

Electronic Health Literacy Skills among Medical and Dental Interns at B P Koirala Institute of Health Sciences

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ABSTRACT

Background: Appropriate use of the available electronic resources is important for decision making in health. The use of electronic resources in health care is universal. The study measures the eHealth literacy skills among the medical and dental interns of the B P Koirala Institute of Health Sciences (BPKIHS), Nepal.

Methods: Self administered electronic Health Literacy Scale (eHEALS) was used to collect data from 125 medical and dental interns at BPKIHS. The interns represent immediate past medical student and soon to be professional doctor.

Results: A quarter of interns are not sure about the usefulness of internet resources for health. The interns have limited knowledge about right resources in the internet. They are not equipped to tell useful resources from the not-useful ones in the internet.

Conclusions: There is a need to pay attention to the eHealth Literacy needs of the interns. Further research may be needed to generate evidence on what interventions may be specific to meet the ehealth literacy needs of the medical and dental interns.

Keywords: e-Health Literacy; electronic resources in health; health information technology; health literacy in Nepal; health literacy of intern.

INTRODUCTION

Health literacy is identified as a public health goal for the new century.^{1,2} Electronic resources are important for accessing information for decision making in health. The use of electronic resources in medicine and biomedical sciences by students and teachers is also increasing.^{3,6} Appropriate skills are needed to use the electronic resources for learning and decision making.⁷

eHealth literacy is defined as, "the interplay of individual and social factors in the use of digital technologies to search, acquire, comprehend, appraise, communicate and apply health information in all contexts of healthcare with the goal of maintaining or improving the quality of life throughout the lifespan".⁸

There is limited information regarding ehealth literacy from Asia⁹ and none was found in context of Nepal. The study aims to measure the eHealth literacy skills among the medical and dental interns of the B P Koirala

Institute of Health Sciences (BPKIHS), Nepal.

METHODS

We find it crucial to measure the eHealth literacy of the health professionals. This is a cross-sectional study conducted among the medical and dental interns of B P Koirala Institute of Health Sciences (BPKIHS), Dharan, Nepal. BPKIHS was chosen purposively for the convenience of researchers. The study was conducted from January 2015 till June 2015.

B P Koirala Institute of Health Sciences (BPKIHS) is a public-funded, oldest and largest amongst health sciences universities in Nepal. BPKIHS has a multidisciplinary approach to deliver community based health sciences curriculum for students. It contributes towards strengthening the district health system through its teaching district concept by collaborating with the health facilities run by the government in the eastern Nepal.¹⁰ Preliminary activities on e-learning are being

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carried out by the institute in eastern Nepal. BPKIHS has a 700 bedded tertiary teaching hospital which serves as a regional hospital in eastern Nepal.¹¹

There were a total of 138 interns at the institute during this period. We invited all the medical and dental interns to participate in this study. The intern doctors were chosen as they represent the immediate past medical student and will soon be working as a full-time professional doctor. The basic socio-demographic characteristics of the respondents were collected.

We attempted to measure eHealth skills using the electronic Health Literacy Scale (eHEALS). The combined knowledge and perceived skills to find, evaluate and apply health information regarding health problems is measured by the eight item eHEALS tool. It has two questions apart from the eight items which rates the usefulness and importance of electronic health resources. eHEALS is a validated tool to assess the comfort and skills for using electronic resources in health.¹² Data were entered in Microsoft excel and descriptive statistics was analysed using the Statistical Package for Social Sciences (SPSS), version 17.0.

Ethical approval for conducting this study was taken from the Institutional Review Committee (IRC) of B P Koirala Institute of Health Sciences. Informed consent was taken from the interns before administering the questionnaire. Data reflecting personal identifications (name, identification numbers) were not collected. The questionnaire was distributed to the interns for self administration and the completed questionnaires were collected in groups later.

RESULTS

A total of 125 out of 138 interns participated in this study. This gave a response rate of 90.57%. There are 122 interns (97.6%) with an Email/Facebook account. Out of 125 interns, 115 interns (92.0%) use the internet every day. Among the internet users, 97.39% interns log into Facebook every day while 42.4% use email service at least once a week. In the past one year, 75 (60.0%) of the interns ever used the internet to search for a health related query. There were 17 (13.6%) interns who have ever participated in a free online course related to health.

