Exploiting the potential of intranet for managing drug spectrum a web base publication in a Tertiary Care Hospital in Mumbai

INTRODUCTION

Drug information is applicable to almost all branches of medicine. The fundamental basis for modern drug therapy knows the pharmacological concepts and its application in routine clinical practice. One of the principle duties of pharmacologist is to provide drug related information to all the specialities. The drug information includes new drug information, drugs withdrawn from the market, newer...
approvals in the country, controversy regarding some drug, therapeutic guidelines for any disease and any serious adverse drug reaction.

**Pharmacology department bridges the gap between practicing physicians and pharmaceutical companies.**[3] Disseminating recent developments in the field of Pharmacology and Therapeutics in an academic institution to the clinicians is a challenge.

As knowledge of pharmacology can be fluid and ephemeral, organizations can only communicate and collaborate effectively through the intranet and exploit their competitive advantage of sharing the new developments in the field of medicine if specific techniques and processes are adequately put in place.

Today, intranet also prevails as an organizational knowledge base. It has advantages over prior digital knowledge bases in that it facilitates the capturing and handling of unstructured and implicit knowledge, in comparison to database management systems that require very structured schemes to be effective. Intranets that are networked across organizational boundaries are seen as user-friendly and cost-effective ways of achieving the goal of facilitating knowledge sharing.[3] This is an important factor since it enables the organization more freedom in sharing information.[3] In this context, the Department of Pharmacology and Therapeutics has been involved in publishing E-journal (drug spectrum) every 3 monthly providing in depth drug information on various aspects (from discovery to recent arrivals) since last 5 years. Being a departmental driven activity, it failed to achieve its purpose. Hence, it was of interest to find out the reasons for not accessing the drug spectrum site and to find out the feasibility of intranet access in the institution by the stakeholders.

**MATERIALS AND METHODS**

The study was commenced after acquiring permission from Institutional Review Board (EC/0A-51/2013). In the departments where all these facilities were available, the concerned faculty and resident doctors were approached, and verbal consent was taken. The privacy and data confidentiality was maintained, and all the entries were coded. The names of the faculty and the resident doctors were not revealed while conducting the study and are not revealed in the publication.

The study was conducted by Department of Pharmacology and Therapeutics at Seth Gordhandas Sunderdas Medical College and King Edward Memorial Hospital at Mumbai.

There are approximately 40 departments (including pre-clinical, para-clinical, speciality and superspeciality) in our institution. There was no formal sample size calculation done. Universal sampling method was used for recruitment. Questionnaires were given to approximately 100 faculty (current total 133) and 500 resident doctors (current total 760) in the year 2012–2013.

A pre-validated questionnaire was used, and content analysis was done [Appendix 1]. The questionnaire was composed of 15 questions (items). The study questionnaire focused on a survey to obtain participants feedback on the use of the intranet and to evaluate the use of intranet as a source of knowledge. The questionnaire also focused on the relevance of the drug spectrum in the context of their subject matter. The questionnaires were given to the participants and after giving them sufficient time there responses were taken.

Data were transposed from self-completed paper questionnaires into an Excel 2003 spreadsheet (Windows 8, Ms Office 2013, Sony Vaio). Data was analyzed by using descriptive statistics.

**RESULTS**

Overall, there were 134 respondents which included faculty and residents from various departments [Table 1]. 115 (85%) respondents of our study have the habit of reading online journals in the subject of their expertise and 96 (71%) read in print journals. 124 (91.85%) participants of the study responded that their departments had computer facilities and 9 (6.66%) participants have responded that their departments do not have computer facility in their department. When asked about availability of computers in individual departments, the responses we received has been depicted in Table 2. 121 (89.62%) faculty and resident doctors own a laptop. 117 (89.66%) respondents stated that their departments had access to internet and 103 (76.29%) responded that their departments had intranet access. Only 67 (49.62%) respondents have accessed, and 67 (49.62%) did not have the time to visit intranet site whereas 67 (49.62%) have not accessed. 116 (85.92%) respondents had visited sites which are relevant to their subject of expertise. 89 (65.92%) respondents were not aware of the drug spectrum. 101 (74.81%) respondents felt that drug spectrum is a useful activity on intranet and would benefit the medical faculty of various departments in our institution.

| Table 1: Total number of faculty and resident doctors |
|------------------------------------------------------|
| Faculty                    | Resident              |
| 29                        | 105                   |

[1] Shetty, et al.: Potential of Drug Spectrum — an intranet journal
Only 45 (33.33%) knew about the intranet periodical drug spectrum, but most of the respondents (33.33%) could explain the meaning of the word drug spectrum according to their understanding, but actually never knew about the online intranet journal drug spectrum. Few inappropriate perceptions of the drug spectrum given by different respondents are mentioned below:
- The range or gamut of actions that a drug can perform
- The susceptibility of various microbes and pathogens to a particular drug.

