

# PHARMACY *practice*

## Employee Knowledge of a Managed Pharmacy Benefit in a Large Corporation

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Knowledge about prescription drug benefits is necessary for consumers to choose appropriate health benefits plans in a consumer-directed health plan market. The objective of this study was to describe employees' knowledge of their prescription drug benefits. A one-group, cross-sectional survey of full-time university employees with a tiered pharmacy benefit was performed. Correct responses to knowledge questions were described individually and as an aggregate index score. Respondent understanding of pharmacy benefits was low to moderate. Specifically, knowledge of pharmacy benefits was most limited with respect to formulary management, cost sharing, and financial implications of out-of-network use and the selection of a branded or generic medication. Future research should refine methods for assessing knowledge of pharmacy benefits, explore knowledge of pharmacy benefits in diverse samples, and assess the consequences associated with variations in knowledge of prescription drug benefits.

The health plan benefits-selection process requires consumers to understand myriad health plan jargon, processes, and rules to select appropriate, affordable coverage that adequately meets their health care needs. Thus, adequate consumer knowledge about health plan coverage facilitates the appropriate selection of health benefit coverage in a market-based system. Market choice of health insurance coverage is premised on the idea that consumers have adequate knowledge to rationally discern among the many nuances of health plan coverage.<sup>1</sup>

Adequate knowledge about health plan coverage has also been recognized as an integral component of health plan quality-assurance programs. The Consumer Assessment of Health Plans (CAHPS) asks survey respondents a series of questions to ascertain consumer understanding of written health plan materials and paperwork.<sup>2</sup> The National Committee for Quality Assurance, Washington, DC, in turn, uses CAHPS as part of its health plan accreditation process. Additionally, the Medicare Current Beneficiary

Survey (MCBS) uses both a perceived knowledge index and a quiz to assess Medicare beneficiaries' program knowledge in its monitoring and evaluation activities.<sup>3</sup>

Prescription drug benefits add to the complexity of health plan benefits selection. In managed pharmacy benefits, administrators typically employ a variety of unique and ever-evolving cost-containment strategies,<sup>4,5</sup> further underscoring the need for more educated consumers. An employee with inadequate knowledge of cost sharing who makes a suboptimal benefit selection based on lowest premium cost may experience downstream consequences of higher cost sharing and restricted formularies, which may subsequently influence adherence to prescribed treatment regimens.

A report to the Department of Health and Human Services questioned whether consumers were "equipped to make good choices regarding their health and drug use. . ."<sup>5</sup> The report concluded, in part, that improving consumer decision making through information about drug "need, appropriateness, and cost" could help manage runaway drug expenditures.<sup>5</sup>

Previous studies have similarly demonstrated that nonelderly consumers have limited understanding of the issues that are fundamental to their choice of health plan coverage, including provider board

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certification, staff privileges, and licensure.<sup>6</sup> They are more knowledgeable about hospital coverage than outpatient physician and drug services<sup>7</sup>; they have limited understanding of methods used to manage care<sup>8</sup>; and they typically underreport coverage for outpatient medical care, mental health and substance abuse services, and prescription drugs.<sup>9</sup> These studies have called for better patient understanding of health plan coverage in response to free market competition for enrollees in the private sector.

Despite the increasing prominence of prescription drugs and consistent growth in pharmaceutical expenditures,<sup>10</sup> little attention has been devoted to exploring how employees understand the mechanics of pharmacy benefits. A recent study evaluating the effect of a three-tier prescription copay on medical care utilization acknowledged the lack of research in patient understanding of tiered pharmaceutical benefits.<sup>11</sup>

Another study used personal interviews to measure consumer knowledge of various topics related to pharmacy benefits including "generic versus brand name issues," "medication formularies," "pharmacy networks," and "cost-sharing arrangements."<sup>12</sup> Although a majority of patients could differentiate between generic and brand name drugs, only a minority were able to grasp the concept of a medication formulary. Beyond the battery of questions used in this study, additional published empirical research that has objectively addressed consumers' knowledge of pharmacy benefits is limited. A recently reported study of consumer knowledge of formularies employed attitudinal, rather than objective, measures to assess pharmacy benefits knowledge.<sup>13</sup> A minority of the respondents reported having a copy of the formulary, being aware of the information covered in it, and were motivated to seek more information regarding formularies. For both studies, however, inability to verify respondents' actual pharmacy benefits limited the interpretation of response accuracy.

The introduction of multitier benefit designs increases the complexity of pharmacy benefits as they become increasingly complex.<sup>14</sup> Under ideal circumstances, insurers and employers should provide educational information about the benefit offerings to their constituents, assess understanding of the information provided, and target educational interventions where knowledge deficits are identified. Although some employers and insurers do provide comprehensive educational materials about pharmacy benefits, little is known about how well their constituents understand and translate this information into knowledge. The purpose of this article is to explore employee knowledge of pharmacy benefits and identify factors associated with varying levels of knowledge.

