Factors Affecting Pharmacist Consultation Services in a University Health Insurance Plan

by Jon C. Schommer

OBJECTIVE: The purpose of this study was to examine the effect that prescription status has on the provision of pharmacist consultation services while controlling for patient age, gender, and for whom the prescription was purchased.

DESIGN: Data were collected through telephone interviews of 1,482 members of a Midwestern university health insurance plan. Logistic regression analysis was used for testing relationships among study variables.

MAIN OUTCOME MEASURES: Five components of pharmacist consultation services served as dependent variables: (1) receipt of written information, (2) consultation offered, (3) receipt of consultation, (4) patient question-asking, and (5) desire for more information.

RESULTS: Of the 1,482 individuals contacted, 1,236 (83%) provided usable responses. Logistic regression analysis showed that while controlling for age, gender, and person for whom purchased, prescription status significantly affected: (1) consultation offered, (2) receipt of consultation, (3) patient question-asking, and (4) desire for more information.

CONCLUSIONS: The results suggest that a patient-oriented information processing perspective that focuses on reducing patients' decision-uncertainty regarding medications is a useful approach for identifying segments of patients that need consultation services.

KEYWORDS: Pharmacist consultation services, managed care, decision uncertainty

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All too frequently, the patient is met by a clerk, who delivers the prescription to the pharmacist, who resides in splendid isolation within a glass enclosure. After an inordinately long time (during which the patient often wanders around and buys other items to relieve his boredom) the clerk returns with the medication and rings up the sale. I've seen the entire transaction completed without any verbal exchange whatsoever! This is poor retailing even without mention of pharmacy practice. Although this picture of the pharmacist is not universal, it is common enough so that the pharmacist has lost professional stature with physicians and the public. Only when pharmacists really provide professional services and inform physicians and the public of their active role in patient care will the image improve.

— David J. Crosby, M.D. in the New England Journal of Medicine, pp. 331-332, August 7, 1969.

I don't know how pharmacists manage to counsel patients at all. Some pharmacies physically don't invite it (I don't want to discuss my problems at a busy cash register—do you?) and the volume of prescriptions filled doesn't allow for it. My other thought is—who pays for counseling? Are pharmacists paid for it when the prescription is paid for? Are there different levels of counseling? [Is there a difference between] the 2-second version versus the 20-minute?

— Anonymous pharmacist's comment in a survey questionnaire, November 2001.

Pharmacist consultation services provided to patients are an important component of health care for improving clinical outcomes, enhancing patient adherence with medical advice, and reducing health care utilization costs associated with adverse drug reactions.¹⁻³ Pharmacist consultation services are defined as "any face-to-face verbal communication between a pharmacist and patient (or agent of the patient; hereafter referred to as patient) about medications or health during the dispensing of a prescription to that patient."⁴

Recent federal and state regulations now mandate pharmacist consultation services be offered to all patients who purchase prescriptions in community pharmacies.^{1,5,6} Despite the mandate for these services, researchers report that the prevalence of pharmacist consultation services often is low. Wiederholt, Clarridge, and Svarstad⁷ reviewed relevant literature and reported that the proportion of patients who received no verbal consultation for original prescriptions ranged between 17% and 30% for physicians and between 30% and 87% for pharmacists in the studies they reviewed. In results from a 12-year longitudinal study (data collected in 1982,

1984, 1992, and 1994) of verbal counseling about prescribed medication, Morris, Tabak, and Gondek⁸ showed that counseling by physicians remained fairly stable, with a range from 66% of patients who reported receiving counseling in 1984 to 70% in 1994. Respondents to their survey reported a slight decline in the transfers of their completed prescriptions to them by pharmacists (50%, 47%, 43%, and 44% over the four surveys). A fairly stable range of patients reported being counseled by pharmacists over the 12-year period (37%, 31%, 37%, and 42%).

Educating patients about prescription medications is an important public health goal that has not yet been reached. Despite the recent pharmaceutical care movement⁹ and regulations stemming from the Omnibus Budget Reconciliation Act of 1990^{1,5} that placed pharmacists in a new communicative role, progress in the provision of pharmacist consultation services to patients has been limited. The quotes at the beginning of this article by Dr. Crosby in 1969 and an anonymous pharmacist in 2001 seem contemporaneous rather than 32 years apart.

