

Information Needs in Primary Care: A Survey of Rural and Nonrural Primary Care Physicians

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Abstract:

Objective: To compare the self-reported information needs of rural and nonrural primary care physicians.

Design & Participants: Mail survey of active non-academic primary care physicians.

Data Collection: A 60 item questionnaire regarding 1) demographic and practice setting data; 2) medical information needs; 3) medical knowledge resource availability and use; and 4) physician information seeking behavior.

Main Results: The response rate was higher among rural than non-rural physicians (55% vs. 42%, $p < 0.001$) and among Family Physicians than others (Family Medicine 53%, Internal Medicine 43%, Pediatrics 48%, $p = 0.015$.) Rural physicians reported working more hours per week (45.3 vs. 42.7, $p = 0.033$.) and seeing more patients per day (24.6 vs. 22.3, $p = 0.005$) than their nonrural counterparts.

Both groups reported a median of about 1 question for every 10 patients they see, with great variance among responses. Both groups reported pursuing answers to about 57% of their questions, and finding answers to about 70% of those they pursue.

Knowledge resource preferences of the two groups were similar. Both groups reported frequent use of consultants, drug compendia, colleagues, and textbooks, and little use of library- or computer-based sources. Compared to nonrural physicians, rural physicians reported less frequent use of consultants, colleagues, librarians, and bound journals. These differences were small, and paralleled differences in availability. The two groups had equal access to textbooks and drug compendia, but for rural physicians, other resources were locally available significantly less often.

Conclusions: Rural and nonrural primary care physicians reported equal information needs, similar information seeking, and similar resource preferences. Rural physicians reported less access to some information resources, but little difference in use of resources. Further studies are needed to determine how these differences impact rural practitioners and their patients.

Keywords:

Information Services; Information Needs; Rural Health Services; Primary Health Care; Physicians, Family.

Introduction

The twin problems of biomedical information overload and inadequate access to information are familiar to every practicing physician. On the one hand, it is impossible for any clinician to keep up with the rapidly expanding biomedical literature. As Lundberg noted, a physician who reads two articles each day will, after one year, be sixty centuries behind (1). In spite of this abundance of information, significant delays have been documented between publication of important new research findings and their incorporation into practice.

These problems of information management may be especially acute among primary care physicians, for whom the domain of practice is most broad; and in particular for those practicing in rural areas, for whom geographic isolation may further limit access to information. Advances in information technology have held the promise of improving the dissemination of new medical knowledge to practicing physicians, yet to date, these systems have not achieved widespread use.

While efforts to improve information access have often focused on rural primary care physicians, little is known about whether and how their information needs actually differ from those of physicians practicing in nonrural areas, or the extent to which limited access to information resources impacts information seeking. We conducted a mail survey to assess the information needs, information seeking, and information resource preferences of rural primary care physicians, and to compare them to those of their nonrural counterparts.

Methods

Design

This mail survey compared responses of rural and nonrural primary care physicians.

Subjects

Using a database of approximately 6,000 licensed physicians, we selected those listing Family Practice, General Practice, Internal Medicine, or Pediatrics as their specialty. Academic physicians (those listing a practice address at the single medical school in the state) and those with out-of-state addresses were excluded. Using the state

Office of Rural Health definition of rural: “more than ten miles from a population center of 30,000 or more,” physicians were classified as practicing in a rural or nonrural location. We chose the term “nonrural” to avoid confusion with other definitions, such as “urban” and “metropolitan”. Five hundred of the 680 rural physicians and 500 of the 1852 nonrural physicians were selected at random. Physicians were excluded if inactive (retired or less than 50% of professional time in patient care) or practicing another specialty (more than 50% of patient care time providing specialty care, regardless of whether formally trained or certified.)

Definition of Terms

For purposes of this study, *patient data* refers to information about a specific patient and *medical knowledge* refers to facts generalizable to other patients (2). *Information gathering*, or “keeping up with the literature,” is distinguished from *information seeking*, which is activity undertaken to satisfy a perceived need (3).