## **SUBJECTS AND METHODS**

A self-administered questionnaire was distributed in March 2002 through interoffice mail to each of 1,380

active, full-time employees (age,  $\geq 18$  yr), of a large university in western Pennsylvania. Employees received the questionnaire nine months after the beginning of the coverage year, and one month before the beginning of open enrollment for the subsequent year (to capture maximum employee experience with current benefit information and avoid confusion with benefit information for the subsequent benefit yr). All employees were surveyed to ensure representation of a range of demographic and occupational classifications. For the health plan coverage year from July 2001 until June 2002, employees had received the same summary of health plan and pharmacy benefits information that described the choices of a core benefit (i.e., a comprehensive major medical plan similar to traditional indemnity insurance), two PPOs, and three HMOs. Each employee also had the option of waiving health plan benefits.

During the open enrollment period for that benefit year, all employees had been given a booklet summarizing health and prescription drug benefits. The pharmacy benefit associated with the core benefit used a coinsurance and deductible without restriction. Alternatively, the pharmacy benefits associated with the PPOs and HMOs employed a formulary with a three-tier copay emphasizing generic substitution and a defined pharmacy network, and it offered a mail-order pharmacy option. For the PPOs and HMOs, the pharmacy benefit manager depended on the type of health plan selected. However, the contract language of the prescription drug benefits was identical regardless of who managed the benefit.

This study focused on employees who enrolled in a PPO or HMO with a managed pharmacy benefit. The first section of the questionnaire identified them. The second section solicited information about the type of pharmacy benefit information respondents received, where and from whom they obtained this, to what extent they read this information, and asked for a self-reported estimate of their understanding of pharmacy benefits. It was believed that these combined factors have the potential to influence the degree of knowledge of pharmacy benefits.

The third section of the questionnaire tested employee understanding of commonly used terminology appearing in educational information for pharmacy benefits. A review of prominent regional health plans' benefits explanations, educational information provided to employees, and advertising materials revealed common, recurring insurance industry-specific jargon and processes that may be confusing to an employee. Questions representing four content areas of pharmacy benefits were derived from the benefits materials distributed to employees during open enrollment: (1) generic versus brand name issues, (2) provider network arrangements, (3) formulary considerations, and (4) cost-sharing arrangements.

Initially, a 16-item true–false knowledge test was developed. Pharmacy academicians and researchers reviewed the initial draft of the true–false questions to evaluate their rationale, content validity, practicality, and functionality. Revisions were made based on feedback obtained. The revised instrument was then administered to five subjects who varied in age, race, and gender. These respondents understood the questionnaire and completed it without significant problems. Minor revisions were made based on feedback obtained. In response to concern from content reviewers that the true–false format may lead to guessing and subsequently overestimate respondent knowledge, a 14-item multiple-choice knowledge test was also developed. The increased complexity of the multiple-choice questionnaire allowed for simulation of more integrated decision making requiring the respondent to assess multiple related concepts at one time.

Each version of the knowledge test represented the four content areas of interest. Regardless of the version, every knowledge item provided a “don’t know/not sure” response option. Multiple questions were asked about each content area to explore a broader understanding of each concept. Questions on the true–false questionnaire were presented in a scrambled order of topics with varied correct response choices to avoid a pattern of responses within each content area. Owing to the complexity inherent in its format, the multiple-choice questionnaire posed queries in a manner generally ordered by content area.

Each question was scored as correct or incorrect by comparing employee responses with the pharmacy benefit information provided to all full-time employees. The “don’t know/not sure” responses were considered incorrect for scoring purposes, a technique that has been used in previous research.<sup>6</sup> A knowledge index, representing each respondent’s total score, was constructed by summing the correct answers.<sup>15</sup>

An additional section of each questionnaire collected self-reported information on the recency and frequency of filling a prescription, because a direct relationship between use and knowledge of pharmacy benefits could exist. The final section of each questionnaire contained questions eliciting demographic information to describe the respondent sample, including age, sex, education level, family income, and self-reported health status. The questionnaire did not contain any personal identifying information, thus assuring the anonymity of responses. The Institutional Review Boards of Duquesne University (Pittsburgh) and the University of Pittsburgh approved the study.

The Human Resource (HR) Benefits Department at the subject university identified, selected, and created one set of interoffice mailing labels for all full-time employees. Labeled distribution envelopes contained a cover letter, a questionnaire, and a self-addressed return envelope. Every other employee received the

multiple-choice questionnaire to achieve similar distributions of both versions.

One week before distribution of the questionnaire, a representative from HR sent an E-mail to employees alerting them to the distribution of the questionnaire. Using a return envelope provided, questionnaires were returned to a specified address through interoffice mail. One week after distribution, a representative from HR sent a follow-up E-mail to all employees encouraging completion of the questionnaire.

