Response-Oriented Patient Evaluation Survey (ROPES): An Administrator's Tool for Identifying Opportunities for Service Quality Improvement

Suzan N. Kucukarslan, Dev S. Pathak, and Kent Summers

ABSTRACT: The objective was to develop a survey to identify deficiencies in pharmacy service quality from the patient viewpoint. Qualitative methodology was used to identify the dimensions of pharmacy service used by patients who were members of a managed care organization and had utilized pharmacy services within the previous three months.

The Response-oriented Patient Evaluation Survey (ROPES) used is an action-oriented instrument intended to help pharmacy administrators identify the strengths and weaknesses of their programs. ROPES was developed through patient and pharmacy administrator interviews to determine the specific aspects of service that require attention or contribute to patient satisfaction. The unique feature of ROPES is a "bothered" scale, which evaluates quality from the patient's perspective.

ROPES can be used to evaluate and identify opportunities for quality improvement in pharmacy services.

Pharmacists, problem solving, access, written information, and wait time were the domains of pharmacy service identified as important by patients. Cronbach's Alpha and factor analysis were used to demonstrate instrument reliability. The instrument also had convergent validity with other self-reported quality measures. A composite ROPES score was computed for each of the identified service domains, which identified access issues as an area for quality improvement for pharmacy managers. Finally, the analysis identified pharmacist, access, and wait time as important drivers of patient satisfaction.

KEY WORDS: Patient satisfaction, Managed care, Pharmacy services, Service quality

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Health care expenditures have been increasing at a faster pace than the general inflation rate since the 1980s. Customers of health care services have been asking providers to demonstrate how well health care resources are utilized. Performance measures have become important tools to evaluate health care providers and facilities.¹ Currently, quality standards and measures for managed care organizations (MCOs) are in the development process. The National Committee for Quality Assurance (NCQA), for example, developed the Health Plan Employer Data and Information Set (HEDIS).^{2,3} Unfortunately, neither HEDIS nor any other such efforts include ratings of service quality from the patient perspective. The purpose of this study is to develop such a service quality measure that pharmacy managers can use to identify opportunities for quality improvement.

Pharmacists provide pharmaceutical products and services to patients in the community setting. Their traditional role has been to deliver the right product to the right patient at the right time. The pharmacist's function is mostly distributive in nature. However, the pharmacy profession is changing from predominantly product focused to service oriented. In 1996, the American Pharmaceutical Association initiated new policy mechanisms to facilitate the implementation of and payment for pharmaceutical services in community pharmacy practice.⁴

Despite professional group initiatives toward service-focused care, pharmacies are evaluated by product-based measures.

The NCQA, for example, assesses performance by the number of prescription drugs per member per year and the prescription drug costs per member per month.⁵ Thus, there is a need to develop measures of pharmacy performance that have a service focus and not a product focus.

The primary focus of such measures is to evaluate how well the organization fulfills patient needs. Administrators need tools to identify weaknesses in the design and the delivery of services to better meet the needs of their clients. Patient complaints can be used to identify services which are either inconsistent in their quality or which are not designed to meet the needs of the customer. However, not all patients complain. Most often dissatisfied patients switch to other service providers.^{6,7} It would be valuable for administrators to identify the reasons for the complaints of lost patients.

Gombeski and his colleagues⁸ demonstrated the need for a survey instrument to pinpoint potentially problematic areas of service delivery. Although patient satisfaction surveys found 94% of their patients were satisfied with hospital services, a patient callback program was developed to identify areas in need of service improvement. Patients were telephoned after being discharged from the hospital and asked if services could be improved. The program identified patients with clinical needs (6%) and with service concerns (6%). Examples of clinical problems were fever, pain, post-operative bleeding, continuous vomiting, or inflammation. Service concerns included questions about billing or obtaining copies of medical records. After one year of the patient callback program, the number of concerns identified during the program decreased and patient satisfaction increased. Gombeski et al. showed: 1) patient satisfaction is not adequate to identify potential areas for service improvement; 2) patients should be asked to identify areas of improvement; and 3) elimination of these potential service quality problems may result in overall patient satisfaction.