Very few respondents were actually aware of the drug spectrum activity and have responded as:
- Intranet periodical from Pharmacology Department
- Drug information bulletin over intranet.

When enquired about content preferences in the drug spectrum, 65 (48%) respondents desired to know about new drug information, 60 (44.44%) about new drug approved by Drug Controller General of India (DCGI), 54 (40%) respondents wanted information on drugs withdrawn from the market and 52 (38.51%) respondents preferred controversies regarding certain drugs.

Nine respondents felt that easy access to drug spectrum is its biggest advantage. Also, seven of them felt that information given in the drug spectrum would indirectly benefit the patients. Twelve respondents felt that drug spectrum is an easily accessible source of drug information. Two of them felt that drug spectrum would be beneficial for them in their clinical practice.

As certain departments do not have intranet access, six respondents felt though it is useful there is no access to intranet and hence they are unable to obtain the benefits of the drug spectrum. Four of them have felt that the contents of the drug spectrum are inadequate. Four of the respondents have felt that the contents of the drug spectrum could be misused. Two felt that drug spectrum contained less information on the pediatric population and hence considered it to be a limitation. Two felt that contents of the drug spectrum could be controversial. Two of them felt that drug spectrum should be accessible on their mobiles, and two of them felt that print copies should be made available.

When asked about the suggestions to improve drug spectrum we received the following comments:
- Make a keyword search incorporated to search any topics in any journal
- E-mail the latest issue to all faculty members so that interested members can access
- Additional information on nutrition, new advances in other fields like surgery, dermatology, interventional radiology, etc
- Approved Indian guidelines on various topics in different medical specialities
- Links for Journal of Postgraduate Medicine, New England Journal of Medicine, Lancet, Drugs.com.

**DISCUSSION**

Our study was conducted with the aim that the faculty and residents should keep abreast with the current trends in the medical knowledge in relation to their respective subjects and hence it mainly addressed: (1) To survey the availability of intranet in campus and (2) Knowledge related to drug spectrum.

In today’s world computers form a part of almost everybody’s lives. With constant advances, technology is also becoming cheaper and accessible.

Internet connections of various types are available. People have their own internet connections and hence can access the desired information anytime they want. Many institutions also have Wi-Fi connections in their premises which is beneficial and cost effective way of providing internet connections to their employees. People can access information at any place through the internet facilities on their mobile phones. Hence, advanced technology has made the access to information just a click away.

Intranet is a modern means of sharing and disseminating information within a particular institution. Hospitals are rapidly adopting the technology of the intranet. According to a survey by Price Waterhouse Coopers and Zinn Enterprises, the proportion of large hospitals with an intranet rose from less than half of the respondents in 1999 to nearly three-quarters in 2000. Use of intranet is not only cost effective but also valuable in disseminating information to various employees of a particular institution.[4,5]

The intranet site also gives departments an opportunity to share their successes and tout important accomplishments.[4,5]

The Department of Pharmacology and Therapeutics had started drug spectrum a quarterly web based publication for the medical faculty and residents of various specialty departments.
Our study showed that the majority of the respondents is in the habit of reading online journals related to their subject. In the field of medicine, it is important to keep pace with the ever growing science as it is important for maintaining high quality patient care. Both the faculty and the resident doctors have to keep abreast with the current medical trends in a tertiary care hospital like ours. But clinicians’ especially resident doctors are busy in their daily clinical routine which includes patient care and administrative duties and hence might not find time to sit in a place and read in print journals. Technology too, in today’s times have advanced, and majority of the respondents having their own laptops and mobiles prefer to read online journals.

Majority respondents still choose to read in print journals related to their subject of expertise. Those would probably be the senior doctors who have developed the habit of reading in print journals since that time computers and internet were either not present or were not in much use.

