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Screening Questions for Nonsteroidal Anti-inflammatory Drug Risk Knowledge

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Abstract

Objective: To evaluate screening questions for estimating nonsteroidal anti-inflammatory drug (NSAID) risk knowledge.

Methods: Cross-sectional data from a telephone interview of NSAID users 50 years of age or older from 39 physician practices in Alabama were used. Patient-reported awareness of

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prescription NSAID risk and health literacy were the independent variables and a cumulative index score of objectively-tested knowledge of four prominent NSAID risks was the dependent variable. General linearized latent and mixed model ordered logistic regression was used to estimate associations among the independent variables, covariates, and objectively-tested NSAID risk knowledge. Population-averaged probabilities for levels of objectively-tested NSAID risk knowledge were subsequently estimated.

Results: Subjective awareness of any prescription NSAID risk (adjusted odds ratio (AOR) =2.40, 95% CI: 1.55 – 3.74), adequate health literacy (AOR=1.71; 95% CI: 1.04 – 2.83) and physician counseling about 1 or more NSAID risks (AOR=1.69; 95% CI: 1.09 – 2.61) were significantly and positively associated with NSAID risk knowledge. The probability of correctly answering at least one of the four NSAID risk knowledge questions was 70% in the absence of any subjective risk awareness and less than adequate health literacy. Whereas, the probability of correctly answering at least one of the four NSAID risk knowledge questions increased to 86% in the presence of subjective awareness of any prescription NSAID risk and adequate health literacy.

Conclusions: Screening questions for subjective NSAID risk awareness and health literacy are predictive of objectively-tested NSAID knowledge and can be used to triage patients and subsequently initiate and direct a conversation about NSAID risk.

Keywords

Anti-Inflammatory Agents; Nonsteroidal; Risk Assessment; Health Communication

Introduction

Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used to treat pain and inflammation.[1] Although effective treatments, NSAIDs are associated with a number of serious adverse effects including: gastrointestinal (GI) bleeding; hypertension; myocardial infarction; and renal toxicity.[2–13] NSAID-related complications are responsible for more than 100,000 hospitalizations and 16,500 deaths annually in the United States (US) and contribute an estimated 2 billion US dollars in excess health care costs.[14]

During the last ten years, NSAIDs have undergone significant scientific scrutiny and the risks identified have led to official medication labeling and guideline revisions.[15–18] The risks associated with NSAIDs continue to receive significant attention.[19] In the absence of true understanding, patients may unknowingly engage in high-risk behavior (e.g., NSAID overuse) or may not recognize signs of an impending problem or side effect.

Although they are widely used, it has been shown that a large percentage of patients do not understand the common risks associated with taking NSAIDs.[20,21] Moreover, NSAIDs are commonly prescribed for patients at high risk of experiencing their adverse consequences.[22,23] Recently, a national initiative has been undertaken to also raise NSAID risk understanding and rational use.[24]

Published research has demonstrated that physician risk counseling is a strong, positive predictor of NSAID risk awareness.[25] Therefore, the point-of-prescribing provides an opportunity for physicians to ascertain and evaluate patient risk knowledge and to properly

communicate accurate risk information. **Formerly testing for health literacy in a clinical practice setting is not a recommended practice as shame associated with inadequate health literacy may adversely affect patient interaction and engagement with their healthcare provider.**[26–27] With this in mind, simple, nonintrusive, **nonthreatening** screening questions may assist in triaging, initiating, and directing a conversation about NSAID risk in busy practice settings.

To further explore this issue, secondary data from the Alabama NSAID Patient Safety Study (2005–2007) were used to explore the use of two screening questions for estimating objectively-tested NSAID risk knowledge. If the two screening questions successfully predict NSAID risk knowledge, this research may affirm their use in screening at busy healthcare settings to facilitate risk counseling.

Methods

Study design

Cross-sectional data from the follow-up phase of The Alabama NSAID Patient Safety Study (2005–2007) were used.[28] Participant-reported data were collected through a guided telephone interview and included socio-demographic information, physician counseling about NSAID risks, as well as both patient-reported subjective awareness of any NSAID risk and objectively tested knowledge of four common and significant NSAID risks. The study was reviewed and approved by the University of Alabama at Birmingham Institutional Review Board.