Similarly, the pharmacy services research literature has found evidence that overall satisfaction may not capture opportunities for service quality improvement. In 1991, Pathak et al.⁹ found satisfied hypertensive elderly patients were bothered by at least one component of the service. Commonly identified troublesome issues were prescription prices and price variability among pharmacies. As in Gombeski et al., the study showed that patients must be asked about specific characteristics of the service. Also, Pathak et al. found patients expressed their negative viewpoint using the term "bothered." A patient may be satisfied with the overall service provided by a pharmacy, but bothered by the quality of the written information provided by the pharmacist. A systematic assessment of services using a "bothered" scale would help managers identify opportunities for service quality improvement. Also, if managers address the issues which are bothersome to their patients, then overall patient satisfaction should increase.

A response-oriented patient evaluation survey (ROPES) is designed to identify attributes of the pharmacy service which were bothersome to the patient and to which pharmacy man-

agers can respond. A direct and negative relationship is expected between the level of being bothered with the service and patient satisfaction. For example, as the level of being bothered increases with wait time, patient satisfaction is expected to decline. Thus, by eliminating problems with wait time, the pharmacy manager would increase patient satisfaction with pharmacy services.

The specific objectives of the study were: 1) identify relevant characteristics of pharmaceutical services which consumers evaluate when considering the performance of the pharmacy; 2) identify those service characteristics to which managers are able to respond; and 3) test the relationship between patient satisfaction and ROPES.

METHODOLOGY

The survey was designed and tested for one MCO which utilizes the staff and network pharmacy models. ROPES was developed in three phases: in-depth telephone interviews and patient nominal groups to identify important service attributes (Phase I); a review of the patient-provided list of service attributes by pharmacy managers (Phase II); and the development and testing of the survey instrument (Phase III).

Phase I

Telephone interviews (n=14) were conducted in Phase I to identify the aspects of services consumers consider when they evaluate pharmacy performance. Members of the MCO who recently had used pharmacy services were selected randomly from three geographic areas: 1) New York/New Jersey/Connecticut region; 2) Houston and Dallas metropolitan areas; and 3) Orlando and Miami metropolitan areas. Interviews were conducted until no new items were identified.

Consumer nominal group sessions were conducted to identify the most important aspects of pharmacy services. Members of the MCO who recently had purchased a prescription drug were selected randomly and invited to participate in the nominal group session. During nominal groups, the participants were asked, "What aspects of the pharmacy do you consider when you evaluate its performance?" The participants were given five to 10 minutes to write down their responses. The responses were listed on large newsprint during a round-robin session. Then the participants were asked to discuss the responses. During the last step, the top five responses were selected and ranked by importance. The group was given one more opportunity to discuss the responses and to perform a second iteration of item selection and ranking to conclude with a group consensus. Three nominal group sessions were conducted with a total of 20 patients.

Phase II

After the list of service attributes important to consumers was compiled, pharmacy directors at national chain pharmacies and at the MCO (n=12) reviewed the service attributes

Table 1. Results of Phases I and II Assessment of Consumer-Identified Aspects of Pharmacy Services