Measurements

A three-part questionnaire was pilot-tested among a small sample of primary care physicians. Part one covered demographic and practice setting data including age, gender, specialty, practice experience, clinical and other activities, the number and specialty of clinicians present in the same office, and the distance to local and referral hospitals. Part two covered availability of knowledge resources and frequency of their use, including textbooks; clinical manuals such as the *Manual of Medical Therapeutics*; drug compendia; personal reprint files, colleagues (in the same specialty); consultants (in another specialty); non-physician sources of information such as pharmacists; computer literature search capability; and library-based resources including bound journals, *Index Medicus*, and reference librarians. Part three covered physicians’ estimates of the number of questions arising during practice per patient seen, the proportion of these questions that they pursue, the proportion for which they are able to find answers, the time expended pursuing their questions, the number of knowledge resources consulted, and their estimate of the impact, if any, on the patient. Physicians were contacted by postcard and later by telephone to remind them to return the questionnaire.

Data Analysis

All data were entered into a microcomputer database and their accuracy verified. Responses of Family Physicians and General Practitioners were combined. Descriptive and comparative statistics were calculated using *JMP* software (SAS Institute, Cary, North Carolina, USA.) Student’s *t*-test was used to test the significance of differences between rural and nonrural respondents for normally distributed interval data, the Kruskal-Wallis test was used for data with a non-normal distribution, and contingency table analysis using Pearson’s chi-square test was used for comparisons of categorical data.

Table 1. Respondents Compared to Target Population

	population		sample		respondents	
Rural/nonrural	R	NR	R	NR	R	NR
number	680	1852	500	500	276	210
mean age	47.8	46.5	47.5	46.9	47.3	47.4
% women	12	19	12.6	20	11	22
Family Pract.	65	34	66	36	70	37
Internal Med.	27	49	26	46	20	48
Pediatrics	8	17	8	17	10	15

Results

Demographics

Of 1000 physicians, 486 responded. Table 1 compares the demographic characteristics of the target population with those of the study sample and the survey respondents. Respondents’ age and gender were similar to those of the target population. The response rate was significantly higher for rural physicians (55.0% vs. 41.9%, $p < 0.001$), and among Family Physicians compared to other primary care specialties (FP 52.6%, IM 42.7%, PD 47.5%, $p = 0.015$). Of the respondents, 110 were excluded because they were not in active practice, they practiced a different specialty, or because of incomplete data. Results refer to the remaining 376 respondents.

Table 2. Activity and Practice Setting Data

		R	NR	P
Experience	years since graduation	18.4	18.1	NS
	years in current setting	12.3	11.1	NS
Professional Activity	professional hours/week	45.3	42.7	0.03
	patients seen per day	24.6	22.3	0.005
	FP	25.4	23.3	NS
	IM	20.7	19.1	NS
	PD	27.2	28.1	NS
Non-clinical activities (% reporting)	teaching	23.3	34.8	0.0175
	research	6.2	5.6	NS
	publications	7.5	9.9	NS
	administration	36.6	43.3	NS
Clinicians present in same office (% reporting)	more than 20	0	16	<0.001 *
	11 to 20	5	6	
	6 to 10	17	22	
	2 to 5	49	43	
	1	29	15	

* *p* for the Kruskal-Wallis rank-sum test for all groups.

Practitioners and Practice Settings

We included questions about practice setting to identify differences in these factors between rural and nonrural primary care physicians which might affect their information management. Table 2 compares the characteristics of the rural and nonrural physicians and their practices. The two groups had equal practice experience, on average 12 years in their current setting, and 18 years since graduation from medical school. Rural physicians reported being busier, working 45.3 hours per week, compared to 42.7 hours per week for nonrural physicians ($p = 0.03$.) Although rural physicians reported seeing more patients per day than nonrural physicians, the difference was not significant within each specialty. Fewer rural than nonrural physicians reported any teaching activity (23.3% v 34.8% respectively, $p = 0.0175$.) but they reported medical research, publications, and administrative activity with equally low frequency. Nonrural physicians more often practiced in offices with 20 or more practitioners, while rural physicians were twice as likely to be in solo practice. On the other hand, most physicians, about 71% of both groups, practice in a setting with at least one other practitioner to whom they might turn for information when needed.