Sample selection

In The Alabama NSAID Patient Safety Study, participants were screened and selected from 39 private health care practices in the state of Alabama. **The pool of practices was derived using the SK&A vendor physician list** (http://www.skainfo-direct.com/index1.cfm), **Alabama Practice Based Network (APBRN) database, and American Medical Association (AMA) data base.** The parent study was originally designed to investigate the effect of a NSAID communication activation kit on patient-reported risk awareness. Participating NSAID users met the following four criteria: (1) registered patient of one of the participating physicians; (2) reported use of a specified prescription-strength NSAID during screening at the physician practice; (3) ≥50 years old; and (4) agreement to provide contact information, consent to participate, and complete a 30-minute follow-up telephone survey. **The telephone interview was conducted by trained research personnel using computer-assisted software technology to allow more complex, hierarchical questionnaire design as well as minimize data entry errors and missing data, and variation in interviewer behavior that may influence response.** Participants were compensated for time and effort with a $20 gift card.

Measurements

The dependent variable was an objective measure of tested risk knowledge. Objective NSAID risk knowledge was derived from four questions that queried participants whether taking NSAIDs increased, decreased, or did not affect the risk of stomach or intestinal

problems such as ulcers, bleeding, or irritation; high blood pressure or hypertension; heart attack; or kidney disease. The correct response was “increases risk” for each of the four questions. In instances when a participant did not attempt to answer a risk knowledge question, it was coded as missing to avoid misclassification of risk knowledge. However, the correct responses for all attempted questions were summed into a five-level index score ranging from 0 to 4.

Two screening questions related to: (1) subjective awareness of any prescription NSAID risk; and (2) adequacy of health literacy were the independent variables of interest. Subjective awareness of any prescription NSAID risk was measured with the question, “Do you know of any problems or risks connected with taking prescription NSAIDs?” The response set included “Yes”, “No”, “Not Sure/Don’t Know”, and “Refused”. For analytical purposes, only responses of “Yes” and “No” were used to avoid differential misclassification of the remaining responses. An estimate of health literacy was derived from the previously validated screening question, “How confident are you in filling out medical forms by yourself?”.[29–32] The health literacy screening question employed a 5-category response set (i.e., Extremely; Quite a bit; Somewhat; A little bit; Not at all) that can be dichotomized along optimal cut-points with responses of “Somewhat/A Little Bit/Not At All” to indicate inadequate health literacy.

The selection of relevant covariates to describe the sample and include in multivariable analyses was based on prior research and observed associations with NSAID risk knowledge.[25,33–35] Socio-demographic covariates included: race (i.e., African-American or White); age (i.e., <65 or ≥65 years); and insurance status (i.e., uninsured/Medicaid or any other insurance coverage).

Physician counseling about NSAID risks, was also included in multivariable models since it had been reported to be associated with increased NSAID risk knowledge in prior research.[25] Physician counseling was measured by participant self-report of their discussion with the physician about four primary NSAID-related risks: stomach or intestinal problems; heart attack; high blood pressure or hypertension; or kidney disease. Respondents answered: ‘Yes’, ‘No’, ‘Not sure’, or ‘Refused’. A Yes or No response determined whether a communication occurred about a particular risk. ‘Not sure’ and ‘Refused’ responses were coded as missing to avoid differential misclassification. To estimate the degree of risk communication, an overall risk communication index score, ranging from 0 to 4, for each respondent was calculated by summing the total number of risks communicated. The overall risk communication index score was dichotomized at 1 or more risks communicated to reflect whether physician counseling about risk had occurred.

Finally, two covariates were also included in preliminary analyses to evaluate whether the type of NSAID used and receiving the parent study intervention had any effect. In the absence of an observed effect, these two covariates were removed from the analyses reported herein.

Analysis

Descriptive, bivariable, and multivariable analyses were conducted using Stata (version 12.1, College Station TX). For all analyses, a-priori statistical significance was set at alpha=0.05. Socio-demographic characteristics, physician communication about each of the four individual NSAID risks (i.e., stomach/intestinal, high blood pressure, heart attack, and kidney), health literacy, as well as subjective awareness and objectively-tested knowledge of NSAID risks were described. The bivariable association between subjective and objectively-tested risk awareness was evaluated using a chi-square test. General Linearized Latent and Mixed Models (**GLLAMM**) with an ordered logistic regression link was used to evaluate the multivariable association between the two screening questions and objectively-tested knowledge of NSAID risks while controlling for relevant socio-demographic covariates, physician counseling, and nesting of participants within the physician's practice as a random effect. The cumulative adjusted odds ratios (AORs) for all covariates as well as predicted population-averaged probabilities and associated 95% confidence intervals of knowing at least 1, 2, 3, or 4 NSAID risks were reported overall and for subgroups with and without expressed subjective awareness of any prescription NSAID risk and adequate health literacy. Precision of the predicted probabilities was quantified using 1000 replications of the bias-corrected and accelerated bootstrap.