There are many economic realities (return on investment, start-up costs, lack of patient/payer demand, promotional costs, etc.) that make the provision of pharmacist consultation services to every patient at every pharmacy visit quite difficult. It is a challenge to identify which patients might be the best “target market” for such services. Also, from a patient care viewpoint, not every patient requires the same level of these services at every pharmacy visit.¹⁰ That is, there are some patients or situations for which consultation services need to be comprehensive and others for which relatively little is necessary. A thorough understanding about levels of consultative services that are provided and about identifying needs for consultation among different segments of patients would give insight for making decisions about what levels are optimal for various patients, could help decision-making related to the use of limited resources in health care, and could help identify ways to make the provision of these services economically viable.

Situation-specific variables can be useful for identifying segments of patients that need consultation.¹¹ For example, a simple situational segmentation approach has been incorporated into some states’ pharmacy practice acts and regulations that require different levels of consultation for new and refill prescriptions.¹² A new prescription is defined as a medication that is dispensed for the first time as identified by a serial number assigned to the original prescription order from the physician. Refills are subsequent dispensings of the medication using the same serial number, as allowed by law. The underlying assumption for such a segmentation approach rests on a patient-oriented, information-processing perspective that focuses on reducing patients’ uncertainty regarding their medications. Such a perspective can be useful for identifying segments of patients that need comprehensive consultation and those that may need relatively little consultation since they may differ in the level of

uncertainty about their medications.^{10,11} Patients’ uncertainty can range from not being sure about how to take their medications to being unsure if their medications will really help treat their maladies.

Some research findings verify that different levels of consultation have been provided for new versus refill prescriptions. Morris¹³ found that respondents to a national telephone survey reported a greater likelihood of receiving pharmacist consultation if they were receiving a prescription they had not taken before. Wiederholt, Clarridge, and Svarstad⁷ extended Morris’ work and studied relationships between prescription status (new vs. refill) along with the individual-specific characteristics of patient age, gender, education, and race, and receipt of consultation at pharmacies. They reported that consultation was more likely for new prescriptions (versus refills). They also reported that younger patients (versus older) were more likely to receive consultation. The effects of gender, education, and race were not significant.

The simple categorization of prescription status (new vs. refill) that was used in previous research has limitations, however. First, it does not fully reflect complex situations in which more than one prescription is dispensed, involving a mix of new and refill prescriptions. Second, it does not consider the level of experience a patient might already have with the medication. For example, a prescription medication might be categorized as “new” but it could be one that the patient has used before under a different serial (prescription) number. This often occurs for prescriptions that are used for acute conditions but may be used seasonally or episodically, such as antibiotics or seasonal allergy medications. Also, patients can have a wide range of experience with refill prescriptions (e.g., one that has been used routinely for years by an individual versus the very first refill for a medication that was started only days ago).

The purpose of this study was to further examine the effect that prescription status has on pharmacist consultation services. This was done by developing a measure of “prescription status” that accounted for (1) situations for which a combination of new and refill prescriptions are dispensed and (2) the degree of experience a patient already had with the medication. In addition to this more specific measure of prescription status, three other variables that were identified from previous studies served as control variables. Age of the patient was included based on research reported by Morris¹⁴ and Wiederholt, Clarridge, and Svarstad⁷ in which the elderly were less likely to receive consultation than younger individuals. Another variable, called person-for-whom-purchased, identified whether the prescription was purchased for self-use only or if at least one prescription was for someone other than self.¹⁴ The last variable, patient gender, was included based on the conclusion of DeSimone, Peterson, and Carlstedt¹⁵ that females are more likely to ask questions of pharmacists than males. Although Wiederholt, Clarridge, and Svarstad⁷ found no effect of patient gender on

receipt of consultation, this variable still was included in this study since it might affect patient question-asking behaviors.¹⁵ Relationships were investigated for these independent variables with five components related to pharmacist consultation: (1) written information, (2) consultation offered, (3) receipt of consultation, (4) patient question-asking, and (5) desire for more information.

Methods

Dependent Variables

Five components related to pharmacist consultation served as dependent variables (see Table 1). The first, called written information, was measured by asking respondents if they received written information about their medication other than what was written on the prescription container. Although not considered pharmacist consultation for this study, written information is an important adjunct to verbal consultation and was included for investigation. The second, called consultation offered, was measured by asking respondents if they were offered the opportunity to talk with the pharmacist about medications or health during their last pharmacy visit. The third, called receipt of consultation, was measured by asking eligible respondents whether or not they talked with the pharmacist about medications or health at their last pharmacy visit. The fourth, patient question-asking, was measured by asking respondents if they asked the pharmacist a question about medications or health during their last visit. The fifth, called desire for more information, was measured by asking respondents if they would have liked more information from the pharmacist during their last pharmacy visit. Each variable was coded 1 = Yes, 0 = No.