Raw data were entered into a database by the principal investigator. After entering data from each respondent, the principal investigator reviewed the entries as a quality assurance check to ensure accuracy. The final coding of difficult-to-interpret survey responses, such as selection of more than one response choice or the mark of a response choice outside the designated response field, was adjudicated by both investigators. Data were exported to Stata 7 (Stata Statistical Software, College Station, TX) for analysis. An *a priori* significance level of .05 was established for all statistical testing.

Descriptive statistics were used to profile the respondent sample for each questionnaire, responses for each knowledge item, and overall test score. The Kuder–Richardson Formula 20 (KR-20) was used to assess internal consistency for each knowledge index measure. Individual relationships between demographic and background variables and knowledge of pharmacy benefits were explored using bivariate analyses. Using a stepwise, backward elimination strategy with a probability of variable removal set to 0.10, multivariate regression was used to explore the relationship between the collective set of demographic and background variables and knowledge of pharmacy benefits. The *post hoc* analyses were performed using a Bonferroni adjustment.

A gold standard does not exist to which the knowledge of pharmacy benefits measures revealed in this study can be compared. Therefore, the method of known groups validity was employed to determine whether variables expected to differ with respect to health plan knowledge would also differ with respect to knowledge of pharmacy benefits. This technique has been reported and used in previous research of health plan benefit knowledge.<sup>6–8</sup>

## RESULTS

Questionnaires were collated by department and location from the employee mailing list and distributed to all 1,380 full-time employees. The number of questionnaires distributed for the true–false (686) and multiple-choice (694) versions differed slightly owing to odd numbers of employees within some departments. A total of 536 completed questionnaires were returned (269 true–false, 267 multiple choice) for an unadjusted response rate of 38.8%. This research

focused on employer-sponsored managed pharmacy benefits; respondents not reporting health care coverage or reporting other health care coverage (N = 67) were excluded from analyses since their responses to the knowledge questions could not be objectively verified. Respondents reporting only a core health insurance benefit (N = 14) were also excluded, because they did not have a managed pharmacy benefit and their orientation to the knowledge questions may differ from those respondents with a managed pharmacy benefit. The small sample size of the core benefit group would also make it difficult to draw meaningful conclusions from any comparative analysis. The employer documented that 300 employees waived health plan and pharmacy benefits during the study year, reducing the target population to 1,080 employees. Using the revised target population and considering the excluded responses, the adjusted response rate was 41.7% (455/1,080).

Age, sex, race, ethnic origin, education level, household income, and self-reported health status characteristics are reported in Table I. In general, the study sample was predominantly Caucasian, female, well educated, and in self-reported good to very good health. The observed distribution of respondent demographic characteristics receiving the true-false and multiple-choice questionnaires were similar, as verified by nonsignificant bivariate analyses. Of the 455 respondents, 72.3% selected an HMO, and 27.7% selected a PPO. Bivariate analyses revealed no relationship between health plan type and age, minority status, education, or income.

Although all employees were given written explanations of pharmacy benefits, only two-thirds of respondents acknowledged receiving written information about prescription drug coverage and one-third acknowledged receipt of information in a verbal format (Table II). With the exception of number of prescriptions filled within the past 30 days, respondent background characteristics did not differ significantly by questionnaire type.

Interestingly, 26.3% of respondents reported receiving both written and verbal information about their health plan, 17.6% reported not receiving any type of information, and 2.3% did not know or were not sure they had received any type of information. The majority of respondents reported fair to good understanding of their pharmacy benefits, and three-fourths reported having a prescription filled during the previous 30 days. Of the 333 respondents who reported having a prescription filled within 30 days of completing the questionnaire, 69.7% indicated they had received written information within the previous year compared with only 57.29% of the 96 respondents who did not have a prescription filled within 30 days of completing the questionnaire ( $\chi^2 = 5.16, P = .023$ ). The relationship between having a prescription filled within the

past 30 days and having received verbal information was not significant ( $\chi^2 = 0.79, P = .374$ ). Of the 115 respondents who indicated they did not receive or did not know they received information about prescription drug coverage, approximately two thirds (67.8%) had a prescription filled within 30 days of completing the questionnaire, compared with 81.0% of the 311 respondents who reported receiving any type of information ( $\chi^2 = 8.38, P = .004$ ).

