SHORT COMMUNICATION

Use of traditional versus electronic medical-information resources by residents and interns

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Abstract

Background: Little is known about the information-seeking behaviour of junior doctors, with regard to their use of traditional versus electronic sources of information.

Aims: To evaluate the amount of time junior doctors spent using various medical-information resources and how useful they perceived these resources to be.

Methods: A questionnaire study of all residents and interns in a tertiary teaching hospital in July and August 2004.

Results: In total, 134 doctors returned the completed questionnaires (response rate 79.8%). They spent the most time using traditional resources like teaching sessions and print textbooks, rating them as most useful. However, electronic resources like MEDLINE, UpToDate, and online review articles also ranked highly. Original research articles were less popular.

Conclusion: Residents and interns prefer traditional sources of medical information. Meanwhile, though some electronic resources are rated highly, more work is required to remove the barriers to evidence-based medicine.

Introduction

Numerous sources of medical information exist for junior doctors, who frequently have to answer clinical questions (Sackett & Straus 1998). Traditional resources like teaching sessions may not be effective in improving physician performance (Coomarasamy & Khan 2004). Meanwhile, electronic resources, accessible via the internet and personal digital assistants (PDAs), are increasing in number. Nevertheless, many obstacles to evidence-based medicine (EBM) exist (Ely et al. 2002).

Little is known about the information-seeking behaviour of junior doctors, with regard to their use of traditional versus electronic information resources. We, therefore, conducted a study on residents and interns at the National University Hospital, a tertiary teaching hospital, to evaluate the amount of time they spent on various resources and how useful they perceived those resources to be.

Methods

We developed a questionnaire that took approximately ten minutes to complete. Through it, we evaluated the time spent per week on traditional resources such as teaching sessions (teaching rounds, grand rounds, and journal clubs), print medical textbooks, print review articles, and print original-research papers, as well as the time spent on electronic resources such as websites (MEDLINE, the Cochrane Library, UpToDate, MD Consult, Medscape and others) and online textbooks, reviews, research articles, and PDAs. A 5-point Likert scale assessed how useful the doctors perceived these resources to be. (Subsequent sections assessed the use of UpToDate and PDAs, the results of which are not discussed here.)

In July 2004, we posted these questionnaires to all interns (in their first postgraduate year) and residents (beyond their first postgraduate year) in the hospital through their department secretaries, who collected the completed questionnaires within 2 weeks and reminded those who had not responded after 2, 4, and 6 weeks.

During the study, the only online resource the hospital had an institutional subscription for was UpToDate, which summarises the medical literature. Most specialty departments had subscriptions to various journals.

We expressed variables as mean±standard deviation and median (range) for parametric and nonparametric data, respectively. We compared variables using the chi-square test, Fisher’s exact test, t-test, Mann–Whitney U test and Sign test, as appropriate. We considered a p value <0.05 significant (two-sided). We used SPSS® version 11.5.

Results

In total, 134 (103 residents, 31 interns; 82 male, 52 female; mean age 28±3 years) out of 168 (133 residents, 35 interns) doctors returned the questionnaire (79.8% response rate). Most respondents (62.7%) were not enrolled in any specialty training programmes, as specialty training often begins late
after internship. Respondents who were in such programmes were trainees in internal medicine (11.2%), anaesthesiology (6.0%), radiology (6.0%), family medicine (3.7%), or others including paediatrics, emergency medicine, ophthalmology, otolaryngology, surgery, orthopaedics, obstetrics–gynaecology, and psychiatry (10.4%). Among the residents, 27.2% were beyond their sixth postgraduate year.

Time spent on various sources of medical information

Doctors spent the most time on traditional resources, such as teaching sessions and print medical textbooks (Table 1). The online resources that doctors spent more time on were MEDLINE, UpToDate, and online review articles.

Excluding mandatory teaching sessions, more cumulative time was spent per week on electronic resources than on traditional resources: 3.7 hours (range 0–42.5 hours) versus 2.0 hours (range 0–25 hours) ($p < 0.001$).

In specific comparisons between print and online tools, more time was spent on print textbooks than on online textbooks ($p < 0.001$), and on online review articles than on print review articles ($p < 0.001$). Minimal time was spent on both print and online original-research papers ($p = 0.10$).

Perceived usefulness of various sources of medical information

Print textbooks and teaching sessions were perceived as the most useful, followed by MEDLINE, online review articles, and UpToDate (Table 1).

Print textbooks were perceived as more useful than online ones ($p < 0.001$), and online review articles were perceived as more useful than print ones ($p = 0.03$). There was no difference in the perceived usefulness of print and online original-research papers ($p = 0.36$).

Comparisons by designation

Residents spent more time than interns per week on print textbooks: median 2 hours (range 0–25 hours) versus 1 hour (range 0–7 hours), respectively ($p = 0.02$). They also spent more time using MEDLINE: 0.5 hour (range 0–25 hours) versus 0 hours (range 0–2 hours), respectively ($p = 0.008$); and spent more time on online review articles: 0.5 hour (range 0–5 hours) versus 0 hours (range 0–2 hours), respectively ($p < 0.001$). Teaching sessions were deemed more useful by residents than by interns: mean score 1.67 ± 0.60 versus 2.00 ± 0.63, respectively ($p = 0.009$).