Service Items	Number of Respondents*=20 (14 telephone interviews)	Provider Comments (n=12)
1. Prescription Product		
a. The prescription includes the prescribed drug product, quantity, and information.	8 (4)	Actionable. ** Add "information on label."
b. Warning labels on prescription bottles are used consistently.	2(2)	Requires professional judgment, therefore can't assure consistency among pharmacists.
c. Instructions on the prescription label are clear and understandable.	7	Actionable. Instructions are as prescribed. If patient needs clarification, pharmacist can contact physician.
d. Prescription products (both new and refill) are ready when promised.	5 (4)	Actionable. One of the biggest complaints. May not be able to control for new prescriptions due to sporadic demand.
e. When a generic drug product was given, the pharmacist identified it as a generic to the prescribed brand name.	6 (1)	Actionable except for prescriptions which are written for generic.
f. When a generic drug product was given, the brand name was written in addition to the generic name.	5	Actionable, except for prescriptions which are written for generic. Dependent upon state law. Not all states allow brand name on label if generic is dispensed.
g. Stock-outs of medication are avoided.	11	Semi-actionable. Cannot control for sporadic demand or products which are not usually stocked.
2. Pharmacist		
a. There is a good relationship between the pharmacist and the patient.	4 (4)	Actionable.
b. Pharmacist is courteous and respectful to the patients.	3 (2)	Actionable.
c. Pharmacist knows patient by name.	5	Actionable/not actionable (split consensus).
d. Pharmacist maintains patient records, including drug allergies and medical conditions.	5 (2)	Actionable. Patient may request review of records. Actionable, but include "as communicated by the patient."
e. Pharmacist explains the purpose of the prescription and its potential side effects or other ill effects in lay terms.	5 (5)	Actionable for new prescriptions.
f. Pharmacist provides written information, explaining the prescription drug and its potential side effects or other ill effects in lay terms.	1 (5)	Actionable. Diagnosis information is available from prescription or from patient.
g. Pharmacist contacts physician if there is a question or problem with the prescription.	2 (1)	Actionable. Part of current service.
h. The information from the pharmacist and the physician is consistent.	1	Not actionable. Don't know what patient was told by physician. Actionable if inconsistency identified by patient. (No consensus) Actionable.
i. Pharmacist provides assistance when selecting nonprescription drugs.	3	Actionable. Add "when asked."
j. Pharmacist is available to answer questions in an emergency at all hours.	2 (3)	Actionable. More managed care organizations are asking for this service. Change "The pharmacist" to "A pharmacist."
k. Pharmacist responds to questions or problems to the satisfaction of the patient.	3 (2)	Actionable.

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Table 1. Results of Phases I and II Assessment of Consumer-Identified Aspects of Pharmacy Services (continued)

Service Items	Number of Respondents*=20 (14 telephone interviews)	Provider Comments (n=12)
3. Pharmacy Environment		
a. A separate area is available for customers with questions about prescriptions and nonprescription medication.	(4)	Cannot provide consultation rooms, but can provide separate area.
b. The pharmacy dispensing and waiting areas are large enough to accommodate the number of patients served by the pharmacy.	1 (2)	Movement to reengineer physical plans to control flow around pharmacy dispensing area.
c. The pharmacy hours are clearly posted.	1	Actionable. Monitored by supervisors.
d. The pharmacy's direct telephone number is easily obtainable.	1	Actionable. Required by law. On label. Have changed label for elderly.
e. The pharmacy atmosphere is pleasant and not rushed.	1 (2)	Strive to make atmosphere pleasant, but cannot guarantee "not rushed." May be rushed if busy.
4. Management/General Business		
a. Complaints or problems are addressed promptly.	(2)	Actionable. Very important to business from a liability standpoint.
b. Technicians address consumer complaints and questions courteously.	(3)	Actionable. Do not specify technician, may not be able to handle problem.
c. The pharmacy hours are sufficient.	4 (4)	Actionable. Necessary to meet market needs. Clarify "sufficient."
d. Information is provided for the availability of after-hour services either by the pharmacy or by other pharmacies.	1	Actionable.
e. Delivery service is available.	4 (1)	Cannot provide in all markets due to cost and safety issues. This service is provided among independents and some chains. Not actionable. Would customers be willing to pay for delivery?
f. Pharmacy is conveniently located.	7 (4)	Actionable by managed care organization by pharmacy network design.
g. Pharmacy department is conveniently located within the establishment.	Not discussed.	Suggested by providers.

*The number of consumers selecting the item as one of the five most important aspects of pharmacy service used when evaluating performance. The numbers in parentheses are the consumers interviewed by telephone who identified the item as important.

**Actionable is defined as a service attribute which pharmacy managers may take some action to remedy as part of the service quality improvement initiative.

identified by the patients to which they could respond. These persons were selected because they represented members of the pharmacy network and HMO pharmacies.

Phase III

The survey was developed from the list of service attributes identified by managed care members and pharmacy managers. Patients were asked to evaluate their most recent experience when purchasing a prescription drug for themselves or a family member at a pharmacy. A five-point bothered scale was used to evaluate each service attribute. The scale anchors were Not At All Bothered and Extremely Bothered. A Not Applicable option was provided for those service attributes the patient may not have experienced. Satisfaction was mea-

sured using a five-point scale with Not At All Satisfied and Extremely Satisfied as the anchors. The patients were asked three questions focusing on: 1) satisfaction with the pharmacist; 2) satisfaction with the pharmacy; and 3) satisfaction with the pharmacy experience.

