

A Study of Clinical Questions in Primary Care

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Summary

This is a prospective study of clinical questions generated in primary care consultations and a comparison of two approaches to answering those clinical questions. Twenty-one doctors in a university-based primary care clinic submitted 78 clinical questions arising from patient consultations during 24 clinic days (0.01 question per patient encounter). These doctors subsequently found answers to 40% of their questions but were satisfied with only 67% of these answers. The investigators were able to provide answers for 95% of the questions asked and the doctors rated these answers as satisfactory in 86% of instances. Answers obtained by investigators had significantly higher satisfaction score than those obtained by doctors' search ($p=0.002$). The two main findings of this study are (1) almost all questions arising in clinic setting could be answered by intensive search; (2) answers found by intensive searches were judged to be more satisfactory than those found routinely by doctors. Provision of an information retrieval service in addition to training in the searching and appraisal of medical literature are possible solutions to the information needs of busy clinicians.

Key Words: Clinical questions, Searching, Primary care

Introduction

Family physicians encounter a wide spectrum of clinical problems. Various studies have found that clinical questions occurred frequently and the majority of them were unanswered during the consultation^{1,2}. In the study by Covell et al¹, almost half of these questions remained unanswered at the end of the clinic day. Chambliss et al³ demonstrated that searching of Medline and textbooks provided satisfactory answers for only 54% of these questions. Gorman et al² showed that

online searches by medical librarians were able to provide "clear answer" to only 46% of the questions raised by primary care physicians. Most of the studies done so far concerned searches made by medical librarians or investigators and only a few investigated the searching made by the doctors themselves. This study aims to compare the search results of doctors and investigators without the involvement of medical librarians. Furthermore, we attempted to determine if the proportion of unanswerable questions could be reduced by a more intensive search.

Materials and Methods

Setting and subjects

This study was conducted in the Primary Care Clinic, University Hospital Kuala Lumpur in the months of March-April 1998. This clinic is part of the teaching unit of the Department of Primary Care Medicine, Faculty of Medicine, University of Malaya. There were 36 doctors in this department, 8 of them were academic staff, while 28 were medical officers. Only medical officers were invited to take part in this study.

Generation of clinical questions

Participating doctors were requested to submit clinical questions that remained unanswered at the end of the clinic day to the investigators. Clinical questions in this study were defined as questions related to patient care that arose during patient consultation. Questions for which answers were easily available in the desk reference were excluded. The doctors were also asked to rate the importance of their questions using a 5-point rating scale.

Searching for answers

After submission of the questions, both the doctors and investigators commenced searching for the answers.

Facilities for searching included both printed and electronic sources (e.g. internet, CD-ROM) available in the department as well as the medical library of the adjacent Faculty of Medicine. No prior training in literature searching was conducted for the participating doctors. After the answers had been found, the doctors were asked to rate their satisfaction with the answers found on their own and those provided by the investigators. The answers provided by the investigators were in the form of a short summary condensed from review articles or original papers. The doctors took into account the relevance of the answers to their clinical questions when they rated their satisfaction.

Data recording

In this study, data were recorded in 4 sets of structured questionnaires. The information asked for in these questionnaires were as follow: (1) Demographic data and information searching behaviour of doctors; (2) Recording of doctor's clinical questions and rating of the importance of questions; (3) Recording of doctor's answer found after searching, information source and doctor's satisfactory rating; (4) Answers provided by investigators, information source and doctor's satisfactory rating. One copy of questionnaires 2-4 was used for each clinical question. All questionnaires were identified by doctor's code numbers to enable data linkage.

