Total quality management (TQM) in a hospital library: identifying service benchmarks*

By Wenda Webster Fischer, M.S.L.S.
Director, Library/Media Services

Linda B. Reel, M.L.S.
Project Researcher, Library

Alliant Health System
P.O. Box 35070
Louisville, Kentucky 40232

Hospitals are turning to total quality management (TQM) to lower costs of providing care. A hospital library in a TQM environment needs to embrace corporate goals while maintaining its accountability as a contributor to quality patient care. Alliant Health System (AHS) Library at Norton Hospital and Kosair Children's Hospital in Louisville, Kentucky, conducted a study to establish TQM benchmarks and to examine the significance of its role in clinical care. Using a methodology designed to allow both library user and nonuser to respond, 2,091 surveys were distributed to physicians and nursing and allied health personnel. Areas surveyed included frequency of library use, impact of information received on clinical judgments, cognitive value of the information, and satisfaction with library products and services. Results confirm that the library has a substantial clinical role. Eighty-eight percent of reporting physicians agreed that information from the library contributed to higher quality care. Nursing and allied health were less convinced of the importance of the library's clinical role. Sixty-nine percent of nursing personnel and 58% of allied health personnel agreed that the library contributed to higher quality care. Nursing and allied health personnel also used the library less frequently than physicians. With these results as benchmarks, improving the clinical role of the library will take commitment to the TQM process and a willingness to change.

Total quality management (TQM) is an approach adopted by hospitals that are anxious to reduce operating expenses created by poor care and wish to provide high-quality care at competitive prices. TQM emphasizes both process and outcome and requires a dramatic shift in many established health care management values and concepts.

TQM is based on the following concepts:

- Change must be based on needs of the customer, not the values of the provider.
- Lack of achievement most likely is caused by system failure rather than by individual performance; therefore, problem solving focuses on the process and joint responsibility rather than on improving individual output.
- Decisions for improvement must come from providers of the service (product) rather than from top managerial authority.
- The emphasis must be on continuous improvement rather than on meeting a specific standard.

TQM calls for flexible planning and a climate of continuous change.

The conflict between these concepts and traditional professional autonomy and managerial authority is profound, and it may prove overwhelming for many innovative managers. However, the stakes are high. Industrial organizations that have adopted TQM reportedly have reduced operating expenses by 20% to 40%; "If health care organizations can do half as well,

* This study was supported by an Alliant Community Trust Grant from Alliant Health System.

quality improvement will have a major impact on the field" [1].

Alliant Health System (AHS), which includes three major hospitals in Louisville, Kentucky, is one of many health care systems seeking to monitor and improve the quality of care it provides. AHS has been using and refining its adaptation of TQM since 1986. The AHS Library, which serves two of the three hospitals, undertook a study to determine benchmarks for its present performance.

PURPOSE OF THE STUDY

Recognizing the importance of embracing the corporate quality management program, the AHS Library reviewed how other institutions have incorporated TQM [2–5]. It then undertook a study of customer use and opinion of library products and services, to establish benchmarks of its present performance. In an environment of continuous improvement, benchmarking is critical. The baseline data can be used as a basis of comparison for future improvement and permits comparison with the best of the competition.

The AHS Library chose to emphasize one of its primary missions: the provision of clinical information for the professional staffs of Norton Hospital and Kosair Children's Hospital. This type of activity and studies of how information is provided to medical professionals have been topics of recent interest for many hospital libraries. Several studies have focused on this area, but not all have used exactly the same methodology [6–9]. While this precluded exact comparisons, some indication of AHS's relative status could be derived.

METHODOLOGY

The library staff developed a questionnaire with the assistance of the AHS planning and marketing department. Other hospital library surveys were reviewed; some of their survey questions were incorporated, and others were included with revisions. Key topics included frequency of use of AHS Library services, other sources of information used, the impact of library information on clinical judgments, the cognitive value of the information, and customer satisfaction.