The mean age of the participants was 24.97±1.09 years. The characteristics of the participants are shown in table 1.

Table 1. Characteristics of the participants.

Characteristics	Respondents
Number of Respondents	125
Mean Age in years (range)	24.97 (22-28)
Gender n (%)	
Male	81 (64.8%)
Female	44 (35.2 %)
Stream n (%)	
Medical Intern	94 (75.2%)
Dental Intern	31 (24.8%)
Home Region n (%)	
Eastern Nepal	29 (23.2%)
Central Nepal	61 (48.8%)
Western Nepal	17 (13.6%)
Mid-western Nepal	11 (8.8%)
Far-western Nepal	2 (1.6%)
India	5 (4.0%)
High School Education Region n (%)	
Eastern Nepal	22 (17.6%)
Central Nepal	76 (60.8%)
Western Nepal	16 (12.8%)
Mid-western Nepal	6 (4.8%)
Far-western Nepal	0 (0%)
India	5 (4.0%)

One fourth (24.8%) of the interns are unsure about the usefulness of the internet for helping them to make decisions about their health. While more-than 2/3rd (69.6%) of them feel that the internet is useful in deciding about their own health, 5.6% feel internet as not useful for making such decisions (table 2).

Table 2. Usefulness and importance of health resources on the internet (n=125).

Questions	Respondents
How useful do you feel the Internet is in helping you in making decisions about your health? n (%)	
Not useful at all	3 (2.4%)
Not useful	4 (3.2%)
Unsure	31 (24.8%)
Useful	66 (52.8%)
Very Useful	21 (16.8%)
How important is it for you to be able to access health resources on the Internet? n (%)	
Not important at all	2 (1.6%)
Not Important	2 (1.6%)
Unsure	18 (14.4%)
Important	77 (61.6%)
Very Important	26 (20.8%)

Table 3. Self-reported eHEALS Internet health literacy scores of the interns.

eHEALS items	Strongly Disagree n (%)	Disagree n (%)	Unsure n (%)	Agree n (%)	Strongly Agree n (%)	Mean Score±SD
I know what health resources are available on the Internet	3 (2.4)	5 (4.0)	36 (28.8)	66 (52.8)	15 (12.0)	3.68±0.83
I know where to find helpful health resources on the Internet	2 (1.6)	10 (8.0)	39 (31.2)	71 (56.8)	3 (2.4)	3.50±0.75
I know how to find helpful health resources on the Internet	0 (0)	9 (7.2)	38 (30.4)	72 (57.6)	6 (4.8)	3.60±0.70
I know how to use the Internet to answer my questions about health	0 (0)	7 (5.6)	36 (28.8)	77 (61.6)	5 (4.0)	3.64±0.65
I know how to use the health information I find on the Internet to help me	1 (0.8)	5 (4.0)	40 (32.0)	75 (60.0)	4 (3.2)	3.61±0.66
I have the skills I need to evaluate the health resources I find on the Internet	1 (0.8)	9 (7.2)	46 (36.8)	62 (49.6)	7 (5.6)	3.52±0.75
I can tell high quality health resources from low quality health resources on the Internet	0 (0)	13 (10.4)	50 (40.0)	53 (42.4)	9 (7.2)	3.46±0.79
I feel confident in using information from the Internet to make health decisions	4 (3.2)	10 (8.0)	46 (36.8)	59 (47.2)	6 (4.8)	3.42±0.84

There are 52.8% of the interns who feel that they know about the available health resources on the internet, lesser proportion (47.2%) feel they are confident about using the available information. We found that 28.8% interns are unsure about the availability of useful health resources in the internet.

The mean item scores and reliability of eHEALS was calculated as shown in table 4. The Cronbach's Alpha for 8 item eHEALS was 0.88.