Certain respondents choose not to read online journals probably because those doctors would either prefer to read in print hard copies or rely on the information obtained from friends, seniors and textbooks. Many choose not to read in print journals in the subject of their expertise as those would possibly be the doctors who prefer reading online journals.

However, for many articles the readers can only access the abstract, but not the full text as they are paid websites. Here drug spectrum can fill the gap by providing information at the doorstep of doctors.

Majority of the faculty as well as resident doctors are aware that their respective departments have computers. Very few have responded negatively to the question which could probably mean that they are not aware of the presence of the computers in their departments. This could be because geographically most of the departments are widespread and doctors from the speciality and super-speciality clinical departments and certain paraclinical departments like pathology and microbiology are engaged in patient care and various other academic and administrative work.

There is a wide range in the number of computers a particular department owns [Table 2]. The range obtained could be because the respondents could possibly have included laptops of the faculty and resident doctors, as well as the desktops present in that particular department.

Majority of the departments in our institution have an internet access and as the majority of the respondents also own a laptop it would be easier for them to access sites related to their subjects and also read online journals.

| Department                              | Number of respondents | Number of computers |
|-----------------------------------------|-----------------------|---------------------|
| Physiology                              | 16                    | 0-6                 |
| Anatomy                                 |                       | 5                   |
| Biochemistry                            | 4                     | 4-7                 |
| Pharmacology and Therapeutics           | 9                     | 6-20                |
| Pathology                               | 4                     | 5-6                 |
| Microbiology                            | 5                     | 8-12                |
| Anesthesiology                          | 5                     | 0-6                 |
| Radiology                               | 7                     | 3-10                |
| Medicine                                | 8                     | 0-20                |
| PSM                                     | 9                     | 3-10                |
| Surgery                                 | 5                     | 2-3                 |
| Orthopedics                             | 8                     | 1                   |
| Dermatology                             | 10                    | 1                   |
| Surgical Gastroenterology               | 8                     | 2-3                 |
| Neurosurgery                            | 4                     | 2-3                 |
| Cardiovascular Thoracic Surgery         | 2                     | 3-8                 |
| Gastroenterology                        | 3                     | 3-4                 |
| Neurology                               | 5                     | 2-3                 |
| Cardiology                              | 3                     | 2-3                 |
| Endocrinology                           | 4                     | 1                   |
| Nursing                                 | 4                     | 10-14               |
| Physical Medicine and Rehabilitation    | 1                     | 2                   |

PSM = Preventive and social medicine

As compared to the internet connection less number of departments had access to intranet. Intranet should be accessible to all the departments so that the faculty and residents can take the benefit of different activities happening in the institution which can indirectly increase the readability of online journals and interaction across the departments.

Lack of time and lack of intranet connectivity in some of the clinical departments desisted majority of our study population from accessing and gathering information from the intranet.

Respondents of our study had certain content preferences for drug spectrum. Emphasis on including the preferences of the respondents would probably increase the readability of the drug spectrum. The most commonly opted information types were new drugs, newer approvals (DCGI), drugs withdrawn from the market and controversies regarding certain drugs. Clinicians have to keep abreast with the recent development with regards to the field of expertise. Taking into account the busy schedule of the clinician’s, intranet could form a user friendly, fast, reliable, and an economic tool for disseminating drug information and drug spectrum is just a click away.

With time drug therapies have changed. e.g. around more than 20 years back nitrates were not the part of treatment of angina pectoris. Currently, nitrates form the mainstay treatment for angina pectoris. Till around the year 2000,
animal insulin preparations were used for the treatment of Diabetes Mellitus but today recombinant human preparations are available. Even various generations of drugs have been added to various classes of antibiotics which previously never existed.

Drug spectrum, therefore, is an essential tool to pass information to the clinicians and academicians of an institute who treat innumerable patients every single day and help them to save precious time. It is our department who actually finds, selects, edits and uploads such important drug information on the intranet quarterly so that clinicians can save time of finding particular information from a vast pool present on the internet. Thus, the time saved can be optimally utilized for patient care.

The respondents felt that easy access to drug spectrum is its biggest advantage. Furthermore, some of them felt that the well searched, crisp articles would help them keep abreast with the recent knowledge and help them treat the patients and hence it would prove beneficial to the patients. Few of them felt that drug spectrum would be beneficial for them in their clinical practice.

Few of them felt the contents to be inadequate. To increase the readability of the drug spectrum, the editors of the journal have to make sure that contents are in accordance with the features mostly recommended by the respondents in question 13 [Appendix 1].