Although sampling physicians, the nursing staff, and allied health personnel was considered, the library staff decided that surveying the entire population was not only possible but also desirable as the most statistically reliable and valid approach. Consequently, the entire clinical staff was included. The physician population consisted of active staff, residents, and fellows. Nursing department personnel included registered nurses, licensed practical nurses, and nurses' aides. Allied health was defined as all personnel directly involved in patient care excluding physicians and nursing staff; this group included pharmacists, social workers, respiratory therapists, and laboratory technologists.

Of the 2,101 surveys distributed, 56% went to the nursing staff, 23% to allied health personnel, and 21% to physicians. All participants were accounted for by hospital job code number so that future surveys would duplicate exactly these groups of personnel. This was important in ensuring that future comparisons would be as valid as possible.

The packet of materials included a cover letter, the questionnaire, and a pre-addressed, prestamped return envelope. The cover letter explained the sponsorship and reason for the survey and was signed by the physician chairman of the hospitals' joint library committee. Included was an incentive in the form of a drawing for a $100.00 gift certificate for books. Participants were asked to return a coupon with their completed questionnaire; the winner later was drawn from all returned coupons (which used numbers rather than names to preserve anonymity).

The questionnaire consisted of 11 questions, most of which had between 6 and 9 parts. The document was printed to allow machine-readable tabulation.

The planning and marketing department received the completed surveys and reviewed them for usability, performed the machine tabulation, and compiled the results. This assistance allowed the library staff to maintain distance from the process, to ensure that participants remained anonymous. This division of labor also established the planning and marketing department as a key player in benchmarking products and services of other hospital departments.

RESULTS

Of the 2,101 surveys distributed, 543 usable surveys were returned. This 26% response rate qualified to represent the finite population of 2,101 medical professionals [10]. The Z-statistics were computed for a population and for a sample distribution of physician and nonphysician proportions. The Z-statistics (Z-score = 0.93 for the population and 0.93 for the sample distribution) validated the statistical equivalence of these compositions in the sample and population. Estimated margins of error for each subpopulation also were calculated. The computed error of estimation in the total sample of 543 respondents was 3.52% (with a finite population correction factor). This error margin was within the generally accepted 5% [11]. So the proportions could be generalized to the population of library users within a ±5% variation.

Respondents were asked to describe library use as constant (weekly or more), frequent (two or three times a month), occasional (once a month or less),

Table 1
Information source preference by professional affiliation

Rank of total sample	Information source	Total		Physician		Resident/fellow		Nurse		Allied health	
		Average score	No. of cases	Average score	No. of cases	Average score	No. of cases	Average score	No. of cases	Average score	No. of cases
1	Private library	3.29	506	2.07	85	2.42	36	3.53	215	3.80	170
2	AHS Library	3.50	502	2.73	81	2.60	35	3.78	212	3.70	174
3	Local colleague network	3.75	497	3.43	82	3.14	35	3.81	211	3.98	169
4	Have assistant do information gathering	4.21	485	3.85	79	4.15	33	4.26	207	4.33	166
5	University medical library	4.23	500	3.76	83	4.09	35	4.29	213	4.43	169
6	National colleague network	4.25	496	3.90	82	4.17	35	4.33	211	4.34	168
7	Hospital library other than AHS	4.50	492	4.27	82	4.35	34	4.56	209	4.57	167
8	Other	4.65	137	3.88	8	4.00	4	4.72	64	4.72	61
9	Search with own computer	4.71	500	4.64	83	4.69	36	4.80	213	4.63	168

Score scale: 1 = constant; 5 = never

seldom (a few times a year), or never. Overall library usage reflects some of the same patterns reported in other studies [12-15]. Physicians reported using the library more frequently than did nursing and allied health personnel. Eighty percent of the practicing physicians reported using the library either constantly, frequently, or occasionally, and 75% of the residents and fellows reported constant, frequent, or occasional use. By contrast, only 40% of allied health professionals and 39% of the nursing staff reported such usage.