The survey was pretested among faculty and graduate students (n=5) trained in survey design, and with professionals not in health care (n=5) to evaluate the clarity and wording of the survey.

The ROPES was mailed to the managed care members who had purchased a prescription drug within the previous three months. A minimum sample size of 481 was needed for $\alpha = 0.05$ and power of 90% for the statistical analysis.¹⁰ A mailing list of randomly selected members of the MCO was

Figure 1. Sample Questions Assessing Level of Being Bothered With Specific Service Attributes

Aspects of Pharmacy Service	Not at All Bothered	A Little Bit Bothered	Somewhat Bothered	Quite a Bit Bothered	Extremely Bothered	Not Applicable
A. Wait time (ready when promised)	☐	☐	☐	☐	☐	☐
B. Directions on label (clarity of directions on label)	☐	☐	☐	☐	☐	☐
C. Communication of generic medication use (pharmacist informed you that a generic medication was used in place of the prescribed brand name medication)	☐	☐	☐	☐	☐	☐
D. Personality of pharmacist (politeness, helpfulness, etc.	☐	☐	☐	☐	☐	☐
E. Accessibility of the pharmacist to discuss your prescription medication (in person or by phone during regular hours)	☐	☐	☐	☐	☐	☐

compiled from 4,800 consumers who had utilized the prescription drug benefit within three months of the survey. After excluding those consumers who were younger than 18 years of age, the list was reduced to 3,942. A second survey was not mailed to the nonrespondents and financial incentives to respond were not offered because of budgetary limitations. We decided to over-sample, anticipating a low response rate.

DATA ANALYSIS

The data were analyzed in three steps. First, the service attributes were reduced using principle component analysis with VARIMAX rotation to identify common service domains or dimensions. Service attributes which loaded highly (eigen value greater than 1.0 with items greater than 0.70 factor loading) defined the service domain. Cronbach's Coefficient Alpha was used to assess the reliability of the service domain measures. The service attributes which did not load on any of the factors were treated as separate independent variables in the regression analysis.

Convergent validity was tested by comparing the service attribute values to the respondents' report of wait time and whether the prescription drug was appropriately prepared. The respondents were asked how long they waited beyond the promised time. This was expected to correlate with the wait time item in the section which assessed the level of being bothered. In addition to wait time, the survey asked consumers if their prescriptions were prepared properly. The question read, "Was the last prescription you picked up from your pharmacy prepared properly (the correct product, quantity, instructions on the label, etc.)?" This was evaluated as Yes/

No/Don't Know. A strong correlation between pharmacist performance and a properly prepared prescription was expected.

The ROPES Score

To facilitate interpretation of the results from the bothered scales, a ROPES Score was calculated, ranging from zero (worst possible score) to 100 (best possible score). The zero-to-four bothered value was recalculated to a zero-to-100 scale using: $(4 - \text{bothered value}) \times 25 = \text{ROPES Score}$. A pharmacy manager could target the service attribute with the lowest score for service quality improvement.

The final step in the data analysis was to test the relationship between bothered and satisfaction. Regression analysis was used to identify the service attributes or domains which significantly explain patient satisfaction. The ROPES Score, rather than the bothered values, were used for the service domains. Recall that a high ROPES Score reflects good performance and a low ROPES Score reflects poor performance. Therefore, a positive relationship between satisfaction and the ROPES Score is expected.

