown in Table 2, three of the individual gist themes that pertained to medication safety (i.e., *The medicine has some serious side-effects, The rheumatologist is concerned about the safety of the medicine,* and *The medicine is less safe than other medicines*) were consistently associated with verbatim discussion of: (1) risk severity/impact, (2) things the patient could do to minimize risk, and (3) therapeutic alternatives to avoid the risk, with correlations ranging from 0.24 to 0.39. Two of the individual gist themes (i.e., *The medicine has some serious side-effects* and *The patient can use the medicine as long as therapy is monitored carefully*) were associated with verbatim discussion of the importance of monitoring to detect potential problems early. Finally, the two individual gist themes that pertained to medication effectiveness and need were negatively associated with discussion of: (1) things the patient could do to minimize the risk and (2) therapeutic alternatives to avoid the risk. Table 2 also shows correlations between the verbatim risk dimensions and the two composite gist themes. The pattern of correlations observed paralleled those for the individual gist themes.

3.5. Regression analyses predicting medication satisfaction

Table 3 shows the bivariate associations between medication satisfaction and all of the predictor variables included in the hierarchical regression model. Better health was associated with greater medication satisfaction (OR = 1.49, p = 0.01); whereas, initiation of a new medication and discussion of a regimen change were associated with lower satisfaction (OR's = 0.45 and 0.61, respectively, both p's <0.01). In the hierarchical logistic regression model predicting medication satisfaction (Table 4), the interaction between the *Medication is Effective* gist communication variable and health was statistically significant

(OR = 2.22, 95% CI = 1.07 to 4.64, $p = 0.04$). This term tested the prediction that the relationship between the gist communication variables and medication satisfaction would depend on patient health status. To evaluate the nature of this interaction, we stratified the sample into quartiles using participant scores on the health status measure. As shown in Fig. 1, among people in the quartile with the best health, participants were more likely to report being totally satisfied with their medications when the gist that the *Medication is Effective* was communicated than when this gist was not communicated. Among people in the other three quartiles, medication satisfaction did not vary across groups.

4. Discussion and conclusion

4.1. Discussion

The findings reported in this paper provide a comprehensive assessment of the information concerning medication risks and benefits that physicians provide during RA patient office visits and the gist that patients extract from this information. This is important because gist understanding has been identified as crucial for informed decision making [23]. Several important findings warrant highlighting.

First, most discussion concerning medication risks was superficial. Although at least one medication side-effect was mentioned for most of the medications coded, at least one risk dimension was mentioned for only 36% of these medications. This finding is consistent with previous research which has found that most medication-related discussion during patient office visits involves the physician identifying the medication and telling the patient how to use it [17–20]. Together, these findings suggest the existence of a wide gap between current practice and normative models of medical decision making that call for a thorough discussion of the risks and benefits associated with all treatment options [31].

Second, the patient coders often had difficulty discerning the gist that the rheumatologists were attempting to convey during the visits analyzed. Only 35.8% of the medications coded by at least two patient coders had gist clarity scores at or above 0.75. This may be due, at least in part, to the minimal discussion of medication risks/benefits that occurred during most visits. When minimal information is provided, individuals are forced to “read between the lines” to extract bottom-line gist meaning, leading to greater variability across individuals and opening the door for misunderstandings that compromise therapy.

Third, the pattern of associations between the verbatim and gist communication variables provide clues as to how patients extract gist from the information that physicians provide concerning medication risks/benefits. For example, discussion of the importance of monitoring was associated with patient extraction of two gist themes: *The medicine has some serious side-effects* and *The patient can use the medicine as long as therapy is monitored carefully.* However, it was not associated with extraction of the gist themes that captured significant physician concerns about medication safety: *Doctor has safety concerns* and *Medicine is less safe than other medicines.* Thus, when extracting gist from the information discussed during visits, the patient coders distinguished between discussion concerning the possibility of medication side-effects versus expression of significant safety concerns. In addition, provision of information concerning risk probability was minimally

correlated with any of the gist communication variables. This is particularly striking because the vast majority of research on risk communication concerns how best to convey probabilistic information. These findings underscore the importance of clear communication concerning other risk dimensions (e.g., strategies to minimize risk) as well.