The most conventional services and products listed were the most popular. All categories of users requested journal articles more frequently than any other product or service. Books were the next most heavily used product, again, by all categories of users. For practicing physicians, the third most popular service was MEDLINE† searches conducted by library staff. Residents and fellows preferred conducting their own MEDLINE searches on library equipment. Both allied health and nursing staffs chose audiovisual material as their third most popular service, with MEDLINE searches conducted by library staff ranked fourth.

Respondents did not like performing searches on their own equipment. When describing use of alternative information sources, residents, as well as physicians and nurses, ranked searching on their own computer last. For physicians, residents, fellows, and nurses, the most frequently used source of information was their own private library, followed by the AHS Library. Allied health users chose the AHS Library first, then their own libraries. The third most frequently used source for all users was the local network of professional colleagues. The complete set of data is presented in Table 1.

The survey relied on historical use of the library to evaluate the impact of information on clinical judgment. Physicians, residents, and fellows were asked how often information received through library services affected their judgments related to diagnosis, diagnostic tests, choice of drugs, choice of other therapy, and length of patient stay.

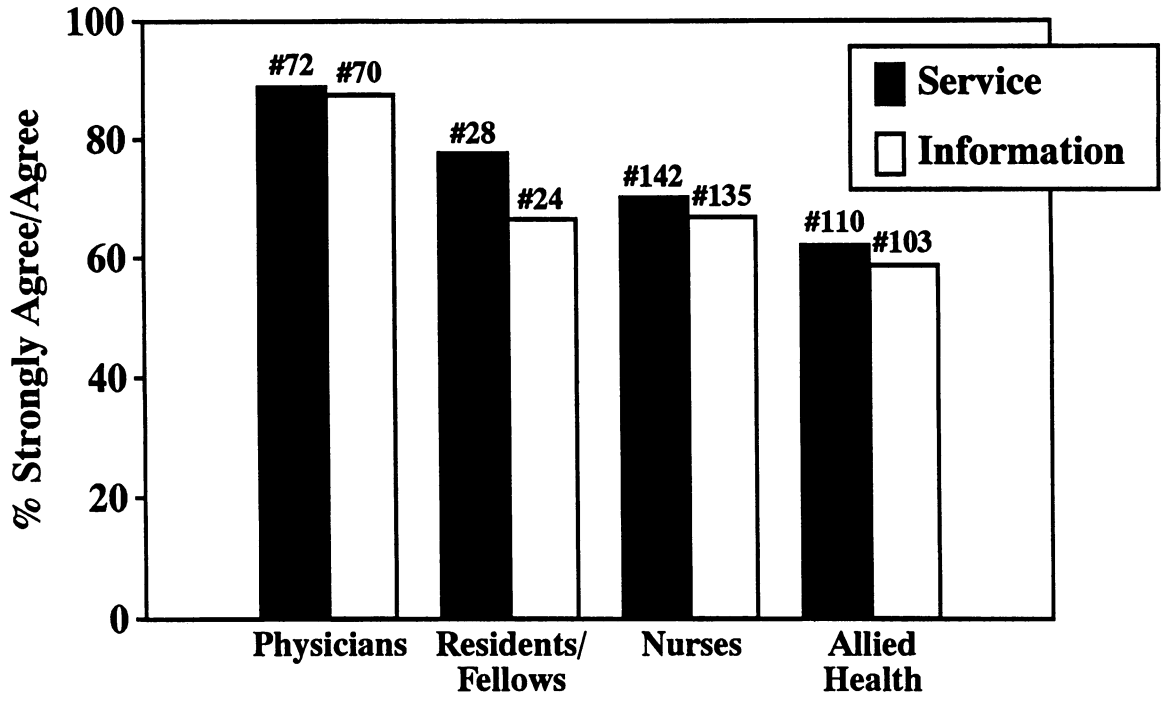
Over 50% of the practicing physicians reported that the information affected their clinical judgments relating to diagnosis, choice of drugs, and choice of

† MEDLINE is a registered trademark of the National Library of Medicine.