Results

Analytical Sample

For this study, 315 participants were included from a total sample of 373. Reasons for exclusion were either missing data on one or more of the variables of interest and/or having participated in the baseline phase of the parent study which may have sensitized the subjective awareness or objectively-tested knowledge of NSAID risk.

Characteristics of the 315 participants are described in Table 1. In general, the majority of participants was white (63%), between 50 and 65 years of age (66%), and privately insured (82%). Approximately one-fourth (26%) of participants were estimated to have inadequate health literacy.

Overall, physician counseling about GI risk was most commonly reported (45%), followed by high blood pressure (36%), kidney disease (35%), and heart attack (34%) [Table 1]. Slightly more than half (54%) of the participants reported counseling on 1 or more NSAID-related risks with only 39% reporting counseling on 2 or more risks.

Although slightly more than one-half of the participants (59%) reported subjective awareness of any prescription NSAID risk, nearly 83% demonstrated objectively-tested knowledge of 1 or more NSAID-related risks [Table 1]. However, only 52% of the sample had objectively-tested knowledge of 2 or more risks. The question testing knowledge of GI risk was most commonly attempted (n=285) by participants with 86% of respondents answering it correctly. In contrast, only two-thirds of participants attempted and provided a definitive answer to questions testing knowledge about high blood pressure (n=188), heart attack (n=195), or kidney disease (n=197). Of those, the highest proportion of participants

correctly answered questions about kidney disease (67%), followed by high blood pressure (49%), and heart attack (43%).

In bivariable analyses, subjective awareness of any prescription NSAID risk was associated with objectively-tested NSAID risk knowledge (χ^2=26.93, p<0.001) [Table 2]. A larger proportion of participants who reported subjective awareness of any prescription NSAID risk had higher objectively-tested knowledge of NSAID risks compared to participants reporting no subjective awareness of any prescription NSAID risk. Importantly, 9% of participants who reported subjective awareness of any prescription NSAID risk demonstrated no objectively-tested knowledge. **In addition, health literacy status was associated with objectively-tested NSAID risk knowledge (χ^2=10.3191, p<0.035)** [Table 3]. **A larger proportion of participants who had adequate health literacy had higher objectively-tested knowledge of NSAID risks compared to participants with inadequate health literacy.**

In multivariable analyses, subjective awareness of any prescription NSAID risk (AOR=2.40, 95% CI: 1.55 – 3.74), adequate health literacy (AOR=1.71, 95% CI: 1.04 – 2.83), being African-American (AOR=1.67; 95% CI: 1.01 – 2.76), and reporting physician counseling about 1 or more NSAID-related risks (AOR=1.69; 95% CI: 1.09 – 2.61) were positively associated with objective NSAID risk knowledge [Table 4]. Age greater than 65 years (AOR=0.37, 95% CI: 0.23 – 0.59) and receiving Medicaid or being uninsured (AOR=0.41; 95% CI: 0.22 – 0.71) were inversely associated with objective NSAID risk knowledge.

In the absence of any subjective risk awareness and having inadequate health literacy, the overall population-averaged probability of correctly answering at least one of the four objective NSAID risk knowledge questions was 0.70 (95% CI: 0.60 – 0.81) [Table 5]. Whereas, the probability of correctly answering at least one of the four objective NSAID risk knowledge questions was increased to 0.86 (95% CI: 0.82 – 0.90) for the participant subgroup who reported subjective awareness of any prescription NSAID risk and had adequate health literacy. The probability of correctly answering all four objective NSAID risk knowledge questions increased from 0.05 (95% CI: 0.03 – 0.09) to 0.14 (95% CI: 0.09 – 0.19) for the participant subgroup who reported subjective awareness of any prescription NSAID risk and adequate health literacy compared to the subgroup who did not report subjective awareness of any prescription NSAID risk and did not have adequate health literacy.