The proportions of respondents who correctly answered each of the true-false and multiple-choice knowledge questions are provided in Tables III and IV, respectively. In general, the proportion of correct

**TABLE I: SAMPLE DEMOGRAPHIC CHARACTERISTICS BY TYPE OF KNOWLEDGE TESTS\***

Demographic Variable	TF (N = 234)†	MC (N = 221)‡
Age (yr)		
20–29	8.12%	6.33%
30–39	17.09%	15.84%
40–49	27.35%	34.39%
50–59	32.48%	33.03%
≥ 60	10.26%	9.50%
unknown	4.70%	0.90%
Gender		
male	32.91%	39.37%
female	66.67%	60.18%
unknown	0.43%	0.45%
Race/Ethnicity		
Caucasian non-Hispanic	91.45%	91.40%
non-Caucasian/Hispanic	6.41%	7.24%
unknown	2.14%	1.36%
Highest Educational Attainment		
high school (9–12 yr)	18.80%	19.46%
trade school	9.83%	4.98%
associates degree	11.54%	7.24%
bachelors degree	16.67%	16.29%
graduate or professional degree	41.88%	50.68%
unknown	1.28%	1.36%
Yearly Household Income		
≤ \$25,000	7.69%	5.88%
\$25,001–\$50,000	27.78%	25.34%
\$50,001–\$75,000	25.21%	27.60%
\$75,001–\$100,000	13.68%	17.19%
> \$100,000	17.52%	17.65%
unknown	8.12%	6.33%
Perceived Health Status		
poor	0.43%	0.45%
fair	4.70%	4.98%
good	40.60%	34.39%
very good	38.03%	42.08%
excellent	15.38%	17.65%
unknown	0.85%	0.45%

\*Proportion of total responses for each demographic variable.

†Total number of responses for true-false questionnaire.

‡Total number of responses for multiple-choice questionnaire.

TF = True-false test; MC = multiple-choice test; N = number.

responses was higher on the true–false questionnaire than on the multiple-choice test. The proportions of respondents correctly answering questions about formulary considerations were consistently lower compared with other content areas on both true–false and multiple-choice questionnaires. The highest proportions of “don’t know” responses were also associated with questions related to formulary considerations.

For respondents completing all knowledge questions, correct responses were summed into a knowledge index score. For both knowledge indexes, the scores were normally distributed. The mean knowledge index score was  $9.9 \pm 2.6$  (standard deviation) for the 16-item true–false questionnaire, equating to a sample average of 62% correct. For the 14-item multiple-choice questionnaire, the mean knowledge index score was  $7.4 \pm 2.5$ , an average of 53% correct. Each knowledge index had similar proportions of “don’t know” responses—27% for the true–false questionnaire and 26.2% for the multiple-choice questionnaire. Both instruments appear to discern among low and high levels of knowledge, as evidenced by the wide distribution of scores for the true–false (3–16) and multiple-choice (0–13) questionnaires.

With respect to the questionnaire reliability and construct validity, internal consistencies for the 16-item true–false measure ( $\alpha = .65$ ) and 14-item multiple-choice measure ( $\alpha = .63$ ) were comparable and consistent with previous published literature on health plan knowledge.<sup>6</sup> Bivariate analyses revealed, a significant positive relationship between perceived level of understanding of pharmacy benefits and knowledge score on both the true–false ( $P = .0095$ ) and multiple choice ( $P = .0001$ ) measures.

Respondents to the true–false measure who perceived their pharmacy benefit knowledge to be excellent had significantly higher pharmacy benefit knowledge scores than respondents who perceived their pharmacy benefit knowledge to be poor ( $P = .007$ ). Respondents to the multiple-choice measure who perceived their pharmacy benefit knowledge to be excellent, good, or fair had significantly higher knowledge scores than respondents who perceived their pharmacy benefit knowledge to be poor ( $P = .0001$ ,  $P = .0001$ ,  $P = .031$ , respectively). Respondents who perceived their pharmacy benefit knowledge to be excellent or good also had significantly higher pharmacy benefit knowledge scores than those who perceived their knowledge to be fair ( $P = .003$ ,  $P = .009$ , respectively). Questionnaire respondents who acknowledged receipt of written pharmacy benefit explanations scored significantly higher than those who did not acknowledge receipt of benefits explanations on both the true–false ( $P = .0013$ ) and multiple-choice ( $P = .0133$ ) measures. For bivariate analyses, the income variable was collapsed to greater or less than

\$50,000. Respondents whose annual family income exceeded \$50,000 scored higher on both the true–false ( $P = .0438$ ) and multiple-choice ( $P = .0229$ ) knowledge of pharmacy benefit measures. Compared with non-Caucasian/Caucasian-Hispanic respondents, Caucasian non-Hispanic respondents demonstrated significantly higher knowledge of pharmacy benefit scores on the true–false questionnaire ( $P = .0079$ ). Having a prescription filled within the previous 30 days was positively related to knowledge of pharmacy benefit score on the true–false measure ( $P = .0316$ ). Although education level was related to health plan benefits knowledge in previous research,<sup>6,8</sup> it was not significantly related to knowledge of pharmacy benefit in this study. This finding may be attributable to the homogeneity of the respondent sample, but it could also be the result of knowledge of pharmacy

**TABLE II: PRESCRIPTION BENEFIT COVERAGE, INFORMATION RECEIVED AND PERCEIVED UNDERSTANDING, AND PRESCRIPTION UTILIZATION PATTERNS BY TYPE OF KNOWLEDGE TEST\***