Table 2
Strongly agree and agree that information received from the library has clinical value

	Physician No. (%)	Resident No. (%)	Nurse No. (%)	Allied health No. (%)
Cognitive value				
Refreshes memory	72 (89%)	33 (92%)	138 (67%)	103 (62%)
Some new knowledge	58 (74%)	31 (89%)	138 (69%)	103 (62%)
Substantiates prior knowledge	42 (55%)	22 (67%)	105 (53%)	64 (40%)
Contribution to quality care				
Contributes to higher quality care	72 (88%)	30 (83%)	139 (69%)	96 (58%)
Contributes to better clinical decisions	66 (85%)	27 (79%)	131 (65%)	98 (60%)

Figure 1
Strongly agree/agree that library service and library information are excellent



other therapy. Forty-eight percent indicated that it affected choice of diagnostic tests. Residents and fellows gave similar responses; however, 63% reported an effect on choice of diagnostic tests, and 52% reported an effect on choice of other therapy. Both practicing physicians and residents/fellows reported a lesser impact on length of patient stay (17% and 15%, respectively).

Nursing and allied health providers were asked how often library information affected patient classification, patient assessment, research on diagnosis, provision of patient education, and development of new services. Both nursing and allied health personnel indicated that the information had the greatest effect on research for diagnosis and patient education and the least effect on patient classification.

Asked how library information made a difference in clinical decisions, practicing physicians and residents/fellows either strongly agreed or agreed that it contributed to higher quality care (88% and 83%, respectively). The information refreshed their memory (89% and 92%) and contained some knowledge that was new to them (74% and 89%). Although over half of nursing and allied health respondents also strongly agreed or agreed that information provided contributed to high-quality care, they were less convinced than the physicians (69% of nursing and 58% of allied health). This pattern held for providing new information (69% nursing and 62% allied health). These data are presented in Table 2.

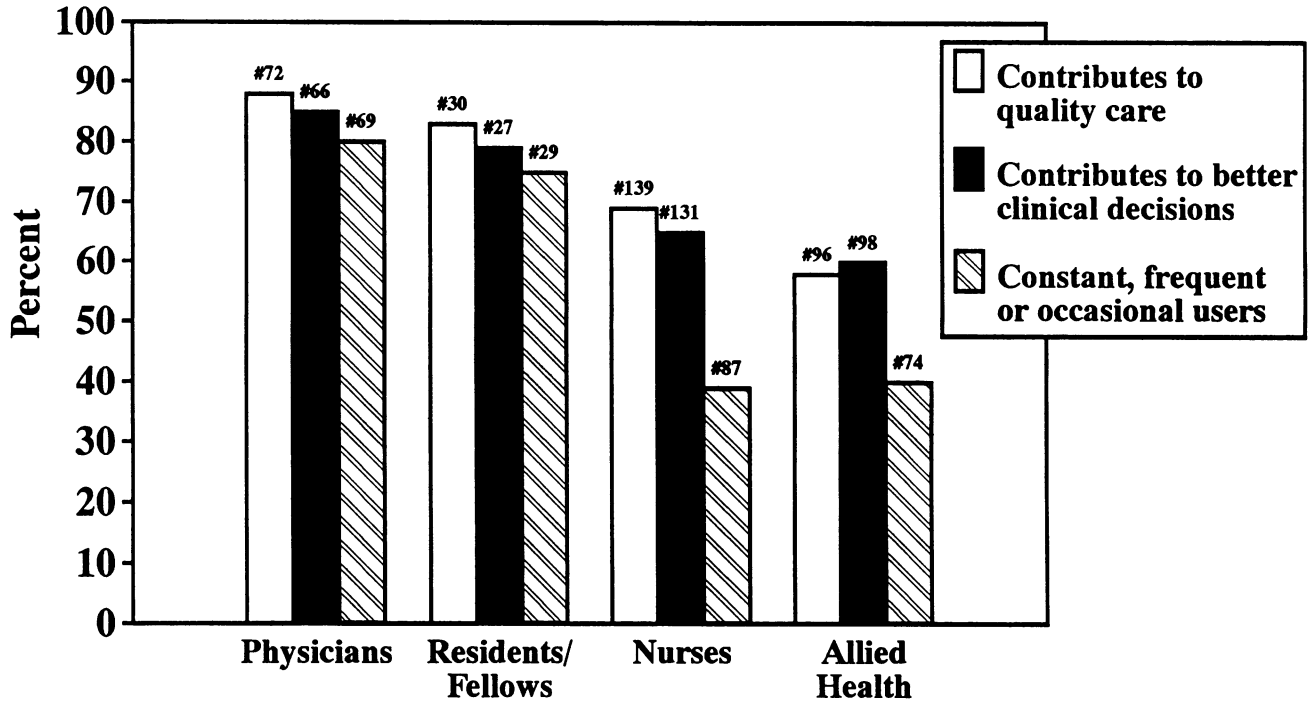
The library collection and library staff were the final areas evaluated. Question topics ranged from knowledge and cooperation of staff to convenience of location and hours. The responses regarding overall quality of service and information are detailed in Figure 1. The highest ratings for both staff and information came from practicing physicians.