Table I
Classification of 78 clinical questions

By discipline	Classification of clinical questions	
	Number (%)	By domain
General medicine	50 (64)	Diagnosis
Orthopaedics	9 (12)	Treatment
Paediatrics	3 (4)	Investigation
General surgery	3 (4)	Drug information
Obstetrics & Gynaecology	3 (4)	Prognosis
Radiology	3 (4)	Others
Psychiatry	3 (4)	Ophthalmology
Pathology	1 (1)	Dental surgery
Total	78	Total
		85*

* Total exceeds 78 because some questions cover more than one domain

Table II
Sample clinical questions

Examples of clinical questions*

1. How to spot a malingering without missing out a genuine complaint?
2. How to approach a patient with giddiness?
3. What is the risk of chronic backache following epidural anaesthesia?
4. Is it safe to prescribe propranolol in a patient with benign prostatic hypertrophy?
5. What are the causes and management of progressive loss of spicy taste?
6. My patient complained that his sweat is not salty. What could be the explanation?
7. What is the importance of regular missed beat on the ECG?
8. How to treat a young woman with unilateral tender pitting oedema?

* Both doctors and investigators did not provide answers for questions 5-8

Table III
Comparison of information sources
of doctors and investigators

Sources	Number (%) of questions	
	Doctors	Investigators
Textbook	9 (29.0)	16 (21.6)
Internet*	7 (22.5)	20 (27.0)
Journal	5 (16.1)	35 (47.3)
Resource person	5 (16.1)	2 (2.7)
Others	5 (16.1)	1 (1.4)
Number of questions searched	31	74

* Internet refers to medical websites such as PubMed, Medscape and other medical homepages. (There is some overlap between internet and journal. When questions were answered adequately by the information provided in the websites or abstracts available in PubMed, the information source was categorised as "internet". However, if the answers were found only in the full-text journal articles, although the references were found through PubMed, the information source was categorised as "journal".)

Main outcome measures

The main outcome measures were number of questions generated, number of questions answered after searching, rating of the "importance" of clinical questions and "satisfaction" with the answers. The rating of the "importance" and "satisfaction" were recorded in Likert's scale of 1 to 5. Score 1 was

"unimportant" or "not satisfied", while score 5 was "very important" or "very satisfied".

Statistical analysis

The information about the participating doctors and clinical questions were analysed using Statistical Package for Social Sciences (SPSS 7.5 for Windows). Mann-Whitney U test was used to assess the difference in the "importance" of questions which were answered and not answered. Wilcoxon's sign ranked test was used to compare the satisfaction rating between answers obtained by doctors and investigators. Level for statistical significance was set at the conventional level of 0.05.

Results

Participating doctors

Twenty-one doctors took part in this study, 17 of them were female. Seven eligible doctors did not participate in this study due to various reasons (on leave, posting outside the department etc). During the study period (24 clinic days) they saw a total of 7101 patients. Mean age of doctors was 35 years (range 29-46) and median years of experience after graduation was 7 years (range 4-20). Seventeen of the doctors were trainees in the Master of Family Medicine Programme (Faculty of Medicine, University of Malaya).

Clinical questions submitted by doctors

A total of 78 clinical questions were submitted to the investigators during the study period. Two doctors did not submit any questions. The rest submitted between 1-18 questions each (median = 3). On average each doctor generated 1 question after every 14 patients daily or 0.01 question per patient encounter. The clinical questions were classified as in Table I. Most of the questions concerned general medicine and centred around issues of diagnosis, treatment and investigation. Some examples of the questions are listed in Table II.

Searching and answering clinical questions

Figure 1 shows the number of questions generated by doctors. Sixteen doctors asked 5 or less clinical questions and the other three doctors submitted 7, 8 and 18 questions respectively. In Figure 1, the number of questions for which the doctors have found the answers were also shown. Five doctors provided answers for all their clinical questions and seven doctors did not return any answers. The investigators managed to find answers for 74 questions, but the doctors answered only 31 questions. Both the investigators and doctors could not find answers for four questions (see Table II).

The time taken by the doctors to search their clinical questions ranged from 0 (same day question was generated) to 30 days (median = 1 day). Two-third of the answers were found within first 2 days.

As shown in Figure 2, doctors rated all their questions as rather important (range 3-5). There was no significant difference in the perceived importance of questions between those answered and not answered (Mann-Whitney U test, $p = 0.63$).

Information sources used in searching

Table III is a comparison of the information sources of the doctors and the investigators. Textbooks, internet and journals provided most of the answers (investigators, 96%; doctors, 68%). For the investigators, journals were the preferred source while the doctors used textbooks more than the other sources. Doctors used resource persons for 5 questions (2

specialists, 2 fellow medical officers and 1 lecturer) but investigators resorted to resource person in only two instances. One doctor indicated that all her 5 questions were answered by "previous reading"!