Descriptive Variable	TF (N = 234)†	MC (N = 221)‡
Current Health Care Coverage for Prescription Drugs		
yes	97.86%	96.38%
no/don't know	1.70%	2.71%
unknown	0.43%	0.90%
Received Written Information Describing Prescription Drug Coverage		
yes	65.81%	63.80%
no/don't know	32.05%	32.13%
unknown	2.14%	4.07%
Received Verbal Information Describing Prescription Drug Coverage		
yes	31.20%	30.32%
no/don't know	66.67%	64.71%
unknown	2.14%	4.98%
Perceived Understanding of Prescription Drug Coverage		
poor	9.40%	8.14%
fair	34.19%	39.82%
good	42.74%	38.01%
excellent	8.55%	8.14%
unknown	5.13%	5.88%
Had Prescription Filled During the Past 30 Days		
yes	75.64%	74.21%
no	21.37%	23.53%
unknown	2.99%	2.26%
Prescriptions Filled During the Past 30 Days (N)		
none	20.94%	24.43%
1–2	41.88%	40.27%
3–4	18.80%	25.79%
≥ 5	15.38%	7.24%
unknown	2.99%	2.26%

\*Proportion of total responses for each demographic variable.

†Total number of responses for “true–false” questionnaire.

‡Total number of responses for “multiple-choice” questionnaire.

TF = True/false test; MC = multiple-choice test; N = number.

benefit being a unique construct. Age, sex, receipt of verbal information describing prescription drug coverage, perceived health status, number of prescriptions filled within 30 days, and health plan type were also not related to knowledge of pharmacy benefit.

Multivariate regression analysis indicated that some variables were significantly related to pharmacy benefit knowledge scores. Acknowledged receipt of written pharmacy benefit information ( $P = .017$ ), perceived excellent understanding of pharmacy benefit ( $P = .039$ ), and having a graduate or professional degree ( $P = .006$ ) were positively related to pharmacy benefit knowledge for true-false questionnaire respondents. For multiple-choice questionnaire respondents, self-reported income greater than \$50,000 ( $P = .006$ ) and perceived fair ( $P = .003$ ), good ( $P = .001$ ), and excellent ( $P = .001$ ) understanding of pharmacy benefit were positively related to knowledge of pharmacy benefit scores. Final multivariate models for each pharmacy benefit knowledge measure had limited predictive power. The final model for the true-false measure had less explanatory power (adjusted  $R^2 = .11$ ) compared with the model for the multiple-choice measure (adjusted  $R^2 = .22$ ).

## DISCUSSION

Using two alternative testing methods, this research contributes an initial view into a variety of aspects of

employees' understanding of managed pharmacy benefits in a large employer sample.

Although acknowledged receipt of written benefits information was positively related to higher knowledge of pharmacy benefits, only two-thirds of respondents actually acknowledged receipt of written pharmacy benefit explanations. Although written pharmacy benefit explanations are provided to all employees in this employer group, the large minority of respondents failing to acknowledge receipt raises concern about their awareness that pharmacy benefit information is an integral component of their health care benefits package. As the complexity of benefits continues to increase, passive dissemination of information may no longer suffice. Decision-making tools that require active employee participation in determining their pharmacy benefit needs within the context of their overall health care needs and financial capacity should be developed and used to enhance employee awareness of their pharmacy benefits.<sup>17</sup>

Is pharmacy benefit knowledge only important when the benefit is being used? If this were true, one may expect verbal information about pharmacy benefits to be associated with recent prescription utilization and higher pharmacy benefit knowledge since verbal discussions are most likely to occur at the point of service, whereas written information is most likely to be distributed at the beginning of the enrollment

**TABLE III: PERCENTAGE OF CORRECT RESPONSES FOR 16 TRUE-FALSE KNOWLEDGE QUESTIONS**

	N*	Correct	Don't Know
<b>Generic/Brand Name Issues</b>			
1. Generic drugs are less effective than brand name (F)	227	83.70%	9.69%
2. Requesting brand name in lieu of generic causes you to pay a higher amount (T)	230	92.17%	5.22%
3. Amount employee pays for brand name is less than for generic (F)	229	88.21%	4.37%
4. Using generic drugs helps to minimize insurance premium increases (T)	229	65.50%	29.26%
<b>Provider Network Arrangements</b>			
5. Pharmacies accepting your insurance belong to a network (T)	229	80.35%	13.10%
6. Prescriptions filled out of network require higher payment (T)	228	74.12%	19.74%
7. Obtaining medications for chronic conditions through mail order will reduce out-of-pocket costs (T)	229	69.43%	27.07%
8. Network pharmacies accept your insurance card (T)	229	84.72%	10.04%
<b>Formulary Considerations</b>			
9. Health insurers use a preferred drug list to maximize quality/value (T)	230	44.78%	43.91%
10. A preferred drug list is known as a formulary (T)	227	31.72%	64.76%
11. Amount employee pays may be higher if not on the preferred drug list(T)	230	53.04%	41.74%
12. Employer has input into the development of the preferred drug list (T)	228	10.96%	60.09%
13. Physicians/pharmacists do not have input into the preferred drug list (F)	230	23.48%	59.57%
<b>Cost-Sharing Arrangements</b>			
14. Out-of-pocket cost for Rx drug is known as a copay (T)	230	97.39%	0.43%
15. Another name for copay is coinsurance or deductible (F)	228	25.44%	21.05%
16. Employees pay the largest portion of cost for prescription drugs (F)	229	65.07%	22.27%

\*Total number (N) of valid responses for each knowledge question, excluding unknown data.

