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An Appraisal of e-Health Information Literacy of Students

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Abstract

Health Information Literacy (HIL) is the competence to make sound health decisions in context of everyday life, which is pivotal in abridging illness and wellness. While the emergent Information and Communication Technologies (ICTs) have facilitated access to information to users' palms, the bewildering nature of abundance of information available makes it difficult for users' to decide which information is to be trusted and which is to be ignored. Thus, HIL in contemporary electronic era assumes more significance to have a healthy global society. The present study was conducted for desideratum of *e*-Health Information Literacy skills of college students, to have an overview of the *status quo* and suggest necessary measures to fill the gaps. An online survey of 946 students was conducted using a pre-developed and validated *e*-Health Literacy Scale. Findings revealed a strong need for taking measures to strengthen the eHealth Literacy amongst students for having a healthy society.

Keywords: e-Health Information Literacy, Health Literacy, Health Decision Making, Information Literacy.

Introduction

"Literacy is a bridge from misery to hope" — Kofi Annan

The world has been witnessing exponential information growth in various disciplines, resultantly the volume of information doubles every two years (Chamberlain, 2020). In this complex information system, the users need to evaluate available information resources carefully and determine how to use relevant information to solve problems and make wise decisions (Farmer, 2003). With the increase in the usage of technology for accessing and sharing information, the need for information literacy programmes has increased. 'Information Literacy' is an understanding and set of abilities enabling individuals to recognize when information is needed and can locate, evaluate, and use needed information effectively (Humes, 1999). In this pursuit, appropriate health literacy enables the users to master content and give them the confidence to proceed with an investigation, be self-reliant, and have a sense of being in control of their learning (Kavulya, 2003). In short, information literacy refers to a set of skills centered on gathering and application of information for the attainment of desired goals. As per the report of American Library Association (1989) on Information Literacy, an information literate person can recognize when information is needed and have the ability to locate, evaluate and use it effectively.

Health-related information shift, change and become defunct remarkably quickly than other kinds of information. Therefore, proper information literacy skills are essential concerning healthcare and proper health literacy skills are need of the hour. Health Information Literacy (HIL) is the competence to make sound health decisions in the context of everyday life be at home, in the community, at the workplace, in the health care system, and/or in exigencies. It is pivotal in abridging illness and wellness. Health literacy can be defined as "the ability to read, understand and act on spoken and written health information from medical professionals" (Breaux, 2003). It is the skill encompassing various facets, viz. recognition of the need for health information, locating appropriate sources, and retrieval of relevant information. It also takes in its ambit the evaluation of information retrieved and its usage for informed health decisions. Health Information Literacy helps in abridging illness and wellness. It is pivotal because the majority of the patients forget what doctors tell them as soon as they leave the office and half of what they do recall they remember incorrectly. Patients, who do not understand doctors' orders make more medication errors, comply with treatment less often and are more likely to suffer from chronic, untreated illnesses, increasing costs in the long run. Leaps in medical advances have left the common person lagging. He/she seems to be lost in the maze of complex medical terms and systems.

Health Literacy has become a multifaceted task, varying frequently due to technological innovation. With the development of the Internet as a source of health information, health literacy may also include the ability to search the Internet and evaluate Web sites. E-Health literacy sometimes called digital health literacy is finding health-related information from the Internet and using it for health-related issues. According to Norman and Skinner (2006b), e-Health literacy is the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem. Authors have provided eHealth Literacy Model: The Lily Model in which e-health literacy is divided into six facets - traditional literacy, health literacy, information literacy, scientific literacy, media literacy, and computer literacy. E-health literacy is an important skill, which helps people to make informed decisions about their health care. E-health literacy can lead to improving health outcomes and reducing health inequities (Wu et al., 2010).

The rise of health-related information on the internet is also now producing the "informed patient" (Henwood et al., 2003). They can review their medical conditions and can understand the advice of the medical practitioners. According to Taylor & Leitman (2001), health information is one of the most investigated topics online. Even during the emergent COVID-19 pandemic, the search for health literacy information was amplified because people were quarantined, isolated, and face-to-face visits to the hospitals and dispensary were cut to curve the spread of COVID-19.