Table 4. Mean score and reliability of the eHEALS			
eHEALS items	Mean	SD	
1 I know what health resources are available on the Internet	3.68	0.829	
2 I know where to find helpful health resources on the Internet	3.50	0.747	
3 I know how to find helpful health resources on the Internet	3.60	0.696	
4 I know how to use the Internet to answer my questions about health	3.64	0.653	
5 I know how to use the health information I find on the Internet to help me	3.61	0.659	

6 I have the skills I need to evaluate the health resources I find on the Internet	3.52	0.747
7 I can tell high quality health resources from low quality health resources on the Internet	3.46	0.778
8 I feel confident in using information from the Internet to make health decisions	3.42	0.835
Sum Score	28.44	04.39
Chronbach's Alpha	0.88	

DISCUSSION

E-learning is an integral part of health professional education, including internet-supplemented courses, online lectures, email, and linkages to online resources; internet-dependent courses requiring students to use web-based resources; and online courses. The role of electronic media is increasing for patient service and health sciences research.¹³ Adult learning is a self directed learning,¹⁴ which will need certain skill and competency among students and health care professionals for the effective use of web based resources.¹³ Using internet as a resource without having the knowledge of the most credible sources and skills puts the users at a risk of

misguided or incomplete information.¹⁵⁻¹⁷ There are evidence that learning methods blended with the use of e-Learning provide better learning in interdisciplinary health sciences courses which also helps decrease disparities in health.^{18,19} There are researches assessing the skills and the utilisation of electronic resources for health by students,^{6,7,20-25} professionals^{16,22,24,26} and general population^{21,27,28} from countries of all income groups.

This study shows that the interns have limited information about finding out the right resources for their learning. Electronic medical records, telemedicine and health information systems, are terms that are frequently used in health care in lower income countries as well, due to exponential growth of information and communication technology.²⁹ Almost all interns access internet daily. However, only a little over half of them use it to search for health related query. A study from Sudan, reported a third of the medical students use internet daily for personal purpose and not academic purpose.²² This seems low in comparison to our study. However, as this study is from seven years ago compared to our study, the internet use may not have been common as they are now. Medical students and less experienced physicians receive help through PubMed and Google searches in the differential diagnosis process.^{6,24,30}

The internal consistency of the eHEALS in this study was good (Chronbach's alpha=0.88). While the use of social media is universal among them, we have 2/5th to 3/5th of them unsure on what to find and how to use the internet for finding useful health resources. This gap needs to be explored. The use of internet among the medical students and doctors in Sudan showed that they are not very knowledgeable about the right source for useful information.²² A few interns explained that they are not taught or told about the importance of knowledge and skills for internet use to find helpful health resources. Students have limited access to free internet in the campus and paid subscription was an expensive option for them. Poor skills and limited access to resources are also reported from other low income countries.²² However, to keep in touch with friends, most of them used cellular data just to log into social media.

Medical and dental interns who have ever searched the internet for health resources reported variety of sources (Pubmed, Medscape, Google Scholar and Google searches). The answers were not consistent. Google was the most used search engine for gathering medical information by 3/4th of the respondents in Canada.²³ While there are many free online courses available,

there are only 17 interns (13.6%) who have ever enrolled in any online courses so far. The use of online resources has been reported as less than 36% in the UK as well.³¹ Though the study settings and the income level of country is very different from Nepal, it is noted that the use of electronics resources for learning among students may need some interventions that are locally appropriate in all settings. This shows that there is a gap that needs to be identified to bring the interns closer to the wide resources available for education and assist in decision making.¹³ Student groups who report confidence in appraising useful resources in the internet, also report that they are not confident enough to use those resources to improve their service delivery skills.³² This may suggest the requirement of a continuous guided process of learning for students from finding the right resources to applying the knowledge to enhance service delivery.²³ There was no difference in the medical and dental interns in any items of eHEALS, which is why the results are not shown here.

BPKIHS has a mission to produce a socially accountable health professional through advancement in research and innovation in service as well as education.¹¹ However, the advancement of information technology, and its impact on medical education³³ was not much anticipated during curriculum designing which is reflected in the curriculum of BPKIHS.³⁴ E-learning has been advocated to be integrated into the medical curriculum.^{29,33} In the longer run, the graduates of BPKIHS will need to be updated with skills and competencies to use the electronic medical and web based health resources for evidence based patient care. Overall, they are not very confident in using the internet for finding useful resources for them. As suggested by literature, the results give us an impressions that there may be a need to train the students regarding the use of web based resources for literature searches for learning in their day to day practice.²⁰ Further studies may be needed to assess demands and barriers to eHealth literacy.³⁵