Discussion

In this cross-sectional, community-based study of chronic NSAID users, subjective risk awareness and health literacy were predictors of objectively-tested risk knowledge. Collectively, screening for subjective NSAID risk awareness and health literacy may assist in targeting physician counseling about NSAID risks, which was also demonstrated to be an important predictor of objective risk knowledge. **Triaging patients using one-item NSAID risk awareness and health literacy screening questions identifies opportunities to address the NSAID risk knowledge gap at the point of prescribing through physician counseling.**

While only serving as control variables in this research, it is important to note variations in NSAID risk knowledge by race, age, and insurance status. The increased NSAID risk knowledge observed with African-Americans may be partially explained by a significantly higher overall comorbidity burden. **African-Americans were more likely to have a comorbidity count above the median compared to White patients (49.57% vs. 34.85%, χ^2= 6.6262, p=0.010). We speculate that low NSAID risk knowledge observed in the older participants may be related to cognitive decline with age although mental health status was not measured in this study.**

Lastly, there was an increased proportion of patients who had Medicaid or were uninsured with inadequate health literacy compared to patients who were insured (42.11% vs. 22.09%; χ^2= 9.7880, p=0.002). The lower NSAID risk knowledge observed in those participants in Medicaid/Uninsured may further highlight a disadvantaged position in the health care system.

The significance of physician counseling in positively contributing to patient NSAID risk knowledge, although **reported as being performed only 54% of the time,** highlights the importance of verbally communicating complete NSAID risk information. Unfortunately, patients spend, on average, between 20 and 21 minutes **per physician visit in the US**[36], which likely affects the amount of time spent on patient counseling. **Post-hoc analysis of data from this study revealed that those with inadequate health literacy were equally likely to report being counseled by a physician when compared to those with marginal/adequate health literacy (37.04% vs. 39.32%, χ^2=0.1317, p=0.717). With less than one-half of patients being counseled, this finding further reinforces the importance of identifying those in most need so that a concerted effort can be made to improve counseling.**

Moreover, physician counseling was associated with subjective awareness of prescription NSAID risk. Those who reported knowledge of any prescription NSAID risk were more likely to be counseled by their physician (58.60% vs. 37.29%, χ^2= 3.9258, p=0.048), which is contrary to what is desired. It would be preferable for more counseling to occur with patients who did not report knowledge of any NSAID risk, further underscoring the importance of the physician-initiated dialogue about NSAID risk.

If the patient is a chronic user of an NSAID, the physician may only target or highlight relevant NSAID risks given other priorities in the encounter as demonstrated by the varying degrees of knowledge for individual NSAID risks in this research. One step to promoting efficiency in the communication of NSAID-related risk at a clinical encounter is to triage and direct counseling by patient-reported subjective NSAID risk awareness and adequacy of health literacy using simple screening questions. Screening questions provide a practical, nonintrusive way for a physician to initiate a conversation about risks associated with NSAID use.

The value of the screening questions used in this study is underscored by their ability to predict objectively tested NSAID risk knowledge. In the presence of subjective NSAID risk awareness and adequate literacy, the probability of knowing all 4 NSAID risks nearly

tripled, increasing from 5% to 14%. Moreover, the probability of knowing at least one objectively tested NSAID risk increased from 70% to 86%. Therefore, by screening patients to identify the absence of subjective risk awareness and **inadequate** health literacy, a physician may be able to identify those at higher risk for not understanding key NSAID risks.

The use of a closed-ended question about risk awareness serves only as a start to a patient-physician conversation about NSAID risk and should ultimately be followed with an open-ended inquiry about the risks the patient actually can describe in their own words. **If the patient responded "yes" to the closed-ended question in this study, it was followed with the question "What problems or risks connected with taking prescription NSAIDs do you know about?" Patient responses were then recorded in their own words. Less than 50% of the patients who reported subjective awareness of NSAID risk were able to articulate a relevant risk in their own words.** Furthermore, a small percentage (9%) of patients who reported subjective risk awareness **did not demonstrate** any objectively tested NSAID risk knowledge. Overestimating the understanding of risks by patients also has important safety implications for medications such as NSAIDs that are commonly used and can lead to serious adverse events. Inadequate risk understanding may precipitate higher medication risk-taking behavior. **A patient unaware of important safety concerns may be less likely to inquire about NSAID risks with their physician or pharmacist and may fail to promptly recognize symptoms of adverse drug events that could be prevented with earlier intervention or medication discontinuation.**

Importantly, it should be reinforced that after triaging patients, it is critical to implement sound literacy-sensitive practices, such as the *Ask Me 3 Program*[37] that encourage patients to ask questions and confirm patient understanding using the teach-back method. These strategies are described succinctly and practically in the AHRQ-commissioned, *Health Literacy Universal Precautions Toolkit*.[38]

