

The ISABEL user survey

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Abstract

ISABEL is a web-based clinical decision-support system for use by healthcare professionals. The Web site has been developed by the ISABEL Medical Charity. The system has come to the attention of the Department of Health, which is examining its potential effectiveness in the wider clinical context and exploring options for promoting its wider use in the NHS. The objectives of the work reported here were to review the existing use of ISABEL and to identify impediments to its development. A questionnaire was sent by e-mail to selected users of the system. Based on an analysis of the results ($n = 518$), we found ISABEL to be a useful tool with many users. We believe that there is evidence of its success sufficient to support its continued availability and development. However, the largest hurdles to its increased use are systemic ones within the NHS and the way services are delivered.

Keywords: *Clinical decision support, Internet technology*

1. Introduction

ISABEL is a web-based clinical decision support system [1] for use by health care professionals. The Web site is owned and has been developed by the ISABEL Medical Charity, a UK-registered charity.

According to the Web site, the project started as a result of a little girl called Isabel falling dangerously ill with complications arising from chicken pox. She had to spend 4 weeks in intensive care to save her life because her serious condition was not recognized in time. As a result of this bad experience, Isabel's parents led an effort to develop a resource that could be used by health-care professionals to assist in the diagnosis of children.

The core of this is a clinical decision-support system. Using proprietary pattern recognition software, Autonomy [2], to search standard paediatric textbooks, a differential diagnostic tool produces a list of up to 15 diagnoses to consider for any given set of clinical features. Further decision support is provided by text, annotated images, and practice guidelines specific to each diagnosis. A section entitled 'experience' attempts to capture and highlight common clinical lessons learned at various steps within the guidelines and at relevant points in the diagnostic process [3].

The system has come to the attention of the Department of Health (DoH), which is examining its potential effectiveness in the wider clinical context and exploring options for promoting its wider use in the NHS.

2. Objectives and study design

This paper reports on work commissioned by the DoH. The objectives were to review the existing use of ISABEL and to identify impediments to its development. The study was done in two parts:

- Web server log data were analysed to determine how many people actually use ISABEL and how often they do so.
- A 24-item questionnaire was sent by e-mail to 4436 of the 7179 registered users of the system. This was designed to determine user attitudes to the system. Since the review concerned ISABEL's use with respect to its impact in the UK, the questionnaire was sent only to those whose registration details showed them to be based in the UK. A letter accompanied it from the ISABEL team encouraging recipients to complete the form. Returns could be sent by e-mail, post, or fax.

This paper focuses on the results obtained in Part 2 of the study.

3. User survey results

The survey received 523 responses (response rate 11.8%), of which 518 (11.7%) were completed sufficiently for analysis. For the purposes of analysis, we were particularly interested in distinguishing between the responses of those who were paediatric specialists and the responses of those who were not. On the basis of declared specialization, we received 300 responses (58% of respondents) that were classified as being from paediatric specialists and 218 (42%) that were classified as being from other health-care professionals. For some analysis, paediatric specialists were further broken down into those who were consultants (132, 51%) and those who were not (126, 49%). Similarly, we sometimes distinguished between GPs (76, 45%) and other non-paediatric specialists (92, 55%).

3.1. Profession, grade, speciality, and time spent on paediatric cases

The vast majority of respondents (90% of paediatric specialists; 88% of others) were doctors, with 51% of paediatric specialists and 31% of other health care professionals being at consultant level. Forty-five percent of the non-paediatric specialist respondents are general practitioners.

We asked about the proportion of time spent on paediatric cases. The overwhelming majority (90%) of paediatric specialists spent more than 90% of their time on these, compared with only 2% of the other health-care professionals. However, over half (54%) of the other health-care professionals spent between 10% and 50% of their time on paediatric cases.

3.2. Work setting and its computer equipment

The second section of the questionnaire asked for details of usual workplace and the information technology (IT) facilities there. Most paediatric specialists were within general hospitals (53%), followed by teaching hospitals (31%). Of the non-paediatric health care

professionals, the majority were situated in primary care (51%), followed by general hospitals (31%).