DISCUSSION

One of the differences between this survey and previous customer surveys at AHS was the inclusion of the entire population of potential clinical users. This was important not only because it established statistical validity but also because it captured the responses of infrequent users and nonusers. Analysis of this full spectrum of data revealed that constant, frequent, or occasional users were more likely to believe the library made a positive contribution to quality care. Conversely, those who seldom or never used the library were more likely to have no opinion or a negative opinion of the library's contribution.

Furthermore, unlike the King study, which reported no correlation between frequency of library

Figure 2
Comparison of library usage and opinion of its contribution to quality care and better clinical decisions



use and perception of clinical value of library information [16], this study found a clear link. For example, compared to physicians, lower percentages of nursing and allied health personnel used the library frequently, and correspondingly, lower percentages found the information useful in making clinical judgments. In addition, a lower percentage of nursing and allied health personnel thought the library made a contribution to quality care (Figure 2).

From a traditional marketing point of view, these correlations suggest that the library needs to increase use of its resources to improve its image as a contributor to quality care and as a useful tool for making clinical judgments. But TQM calls for a more complex examination. Should library resources be used to increase library use by the health professional who derives limited clinical value? Is infrequent usage due to the library's failure to meet information needs? Or is it due to a diminished need for a variety of published information sources?

The answers to these questions may clash with the traditional views that a library should service all who have the intellectual curiosity to enter its doors and that the more knowledge an individual has the better job that individual can do. However, within the context of TQM, the unsettling possibility of such a clash could lead to positive change. Because the driving force in TQM is customer needs rather than provider values, the AHS Library must probe deeply, through focus groups and individual contacts, to establish its proper role in providing clinical information to all, particularly to nursing and allied health personnel. Definition of this role is complicated by the fact that provision of clinical information is only one of the library missions. If fewer resources were devoted to clinical information for nursing and allied health personnel, then what resources should be provided to this group in terms of nonclinical information support?

Because the provision of clinical information is among the library's primary missions, it is satisfying that the survey results show that physicians not only use the library but also believe the clinical information contributes to higher quality care. Fortunately, in this case, the needs of the customer coincide with the values of the provider. However, in adopting continuous improvement as a legitimate goal, the library pledges to improve its high rating from physicians. One possible approach is to target physicians who seldom use information from the library to modify or confirm clinical judgments. One particular medical specialty was overrepresented in this group of users.