Table 3. Reported Information Need and Information Seeking of Primary Care Physicians

		rural	nonrural	p
Information Need, (questions per patient seen)	mean	0.52	0.5	NS
	10 th pctl	0.05	0.04	
	25 th pctl	0.07	0.07	
	median	0.1	0.2	
	75 th pctl	0.5	0.78	
	90 th pctl	1	1.3	
Information Seeking	questions pursued, %	56.8	58.4	NS
	questions answered, %	68.3	71.4	NS
	sources consulted, n	2	2	NS
	time spent, minutes	12.6	11.8	NS
	impact on patient, %	46	48.3	NS

Information Resources

Subjects were asked to indicate the nearest available location of each information source: in the office, in town (at home or at the hospital,) and out of town. General textbooks, specialty textbooks, and drug compendia such as

the *Physicians Desk Reference* or *Facts and Comparisons*, were available in the almost all physician's offices, whether rural or nonrural. All other resources were significantly less available to nonrural physicians. Figure 1 presents the information resource preferences of rural and nonrural physicians, in terms of relative frequency of reported use of each resource, indexed to the most used source. Overall, rural and nonrural physicians reported very similar patterns of use. Small but statistically significant differences were found for consultants, colleagues, and non-physician sources, consistent with differences in their availability.

Information Needs

There was no difference in reported information need between rural and nonrural primary care physicians. The median reported information need, estimated as the number of questions arising per patient seen in the office, was about one question for every ten patients seen. The mean estimate was 0.51 ± 0.13 , or about one question for every two patients. Neither was there a difference in reported information seeking between rural and nonrural primary care physicians, both groups reporting that they pursue about 57% of their questions and find the answer to 70% of those they pursue. Once they choose to pursue a question, both groups estimated spending an average of 12 minutes to find an answer, consulting an average of two information sources. Finally, both rural and nonrural primary care physicians estimated that finding the answer to a clinical question has an impact on patient care about 47% of the time.

Discussion

There are two main findings of this study. First, rural primary care physicians do in fact report significantly less access than nonrural physicians to nearly all sources of medical information which might be used to answer questions about patient care. Second, despite differences in practice settings and availability of information resources, rural primary care physicians appear to be no different from nonrural physicians in their self-reported information need, information seeking behavior, or information resource preferences. As would be expected, rural primary care physicians reported greater geographic and professional isolation, practicing twice as often in a solo setting, and on average much farther from a referral hospital where specialty consultation and sophisticated information resources might be available. While they were equally likely to have most text sources in their offices, such as textbooks and drug compendia, they were significantly less likely to have immediate access to human sources of information, including colleagues, consultants, and non-physicians sources such as pharmacists. More striking was the finding that although similar small percentages of both groups had the less frequently used resources on hand in their offices, 34% had no bound journals and 80% had no medical librarian available to them anywhere else in town.

Though small statistically significant differences were found in frequency of use of colleagues and consultants, rural and nonrural primary care physicians in this study reported the same overall pattern of information resource

preferences, regardless of physical separation. For human sources, differences in physical location did not appear to translate into important differences in frequency of use, in part because of the strong preference for human sources of information, and in part because availability by telephone tended to equalize access, regardless of physical distance. Many studies have documented the preference for human information sources in meeting information needs, in health care and in other domains, including dentists (4), nurses (5), physicians (2, 6), business computer users (7) and engineers (8). The limitations of access found in this study appear to be largely overcome by the strength of this preference.

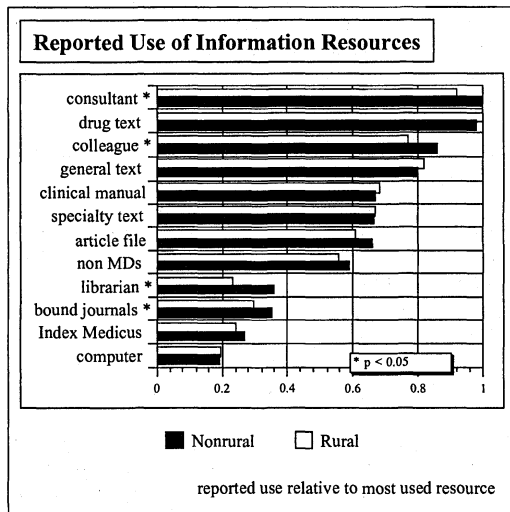


Figure 1. Preference for Information Resources
(Indexed to the resource reported to be most used)

Small statistically significant differences were also found in the reported use of bound journals and librarians, but these differences had little impact on the overall pattern of resource use, and were much less pronounced than the differences in their availability. Library resources and computer resources were the least frequently used sources for all primary care physicians, whether in rural or nonrural settings. Again, the preference for texts on hand in the office and human sources whether in person or by telephone appears to have a greater impact on reported use than availability. It remains to be seen whether making these sources of information more available or accessible to primary care physicians in either setting would have a substantial impact on their information needs or their information seeking behavior.