We asked three questions to do with the availability of computers in the usual work setting. These asked for the number of computers normally available, the number of those that are connected to the Internet, and how many other people shared access to them.

Only about 4% of the paediatric specialists had no computers available for use in their usual work setting, compared with only 1.5% of GPs and 6% of other (non-paediatric) health-care professionals. Of the computers available, 82% were connected to the Internet.

When it came to having to share computers, some 56% of paediatric consultants shared with only one person or not at all, as compared with some 12% of the other paediatric specialists. For the GPs, some 30% either did not share or shared with only one other person. For the other group, some 47% would either not share or shared only with one person.

Table I summarizes the availability of computers in the workplace. GPs appeared to have the best access to computers (in terms of the number of computers available, and the ratio of users to those machines), and paediatric specialists had less access than non-specialists. Paediatric consultants had the fewest people to share their computer with, though GPs were more likely to have a computer to themselves.

3.3. Computer location and usage

We asked subjects to tell us typically how close the computers were when they were talking to the patient. For paediatric staff, the computers were in the same room as the patient only 18% of the time, with a further 37% having access in an adjoining room. Of those who had access to computers next to the patient, all bar one were consultants. For other health-care professionals, 57% had access in the same room. Almost all of those who had access to computers next to the patient were general practitioners. This suggests that the secondary care sector has some distance to go to meet the primary care sector for convenient access to computers during patient consultations.

The frequency of use of computers is high among all our respondents, with 95% of paediatric specialists and 99% of others using computers at least several times a day.

3.4. Usage of ISABEL

The next section of the questionnaire asked about the respondent's usage of ISABEL and how useful they found it. Of the subjects who were paediatric specialists, 10% said they never used

Table I. Computer accessibility by user category.

	<i>N</i>	Mean (median) number of computers available in workplace	Percentage of computers with Internet connections	Mean (median) number of persons sharing available computers with	Ratio of persons sharing to computers
Paediatric Consultants	112	2.7 (1)	86	7.9 (2)	2.6
Other Paediatric Specialists	156	3.3 (3)	86	14.7 (11)	5.8
General Practitioners	68	9.5 (7)	80	11.7 (9)	1.2
Other health-care Professionals	131	4.8 (2)	78	10.4 (3)	3.8
Total	467	4.5 (2)	82	11.4 (6)	3.3

ISABEL, while 14% of other respondents also claimed never to use it. Of those who did use it (see Table II), one paediatric consultant, who spent over 90% of his time on paediatric cases, used ISABEL several times a day, but only 4% of paediatric specialists and 1% of others claimed to use it more than weekly.

We asked respondents whether they would use ISABEL more if they had the opportunity, and why or why not. In each group, 76% said yes and 24% said no. A number of common issues emerged in the free text comments. A significant minority (25% of paediatric consultants and 33% of GPs) were bound by time constraints, and 16% of paediatric specialists (though only 9% of others) were bound by the availability of IT facilities. Of those who said they would not use ISABEL more, the predominant reason was that ISABEL was already used as frequently as it was required. A significant number of respondents did not use it more because it was not relevant to their current practice. However, over one-third of paediatric consultants and one-fifth of general practitioners found ISABEL unsatisfactory in some way in its current form.

We asked what types of cases ISABEL was used for. Only 2% of users used it routinely in all cases; 59% of paediatric specialists and 64% of others said they used it 'only in some cases', while 38% of paediatric specialists and 33% of others said they used it 'only in difficult cases'. This suggests that the difficulty of the case is not the major reason for it not to be used.

We were interested to find out what aspects of ISABEL were used most, and asked respondents to gauge how much they used each section, expressed as a percentage of overall use. This question was answered in full by 85 respondents in each group. Of these, 85% said they used it to assist decision-making, 31% for confirmation of diagnoses and 22% for other purposes. These include obtaining general information, education and teaching purposes, and to consult protocols and guidelines. Of respondents, 70% were of the opinion that ISABEL assisted in clinical management, but the majority of the rest were not certain. A small minority (5%) were of the opinion that it did not assist.