Satisfaction rating of answers

In Figure 3, satisfaction rating of the answers found by doctors and investigators are compared. Doctors rated 67% of their own answers as satisfactory (score 4 and 5 of Likert's scale). On the other hand, they were satisfied with 87% of the answers found by investigators (for the same set of 31 questions). The satisfaction for 19 pairs of answers were rated equally by doctors, but for the other 12 pairs the answers obtained by investigators were judged to be better than their own. Overall, the satisfaction score of investigator's answers was significantly better than doctors' answers (Wilcoxon sign ranked test, $p = 0.002$).

Discussion

Main findings of this study

Doctors in this study generated few clinical questions. On average, each doctor generated only 1 question after every 14 patient encounters. They found answers for 40% of their clinical questions although all of them rated their questions as rather important. When given another set of answers independently searched by the investigators and asked to compare with their own answers, they were significantly more satisfied with the former.

Studies on clinical questions

Table IV is a summary of recent studies on asking and searching clinical questions in the primary care settings (based partly on a review by Richard Smith⁴). Although all the studies were done in ambulatory care, they differed considerably in their study design. Gorman et al² searched only 20% of the questions identified and their doctors found that 46% of the questions were adequately answered by the information provided. Chambliss et al³ reported that 54% of the questions were judged to be "answered" by the materials given to the doctors. Ely et al⁵ found that family physicians

Table IV
Summary of studies on asking searching clinical questions in clinical settings

Study	Subjects	Length of study (days)	Patient encounter	Question rate*	Answered# by investigators	Answered# by doctors
Covell ¹ 1985	47 internists	0.5	409	0.66	NA	NA
Ely ⁵ 1992	30 family physicians	0.5	602	0.07	NA	NA
Gorman ² 1994	49 primary care physicians	0.5	NA	0.57	20%	NA
Chambliss ³ 1996	9 family physicians	217.5	NA	NA	83%	NA
Barrie ⁶ 1997	27 general practitioners	0.5	376	0.23	NA	45%
Ely ⁷	103 family physicians	1.0	2467	0.44	NA	28.9%
This study	21 medical officers	24	7101	0.01	97%	40%

NA not available

* Question rate is number of questions asked per patient encounter.

Proportion of questions where answers were found after searching.

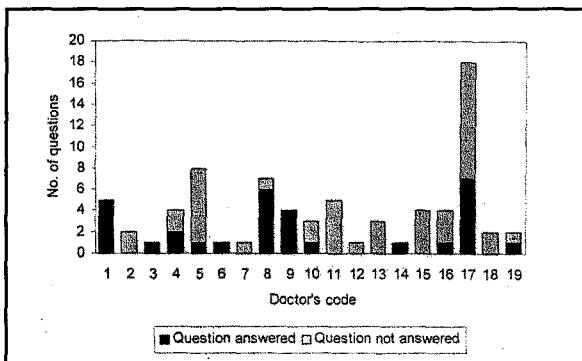


Fig 1 : Number of questions generated and answered by doctor

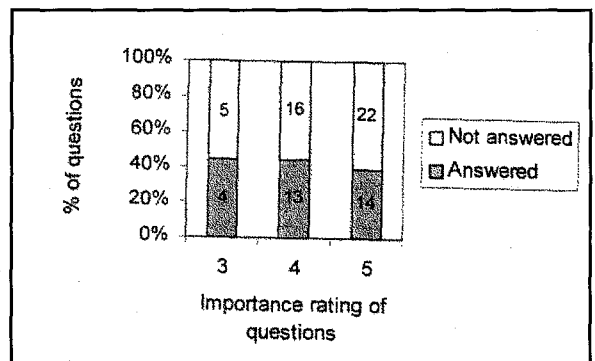


Fig 2 : Questions generated by doctors and their importance rating (with number of questions in stacked columns)