The research reported herein has several methodological limitations. First, all data were obtained from self-reported patient interview and may be subject to recall bias. There may also be a social desirability bias in response to questions about risk communication practices and may represent the current upper boundary for risk communication. Relationships between temporal NSAID exposure and risk communication cannot be determined from the cross-sectional data used further limiting causal associations. **The date of the most recent physician office visit was not recorded. Therefore, the time lag between physician visit, NSAID prescribing, and patient interview cannot be established. However, approximately 83% (260/313) of patients reported that they were still taking either their prescription NSAID reported on the screening survey or taking another prescription NSAID in the 4 weeks prior to interview. Historical NSAID use, including duration, was unknown, which may introduce variability in the opportunities for risk communication. Finally, although the data for this research were derived from a study conducted during 2005–2007, the issue of NSAID safety remains relevant as the FDA recently reviewed the cardiovascular safety of NSAIDs and voted against modifying the currently in-force safety labeling.**[39]

Conclusion

Screening questions for subjective NSAID risk awareness and health literacy are predictive of objectively-tested NSAID knowledge. Simple nonintrusive screening questions for subjective NSAID risk awareness and health literacy are predictive of objectively-tested NSAID knowledge and can be used to triage patients and subsequently initiate and direct a **patient-physician** conversation about NSAID risk. **An increase in overall physician counseling on NSAID risks would be beneficial for patient safety.**

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Abbreviations:

NSAIDs	Nonsteroidal anti-inflammatory drugs
GI	Gastrointestinal
US	United States
GLLAMM	General Linearized Latent and Mixed Models
AORs	Adjusted odds ratios

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Table 1.

Demographic Characteristics (n=315, unless noted))

	%	n
African-American	37.14	117
Age ≥65 years	33.97	107
Medicaid/Uninsured	18.10	57
Inadequate Health Literacy[1]	25.71	81
Physician Counseling About Individual NSAID[2] Risks		
Stomach or Intestinal Problems (n=309)	45.31	140
High Blood Pressure or Hypertension (n=305)	36.07	110
Heart Attack (n=306)	33.99	104
Kidney Disease (n=304)	35.20	107
Physician Counseling About 1 or more NSAID[2] Risks	53.97	170
Subjective Awareness of Any NSAID[2] Risk[3]	59.05	186
Objective (Tested) Knowledge of Individual NSAID[2] Risks		
Stomach or Intestinal Problems (n=285)	85.61	244
High Blood Pressure or Hypertension (n=188)	48.94	92
Heart Attack (n=195)	43.08	84
Kidney Disease (n=197)	67.01	132
Objective (Tested) Knowledge of NSAID Risk (Aggregated)[4]		
0 Risks	17.14	54
1 Risk	30.48	96
2 Risks	23.17	73
3 Risks	18.41	58
4 Risks	10.79	34

[1]Health Literacy was estimated using the following question and response set: How confident are you in filling out medical forms by yourself?" The 5-category response set (i.e., Extremely; Quite a bit; Somewhat; A little bit; Not at all) was dichotomized along optimal cut-points with responses of "Somewhat/A Little Bit/Not At All" indicating inadequate health literacy.

[2]NSAID – Non-steroidal Anti-Inflammatory Drug

[3]Subjective Awareness of Any NSAID Risk was estimated with the following question: "Do you know of any problems or risks connected with taking prescription NSAIDs?" The response set included "Yes", "No", "Not Sure/Don't Know", and "Refused" with Yes and No indicating presence and absence of subjective risk awareness, respectively.

[4]Objective (Tested) Knowledge of NSAID Risk (Aggregated) represented as an index score ranging from 0 to 4

Table 2.

Percent of Participants Identifying Given Number of NSAID[1] Risks by Subjective Risk Awareness (n=315)

		Subjective Awareness of Any Prescription NSAID Risk[3]	
Objective (Tested) Knowledge of NSAID Risk[2]	Number of Risks Known	% Yes (n=186)	% No (n=129)
	None	9.14	28.68
	1	28.49	33.33
	2	29.03	14.73
	3	20.97	14.73
	4	12.37	8.53

[1]NSAID – Nonsteroidal Anti-inflammatory Drug; Test for Association: χ^2=26.93, p<0.001

[2]Objective (Tested) Knowledge of NSAID Risk represented as an index score ranging from 0 to 4

[3]Subjective Awareness of Any NSAID Risk was estimated with the following question: “Do you know of any problems or risks connected with taking prescription NSAIDs?” The response set included “Yes”, “No”, “Not Sure/Don’t Know”, and “Refused” with Yes and No indicating presence and absence of subjective risk awareness, respectively.

Table 3.