RESULTS

Phases I and II were conducted to identify service items to include in ROPES. The results of the consumer interviews (nominal group sessions and in-depth telephone interviews) and pharmacy provider responses are summarized in Table 1. Each of the service attributes was categorized into one of the following: 1) prescription product; 2) pharmacist; 3) pharmacy environment; and 4) management and general business. These categories were chosen to simplify the presentation of

Table 2. Comparison of Early and Late Respondents

	Early Respondent (n=40)	Late Respondents (n=38)	Other Respondents (n=769)	Total (n=847)
Sex				
Male	27.5%	34.2%	28.8%	28.9%
Female	47.5	65.8	70.2	68.7
Missing	25.0	00.0	1.0	1.7
Education				
Grade School	2.5	2.6	0.7	0.8
Some High School	10.0	2.6	3.6	3.9
High School Graduate	10.0	21.1	23.0	22.3
Technical School	7.5	5.3	5.2	5.3
Some College Education	12.5	31.6	32.4	31.4
College Education*	35.0	31.6	33.8	33.8
Missing	22.5	5.3	1.3	2.2
Age	42.4 (27.2)	47.7 (11.7)	46.8 (11.7)	46.6 (14.8)
Performance Score				
Pharmacist Dimension	86.3 (32.0)	92.6 (13.9)	91.4 (21.1)	92.3 (18.8)
Problem-Solving Dimension*	68.0 (40.0)	86.4 (27.5)	85.2 (27.2)	84.6 (27.9)
Access Dimension*	95.0 (9.0)	69.9 (38.6)	79.6 (27.9)	79.7 (28.3)
Written Drug Information	94.0 (22.0)	93.8 (19.5)	96.0 (14.4)	95.8 (15.0)

*Significant difference between late and early respondents at p , or = 0.10.

the results. The factor analysis results presented later will provide a different classification based on statistical analysis. The number of members who placed the particular service characteristic in the top five during the nominal group meetings is reported in column two, with the number of telephone interviews who mentioned the particular service characteristic reported in the parentheses.

Pharmacy providers' responses appear in the third column. These providers represented chain pharmacy operations and staff model HMO pharmacy. Of 30 total items, 19 were selected for the statements which assessed the level of being bothered with the pharmacy experience. There were six nonactionable items or items for which consensus was not reached (items 1f, 1g, 2c, 3a, 3b). These items were not included in the survey instrument. The wait time items were consolidated to reflect wait time beyond the promised time. Finally, questions about stock-out (Did the pharmacy have the medicine?) and the appropriateness of the prescription (Was the prescription prepared appropriately according to the patient's perception?) were not evaluated using the bothered scale, but as Yes/No responses.

The final survey instrument consisted of 19 service attributes. Each attribute was evaluated by the consumer on the bothered scale described earlier. Figure 1 provides sample questions about the service attributes.

The response rate for the survey was 22.4%, with 3,942 surveys mailed, 265 returned as undeliverable, and 847

completed. The number of respondents exceeded the minimum required sample. Early respondents and late respondents were compared to assess for nonresponse bias. The assumption is that the late respondents are similar to the nonrespondents. There was a six-week time span between the early and late respondents. Table 2 compares the early (n=40) and late respondents (n=38). A greater proportion of the early respondents had less formal education than the rest of the respondents. Also, the early respondents scored the problem-solving dimension of the pharmacy service lower than the other respondents and scored the access dimension higher than the other respondents. However, the demographics and ROPES scores were not significantly different between the late respondents and the other respondents (those not in the early or in the late group).

The bothered scores for each service attribute are listed in Table 3. There were three aspects of pharmacy services which appeared to be more bothersome to the consumers than the other service attributes. These included: 1) wait time; 2) the availability of after-hours drug information; and 3) restrictions in selecting a pharmacy. The wait time was the service attribute which received the highest bothered score (most bothered the patients). It is important to note that the total wait time was not assessed. Wait time in ROPES reflects a delay in service delivery beyond the promised time. For example, if a consumer was told his or her prescription would be ready if a refill was called in 24 hours in advance but was not ready when

Table 3. Consumer Response to Pharmacy Service Attributes Using "Bothered" Scales* (n=847)