Independent Variables

Prescription status was measured by using a series of questions. First, respondents who had purchased a prescription medication within the last 6 months were asked if their last prescription purchase was for refill(s) only, new prescription(s) only, or a combination of new and refill prescriptions (coded 1, 2, 3, respectively). Then, those who answered refill(s) only were asked which of the following categories best described their refill(s): (1) a refill prescription that had been taken for more than one year, (2) at least the second refill but taken for one year or less, or (3) the first refill for the prescription. If more than one refill was purchased at the pharmacy visit, the interviewer was instructed to record information about the prescription that was the newest (i.e., highest number response from 1–3 that applied). This coding scheme was based on one used by Schommer and Wiederholt¹⁶ in which positive relationships were found between these categories and the importance of consultation from both pharmacists' and patients' perspectives.

TABLE 1 Study Variables

Dependent Variables (Components of Consultation)

- **Written Information:** Received written information about the medication other than what was written on the prescription container (1 = yes, 0 = no)
- **Consultation Offered:** Offered the opportunity to talk with the pharmacist about medications or health during their last pharmacy visit (1 = yes, 0 = no)
- **Receipt of Consultation:** Talked with the pharmacist about medications or health at their last pharmacy visit (1 = yes, 0 = no)
- **Patient Question Asking:** Asked the pharmacist a question about medications or health during their last visit (1 = yes, 0 = no)
- **Desired More Information:** Would have liked more information from the pharmacist during their last pharmacy visit (1 = yes, 0 = no)

Independent Variables

- **Prescription Status (PS):**
 - PS(1) = a refill prescription which had been taken for more than one year (reference category)
 - PS(2) = at least the second refill, but it had been taken for one year or less
 - PS(3) = the first refill for the prescription
 - PS(4) = a new prescription that had been taken before by the patient
 - PS(5) = a new prescription that had never been taken before by the patient
 - PS(6) = a combination of new and refill prescriptions for which the new prescription(s) had been taken before
 - PS(7) = a combination of new and refill prescriptions for which the new prescription(s) had never been taken before by the patient
- **Patient Age (AGE):**
 - 18 – 29 years (reference category)
 - 30 – 39 years
 - 40 – 54 years
 - 55 – 74 years
 - 75 years and above
- **Patient Gender (GENDER):**
 - Male (reference category)
 - Female
- **Person for Whom Purchased (PURCHASE):**
 - For yourself only (reference category)
 - At least one prescription was for someone other than yourself

Respondents who answered new prescription(s) only to the first question were asked if the new prescription (1) had been taken before or (2) had never been taken before by the patient. Respondents who reported they purchased a combination of new and refill prescriptions also were asked if the new prescription (1) had been taken before or (2) had never been taken before. For each question, the highest number response was recorded if more than one new prescription was purchased. This coding scheme was based on the finding by Morris¹³ that showed more consultation occurred for patients who received a

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TABLE 2 Summary of Responses for Individuals who Had Purchased a Prescription Medication within the Last 6 Months (n=716)

	Frequency	Percent
Written Information Was Received		
Yes	380	53.1
No	336	46.9
Consultation with a Pharmacist Was Offered		
Yes	472	65.9
No	244	34.1
Talked with the Pharmacist		
Yes	210	29.3
No	506	70.7
Asked the Pharmacist a Question		
Yes	130	18.2
No	586	81.8
Desired More Information		
Yes	65	9.1
No	651	90.9
Prescription Status		
Refill, taken for more than one year	140	19.6
At least the second refill, but taken one year or less	90	12.6
First refill for the prescription	30	4.2
New, had been taken before	102	14.2
New, had not been taken before	170	23.7
Combination of new and refill, new prescription had been taken before	97	13.5
Combination of new and refill, new prescription had not been taken before	87	12.2
Patient Age		
18 to 29 years	212	29.6
30 to 39 years	178	24.9
40 to 54 years	254	35.5
55 to 74 years	72	10.1
75 years and above	0	0.0
Patient Gender		
Female	390	54.5
Male	326	45.5
Person for Whom Purchased		
Yourself	509	71.1
Someone other than yourself	207	28.9

prescription they had not taken before.

