

# Searching for Medical Literature on Internet - Evaluation of Knowledge among Faculty Members

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## **Abstract:**

*Internet is ubiquitous. Medical education and Research needs knowledge about Internet and medical literature search capability for all medical teachers. This has been studied for students but not for medical teachers. This study was undertaken to assess and improve the knowledge of internet resources among medical teachers and improve their knowledge in searching for medical literature online. 33-medical Teachers of our institutions participated in this study. Training involved two lectures about 'Internet basics' and 'Medical Literature search' followed by live demonstration. Pre and post training validated questionnaire data analyzed by excel spreadsheet. Analysis showed 32% improvement in knowledge, post training. Participants >40 years age and males showed more improvement. 61% participants were spending <25%-Internet-time for searching medical information. 'Medical literature search on Internet' capability has been studied for students but not for medical teachers. Contrary to popular perception participants >40 years of age showed more improvement. Even after training only 32% improvement suggests more structured training and changing attitude. Females showed less improvement compared to males, needs study on larger sample. Regular implementation of focused training modules can produce better results. Medical faculty members have moderate knowledge about working of internet and searching for online medical literature. Targeted and well-structured training can significantly improve their knowledge. The development of positive attitude towards technology and search knowledge can be helpful towards achievement of long-term institutional goals of training better medical graduates of the future.*

**Key words:** Information, Internet, Medical, Search, Literature

## **Introduction**

Effective and efficient medical training can help craft excellent physicians for the future<sup>1,2</sup>. Such impactful medical training can only be delivered by a well-trained and resourceful medical faculty, which has the foresight and tools to adapt to needs of healthcare in the future. Technology has added a new dimension as a major enabler of better medical education, while internet has revolutionized education by providing new avenues to analyze and compare available literature quickly and efficiently<sup>3</sup>. In the age of connectivity, knowledge about internet and skills to improve search capabilities for medical literature online can provide crucial tools to medical teachers to conduct comprehensive research and deliver excellent clinical training.<sup>4,5</sup>

Knowledge about 'Internet' and 'Medical Literature Search on Internet' is essential for all Medical Teachers for effective teaching and research capability.<sup>6,7</sup> Networked world has opened up new avenues to analyze and compare available world literature, which was hitherto not possible.

Most of us now use 'Internet' for various purposes, may be it for social, entertainment or educative purposes. Medical Faculty can't afford to lag behind regarding 'Internet' use. We all must have sound knowledge about 'Internet'. There is vast amount of Medical literature available on 'Internet'. Research work and education work needs extensive exploration on Internet. Medical faculty is expected to have sound knowledge about 'Effectively finding Medical literature

on Internet'. It is perceived that medical faculty have less effective capability about 'Medical Literature search on Internet'.

Medical education is changing fast. Evidence based medicine and competency based education presents newer challenges for curriculum development. Faculty has to be ready to embrace new technology and Internet. Emerging field of 'E-learning' and efficient use of established practice of 'Telemedicine' will need teachers trained in latest technologies.

## **Aims and Objectives:**

This study was undertaken to assess and improve the knowledge of internet resources among the medical faculty and improve their skills in searching for medical literature online.

## **Materials and Methods:**

Although, this is educational project 'Institutional Ethics Committee' clearance was applied and permission was received. Pre validated questionnaire with 26 questions was designed. Informed voluntary participation consent was obtained. Faculty members of our institution were invited to participate in this study on voluntary basis. Fixed dates for lectures and demonstration were intimated to all. In institution lecture hall all participants were invited. There were 6 demographic questions and 20 knowledge related questions.

Demographic questions were related to age, sex, designation, amount of time spent for Internet, amount

of time spent on Internet for ‘Searching Medical Literature’. Descriptive question about use of ‘Smart-Phone Health Application’ was also asked.

20-Knowledge based questions were about various aspects like ISSN, HINARI, PubMed, WebMD, eTBLAST (Plagiarism detection), CINAHL etc. In lecture-2 all this terms were completely explained.

Before training and after training same questionnaire was given and responses were obtained. Whole collected data was entered into MS-Excel spreadsheet software and analyzed for various parameters. Graphs were prepared with same software.

**Study group:** Faculty members of our institution with various designations voluntarily participated in this study.

**Sample size:** 33 faculty members participated in this study.

**Teaching/ Learning method:** Faculty members were given 2 didactic lectures and demo session. Lecture content was prepared and given by the author himself. Lecture content was prepared and given by the author himself, who is avid user of Internet for Medical Resources and has in depth knowledge about the subject.

A. Lecture-1 ‘Internet’( Information about Internet) (45min)

Here complete information about working of Internet and its medical usefulness was elaborated.

B. Lecture-2 ‘Medical Literature Search on Internet’ (45min)

This lecture emphasized various important aspects of medical literature search. Concepts like HINARI, PubMed, Cochrane database, TRIP database, Plagiarism, journal ISSN No, Impact factor etc. were explained and discussed.

C. Live demo of search tools / methods.

Lectures were followed by live demonstration of literature search on PubMed, TRIP database etc.