Service Attribute	Mean (Standard Deviation)	Percent of Respondents Choosing "Not Applicable"
Directions on label	1.10 (0.48)	5.4
Quality of written information	1.17 (0.64)	11.7
Availability of written information	1.20 (0.68)	10.8
Pharmacy department location	1.20 (0.69)	7.9
Pharmacist's skill in identifying problems	1.27 (0.81)	30.3
Quality of pharmacist consultation	1.30 (0.80)	17.6
Availability of assistance with nonprescription medication	1.37 (0.92)	31.1
Personality of pharmacist	1.38 (0.89)	7.3
Pharmacy store/clinic location	1.39 (0.92)	5.6
Access to pharmacist for consultation	1.39 (0.94)	11.2
Pharmacist's willingness to solve problems	1.39 (0.99)	32.6
Pharmacy hours	1.41 (0.91)	8.2
Communication of generic drug	1.45 (1.06)	25.9
Response to complaints	1.58 (1.13)	37.4
Amount of time to respond to complaints	1.64 (1.19)	33.6
Wait time	1.92 (1.31)	6.7
Availability of home delivery	1.74 (1.35)	66.1
Availability of after-hour drug information	2.07 (1.43)	57.0
Restriction in selecting pharmacy of choice	2.09 (1.50)	13.1

*Bothered Scale: 1=Not at All Bothered; 2=A Little Bit Bothered; 3=Somewhat Bothered; 4=Quite a Bit Bothered; 5= Extremely Bothered.

promised, this would be a delay in service delivery. Availability of after-hours drug information was another bothersome issue to consumers, particularly those with questions or medicine needs after hours.

Restricted choice of pharmacies was the third most bothersome service attribute. The respondents rated this item the highest on the bothered scale with 87% responding to this item.

The survey instrument included the Not Applicable option for the respondents. There were two items which were not applicable to more than 50% of the respondents: availability of home delivery, and availability of after-hours drug information. Consumers with household income of greater than \$30,000 indicated that availability of home delivery and after-hours drug information was not applicable to them. There was no significant relationship between age, gender, or education level and the applicability of home delivery and the availability of after-hours drug information to the respondents.

Factor analysis was used to identify pharmacy service domains. The pharmacy service attributes were divided into four different domains: pharmacist, problem solving, access to pharmacy, and written information. These service domains and their corresponding service attributes are listed in Table 4.

The reliability of the instrument for measuring the four dimensions of pharmacy service also is detailed in Table 4. Cronbachs' Alphas for four service domains were greater than

0.70. Thus, the service quality measures are considered reliable.¹² Although wait time loaded on the problem-solving dimension, we decided to keep it as a separate variable, because wait time is a commonly used service quality measure. Also, Cronbach's Alpha improved from 0.889 to 0.915 by eliminating wait time from the problem-solving score.

The bold numbers are the mean ROPES Scores for each of the service domains. As stated earlier in the methods section, a high value for performance indicates fewer bothered patients than a lower performance score. Table 5 lists these measures. Problem-solving and access-service domains offer pharmacy managers the greatest opportunity for improving service quality. Pharmacy patients were bothered most by how pharmacies address complaints and with the availability of after-hours drug information, convenient hours, and home delivery.

Other quality measures were included in the survey instrument in addition to the bothered questions. These included actual wait times beyond the promised time and the appropriate preparation of the prescription. This step was taken to validate the other measures in the instrument. First, the bothered-with-wait-time variables were correlated with the actual time the consumers had to wait (see Figure 2). The respondents had six choices: 1) prescription was ready when promised; 2) less than five minutes; 3) from five to 15 minutes; 4) from 16 to 30 minutes; 5) from 31 to 60 minutes; and 6) more than 60

Table 4. Pharmacy Service Domains With Factor Loading and Cronbach's Alpha

Service Domain/Attributes	Factor Loading	Communality	Item-to-Total Correlation	Coefficient Alpha
PHARMACIST				0.940
Access to pharmacist for consultation	0.845	0.726	0.815	
Quality of pharmacist consultation	0.886	0.773	0.852	
Willingness of pharmacist to solve problem	0.893	0.778	0.858	
Pharmacist's skill in identifying problems	0.825	0.722	0.794	
Availability of assistance with OTC drugs	0.827	0.658	0.799	
Personality of pharmacist (friendliness, helpfulness, etc.)	0.828	0.665	0.802	
Total for PHARMACIST	4.621 (eigenvalue)	0.770 (Total variance explained)		0.911
PROBLEM-SOLVING			0.837	
Time to respond to problem	0.915	0.836	0.837	
Response to the problem	0.915	0.836		0.819
Total for PROBLEM-SOLVING	1.837 (eigenvalue)	0.992 (Total variance explained)	0.699	
ACCESS			0.690	
Availability of after-hour drug information	0.814	0.664	0.634	
Availability of home delivery	0.798	0.637		0.928
Pharmacy hours	0.714	0.510	0.866	
Total for ACCESS	2.202 (eigenvalue)	0.734 (Total variance explained)	0.866	
WRITTEN INFORMATION				
Availability of drug information leaflets	0.930	0.865		
Quality of the drug information leaflets	0.930	0.865		
Total	1.866 (eigenvalue)	0.933 (Total variance explained)		