For data analysis, prescription status was coded in the following manner: 1 = a refill prescription that had been taken for more than one year; 2 = at least the second refill, but taken for one year or less; 3 = the first refill for the prescription; 4 = a new prescription that had been taken before by the patient; 5 = a new prescription that had never been taken before by the patient; 6 = a combination of new and refill prescriptions for which the new prescription(s) had been taken before; and 7 = a combination of new and refill prescriptions for which the new prescription(s) had never been taken before.

Patient age and gender were measured by asking respondents to report each during their interviews. Patient age was cat-

egorized following the same coding used by Wiederholt, Clarridge, and Svarstad⁷: (1) 18 to 29 years, (2) 30 to 39 years, (3) 40 to 54 years, (4) 55 to 74 years, and (5) 75 years and above. Gender was classified as 1 = female or 0 = male. The variable person for whom purchased was ascertained by asking respondents whether the last prescription they purchased was 0 = for yourself only or 1 = at least one prescription was for someone other than yourself (See Table 1 for a summary of variables.).

Sample

The population selected for this study consisted of enrollees in a Midwestern university health insurance plan. This population was utilized because (1) most members of this population were

users of prescription medications and would provide variability in responses for prescription status measures, age, person for whom purchased, and gender; (2) they comprised a defined managed care population; and (3) respondents were identifiable, accessible by phone at a relatively low cost, and likely to have the abilities necessary for participating in a telephone interview.

The goal was to obtain approximately 1,200 completed interviews in order to meet the data analysis sample size requirement of 600 usable responses for all the study variables from individuals who had purchased a prescription within the last six months.¹⁷ A random sampling procedure was utilized in which the universe of names was catalogued into a computer file based on university records. After excluding redundant names and those with telephone numbers outside the local area code, a total of 58,091 names comprised the sampling frame (4,488 faculty, 13,804 staff, 10,936 graduate students, and 28,863 undergraduates). Then, a disproportionate stratified sample of 1,950 individuals was chosen for participation in a telephone interview (502 faculty, 502 staff, 481 graduate students, and 465 undergraduates). Such a sampling procedure was utilized so that undergraduates would not comprise the majority of the sample. We sought nearly equal representation in our sample from each of the four respondent types.

Data Collection

Data were collected for the dependent and independent variables through telephone interviews as part of a larger study conducted by Polimetrix Laboratory for Political and Social Research in 1994. The timing of the interviews coincided with implementation of the new OBRA 90 pharmacist consultation regulations^{1,5,6} that took effect in 1993. The data collected for this study represent a snapshot of pharmacist consultation services during a time of regulatory change and implementation. Thus, the findings can be useful for understanding relationships among study variables for application in future time periods. Before being asked questions regarding the variables, respondents were asked if they had purchased a prescription medication within the last 6 months. This served as a screening variable since respondents' recall of consultation services was expected to diminish as the length of time since their last prescription purchase increased.^{7,18} Only those respondents who had purchased a prescription medication within the last 6 months were asked to answer all the questions.

After interviewer training and pretests were completed, data were collected through telephone interviews conducted over a one-month period by 15 interviewers. Each phone number was called until an interview was completed or the number was considered unusable (e.g., disconnected with no forwarding information, refusal during an interview, or individuals reachable at the phone number were no longer part of the original sampling frame). For no answers and recording machine responses, at least six further attempts were made at different times of the day

and evening and on different days before they were considered to be unsuccessful.

Data Analysis

Data were coded and entered into SPSS for Windows statistical software. Frequencies and descriptive statistics were calculated for each variable to help identify miscoded data and outliers. Categories for the independent variables were based on previously reported research.^{7,13-16} Logistic regression analysis was used for testing relationships among study variables. To help determine the order of variables entered for the logistic regression models, Chi-Square Automatic Interaction Detection (CHAID) analysis was used as a first step.^{17,19-21} CHAID is a segmentation technique for dividing a population into segments that differ with respect to a designated criterion. CHAID first divides a population into two or more distinct groups based on categories of the "best" predictor of a dependent variable (based on the chi-square statistic). It then splits each of these groups into mutually exclusive and exhaustive subgroups based on other predictor (independent) variables. This splitting process continues until no more statistically significant predictors can be found or until a stopping rule is met.