Drug Spectrum is freely available for the medical and the paramedical staff to read. The articles in our journal are contributed by doctors and hence misuse could be probably done by the junior medical and the paramedical staff who could misinterpret the contents of the articles if appropriate guidance is not available.

Most of the faculty and residents from the Department of Pediatrics felt that drug spectrum contained less information related to a pediatric population. It is of utmost important for clinicians to keep abreast with the recent information in the subject of Pediatrics. Almost all the drug related information in drug spectrum pertained to the adult population and hence the pediatricians felt the contents to be inadequate.

Few of the respondents felt the contents of the drug spectrum to be controversial. On certain articles where there is a disagreement as it may happen most of the time while the mind critically evaluates a scientific article, the reader can always recheck the facts of the material they feel controversial of the article they are interested in.

### Appendix 1

| Serial number | Question                                                                 | Yes | No |
|---------------|--------------------------------------------------------------------------|-----|----|
| 1             | Are you in habit of reading on line journals related to your subject?    |     |    |
| 2             | Are you in habit of reading in print journals related to your subject?   |     |    |
| 3             | Does your department have computers?                                     |     |    |
| 4             | How many computers does your department have?                            |     |    |
| 5             | Do you have your own laptop?                                             |     |    |
| 6             | Does your department have access to internet?                            |     |    |
| 7             | Does your department have intranet access?                               |     |    |
| 8             | Did you ever visit intranet site?                                        |     |    |
| 9             | Do you get time to access intranet?                                      |     |    |
| 10            | Do you access sites which are relevant to your subject?                  |     |    |
| 11            | Do you access sites which are not related to your subject of interest?   |     |    |
| 12            | Do you know what “drug spectrum” is?                                     |     |    |
| 13            | In case such an activity is existing what features would you recommend?  |     |    |
| a)            | New drug information                                                     |     |    |
| b)            | Black box warning for any drugs                                          |     |    |
| c)            | Drugs withdrawn from market                                              |     |    |
| d)            | List of available drugs in Indian market                                 |     |    |
| e)            | Newer approvals (DCGI)                                                   |     |    |
| f)            | Controversy regarding some drug                                          |     |    |
| g)            | Therapeutic guidelines for any disease                                   |     |    |
| h)            | Nobel laureate information                                               |     |    |
| i)            | News                                                                     |     |    |
| j)            | All of the above                                                         |     |    |
| k)            | Any other                                                                |     |    |
| 14            | Is it useful for you to have such an activity on intranet?              |     |    |

**Advantages of drug spectrum as an informative tool in intranet**

**Drawbacks of drug spectrum as an informative tool in intranet**

**Suggestions to improve drug spectrum**

**General comments**

DCGI=Drug Controller General of India

Some respondents desired print copies of the journal. Again, our study emphasizes on the regular use of intranet for reading our journal.

Few respondents felt that drug spectrum should be accessible on their mobiles. This could only be possible with a certain technological modifications. To begin with, first the faculty and the residents should be able to access drug spectrum regularly on the intranet, later the other modes of accessibility can be thought. Furthermore, once intranet is established, then it can serve as a reliable tool of disseminating authentic scientific, medical, as well as institutional information.

**LIMITATIONS**

As it is a single center study, the results may not be extrapolated to other institutions across India or the wider world.
CONCLUSION

Hence to conclude, our study emphasizes on intranet as an important tool to disseminate medical information in a tertiary care hospital like Seth Gordhandas Sunderdas Medical College and King Edward Memorial Hospital. During the study, it was felt that our department needed to increase the awareness related to drug spectrum before the activity was started on a regular basis.

Almost everybody in today's times have access to computers and internet but the doctors might not get certain articles relevant to them as most journals are paid ones and only the abstract of certain articles and not the full text are available. Hence, drug spectrum would be a good intranet based magazine which would give the medical staff and resident's latest, tailor made information in a short span of time.

To make drug spectrum more readable it was decided that the suggestions of the respondents, like-new drugs, newer approvals (DCGI), drugs withdrawn from the market and controversies regarding certain drugs needs to be incorporated.

It will be useful to incorporate information pertaining to the pediatric population.

Our study thus emphasizes on the positive and immense utility of intranet in an institution and the advantages drug spectrum has been offering to the medical staff and residents of our institution.

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