Review of Related Literature

E-health literacy is a very important area of research and many pieces of research have been undertaken to access the level of digital literacy among people. Among the initial studies Kummervold et al. (2008) have reported an increase in the use of the Internet for health purposes in Europe from 2005 to 2007. Siliquini et al. (2011) reported in their research that 57% of the respondents reported using the Internet to search for health-related information. Park and Lee

(2015) conducted a study to assess the eHealth literacy skills of nursing students of South Korea and respondents of the study Internet as an important source to make health-related decisions. Tubaishat and Habiballah (2016) concluded that students lack skills to differentiate between high and low-quality online health resources. A similar study was conducted by Rathnayake and Senevirathna (2019) in Sri Lanka, it was found about 49.4% of the respondents had inadequate eHealth literacy skills. Alhuwail and Abdulsalam (2019) conducted a study to clarify the eHealth literacy levels of the participants in Kuwait and concluded that females in Kuwait demonstrated a higher average eHEALS compared with males. Yaşin and Özen (2011) found the same results in Turkey, according to researchers women were found to perceive eHealth information quality higher than men. Tsukahara et al. (2020) concluded that the score of medical streams respondents was 2.9 points higher than that of nonmedical students. They further found that respondents from graduate school had higher scores than undergraduate students. Adil et al. (2021) conducted a similar study, conducted study to access eHealth literacy among university students of Pakistan and they found levels of e-health literacy were significantly different from each other Ph.D. and BS/Masters. While conducting a survey Wang et al. (2020) found that there is a big gap between urban and rural populations (16.92% vs. 8.09%) of China regarding health literacy skills. Shiferaw et al. (2020) found similar results, whereby students from urban areas were 4.24% higher in eHealth literacy skills as compared to those from rural areas. Hsu (2019) conducted a study to see the effect of age on electronic health literacy among college students and older adult students and found a significant gap in eHealth literacy between the two groups. On the contrary, Tubaishat and Habiballah (2016); Rathnayake and Senevirathna (2019) found no relationship between age and eHEALS. The review mentioned above revealed that many studies have been conducted to assess the eHealth literacy skills of students but there is no study undertaken to assess the eHealth literacy skills of students of Chandigarh. Availability of a large amount of information on the Internet does not ensure that the students are skilled at conducting Internet searches for health information. The present study was conducted for the desideratum of e-Health Information Literacy skills of students of colleges of Chandigarh, to have an overview of the status quo and suggest necessary measures to fill the gaps.

Objectives of the study:

The present study was conducted with the following objectives:

1. To assess the eHealth Literacy amongst college students.
2. To ascertain the difference in eHealth Literacy of students based on their demographic variables.

Methodology

To assess e-Health Literacy amongst students, a survey of undergraduate and postgraduate students of colleges of Chandigarh was conducted. ‘eHEALS: The eHealth Literacy Scale’ was developed and validated by Norman and Skinner (2006a) having a Coefficient alpha of 0.88 was used as a data collection tool. The study focused primarily to ascertain the opinion(s) and experience(s) of students about using the Internet for health information. The awareness and use of digital technologies for accessing health-related information were also examined. The survey was conducted online and the questionnaire was converted to e-format using Google Forms. The weblink of the questionnaire was shared with 2000 students chosen randomly froma databse of 10000 students, whose email IDs were collected with help of faculty of different colleges. In total 946 students’ responses were recorded. The output of survey results was exported and saved

in Microsoft Excel. Descriptive analysis has been applied for the interpretation of results. Basic statistical tests were applied to find the difference in opinion of students based on demographic parameters.

Analysis of Data

The questionnaire consisted of two parts, viz. Part-I aimed at ascertaining the demographic details of students and Part-II consisting of statements related to eHealth Literacy of respondents.

Table 1: Demographic data of the respondent

Strata	No. of respondents	S.D	Mean	Percentage
Place of Residence				
Rural	325	5.185	37.32	34.35%
Urban	621	5.488	37.19	65.65%
Stream				
Arts	395	5.675	37.13	41.76%
Science	367	5.347	37.46	38.80%
Commerce	56	4.767	37.30	05.91%
IT	128	4.812	36.84	13.53%
Total				
e-health literacy	946	5.384	37.23	100%
Age	946	1.682	19.17	100%

Out of the total 946 respondents, 65.65% (621) students belonged to Urban areas and 34.35% (325) belonged to Rural locales (Table 1). Majority of the students viz. 41.76% were pursuing their studies in the Arts stream, followed by 38.80% respondents from the Science discipline, 13.53% from Information Technology field, and the remaining 5.91% students representing Commerce stream.