The limitation of CHAID is that all of the variables are not considered simultaneously but are considered sequentially in their order of significance. Thus, in this study, CHAID was used as a first step for identifying the order of models to be tested by logistic regression analysis. Goodness of fit for competing logistic regression models was assessed based on the change in -2 log likelihood and model improvement chi-square statistics. The best fitting model for each dependent variable was chosen based on goodness of fit and parsimony of interpretation. After the best fitting model was determined, the odds ratio [exp (β)] and corresponding 95% confidence interval were computed for the regression coefficient of each significant predictor variable.

Results

Of the 1,950 phone numbers called, 155 (8%) were deemed unreachable and 313 (16%) were not eligible because the individuals reachable at the phone number were no longer part of the original sampling frame. Of the remaining 1,482 eligible individuals who were contacted, 1,236 (83%) provided usable responses to their interviews. Of the 1,236 respondents, 798 (65%) reported that they had purchased a prescription medication within the last 6 months. Eighty-two of the 798 cases contained at least one variable coded as "don't know" or "refusal." Therefore, 716 cases contained complete data and were included for data analysis.

Table 2 (page 35) contains a summary of responses for each study variable. The results show that 53% of the respondents reportedly received written information, 66% were offered consultation, 29% talked with a pharmacist, 18% asked the pharmacist a question, and 9% desired more information at their last

TABLE 3 Logistic Regression Models^a For Components of Pharmacist Consultation (n=716)

Component of Consultation ^b	Percent who Answered "Yes"	Model	Model Chi-Square	Predictor Variable ^c	Odds Ratio exp (b)	95% Confidence Interval for the Odds Ratio ^d
Written information	53.1%	Constant, AGE, GENDER	15.7, p = 0.003	AGE(30-39)	0.74	0.49 – 1.11
				AGE (40-54)	0.59	0.40 – 0.85
				AGE (55-74)	0.62	0.36 – 1.08
				GENDER (female)	1.43	1.06 – 1.93
Consultation offered	65.9%	Constant, PURCHASE, GENDER, PS	21.0, p = 0.007	PURCHASE (other than self)	1.50	1.04 – 2.17
				GENDER (female)	1.47	1.06 – 2.03
				PS (2)	1.11	0.65 – 1.92
				PS (3)	2.70	1.03 – 7.06
				PS (4)	1.20	0.71 – 2.04
				PS (5)	1.41	0.89 – 2.25
				PS (6)	1.75	1.00 – 3.08
				PS (7)	2.02	1.11 – 3.67
Receipt of consultation	29.3%	Constant, PS, AGE	52.5, p <0.001	PS (2)	0.80	0.40 – 1.59
				PS (3)	1.66	0.68 – 4.07
				PS (4)	2.01	1.11 – 3.66
				PS (5)	2.41	1.42 – 4.09
				PS (6)	1.04	0.55 – 1.97
				PS (7)	3.64	2.01 – 6.61
				AGE (30-39)	2.12	1.31 – 3.43
				AGE (40-54)	2.40	1.54 – 3.76
				AGE (55-74)	2.76	1.49 – 5.10
Patient question-asking	18.2%	Constant, PS, PURCHASE	53.3, p <0.001	PS (2)	1.46	0.61 – 3.48
				PS (3)	2.59	0.88 – 7.59
				PS (4)	2.19	1.00 – 4.80
				PS (5)	2.87	1.43 – 5.77
				PS (6)	0.97	0.39 – 2.43
				PS (7)	7.22	3.47 – 15.05
				PURCHASE (other than self)	1.66	1.09 – 2.52
Desire for more information	9.1%	Constant, PS	13.5, p = 0.036	PS (2)	1.04	0.36 – 3.03
				PS (3)	1.04	0.21 – 5.08
				PS (4)	1.58	0.62 – 4.05
				PS (5)	2.28	1.02 – 5.10
				PS (6)	0.47	0.12 – 1.76
				PS (7)	2.33	0.94 – 5.78

^a Independent variables for logistic regression models were: prescription status (PS), patient age (AGE), patient gender (GENDER), and person for whom purchased (PURCHASE). Ordering of variables for building logistic regression models was determined by Chi-Square Automatic Interaction Detection (CHAID) analysis. The best fitting models for each component of consultation were determined by –2 log likelihood, model improvement chi-square, and parsimony of interpretation.