Percent of Participants Identifying Given Number of NSAID[1] Risks by Estimated Health Literacy Status (n=315)

		Health Literacy Status[3]	
Objective (Tested) Knowledge of NSAID Risk [2]	**Number of Risks Known**	**% Inadequate (n=81)**	**% Marginal/Adequate (n=234)**
	None	**27.16**	**13.68**
	1	**27.16**	**31.62**
	2	**23.46**	**23.08**
	3	**17.28**	**18.80**
	4	**4.94**	**12.82**

[1]NSAID – Nonsteroidal Anti-inflammatory Drug; Test for Association: χ^2=10.3191, p<0.035

[2]Objective (Tested) Knowledge of NSAID Risk represented as an index score ranging from 0 to 4

[3]Health Literacy Status was estimated with the following question: “How confident are you in filling out medical forms by yourself?” The 5-category response set (i.e., Extremely; Quite a bit; Somewhat; A little bit; Not at all) was dichotomized with responses of “Somewhat/A Little Bit/Not At All” to indicate inadequate health literacy.

Table 4.

Factors Associated with Objective (Tested) Knowledge of NSAID[1] Risk[2] (n=315)

	Tested NSAID Risk Knowledge
	Cumulative Adjusted Odds Ratio (AOR) (95% CI)
African-American vs. White	1.67 (1.01 – 2.76)
Age ≥65 years vs. <65 years	0.37 (0.23 – 0.59)
Medicaid/Uninsured vs. Insured	0.41 (0.22 – 0.77)
Adequate Health Literacy vs. Inadequate/Marginal[3]	1.71 (1.04 – 2.83)
Physician Counseling About 1 or More Risks	1.69 (1.09 – 2.61)
Subjective Awareness of Any NSAID Risk[4]	2.40 (1.55 – 3.74)

[1]NSAID - Nonsteroidal Anti-Inflammatory Drug

[2]Objective (Tested) Knowledge of NSAID Risk (Aggregated) represented as an index score ranging from 0 to 4

[3]Health Literacy was estimated using the following question and response set: How confident are you in filling out medical forms by yourself?" The 5-category response set (i.e., Extremely; Quite a bit; Somewhat; A little bit; Not at all) was dichotomized along optimal cut-points with responses of "Somewhat/A Little Bit/Not At All" indicating inadequate health literacy.

[4]Subjective Awareness of Any NSAID Risk was estimated with the following question: "Do you know of any problems or risks connected with taking prescription NSAIDs?" The response set included "Yes", "No", "Not Sure/Don't Know", and "Refused" with Yes and No indicating presence and absence of subjective risk awareness, respectively.

Table 5.

Predicted Probabilities (95% CI)[1] of Objective (Tested) Knowledge of NSAID[2] Risks by Subjective Awareness and Estimated Health Literacy

	Objective Knowledge of NSAID Risks (Number of Risks Known)			
	>0	**>1**	**>2**	**>3**
Overall	0.82 (0.78 – 0.88)	0.52 (0.46 – 0.58)	0.29 (0.24 – 0.34)	0.11 (0.07 – 0.15)
No Subjective NSAID Risk Awareness[3] and Inadequate Health Literacy[4]	0.70 (0.60 – 0.81)	0.35 (0.26 – 0.47)	0.17 (0.11 – 0.25)	0.05 (0.03 – 0.09)
Subjective NSAID Risk Awareness[3] and Adequate Health Literacy[4]	0.86 (0.82 – 0.90)	0.59 (0.52 – 0.66)	0.35 (0.28 – 0.42)	0.14 (0.09 – 0.19)

[1] Probabilities predicted from General Linearized Latent and Mixed Models with ordered logistic regression link and controlling for race, age, insurance status, and physician counseling about NSAID risk with precision of the predicted probabilities quantified using 1000 replications of the bias-corrected and accelerated bootstrap.

[2] NSAID - Nonsteroidal Anti-Inflammatory Drug

[3] Subjective NSAID Risk Awareness was estimated with the following question: “Do you know of any problems or risks connected with taking prescription NSAIDs?” The response set included “Yes”, “No”, “Not Sure/Don’t Know”, and “Refused” with Yes and No indicating presence and absence of subjective risk awareness, respectively.

[4] Health Literacy was estimated using the following question and response set: How confident are you in filling out medical forms by yourself?” The 5-category response set (i.e., Extremely; Quite a bit; Somewhat; A little bit; Not at all) was dichotomized along optimal cut-points with responses of “Somewhat/A Little Bit/Not At All” indicating inadequate health literacy.