The library staff plan to meet with physicians in this specialty to find out how library information could be made more useful in development of clinical judgments.

CONCLUSION

This survey provided internal baseline data and identified important areas for further internal investigation. It did not, however, provide data enabling direct comparison with other libraries. More specifically, the AHS study confirmed other studies showing that clinical information from the library does affect clinical judgment. The methodology popular in other studies, which was based on current rather than historical library use, may have presented more accurate pictures of how clinical information affects clinical judgment. However, this approach gathers responses only from library users. The AHS study was designed not only to determine whether library information made an impact on clinical judgment, but also to gather data to improve library performance. For this purpose, the approach of gathering information from the infrequent user and the nonuser was as important as surveying more frequent users. By relying on historical use of the library, AHS captured the infrequent user and nonuser response, although comparisons with other libraries were compromised.

This leaves issues that require further exploration. If true national benchmarks are to be established, standard baseline criteria and survey instruments must be created for interlibrary studies.

Two other areas that require further attention are evaluation of service areas most useful to allied health and nursing personnel and development of library resources to meet these customers' needs, and research to learn why some physicians, residents, and fellows did not find the clinical information provided useful and how library services could be improved to accommodate them.

Overall, this study established benchmarks of frequency of library use. It assessed the clinical value of information provided to users, and it evaluated the performance of library staff and the quality of service. The library staff now must use this knowledge effectively in other phases of TQM. Success will depend on commitment and willingness to change.

ACKNOWLEDGMENTS

This study was made possible through a $5,000 Community Trust Grant from AHS, Louisville, Kentucky. Special thanks are extended to the Joint Library Committee of Kosair Children's Hospital and Norton Hospital; Neal Smith, marketing manager, planning and marketing department, AHS; and Sukhen Dey, Ph.D., associate professor of Computing Science, Indiana University SE, New Albany, Indiana.

For more complete information on any aspect of the study or for a copy of the survey, contact Wenda Webster Fischer at 17200 Creek Ridge Road, Louisville, Kentucky 40245-4358.

REFERENCES

1. McLaughlin CP, Kalunzy AD. Total quality management in health: making it work. Health Care Manage Rev 1990 Summer;15(3):7–14.
2. Ibid.
3. Berwick DM. Sounding board: continuous improvement as an ideal in health care. NEJM 1989 Jan 5;320(1):53–6.
4. Fredenburg AM. Quality assurance; establishing a program for special libraries. Spec Libr 1988 Fall;79(4):277–83.
5. Buchanan HS. Total quality management: an introductory course for librarians. 2d ed. (Course guide for MLA "New Perspectives" course 211.) Louisville, Kentucky, 1991.
6. King DN. The contribution of hospital library information services to clinical care: a study in eight hospitals. Bull Med Libr Assoc 1987 Oct;75(4):291–301.
7. Medical Library Association Hospital Library Section, Medical Library Association Library Research Section. Symposium: evaluation in health sciences libraries: measuring our contribution and our value [guide for symposium during the Eighty-ninth Annual meeting of the Medical Library Association, May 25, 1989]. Chicago, IL: the Association, 1989.
8. Gilbert CM, Manko D. Evaluation of library information services. Nat Network 1990;14(3):13–5.
9. Marshall JG. The impact of the hospital library on clinical decision making: the Rochester study. Bull Med Libr Assoc 1992;80(2):169–84.
10. Brightman H, Schneider H. Statistics for business problem solving. Cincinnati: South-Western Publishing Company, 1992:320–432.
11. Ingram JA. Introductory statistics. Menlo Park, CA: Cummings Publishing Company, 1974.
12. Marshall, op. cit.
13. Gilbert, op. cit.
14. Medical Library Association Hospital Library Section, op. cit.
15. King, op. cit.
16. Ibid., 300.

Received November 1991; accepted April 1992