^b See Table 1 for definitions of each component of consultation.

^c See Table 2 for a more in-depth summary of these findings.

^d PS = prescription status, AGE = patient age, GENDER = patient gender, PURCHASE = person for whom purchased. Refer to Table 1 for variable definitions and reference categories used for logistic regression analysis.

^e Confidence intervals for the odds ratio = $\exp[\beta - 1.96(s.e.\beta)]$ to $\exp[\beta + 1.96(s.e.\beta)]$.

prescription purchase. Table 2 also shows that the desired variation in measures of prescription status was accomplished from the study sample. None of the respondents were aged 75 years and above. Based on descriptive statistics for patient age, the greatest reported age for the sample was 70 years. Thus, only four categories of age were used for analysis.

Potential multicollinearity problems for logistic regression

were addressed by computing the phi correlation between gender and person for whom purchased ($\phi = -0.18$), and the Spearman rank correlation between gender and age ($r_{sr} = -0.16$), age and person for whom purchased ($r_{sr} = 0.25$), gender and prescription status ($r_{sr} = -0.08$), age and prescription status ($r_{sr} = -0.004$), and person for whom purchased and prescription status ($r_{sr} = 0.15$). Since each of the correlation coefficients had

an absolute value less than 0.30, multicollinearity was not considered a problem.

Table 3 contains logistic regression results for the associations of prescription status, age, gender, and person for whom purchased with the five components of pharmacist consultation. The results showed that (while controlling for age, gender, and person for whom purchased) prescription status significantly affected: (1) consultation offered, (2) receipt of consultation, (3) patient question-asking, and (4) desire for more information. Respondents whose prescriptions were a first refill [PS(3)] or were a combination of new and refill prescriptions for which the new prescription had not been taken before [PS(7)] were more likely to report that they were offered consultation. For both receipt of consultation and patient question-asking, three types of prescriptions resulted in a higher likelihood of each. The prescriptions were: (1) new prescription, taken before [PS(4)], (2) new prescription, not taken before [PS(5)], and (3) combination of new and refill prescriptions for which the new prescription had not been taken before [PS(7)]. Only one prescription type increased the likelihood of a reported desire for more information: a new prescription, not taken before [PS(5)].

The control variables in this study were associated with some of the dependent variables. For example, older respondents, compared to the reference category of 18 to 29 year olds, were less likely to receive written information and more likely to receive consultation. Also, female respondents, compared to males, were more likely to report receiving written information and offers of consultation. Finally, respondents who purchased prescriptions for someone other than themselves were more likely to receive an offer of consultation and were more likely to ask the pharmacist a question.

■ Limitations

Before the results are discussed, some limitations of this study should be noted. The sample was not representative of the general population of the United States. However, the sample provided the necessary variation for the study variables and was useful for investigating the effects of prescription status, patient age, person for whom purchased, and patient gender in a defined university health insurance plan. The effect of age in this study should be interpreted with caution. If individuals older than 70 years of age had been included in the sample, effects of age likely would have been different.⁷ Another limitation is that specific categories of prescriptions were not studied. Since the type of medication can present unique information needs, more research is needed to investigate the influence of therapeutic category on the provision of consultation services. Finally, the data are cross-sectional and were collected in 1994. Thus, the estimates of consultation should be viewed as historical snapshots for that year only. However, the significant relationships among variables are not likely to be time-dependent and provide valuable information for planning and implement-

ing pharmacist consultation services in the future.

■ Discussion

The results can be interpreted by using the basic premise that the role of pharmacist consultation services is to reduce decision-uncertainty for patients. For this discussion, uncertainty is defined as the perception of an individual regarding the lack of information about, and the inability to predict, key outcomes of interest for his or her decision environment.²² Decision-uncertainty regarding prescription medications could include, for example, individuals' perceptions about (1) not being sure whether to take a medication with or without food, (2) being unsure if the medication will be effective in treating their condition, (3) how one drug may work in interaction with another drug they are taking, or (4) whether to stop a drug or keep taking it when a certain side effect is experienced.