**Limitations of Methodology:**

- As the participation was voluntary large sample could not be assessed due to limited participation.
- More training could have been helpful.
- In online literature there were studies regarding student evaluation but ‘Faculty’ evaluation studies were not found.

**Observations and Results:**

- There were 33 participants (21 Males and 12 Females).
- Age ranged from 25 to 50 years (Avg. age was 33 yrs.).
- There were 4 Tutors, 23 Assistant Professors, 5 Associate Professors and 1 Professor.
- Out of a total of 26 questions, 6 were qualitative (demographic) and 20 were assessment questions related to internet and online medical literature search.
- Pre-training survey: 10-65% correct answers (avg. 38%).
- Post-training survey: 25-90% correct answers (avg. 70%).
- There was 32 percentage point improvement post-training for the group (p<0.05)(Table 1).
- Average female results: 38% (pre-training) & 63% (post-training) indicating 25% point change.
- Average male results: 38% (pre-training) & 73% (post-training) indicating 35% point change.
- 95%-Confidence Interval -7.88 to -5.03.
- Internet for Medical Use- 39% participants spent >25%-Internet time for medical related information search.

**Result**

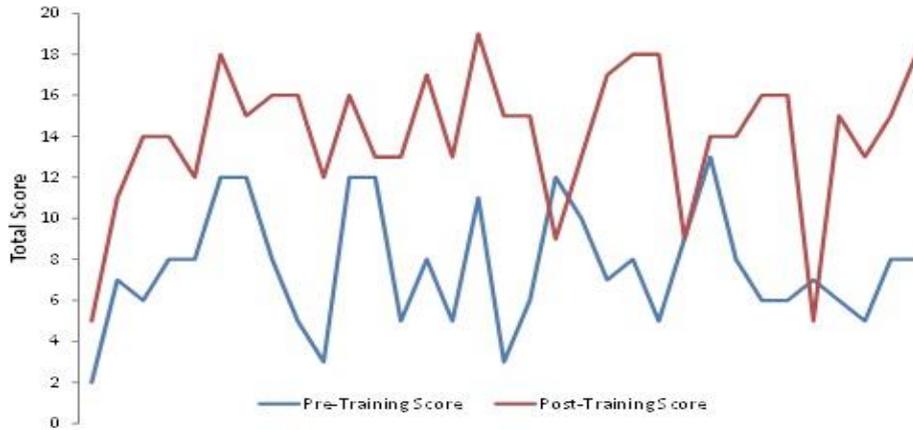
**Table:**

	<b>Pre training mean %</b>	<b>Post training Mean %</b>	<b>Improvement %</b>
Faculty members n=33 (M-21/F-12)	(7.61), 38% (SD=2.89)	(14.06), 70% (SD=3.38)	32% (p<0.0001) 2-paired-t

**Paired t test results**

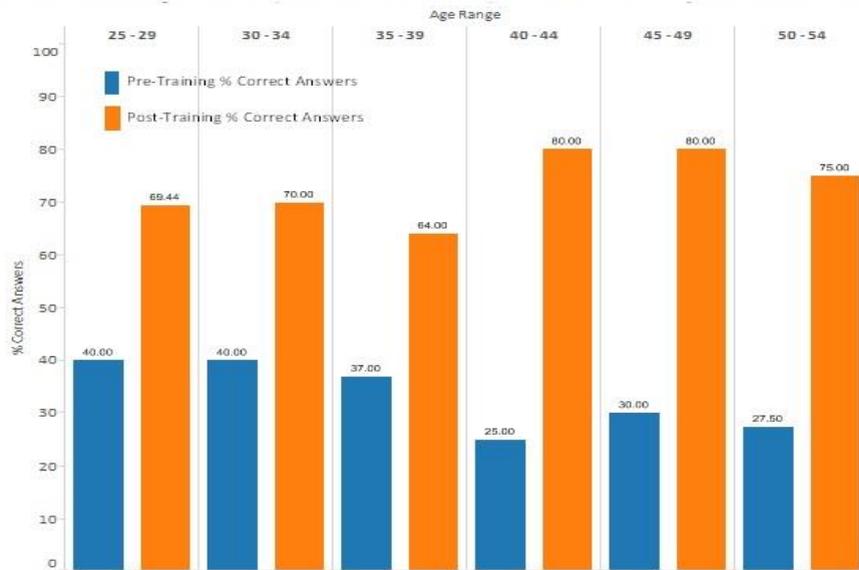
<p><b>P value and statistical significance:</b>                  The two-tailed P value is less than 0.0001, By conventional criteria; this difference is considered to be extremely statistically significant.</p> <p><b>Confidence interval:</b>                  The mean of Pre Training minus Post Training equals -6.45                  95% confidence interval of this difference: From -7.88 to -5.03</p> <p><b>Intermediate values used in calculations:</b>                  t = 9.2499                  df = 32      standard error of difference = 0.698</p>
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Training lead to 32% increase in correct answers across all age groups.