Fourth, we found partial support for predictions concerning the relationship between medication satisfaction and (a) patient health status and (b) communication concerning medication risks/benefits. As predicted, the relationship between medication satisfaction and gist communication concerning medication effectiveness depended on patient health status. Among patients in better health, medication satisfaction was greater when the physician communicated the gist that the *Medication is effective.* From the perspective of *fuzzy-trace theory*, communicating medication-effectiveness gist clearly can help patients make the connection between improved health status and the receipt of effective therapy. Among patients in poorer health, medication satisfaction did not vary as a function of whether medication effectiveness gist was communicated. In this case, patients who perceive their health negatively are likely to reject physicians' communication emphasizing medication effectiveness. However, we did not find the predicted interaction between gist communication concerning medication risks and health status. This prediction was based on the assumption that health status and medication satisfaction would be positively correlated in the absence of medication safety concerns and that discussion of medication risks would weaken this association. Although health status and medication satisfaction were positively correlated, we found no evidence that discussion of medication risks weakened this association.

Several study limitations should be noted. The patients who coded the transcripts using the *Gist Coding Scheme* were not the same patients whose office visits were audiotaped. In addition, the coders worked from written transcripts of the visits. Thus, they could not hear the tone of voice that patients and rheumatologists used when discussing medication risks/benefits or observe information communicated nonverbally. Most patients in the study had a long-term relationship with their rheumatologist and were on stable medication regimens. These factors would likely attenuate relationships observed between the communication variables and medication satisfaction. Finally, analyses were limited to discussions of medications in which the gist communicated by the rheumatologist was clear as indicated by consistency in the gist themes extracted by the four patient coders. Examining the effect that less clear communication may have on patient satisfaction and decision making remains an important area for future research.

4.2. Conclusion

Most research on medication risk/benefit communication has focused on the effects that written information has on patient knowledge and decision making. Studying medication risk/benefit communication within the context of the patient-provider relationship is considerably more complex. Our findings demonstrate the feasibility of using *fuzzy-trace theory* to better understand the gist that patients extract from the information concerning medication risks/benefits that physicians provide during office visits. Our findings also underscore the importance of considering the multiple risk dimensions (e.g., controllability)

that can affect the gist that patients extract from information concerning medication risks/benefits.

4.3. Practice implications

Study findings highlight the multidimensional nature of medication risk communication. When discussing medication risks with patients, health care providers should ensure that patients understand how medication self-management practices (e.g., obtaining recommended laboratory monitoring) can minimize the potential for harm. Study findings also highlight the importance of communication concerning medication effectiveness and need. Health care providers should ensure that patients understand the clinical criteria they use when evaluating medication effectiveness. At the same time, health care providers must recognize that patients may evaluate therapy using different criteria [32,33]. Optimal communication requires a shared understanding of desired therapeutic outcomes.

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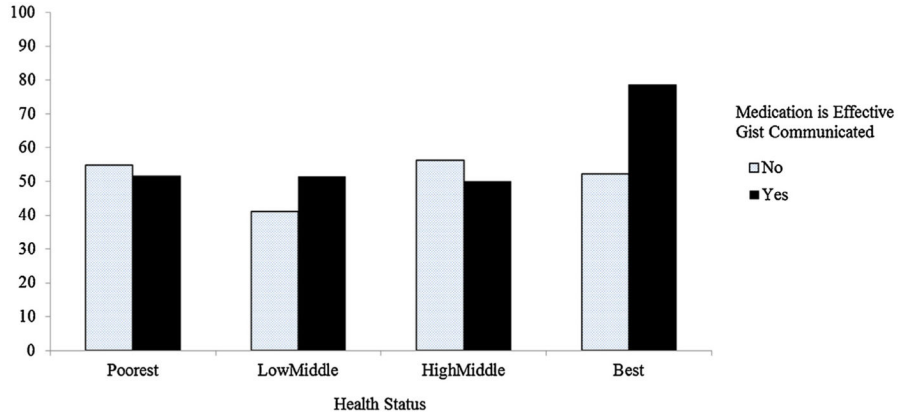

Fig. 1.

Percentage of participants totally satisfied with medication by whether medication effectiveness gist is communicated.

Table 1

Prevalence of risk/benefit communication during office visits ($N = 428$).

Gist themes extracted[a]	% (n)
The medicine is needed a fair amount or a lot. [ICC: 0.72]	36.7 (157)
The medicine is helping (or would help) a fair amount or a lot. [ICC: 0.75]	34.4 (147)
The patient can use the medicine as long as therapy is monitored carefully. [ICC: 0.83]	25.5 (109)
The medicine has some serious side-effects. [ICC: 0.62]	23.4 (100)
Doctor is concerned about the safety of the medicine a fair amount or a lot. [ICC: 0.80]	13.2 (47)[a]
Medication is less safe than other medications. [ICC: 0.68]	6.8 (29)
Verbatim information discussed	
At least one medication side-effect discussed	64.0 (274)
At least one risk dimension discussed	36.0 (154)
What to do to minimize the risk [ICC: 0.61]	19.9 (85)
Importance of monitoring to detect potential problems early [ICC: 0.90]	18.0 (77)
Probability [ICC: 0.79]	6.8 (29)
Potential severity/impact [ICC: 0.53]	6.3 (27)
Therapeutic alternatives to avoid the risk discussed [ICC: 0.62]	5.8 (25)
Time course of risk [ICC: 0.74]	4.2 (18)
What to do if the risk occurs [ICC: 0.75]	3.5 (15)
Whether potential harm would be permanent or temporary [ICC: 0.85]	0.7 (3)