The study used the eHEALS, which gave the brief measure of the eHealth literacy skills. However, the performance of the interns, if measured using participant observation methods would have provided more insight on the ehealth skills of these interns. The study could not capture the internet access of the interns at different wards, clinics, classrooms, hostels and libraries. Purposively selected BPKIHS as study site may not represent the scenario of Nepal. However, this can serve as a preliminary evidence to conduct robust research in the future.

e-Learning and telemedicine is in use in Bosnia and

Ethiopia, which are in similar income group as Nepal.^{29,36} There is a study reporting on the use of telemedicine in Nepal.³⁷ While there is limited information on health literacy of the people in Nepal, use of electronic resources is being promoted among the healthcare professionals. Each organization has challenges in utilizing the collective individual knowledge effectively and efficiently.³⁸ The outcome of the study was expected to give the baseline information on the level of eHealth literacy of the interns, which is important for policy makers to design the e-learning and telemedicine in Nepal.

This study provides scientific evidence to the BPKIHS Academic administration to leverage the existing interest and skills of the students for better use of the existing electronic resources in medical education. The finding from this study provides evidence to tailor learning objectives and improve service delivery skills through the ongoing eLearning and telemedicine projects at BPKIHS.

CONCLUSIONS

There is a need to work further into the usefulness and importance of health resources on the web for the use of the interns. While further research may be needed to generate evidence on what interventions may be specific to meet the needs of the interns, we are required to look for long term solutions. This study gives a baseline eHealth literacy level, so we need to design short interventions and measure the levels after the interventions. This research may not have enough evidence to say this, but if we fail to address this issue, we may not be able to evaluate the outcome of the pilot project on e-learning currently ongoing in our institute.

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REFERENCES

1. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. *Health Promot Int.* 2000;15(3):259–67.
2. Nielsen-Bohlman L, Panzer AM, Kindig DA. *Health literacy: A prescription to end confusion.* Washington DC: National Academies Press; 2004.
3. Giustini D. How Google is changing medicine. *BMJ.* 2005;331:1488–9.
4. Lindberg D, Humphreys B. 2015-The future of medical libraries. *N Engl J Med.* 2005;352:1067–70.
5. Oblinger D. Boomers, Gen-Xers & Millennials. Understanding the new students. *Educ Rev.* 2003;38(4):37–47.
6. Peterson MW, Rowat J, Kreiter C, Mandel J. Medical students' use of information resources: is the digital age dawning? *Acad Med.* 2004;79(1):89–95.
7. Judd T, Kennedy G. A five-year study of on-campus Internet use by undergraduate biomedical students. *Comput Educ.* 2010;55(4):1564–71.
8. Bautista JR. From solving a health problem to achieving quality of life : Redefining eHealth literacy. *J Lit Technol.* 2015;16(2):33–54.
9. Zheng Y. Information culture and development: Chinese experience of e-Health. In: *Proceedings of the 38th Annual Hawaii International Conference on System Sciences.* 2005. p. 1–11.
10. Pokharel PK, Budhathoki SS, Upadhyay MP. Teaching district concept of B P Koirala Institute of Health Sciences: a model for inter disciplinary community based health professions education and comprehensive health service delivery in rural Nepal. *Kathmandu Univ Med J.* 2016; Submitted.
11. B P Koirala Institute of Health Sciences. Introduction [Internet]. 2015 [cited 2015 Dec 31]. Available from: <http://bpkihs.edu/introduction.html>
12. Norman CD, Skinner HA. eHEALS: The eHealth literacy scale. *J Med Internet Res.* 2006;8(4):1–11.
13. Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T, et al. Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *Lancet.* 2010;376(9756):1923–58.
14. Merriam SB. Andragogy and self-directed learning: Pillars of adult learning theory. *New Dir Adult Contin Educ.* 2001;(89):3–14.
15. Falagas ME, Karveli EA, Tritsaroli VI. The risk of using the Internet as reference resource: a comparative study. *Int J*