In contrast to the results reported here, earlier studies reported differences in information resource preferences between rural and nonrural physicians. Stinson and Mueller reported that urban physicians relied more heavily on colleagues to answer their questions, while rural physicians made greater use of the literature (9). In contrast, Moore-West et al reported that urban physicians prefer books while those from smaller communities preferred colleagues (10).

We found that although small differences in use of colleagues and consultants were reported by respondents, the overall pattern of information resource preferences was very similar regardless of practice location. This preference pattern is similar to that reported elsewhere for primary care physicians in Minnesota (2) and Sweden (11).

It is likely that the two aspects of the methods in this study contribute to differences from previous reports. First, all information sources were compared using a common scale, allowing more direct comparison than in other studies which grouped information sources in varying ways and asked about them separately. Second, the present study was confined to the domain of *information seeking* (to the exclusion of *information gathering*) and the domain of *medical knowledge* (to the exclusion of *patient data*.) Preferred sources for information gathering, such as continuing medical education or non-directed reading of professional journals were not included or compared.

Similarly, other studies of physician information need have reported widely varying estimates of its magnitude, in part because of differences in setting, definitions, and methods. Previous studies have included academic physicians, physicians-in-training, and subspecialists, who may have very different information needs, both qualitatively and quantitatively (12). These groups were explicitly excluded from this study. Furthermore, earlier studies have not consistently distinguished between patient data needs and medical knowledge needs, which present different sets of problems requiring different methods of study (see (13).

Limitations

One potential limitation of this survey is its generalizability. Though the response rate of 48.6% is acceptable for mail surveys of professionals (14) it remains true that fully half the population of interest did not respond to the survey. Although the age and gender of the respondents was the same as those of the target population, rural physicians and Family Practitioners were over-represented among the respondents, and one can only speculate whether the information needs and information seeking of nonrespondents is different in any important way from the data presented here. Furthermore, many rural communities in Oregon, and perhaps in other states, are too small to support a physician and depend on other professionals, notably nurse practitioners and physician assistants, to provide primary care (15). The information needs and information seeking of these primary care clinicians may be different from those of physicians, and were not addressed by this study.

Of greater concern is the potential bias introduced by the mail survey method. Covell, Uman and Manning compared responses of internists to a questionnaire with observations made during office-based interviews. In that study, physicians responding to a questionnaire substantially underestimated their information needs, overestimated their information seeking, and misperceived their information resource preferences. Physicians in their study reported greatest use of journals and textbooks, but direct observation showed greatest use of consultants and other health professionals. Although methodological problems

exist with that study, including different wording of the questions used in their questionnaire compared to those used in the personal interviews, no other information needs study has directly compared data from a mail survey with that obtained in personal interviews. Other reports of physician information resource preferences have reported patterns of use similar to those reported here (2, 11, 16).

Implications

A recent review of the effectiveness of continuing medical education (17) concludes that traditional classroom continuing medical education (information gathering) may have very limited effect on practice, and that, to be effective, CME must be based on adequate assessment of physicians' needs and involve practice-based strategies of communicating new information. This underscores the importance of focusing efforts to disseminate evidence on existing information seeking behavior motivated by the need to answer questions that arise in the course of routine primary care practice.

Conclusion

This study confirms the expectation that rural primary care physicians have significantly less access than nonrural physicians to most sources of medical knowledge which they might use to answer questions about optimal patient care. But, in spite of differences in their practice settings and substantial differences in the availability of information resources, rural primary care physicians appear to differ little from nonrural physicians in their self-reported information need, their information seeking behavior, or their information resource preferences. Rigorous studies are needed to determine whether increasing the availability of resources which are little used by either group will have an impact on physicians' information management, their clinical practices, or their patients' outcomes.

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