†Proportion of "don't know" responses for each knowledge question.

T = True; F = false; Rx = prescription.

**TABLE IV: PERCENTAGE OF CORRECT RESPONSES FOR 14 MULTIPLE-CHOICE KNOWLEDGE QUESTIONS**

	N*	Correct	Don't Know†
<b>Generic/Brand Name Issues</b>			
1. Generic drugs have the same active ingredient and strength as their brand name alternatives	209	89.95%	3.83%
2. Generic drugs are not available until the original brand name comes off patent and cost less due to fewer research and advertising costs	206	48.06%	18.93%
3. I pay one price for generics, a higher price for brand name drugs on the preferred list, and an even higher price for brand name drugs not on the preferred list	209	23.92%	13.40%
<b>Provider Network Arrangements</b>			
4. In order for my prescription to be covered by my plan I must have it filled at a network pharmacy	210	89.05%	7.14%
5. If I do not fill my prescription at a pharmacy specified by my prescription drug plan, I have to pay the full price for the prescription	210	38.10%	39.52%
6. Mail-order pharmacies are best used to obtain medications for chronic conditions	208	48.08%	47.12%
<b>Formulary Considerations</b>			
7. A health insurance company often refers to a list of preferred drugs as a formulary	212	24.06%	53.77%
8. The list of preferred drugs is developed by my employer and health professionals hired by my insurance company	210	28.10%	50.95%
9. The list of preferred drugs is developed and maintained to ensure standard benefits, control costs and minimize premium increases, and ensure quality drug use	207	44.44%	19.81%
10. For medications covered by my prescription drug insurance, the preferred drug is typically a generic drug unless a generic is not available to treat the condition	210	57.14%	16.19%
<b>Cost-Sharing Arrangements</b>			
11. The amount that I have to pay for each prescription I obtain using my insurance is called a copayment	212	92.45%	4.72%
12. The amount that I have to pay when I obtain a prescription covered by my health plan is determined by my employer and my health insurance company	212	85.85%	9.43%
13. My employer pays the largest portion of the cost for most prescription drugs obtained through my prescription drug plan	211	23.22%	25.12%
14. I have no limit on the number of prescriptions I can obtain with my plan	210	47.14%	48.57%

\*Total number (N) of valid responses for each knowledge question, excluding unknown data.

†Proportion of "don't know" responses for each knowledge question.

period. This research questions the aforementioned assumption, since only written information explaining pharmacy benefits was significantly associated with recent prescription use and higher pharmacy benefit knowledge scores.

Concern over the possibility of successful guessing and artificially inflated knowledge scores from using only a dichotomous response set (true–false) led the researchers to employ an alternative multiple-choice format. Compared with the multiple-choice items, the consistently higher proportions of respondents with correct answers for the true–false items, similar proportions of respondents with “don’t know” responses, and the homogeneous respondent samples for both questionnaires strengthened these suspicions. Previous health plan benefit–knowledge research that has been limited to dichotomous choice (e.g., agree/disagree, yes/no) responses<sup>6,8</sup> may have overestimated levels of knowledge. Future research that is conducted on health plan and knowledge of pharmacy benefits should incorporate more comprehensive and diverse item construction, using both types of

question formats, to further evaluate this phenomenon.

This was the first study to objectively verify and describe the state of knowledge of pharmacy benefits in a large employer population. Regardless of the questionnaire used, employees demonstrated low to moderate overall knowledge of pharmacy benefits. Considering this limited knowledge, further examination of the implications of specific areas of knowledge deficit is warranted.