Half the respondents used ISABEL 'in some cases', with one-third of respondents only using ISABEL in difficult cases. Only about 2% used ISABEL in all cases presented. The aspects that were particularly liked by users were the differential diagnostic tool (50%) and the guidelines (23%), and approximately two-thirds were of the opinion that ISABEL assists in clinical management. Half of the respondents found ISABEL easy to use most of the time, with one-quarter finding it always easy to use.

4. Discussion

Our survey achieved an 11% response rate from those to whom it was sent, but, we suspect, based on the size of the user community identified in Part 1 of the study, that

Table II. Frequency of ISABEL use.

Frequency of use	Paediatrics	Percentage	Other	Percentage
Several times a day	1	<1	0	0
Daily	11	4	2	1
Weekly	64	24	26	14
Occasionally	194	72	158	85
Total	270	100	186	100

responses include a very high proportion of the regular users of ISABEL. Of the respondents, 58% were paediatric specialists, but the fact that 42% were not indicates that people in a wide variety of health service roles use ISABEL. Around 90% of users are doctors of one grade or another, with over half of the paediatric specialist doctors being consultants.

Much of our analysis has distinguished between paediatric specialists and non-specialists. It is interesting to note from the user survey that nearly one in four respondents works in the primary care sector, indicating that ISABEL is not just a tool for secondary-care specialists. It is also not solely a tool for doctors—approximately 10% of users are nurses or therapists.

It is evident from both the Web survey and the questionnaire results that ISABEL has a small number of very devoted users, who think very highly of it. However, even the most devoted users typically use it less than once a week, so it has clearly not become part of the routine—only 2% of users claimed to use it in every case. Nevertheless, it obviously has an important role in allowing both specialists and non-specialists to confirm or assist the diagnosis in a minority of cases.

As one might expect, paediatric specialists use ISABEL slightly more frequently than non-specialists, but very few people use it more often than weekly. Three-quarters say they would use it more but for time constraints and lack of access to information technology. An interesting result from our user survey is that not all users wish to use ISABEL more. There is a clear indication that many users feel they do not need to use it in all, or even most, cases. Instead, they use ISABEL occasionally, and feel some security in having it available to back up their judgement. However, one-third of paediatric consultants and one-fifth of general practitioners say ISABEL is unsatisfactory in its present form, and improvements are needed.

For those who wish to use ISABEL more, or to encourage new users to adopt its use, there are several key issues that would need to be addressed:

- Improve professionals' access to IT. Only just over half of paediatric consultants have access to their own computer, while the rest (and nearly 90% of those below consultant grade) have to share, often with large numbers of people. Our user survey shows that 97% of our respondents use computers at least several times a day, but an average of 3.29 people share each computer, so one imagines that there must be some queuing going on, or opportunities lost because a computer is not available at the right time.
- Where the computers are is also important. Among paediatric specialists, only 3% have a computer next to the patient, and a further 15% have one in the same room. This compares unfavourably with figures of 41% and 16% among non-specialists (most of whom are GPs). This reveals a glaring difference in technology availability between the secondary and primary care sectors. A few respondents explicitly mentioned wireless networking as a means to resolve this issue in hospitals.
- Many respondents found difficulty in remembering that ISABEL is available. Making it part of clinical protocols and/or increasing publicity and awareness of it would help. Another issue raised was to encourage the use of ISABEL to verify diagnoses rather than to make them. This presupposes, however, that clinicians have easy access to the tool when it is needed.
- ISABEL is not only useful as a diagnostic tool, or as a means of checking diagnoses. Several respondents commented on its usefulness as an educational tool, too. This needs to be taken into account in any further development of it.

- Finally, many respondents felt that while it was fine as a paediatric tool, it would be more valuable to have an adult version available as well.

All in all, ISABEL is a useful tool with many users. We believe that there is evidence of its success sufficient to support its continued availability and development. However, the largest hurdles to its increased use are systemic ones within the NHS and the way it delivers its services.

It would be interesting if a hospital trust decided to re-engineer its paediatric A&E services around the routine use of ISABEL, but that would probably require significant resources and a considerable change to the way of working for many staff. We look forward to studying the effects of that in practice, if it ever happens.

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