Reduction of patients' decision-uncertainty is a relatively new concept for pharmacist consultation in that it posits a patient-oriented information-processing perspective rather than a product-oriented regulatory perspective. The product-oriented regulatory perspective of consultation that is still common in pharmacy practice suggests that pharmacists have a legal responsibility to provide information about the use of drug products.^{23,24} However, a patient-oriented information-processing perspective that focuses on reducing patients' decision-uncertainty regarding medications can be useful for identifying segments of patients who need comprehensive consultation and those who may need relatively little consultation.

Using the premise that reducing a patient's uncertainty should be the goal for consultation services, the results of this study can be interpreted quite parsimoniously since each segment of respondents that reported a high incidence of consultation was one that has a potential for high uncertainty concerning the use of their prescriptions (see Table 3). For example, individuals who purchase a new prescription might have uncertainty about the directions for using the medication. Also, individuals who purchase a combination of new and refill prescriptions, who have never before taken the new prescription, could be expected to experience a high level of uncertainty. For these situations, a prescription that has never been used before must be incorporated into the patient's current drug regimen. Uncertainty could arise regarding interactions with other medications or the possibility that some medications need to be discontinued. The finding that respondents aged 30 and older reported receiving more consultation than those aged 18 to 29 may be due to the uncertainties surrounding diseases faced by the older age group. Prescriptions used by younger adults might be used for cosmetic conditions (e.g., acne medications) or used for a short period of time (e.g., antibiotics or flu medications) and have a relatively low level of uncertainty associated with them.

A similar interpretation can be applied to the findings for

patient question-asking. Patients are likely to seek information through question-asking when they experience uncertainty regarding a medication. The same prescription types discussed for receipt of consultation also resulted in a reportedly high incidence of question-asking. Since asking the pharmacist a question leads to consultation,²⁵ much of the consultation reported could be a result of the patient actively seeking information. Taken together, these results can help define segments of patients for which pharmacists need to provide more comprehensive consultation in order to decrease patients' decision-uncertainty regarding prescriptions. These segments also could serve as target markets for consultation services.

The results also showed that the respondents who most likely desired more information from their pharmacists were those who purchased new prescriptions they had not taken before. This result shows that, even though this group of individuals was one of the most likely segments to receive consultation and ask their pharmacists a question, some of the respondents still desired more information. This result can be interpreted as a reflection of the great deal of uncertainty experienced under these situations. Pharmacists should focus on these segments of patients and may need to provide even more comprehensive consultation and/or follow-up to help decrease the uncertainty experienced by these patients.

The use of information-processing principles targeted at reducing patients' uncertainty regarding medications and health could be useful to pharmacists for making decisions about the provision of consultation services.²⁶ Research already has been reported for nutritional information disclosure using an information-processing approach to help reduce consumers' uncertainty about using food products.^{27,28} Designing information focused on reducing patients' uncertainty about prescription drugs also would be a fruitful area for future research.

The results in this study have some managerial and research implications for managed care pharmacists and managed care pharmacy. First, there is the need for pharmacists to continually improve efficiencies in their practice in light of the current high demand for pharmacists and expansion of services that pharmacists provide. The segmentation approach that was discussed in this article could be useful for improving efficiencies because pharmacists and their support staff could identify patients who would need in-depth consultation services by asking their patients some brief questions to assess patients' levels of uncertainty surrounding medication-taking and the patients' level of experience with taking their medications.

A second managerial implication is that a segmentation approach for identifying the need for pharmacist consultation could help direct resources for pharmacist consultation to patients who need the service. A one-size-fits-all approach can result in a waste of valuable resources. Future research might investigate the notion that some situations require face-to-face consultation while other situations might be better suited for

other communication channels.

Finally, there are a number of research implications that could be studied. More work could be conducted to determine whether managed care databases could be used to prospectively identify patients who might need or want consultation services based on the seven categories of "prescription status" described in this article (see Table 1). Other research could begin to investigate whether a reduction in patients' uncertainty about their medications could affect outcomes such as satisfaction with their pharmacy (and their health care plan), utilization of services, or clinical outcomes.¹⁻³ Another research stream could begin to study how tailored consultation services (based on uncertainty reduction for patients) could serve as a performance measure that a managed care plan could use to evaluate its pharmacy network.

Conclusion

The purpose of this study was to build upon research that examined the effect of prescription status on the type and extent of pharmacist consultation services provided to patients. Based on the findings, it is proposed that a patient-oriented information-processing perspective that focuses on reducing patients' decision-uncertainty regarding medications is a useful approach for identifying segments of patients who need pharmacist consultation services.

Disclosures

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