Given that the use of generic drugs has grown significantly in the recent past, respondents indicated substantial understanding of the clinical equivalence between generic and brand name drugs and appeared to recognize that the use of generic drugs leads to lower out-of-pocket costs. Fewer respondents, however, could identify how and why generic drugs reach the market, why they cost less, and their important role in minimizing insurance premium increases. Improving the understanding of these concepts may further reassure consumers that generic drugs are safe, effective, and play an important role in health care cost containment. This reassurance and improved understanding

**TABLE V: MEAN KNOWLEDGE SCORE FOR SELECT CHARACTERISTICS BY KNOWLEDGE TEST**

Variable/Response Category	TF Score* (maximum = 16)		MC Score† (maximum = 14)	
	Mean	P	Mean	P
Age (yr)				
20–29	9.83	.1314‡	6.31	.1494‡
30–39	9.72		7.59	
40–49	9.83		7.31	
50–59	10.50		7.35	
≥ 60	8.87		8.61	
Gender				
male	9.75	.5226§	7.46	.8411§
female	9.99		7.39	
Race/Ethnicity				
Caucasian non-Hispanic	10.07	.0079§	7.49	.0835§
non-Caucasian/Hispanic	8.14		6.23	
Highest Educational Attainment				
high school (9–12 yr)	9.93	.0556‡	7.14	.6364‡
trade school or associate degree	9.45		7.00	
bachelors degree	9.29		7.44	
graduate or professional degree	10.47		7.62	
Yearly Household Income				
≤ \$50,000	9.43	.0438§	6.78	.0229§
> \$50,000	10.20		7.70	
Perceived Health Status				
poor to good	9.55	.0638§	7.54	.5904§
very good to excellent	10.23		7.34	
Received Written Information Describing Prescription Drug Coverage				
yes	10.32	.0013§	7.75	.0133§
no/don't know	9.10		6.81	
Received Verbal Information Describing Prescription Drug Coverage				
yes	10.07	.6269§	7.41	.9440§
no/don't know	9.89		7.44	
Perceived Understanding of Prescription Drug Coverage				
poor	8.77¶	.0095‡	5.06	.00001‡
fair	9.73		6.88  ,**	
good	10.08		8.09  ,**	
excellent	11.47¶		9.29  ,**	
Had Prescription Filled During the Past 30 Days				
yes	10.14	.0316§	7.55	.1437§
no	9.17		6.91	
Health Plan Type				
A (PPO)	10.09	.6823‡	7.74	.5640‡
B (PPO)	10.38		7.94	
C (HMO)	9.91		7.68	
D (HMO)	9.69		7.11	
E (HMO)	10.48		7.47	
Prescriptions Filled During Past 30 Days (N)				
0	9.17	.1283‡	6.91	.2597‡
1–2	9.98		7.29	
3–4	10.20		7.90	
≥ 5	10.51		7.69	

\*16-Item true–false questionnaire.

†14-Item multiple-choice questionnaire.

‡One-way analysis of variance.

§Independent samples *t* test.

¶Excellent > poor (*P* = .007) after Bonferroni adjustment.

||Excellent, good, fair > poor (*P* = .0001, *P* = .0001, *P* = .031; respectively) after Bonferroni adjustment.

\*\*Excellent, Good > Fair (*P* = .003, *P* = .009; respectively) after Bonferroni adjustment.

may further enhance generic drug utilization.

Large proportions of respondents failed to understand the financial consequences of using an out-of-network pharmacy provider and of not adhering to the precepts of tiered pharmacy benefits. Since this research identified household income to be positively related to overall knowledge of pharmacy benefits, a lack of awareness of these financial consequences may place the greatest fiscal strain on those who can least afford it. Increasingly smaller provider networks may exacerbate these burdens.<sup>18</sup> For example, a patient may have to incur additional travel expenses to access a network provider. This is especially troublesome for those without easy access to travel and/or a well-established social support network. Although an employee may quickly learn that there is a financial penalty for using a nonnetwork provider, selecting a pharmacy benefit that excludes a convenient provider with whom they have a positive rapport forces them to make difficult choices between cost and provider. Once enrolled, benefits are typically in place for one year. Thus, a suboptimal benefit choice may decrease convenience, require an undesired change in provider related to financial reasons, and ultimately lead to beneficiary dissatisfaction. Potential dissatisfaction should concern pharmacy benefit managers and should underscore the importance of a fully informed consumer.

Only a minority of respondents was able to correctly identify that mail-order pharmacies are best used for obtaining chronic medications; a majority understood that the use of mail-order pharmacies for obtaining chronic medications reduces out-of-pocket costs. Efforts made to increase the utilization of mail-order pharmacy services stand the greatest chance for success if consumers understand the conditions under which such programs should be used, along with the financial benefits of their use.

Consistent with previously published research,<sup>12</sup> only a minority of respondents understood the terminology used to describe medication formularies, the purpose of medication formularies, and who has input into their development.



These knowledge deficits may lead to misconceptions about formulary management. In fact, comments on the questionnaires suggest that respondents perceive formulary decisions as strictly being made on cost with little regard for value, quality, or positive health care outcomes. These misconceptions may precipitate unnecessary questions to health care providers and ultimately lead to consumer dissatisfaction. If formulary management is to remain a fundamental tool for pharmacy benefits managers, a full and transparent disclosure of the process is necessary to ease the concerns of consumers and encourage their active participation to facilitate medication management within the context of their pharmacy benefits.