Table 5. Performance Scores for Pharmacist, Problem-Solving, Access and Written Information Domains of Pharmaceutical Services

Pharmacy Dimension/Service Attributes	Scores (means, s.d.)
Pharmacist	92.3 (18.8)
Personality of pharmacist	90.5 (22.4)
Access to pharmacist for consultation	90.3 (23.4)
Quality of pharmacist consultation	92.5 (20.1)
Availability of assistance with OTC meds	90.9 (23.0)
Willingness of pharmacist to solve problem with prescription	90.3 (24.7)
Skill of pharmacist in identifying problem with prescription	93.2 (20.2)
Problem-Solving	84.6 (27.9)
Amount of time to respond to complaints	84.0 (29.8)
Response to complaints or problems	85.4 (28.2)
Access	79.7 (28.3)
Availability of after-hour drug information	73.1 (35.7)
Availability of home delivery	81.3 (33.9)
Pharmacy hours	89.7 (22.6)
Written Information	95.8 (15.0)
Availability of drug information leaflets	95.1 (17.0)
Quality of drug information leaflets	95.7 (15.9)

minutes. The analysis of variance found a significant relationship between the two measures of wait time. Furthermore, the largest bothered scores existed for the consumers who waited more than 15 minutes beyond the promised delivery time. Consumers who waited from five to 15 minutes had bothered scores with wait time of 2.42, while those who waited 16 to 30 minutes beyond the promised time scored 3.63 on the bothered scale. This demonstrates that the wait time measured on the bothered scale has convergent validity.

Pharmacist service and problem-solving measures were compared with a variable which asked consumers if their prescriptions were prepared properly (see Figures 3 and 4). The survey defined "properly" very broadly to mean correct name on prescription, correct instructions, correct medicine, and correct quantity. This item was measured as a discrete variable with Properly Prepared, Not Properly Prepared, and Do Not Know as the three options. Consumer evaluations of pharmacist performance and problem-solving performance were expected to highly correlate with the appropriateness

Table 6. Regression Analysis of Pharmacist Performance, Problem-Solving, Access, Drug Information, and Wait Time With Satisfaction

Independent Variables	Satisfaction With the Pharmacist	Satisfaction With the Pharmacy	Satisfaction With the Experience
Pharmacist Score (Beta)	0.64	0.52	0.33
Problem-Solving Score (Beta)*	n.s.	n.s.	n.s.
Access Score (Beta)	n.s.	0.18	0.16
Drug Information Score (Beta)	n.s.	n.s.	n.s.
Wait Time (Bother Measure) (Beta)	-0.28	-0.35	-0.383
Adjusted R ²	0.49	0.54	0.51

*Problem solving was a significant predictor of consumer bothered with restricted choice of pharmacies.

of how the prescription was prepared. Those consumers who felt their prescription was not prepared properly gave the pharmacist a score of 73, while those who felt the prescription was prepared properly gave the pharmacist a score of 94. Those who felt their prescriptions were not prepared properly rated problem-solving performance as 55. Both the pharmacist and the problem-solving scores were significantly correlated with whether the consumer felt the prescription was prepared properly. Thus, convergent validity was established for the pharmacist and problem-solving constructs.

Regression analysis tested the pharmacy scores in their ability to predict consumer satisfaction. Satisfaction with the pharmacist, pharmacy, and the specific experience were tested as dependent variables in the regression models. The results of the three multiple regression models are listed in Table 6.