Discussion

Earlier studies have focused on residents' use of electronic resources (Schilling et al. 2005), but how this use compared to use of traditional teaching sessions was unknown. We found that residents and interns spent the most time on traditional resources like mandatory teaching sessions and print textbooks, rating them as most useful. However, after excluding teaching sessions, we found that more cumulative time was spent on electronic resources than on traditional resources for self-learning—an encouraging finding, as electronic resources provide current information.

Our study had several limitations: although we urged the respondents to be truthful in the questionnaire, direct observation of their behaviour was beyond the scope of the study; the interns were surveyed only during

<table>
<thead>
<tr>
<th>Resource</th>
<th>Median hours spent per week (range)</th>
<th>Mean score</th>
<th>Number (%) of doctors who rated it as useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaching sessions</td>
<td>3.0 (0–10)</td>
<td>1.75 ± 0.62</td>
<td>123 (91.8)</td>
</tr>
<tr>
<td>Print textbooks</td>
<td>2.0 (0–25)</td>
<td>1.66 ± 0.60</td>
<td>127 (94.8)</td>
</tr>
<tr>
<td>Print reviews</td>
<td>0.0 (0–3)</td>
<td>2.33 ± 0.86</td>
<td>77 (57.5)</td>
</tr>
<tr>
<td>Print original articles</td>
<td>0.0 (0–3)</td>
<td>2.47 ± 0.80</td>
<td>66 (49.3)</td>
</tr>
<tr>
<td>Electronic resources</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MEDLINE</td>
<td>0.5 (0–25)</td>
<td>1.92 ± 0.75</td>
<td>114 (85.1)</td>
</tr>
<tr>
<td>UpToDate</td>
<td>0.5 (0–0)</td>
<td>2.22 ± 1.05</td>
<td>66 (49.3)</td>
</tr>
<tr>
<td>Online reviews</td>
<td>0.0 (0–5)</td>
<td>2.08 ± 0.87</td>
<td>91 (67.9)</td>
</tr>
<tr>
<td>Other internet sources</td>
<td>0.0 (0–20)</td>
<td>2.66 ± 0.73</td>
<td>41 (30.6)</td>
</tr>
<tr>
<td>Personal digital assistant</td>
<td>0.0 (0–14)</td>
<td>2.50 ± 0.90</td>
<td>62 (46.3)</td>
</tr>
<tr>
<td>Online original articles</td>
<td>0.0 (0–3)</td>
<td>2.38 ± 0.84</td>
<td>71 (53.0)</td>
</tr>
<tr>
<td>Medscape</td>
<td>0.0 (0–7)</td>
<td>2.50 ± 0.73</td>
<td>61 (45.5)</td>
</tr>
<tr>
<td>Online textbooks</td>
<td>0.0 (0–7)</td>
<td>2.37 ± 0.80</td>
<td>76 (56.7)</td>
</tr>
<tr>
<td>Cochrane Library</td>
<td>0.0 (0–2)</td>
<td>2.63 ± 0.75</td>
<td>48 (35.8)</td>
</tr>
<tr>
<td>MD Consult</td>
<td>0.0 (0–2)</td>
<td>2.65 ± 0.80</td>
<td>43 (32.1)</td>
</tr>
</tbody>
</table>

Mean scores are based on a scale in which 1 = strongly agree, 2 = agree, 3 = not sure, 4 = disagree, 5 = strongly disagree; when 134 doctors were asked if each resource was useful to them for acquiring medical knowledge.
their first internship rotation (which spans May to August in Singapore); the response rate was not 100%; and we did not differentiate between the various instructional methods of teaching rounds, grand rounds and journal clubs.

Our study highlights several barriers to EBM. First, print textbooks—which are rapidly outdated—remained the most popular self-learning tool. The literature suggests that doctors prefer online resources to answer specific clinical questions and print textbooks for general information (Green et al. 2000; Schilling et al. 2005).

Second, although MEDLINE, UpToDate, and online review articles were considered useful, less than half of the doctors studied used them for more than half an hour per week. Interns spent less time on several resources than residents, probably because interns are busier and less motivated by distant postgraduate examinations.

Third, even less time is spent reading original research articles. While the lack of access to EBM tools is a barrier to EBM (Sackett & Straus 1998; Ely et al. 2002), online reviews remain popular, implying that many doctors have access to online journals. This suggests that, disturbingly, most residents and interns simply do not have the time or interest to read original articles (Sackett & Straus 1998; Ely et al. 2002).

What are the implications of our study? Medicine is both a science and an art, and teaching sessions incorporating the personal touch of mentorship remain prevalent. Since clinically integrated interactive sessions are more effective than didactic lectures at improving physician performance (Goomarasamy & Khan 2004), traditional and electronic methods of learning could be integrated. An example would be bedside rounds and journal clubs, in which house staff discuss the latest literature concerning their patients’ conditions after reviewing MEDLINE, UpToDate, and original research articles. Hospitals should facilitate an environment that will give junior doctors the time, motivation, and infrastructure to embrace EBM and electronic resources (Sackett & Straus 1998; Ely et al. 2002).

Conclusion
Residents and interns prefer traditional sources of medical information, such as teaching sessions and print textbooks. Although electronic resources like MEDLINE, UpToDate, and online review articles also rank highly with doctors, more work is required to remove the barriers to EBM.

Acknowledgements
We are grateful to the residents and interns who participated in this study.

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References