Note: ICC: Intraclass correlation coefficients calculated based on medications coded by all four gist coders. The dataset included observations involving 428 medications taken by 169 patients.

[a]Based on 356 observations because this theme was added after coding started.

Table 2

Correlations between gist themes and verbatim risk dimensions ($N = 428$).

			Individual gist themes				Composite gist themes	
Verbatim risk dimensions discussed	**Some serious side-effects**	**Doctor has safety concerns[a]**	**Less safe than other medicines**	**Safe if monitored carefully**	**Medicine is helping patient**	**Patient needs medicine**	**Medication has risks**	**Medication is effective**
Probability	0.16	0.03	0.00	0.10	0.04	0.05	0.17*	0.04
Importance of monitoring	0.29**	0.05	−0.01	0.47**	0.06	0.10	0.28**	0.10
Potential severity/impact	0.29**	0.32**	0.31*	0.07	−0.05	−0.02	0.32**	−0.02
What to do to minimize the risk	0.24**	0.37**	0.29*	−0.14*	−0.22**	−0.21**	0.27**	−0.22**
Therapeutic alternatives to avoid the risk discussed	0.31**	0.39**	0.33**	−0.08	−0.16**	−0.17**	0.32**	−0.17

Note: The dataset included observations involving 428 medications taken by 169 patients. Values presented are phi coefficients. *p*-Values are based on generalized estimating equations with observations clustered by patient.

[a]Based on 356 observations because this theme was added after coding started.

*$p < 0.001$.

**$p < 0.0001$.

Table 3

Bivariate associations between medication satisfaction and predictor variables ($N = 383$).

Predictor variables	*n*	OR	95% CI	*p*
Sociodemographics				
Age	380	1.02	0.99–1.04	0.16
Race (Reference group: white)	372	1.13	0.56–2.30	0.73
Gender (Reference group: female)	380	0.80	0.46–1.39	0.42
Education (Reference group: beyond high school)	369	1.39	0.87–2.21	0.17
Health status				
Health	372	1.49	1.10–2.02	0.01
Medication regimen				
Initiation of a new medication	380	0.45	0.27–0.75	0.002
Discussed a regimen change	380	0.61	0.41–0.91	0.01
Verbatim communication variables				
# of risks discussed	380	0.92	0.76–1.11	0.39
Average # of dimensions discussed/risk	380	1.12	0.92–1.36	0.28
Gist communication variables				
Medication has risks	380	0.77	0.50–1.19	0.24
Medication is effective	380	1.45	0.95–2.20	0.08

Note: Data were aggregated by visit, resulting in 383 observations. Number of observations vary across predictor variables due to missing data. Analysis performed using generalized estimating equations with observations clustered by patient.

Table 4

Hierarchical logistic regression models predicting satisfaction with medication ($N = 363$).

Step	Predictor variables	OR	95% CI	*p*
1	Sociodemographics			
	Age	1.01	0.99–1.04	0.31
	Race (Reference group: white)	1.10	0.49–2.45	0.82
	Gender (Reference group: female)	0.77	0.43–1.39	0.39
	Education (Reference group: beyond high school)	1.32	0.82–2.13	0.25
2	Health status			
	Health	1.51	1.08–2.12	0.02
3	Medication regimen			
	Initiation of a new medication	0.59	0.34–1.01	0.05
	Discussed a regimen change	0.72	0.47–1.09	0.12
4	Verbatim communication variables			
	# of risks discussed	0.96	0.86–1.08	0.53
	Average # of dimensions discussed/risk	1.35	0.97–1.88	0.08
5	Gist communication variables			
	Medication has risks	0.87	0.50–1.51	0.62
	Medication is effective	1.58	1.00–2.48	0.05
6	Two way interaction terms			
	Health × gist risks	0.69	0.31–1.53	0.36
	Health × gist effectiveness	2.22	1.07–4.64	0.04

Note: Data were aggregated by visit, resulting in 383 observations. 20 observations with missing data were not included in the analyses. Analysis performed using generalized estimating equations with observations clustered by patient.