There was some multicollinearity among the independent variables. Multicollinearity diagnostics indicated there were seven factors with 6.75 as the greatest eigenvalue and 0.00869 as the smallest eigenvalue. The formula, $k = (\text{largest eigenvalue} / \text{smallest eigenvalue})^{1/2}$ was used to assess the degree of multicollinearity. A k value of greater than 30 indicates the existence of multicollinearity.¹¹ The k for the regression equations was 27.9. Closer examination of the correlation between independent variables indicated that the pharmacist variable was correlated with written information and problem-solving variables, with correlation coefficients of 0.79 and 0.66, respectively. Correlation is expected between the pharmacist and other variables which describe the service encounter, because the pharmacist is an integral part of the service. Eliminating one of the variables from the equation would have reduced the usefulness of the model. Thus, the variables were included in the regression models. The Durbin-Watson Statistic indicated no heteroscedasticity.

Patient satisfaction was regressed on the performance scores (calculated from the bothered values) and the wait time (bothered value). Recall the performance score for each domain is the mean of the individual service attributes for that domain. An increase in the performance scores is expected to increase member satisfaction. The wait-time bothered value remained in its original form (0=Not At All Bothered to 4=Extremely Bothered). The results show that satisfaction will decrease as members become more bothered with wait time. Patient satis-

faction with the pharmacist and pharmacy as well as the patient's experience at the pharmacy are likely to be influenced by the pharmacist's performance, wait time, and access to pharmacy services (pharmacy and experience satisfaction only). Thus, drivers of satisfaction are the pharmacist, wait time, and access.

DISCUSSION

The ROPES was designed to provide pharmacy managers information about service quality from their patients' perspective. The unique feature of ROPES from other patient satisfaction surveys is the scale used to measure quality. Pharmacy patrons were asked to rate their level of being bothered with any aspects of the pharmacy service. These bothered ratings were later converted to a ROPES Score, ranging from zero (greatest degree of bothered with all of the service attributes) to 100 (not at all bothered with any of the service attributes). Pharmacy managers can compare the service attributes using the ROPES Score to identify opportunities for quality improvement. For example, the respondents to our survey gave pharmacists a ROPES Score of 92.3 and Access Score of 79.7.

Figure 2. Consumer Reported Wait Time Compared With Affective Evaluation of Wait Time

Figure 3. Pharmacist Score Compared With Patient Perceived Appropriateness of Product

Therefore, pharmacy managers should target access issues for service quality improvement.

Patient satisfaction is reflected in the ROPES Scores for pharmacists, access, and wait time (bothered rating). Pharmacists, access, and wait time are important variables for patient satisfaction—the value drivers for service quality. Therefore, pharmacy managers who wish to improve patient satisfaction should target these components of service delivery. Low ROPES Scores for pharmacists, access, and wait time are likely to reduce patient satisfaction. Also, low ROPES Scores for problem solving and drug information should not be ignored, even though these variables were not significant in the patient satisfaction equation. Managed care members who participated in the telephone interviews and nominal group sessions identified these domains as important components of pharmacy services. Therefore, a low ROPES Score for problem solving should be considered important. One pharmacy manager commented during Phase II that complaint handling is important not only to improving patient satisfaction, but also preventing potential litigation. From a service-quality perspective, complaint handling should be examined closely, not only for improving patient satisfaction, but also to identify system problems in delivering pharmacy services.

Figure 4. Problem-Solving Score Compared With Patient Perceived Quality of Product

LIMITATIONS

This study has two limitations which should be addressed. First, the response rate is 22.4%. Although our sample size was appropriate for the statistical analysis, potential nonresponse bias exists. Our analysis indicated no difference between early and late respondents, except with problem-solving score. The early respondents rated the pharmacy lower on the problem-solving score than the late respondents. These respondents could have had complaints which were left unresolved at the pharmacy and thus were able to partially remedy their complaint by responding to the survey.

Second, ROPES should be further refined and tested to improve the response rate. This was the first study to design a survey instrument for customer satisfaction by asking the patient if they were bothered with the specific service attributes. The ROPES Score is designed to pinpoint areas for quality improvement based on patients' level of being bothered with specific aspects of pharmacy services.

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