**Fig. 1: Shows actual score for all faculty members**

Pre(blue-bar) and Post(orange-bar) training results for all age-groups . For age >40 years more change to correct answers.



**Fig. 2: Shows percentage score variation for all age groups**

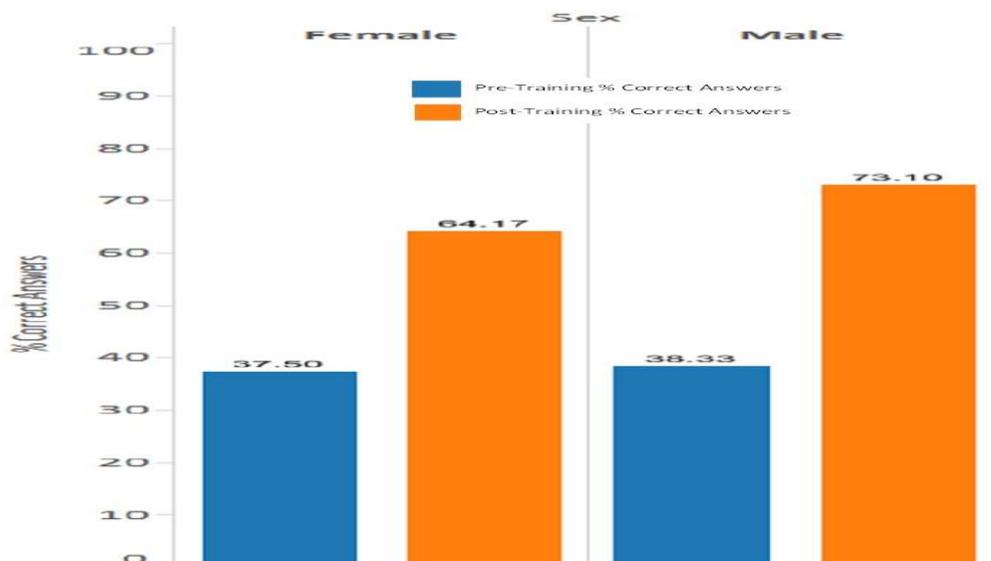


Fig. 3: Shows score variation for male and female

### Discussion:

Today on Internet there are large numbers of medical related websites. It is researcher's duty to find valid and authentic data. Evidence based medicine has been given special importance. Faculty members should find information with higher level of 'Evidence'. Many Internet databases give specific 'Evidence based' information. 'Evidence based medicine' combines systematic review of available literature with experience of medical professional. Finding authentic, unbiased medical information is necessary for advancement. There is vast amount of information available on Internet.<sup>8,9,10</sup>

Knowledge about PubMed, Cochrane library, MeSH, HINARI, TRIP-Database, eTBLAST gives new perspective of medical literature search. Analysis of this knowledge provides information about future planning of Faculty Development programs in the institution.

In this study, before training the questionnaire showed 38% correct knowledge, which was markedly improved to 70% post training. (Graph 4) Improvement post training for males was higher compared to females. Health related smartphone applications used by participants were PubMed, Cochrane, Statcal, EPI-Info, WebMD, Google, FitBit etc.

- If Teaching Faculty is not sufficiently ready for medical literature search on Internet then medical education suffers. For research purpose and teaching to students finding reliable medical literature is of paramount importance.<sup>11</sup> If a teacher is less efficient then both research and teaching work is adversely affected.
- If Teachers lag behind the students in Internet usage, students do not find the teacher effective.<sup>12</sup>
- Any new implementation of digital technology project in medical college without faculty knowledge assessment can prove to be disastrous.

- If we want to implement any 'Faculty Development' program as 'E-learning', then this skill has got great value.
- 'Evidence based medicine' practice and 'Competency Based Medical Education' implementation is greatly influenced by knowledge of internet.<sup>13</sup>

**Cochrane Library** provides systematic review and meta-analysis about selected medical articles which is immensely beneficial to researcher. But this is subscription based site. Institution or individual pays for getting information. Here information is unbiased in nature.

**TRIP database** gives systematic review of relatively recent literature. This provides images and videos of medical procedures for learning.

**Health Finder** and **WebMD** (sponsored content) provides consumer centric information. Because of large amount of advertise based content researcher has to be careful about available information.

For detection of **Plagiarism** (unauthorized copying of data), **eTBLAST** is better. Researcher and editors of medical journals uses this to detect unauthorized copying.

**HINARI** was developed by **WHO** to provide medical information to underdeveloped countries either free or with nominal cost. Unfortunately India and China not included in this.

**Google** itself is not optimized for medical literature queries. **Google Scholar** is designed to answer research related queries. But **PubMed** is much better compared to Google Scholar.

**CINAHL** sponsored by UK government is useful resource for nursing professionals.

### Acknowledgements:

All faculty members of our institution who participated for this study.

### Conclusions:

Medical faculty members have moderate knowledge about working of internet and searching for online medical literature. Targeted and well-structured training can significantly improve their knowledge and skills. The development of positive attitude towards technology and search skills can be helpful towards achievement of long-term institutional goals of training medical graduates of the future.

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