- Med Inform. 2008;77(4):280–6.
16. Davies K. The information-seeking behaviour of doctors: a review of the evidence. *Health Info Libr J.* 2007;24(2):78–94.
 17. World Health Organization. *Utilization of Health Information for Decision-Making.* 2008.
 18. Carbonaro M, King S, Taylor E, Satzinger F, Snart F, Drummond J. Integration of e-learning technologies in an interprofessional health science course. *Med Teach.* 2016;30(1):25–33.
 19. Viswanath K, Kreuter MW. Health disparities, communication inequalities, and e-Health: a commentary. *Am J Prev Med.* 2007;32(5 Suppl):S131–3.
 20. Stelfefson M, Hanik B, Chaney B, Chaney D, Tennant B, Chavarria EA. eHealth literacy among college students: a systematic review with implications for eHealth education. *J Med Internet Res.* 2011;13(4):1–16.
 21. Tennant B, Stelfefson M, Dodd V, Chaney B, Chaney D, Paige S, et al. eHealth literacy and Web 2.0 health information seeking behaviors among baby boomers and older adults. *J Med Internet Res.* 2015;17(3):e70.
 22. Ahmed AM, Yousif E, Adballa ME. Use of the Internet by Sudanese doctors and medical students. *East Mediterr Heal J.* 2008;14(1):134–41.
 23. O'Carrol AM, Westby EP, Doodley J, Gordon KE. Information-seeking behaviors of medical students: a cross-sectional web-based survey. *JMIR Med Educ.* 2015;1(1):e4.
 24. Falagas ME, Ntziora F, Makris GC, Malietzis G, Rafailidis PI. Do PubMed and Google searches help medical students and young doctors reach the correct diagnosis? a pilot study. *Eur J Intern Med.* 2009;20(8):788–90.
 25. Hanik B, Stelfefson M. e-Health literacy competencies among undergraduate health education students: a preliminary study. *Int Electron J Health Educ.* 2011;14:46–58.
 26. Hughes B, Joshi I, Lemonde H, Wareham J. Junior physician's use of Web 2.0 for information seeking and medical education: a qualitative study. *Int J Med Inform.* 2009;78(10):645–55.
 27. Robinson C, Graham J. Perceived Internet health literacy of HIV-positive people through the provision of a computer and Internet health education intervention. *Health Info Libr J.* 2010;27(4):295–303.
 28. van der Vaart R, van Deursen AJAM, Drossaert CHC, Taal E, van Dijk JAMG, van de Laar MAFJ. Does the eHealth literacy scale (eHEALS) measure what it intends to measure? Validation of a Dutch version of the eHEALS in two adult populations. *J Med Internet Res.* 2011;13(4):1–16.
 29. Masic I. e-Learning as new method of medical education. *Acta Inform Med.* 2008;16(2):1023–17.
 30. Greenwald R. And a diagnostic test was performed. *N Engl J Med.* 2005;359:2089–90.
 31. Brown CA, Dickson R, Humphreys A, Mcquillan V, Smears E. Promoting academic writing/referencing skills: Outcome of an undergraduate e-learning pilot project. *Br J Educ Technol.* 2008;39(1):140–56.
 32. Brown CA, Rumona D. Healthcare students' e-Literacy skills. *J Allied Health.* 2010;39(3):179–84.
 33. Ruiz JG, Mintzer MJ, Leipzig RM. The impact of e-Learning in medical education. *Acad Med.* 2006;81(3):207–12.
 34. B P Koirala Institute of Health Sciences. *The MBBS Curriculum of B P Koirala Institute of Health Sciences, Dharan.* 2nd ed. Dharan: B P Koirala Institute of Health Sciences; 2014.
 35. Chan C V, Kaufman DR. A framework for characterizing eHealth literacy demands and barriers. *J Med Internet Res.* 2011;13(4):e94.
 36. Sabanovic Z, Masic I, Salihefendic N, Zildzic M, Zunic L, Dedovic S. e-Health in Bosnia - starting from the ground up. *Acta Inform Med.* 2009;17(3):135–8.
 37. Ullrich JN, Poudyal G, Marks SJ, Vrabcic TR, Marks B, Thapa ABS, et al. Ocular telemedicine between Nepal and the USA: prevalence of vitreoretinal disease in rural Nepal. *Br J Ophthalmol.* 2009;93(5):698–9.
 38. Lorenzi NM, Riley RT. Knowledge and change in health care organizations. In: Balas E, Boren S, Brown G, editors. *Information Technology Strategies from the United States and the European Union.* Amsterdam: IOS Press; 2000. p. 63–9.