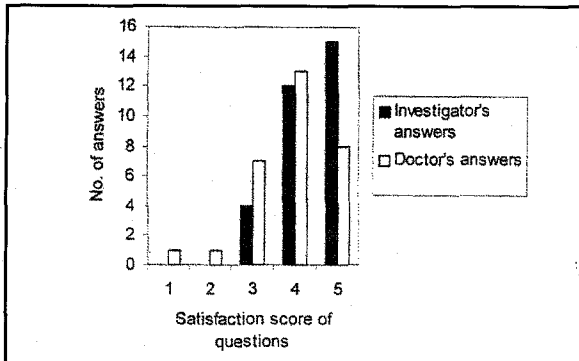


Fig 3 : Comparison of satisfaction score of investigators' and doctors' answers

asked few but highly specific questions. They did not search for the answers in this study. Barrie et al⁶ found that 45% of the questions that remained unanswered at the end of the consultation were successfully searched by the doctors. Ely et al⁷ recently published the largest study on clinical questions where 103 family physicians asked a total of 1101 questions. However, they did not attempt searching for the answers. Our study differs from the above studies in two respects: both investigators and doctors simultaneously searched for the answers, and the questioning doctors rated their satisfaction with both sets of answers found.

Questioning behaviour of doctors

As noted in Table IV, the question rate of doctors was highly variable. Several reasons may explain the variation, among them different definitions of clinical question, prompting of doctors for further questions during or at the end of consultation, academic setting of the study and duration of study period. The low question rate of our study is partly due to the lack of prompting and the strict definition of clinical question. In our study, we intentionally excluded questions that could be easily answered using desk reference and we collected questions only at the end of clinic day, thus focussing only on questions that were more clinically relevant to the doctors. It is possible that our doctors might be less keen to ask questions when the trouble of searching is perceived to be too difficult or time consuming. A few of the questions submitted by the

doctors were rather vague and needed further clarification with them. This suggests that many of our doctors could not frame answerable clinical questions thus leading to some difficulty in their subsequent search.

In Smith's review⁴, most of the questions generated in clinical settings concerned issues of diagnosis and treatment, which we have found as well.

Searching and answering clinical questions

In contrast to previous studies, we searched all the questions submitted and found answers for 95% of them. Our doctors, however, answered only 40% of their questions, and were more satisfied with the answers provided by the investigators. We have therefore shown that most of the clinical questions raised in our clinic could be satisfactorily answered if we searched intensively. These answers, however, were obtained after spending considerable time and effort on the part of the investigators. Medical librarians with expertise in information searching could be an important aid in the search effort (as shown by Gorman⁸) but the answers identified often lack clinical relevance.

The cost-effectiveness of this effort and the positive impact in patient care were not evaluated in this study. The manner in which we provided the answers may explain why our doctors were more satisfied: each answer contained a short summary (based on a review article or an original paper) and was written specifically to relate to the clinical problem faced by the doctors. Some references were given together with our answers. Our doctors did not provide answers for 60% of their questions. We do not know the proportion of question which the doctors had attempted searching but failed to find the answers. One important barrier for initiating an effective search is the lack of accessibility of published information sources (e.g. updated textbooks, computer with internet link and electronic databases) within the clinic. Provision of such facilities at the point of care would be ideal but by themselves do not result in successful search. Although we did not specifically examine the doctors' searching and critical appraisal skills, their reliance on "easier" sources of information (textbooks and resource persons) suggested

that they might be lacking skills in these areas. Furthermore, some of the doctors may be overwhelmed by the voluminous information and have difficulty synthesising the published information with the particular clinical circumstances dictated by their patients. Thus, training of doctors in "essential informational skills" (e.g. searching skills, appraisal skills), as recommended by Coiera⁸, should be part of the postgraduate teaching programmes.

Conclusion

Our study documented unmet information needs in a busy primary care clinic. Almost all the answers to clinical questions can be found if the published literature was searched intensively. Doctors in our study were more satisfied when they were provided with summarised answers that relate to the clinical problems asked, backed by relevant references. Possible solutions to fill the information needs in clinical practice include the provision of an information retrieval service as well as providing training in the searching and appraisal of medical literature.

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