Although most respondents were able to recognize that their fixed out-of-pocket cost for each prescription is known as a copay and that their employer and health insurer determine their out-of-pocket cost collectively, only a small minority of respondents was able to discern among a copay, coinsurance, or deductible. This lack of knowledge is cause for concern, as plan sponsors turn to complex strategies to increase member cost sharing such as deductibles, tiered coinsurances, and reference pricing<sup>14,19</sup> with little knowledge of how well consumers understand these concepts. Recent research concluded that adding copayment levels, increasing copayments or coinsurance, or requiring mandatory generic substitution reduced health insurer drug spending but placed greater out-of-pocket cost burden on the beneficiary,<sup>21</sup> which raises the question of whether lack of knowledge of pharmacy benefits contributes to this increased cost sharing.

Respondents did not appear to understand that their employer pays for the majority of their pharmacy benefits. Interestingly, large minorities of respondents believed that either the health insurer or the employee paid the largest portion of their pharmacy benefits. These misperceptions regarding who primarily funds the pharmacy benefits may lead to distorted consumer expectations and demand.

**Limitations.** This pilot study represents an initial attempt to objectively examine the pharmacy benefit knowledge of employees in a large employer group at one point in time, March 2002. Although benefit structures are revised periodically, the concepts tested in this research remain fundamental to strategies used to manage pharmacy benefits today. Furthermore, this study tests comprehension of the information presented to employees about their benefits. Thus, the results should raise concerns about the retention of benefit information, and should stimulate the development, implementation, and testing of alternative benefits education strategies to improve employee comprehension and retention.

The two main questions that arise are related to

sampling and questionnaire validity, and should be refined in future work. The sample is relatively homogenous with respect to race and education, two characteristics expected to have a strong relationship with knowledge. Furthermore, this research describes a working-age sample and does not include the nonworking and senior populations. The sample also excludes individuals who waive their health benefits. The restricted diversity of the sample reduced the generalizability of the results and most likely contributed to the limited explanatory power of the multivariate regression models.

Given the diversity of pharmacy benefit offerings across the general population, this sample was chosen for study to objectively verify the responses to the knowledge test within a defined population with a specific set of benefit offerings. The response rate was lower than desired, and the data did not exist to compare the observed sample demographic characteristics with those of the target population. With the exception of the disproportionately high percentage of female respondents, however, the respondent sample is generally what one would expect in this university-based employer.

The ability to enhance response with additional follow-up of nonrespondents was limited by a guarantee of anonymity. Future research should include additional methods to improve follow-up of nonrespondents.

As expected with survey research, it is assumed that study participants responded truthfully and accurately. However, it is not certain whether the questions captured all there is to know about pharmacy benefits. The results from this study are derived from one large employer sample and thus extrapolation of results must be performed with caution.

Splitting the sample and administering two different questionnaires allowed for expanding the test item pool and an exploration of different testing formats for assessing pharmacy benefits knowledge. Although there was an insufficient sample to test the level of item difficulty, similar questions appear to elicit similar responses. In this study, questionnaire items were derived from educational materials distributed to all employees with a common benefit. Therefore, a correct answer for each individual questionnaire item could be assigned. For example, questions may arise as to whether the employer had input into a preferred drug list. Although some employers rely solely on the proposed preferred drug list developed by a contracted pharmacy benefits manager without providing input, the self-insured employer group in this study adds and deletes covered products proposed by the contracted pharmacy benefit manager and approves the final preferred drug list. Therefore, the employer group under study has input into the development of the preferred drug list. Another difference in interpretation may arise

with respect to the interpretation of the terms copay, coinsurance, and deductible. The employer group under study used the Academy of Managed Care Pharmacy, Alexandria, Virginia, distinction with respect to cost sharing that a copayment is a flat dollar amount whereas a co-insurance is a defined percentage of the charges for services rendered.<sup>20</sup>

## CONCLUSION

Two questionnaires to assess employee knowledge of pharmacy benefits were used in a large employee population. Both versions demonstrated sufficient content and construct validity with similar internal consistency suitable for decision making at the group level. Alternative testing formats (true-false vs. multiple-choice) derived from identical material, however, may reveal different levels of aggregate knowledge in seemingly comparable samples. Although a majority of the respondent sample could accurately discern basic concepts (e.g., generic vs. brand medications) and recognize common terminology (e.g., copay), overall knowledge about pharmacy benefits was low to moderate and appears to be inadequate for empowered decision making in a market-based system. Specifically, knowledge of pharmacy benefits was most limited with respect to formulary management, cost-sharing and financial implications of out-of-network use and generic/brand selection. Future research should strive to refine these newly developed instruments into one ideal format and replicate the study in more diverse samples. Once the prevalence and characteristics associated with inadequate pharmacy benefit knowledge are established, methods can be developed and targeted to improve consumer understanding. In addition, the relationships between pharmacy benefit knowledge and health care outcomes, such as satisfaction, utilization, and cost, should be explored.

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## DISCLOSURES

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