Table 2: Age Group of Students

Age Group	Number of students
16-19	599
20-23	336
24+	11

The age of respondents varied from 16 to 24+ years, including 599 (63.3%) students in the age group of 16 -19 years and 336 (35.5%) students aging between 20-23 years. A small number of students (1.16%) belonged to 24+ years of age (Table 2).

e-Health Literacy of Students:

'eHEALS: The eHealth Literacy Scale' of Norman and Skinner (2006a) consists of eight statements aimed to ascertain the eHealth Literacy of respondents. In the present study, in

addition to these eight statements, two more statements about the ability of respondents in accessing information from the Internet (How do you feel the Internet is in helping you in making decisions about your health?) and the perception of respondents about the usefulness of Internet-based information on decision making (How is it for you to be able to access health resources on the Internet?) were also added in the questionnaire. These statements on Likert's scale consisted of five options, each, from 'Not important at all to 'Very Important'. For statements adopted from eHEALS, five options provided against each of the eight statements varied from 'Strongly Disagree' to 'Strongly Agree'. The students were required to choose the appropriate option against each statement, whose responses are presented in Table 3.

Table 3: eHealth Literacy of Students

Sr. No.	**Statement**	**Not important at all**	**Not important**	**Unsure**	**Important**	**Very Important**
1	How do you feel the Internet is in helping you in making decisions about your health?	24 (02.54%)	52 (05.50%)	106 (11.21%)	541 (57.19%)	223 (23.57%)
2	How is it for you to be able to access health resources on the Internet?	19 (02.01%)	70 (07.40%)	144 (15.22%)	548 (57.93%)	165 (17.44%)
		Strongly Disagree	**Disagree**	**Undecided**	**Agree**	**Strongly Agree**
3	I know what health resources are available on the Internet	12 (01.27%)	62 (06.55%)	279 (29.49%)	521 (55.07%)	72 (07.61%)
4	I know 5where to find helpful health resources on the Internet	19 (02.01%)	82 (08.67%)	226 (23.89%)	534 (56.45%)	85 (08.99%)
5	I know how to find helpful health resources on the Internet	12 (01.27%)	73 (07.72%)	220 (23.26%)	528 (55.81%)	113 (11.95%)
6	I know how to use the Internet to answer my questions about health	9 (00.95%)	32 (03.38%)	143 (15.12%)	605 (63.95%)	157 (16.60%)
7	I know how to use the health information I find on the Internet to help	8 (08.85%)	31 (03.28%)	118 (12.47%)	659 (69.66%)	130 (13.74%)

	me					
8	I have the skills I need to evaluate the health resources I find on the Internet	17 (01.80%)	52 (05.50%)	180 (19.03%)	598 (63.21%)	99 (10.47%)
9	I can tell high-quality health resources from low-quality health resources on the Internet	22 (02.33%)	123 (13.00%)	297 (31.40%)	430 (45.45%)	74 (07.82%)
10	I feel confident in using information from the Internet to make health decisions	30 (03.17%)	76 (08.03%)	297 (31.40%)	447 (47.25%)	96 (10.15%)

The first two statements deal with the respondents' access to health information using the Internet and its utilization for health decision-making. More than 4/5th of the total respondents found the Internet helpful in their health-related decision-making, making it obvious that the users access and rely on health-related information available on the Internet to a great extent. This may be attributed to the fact that the Internet is an easily approachable source of health-related information. The significance increases further when someone needs to access information on personal health issues that he/she finds difficult to share with family and doctor. Similarly, 75.36% of students responded to the statement 'How important is it for you to be able to access health resources on the Internet?' as important or very important. With the increasing health awareness, people are moving towards the Internet to access information on this vital subject. About 09.41% of students still feel that it is not important for them to access information on health from the Internet. This may be because not all information available on the Internet is authentic.

About 62.68% of students either agreed or strongly agreed to the statement, 'I know what health resources are available on the Internet. About 29.49% were undecided about it, while 07.82% of respondents were either strongly disagreed or disagreed with the statement. Though more than 60% of the respondents claimed familiarity with the health information resources available over the network of networks, a significant proportion of (37.32%) needs to be acquainted with the various authentic sources of information available over the Internet. Similarly, responses of around 1/3rd of the students elaborate the need for apprising them about where to find helpful health resources on the Internet. About 67.75% of respondents either agreed or strongly agreed to the statement 'I know how to find helpful health resources on the Internet, whereas responses of remaining students reveal the need for imparting them adequate search skills to get desired information. Nearly 80.54% of students either agreed or strongly agreed with the statement 'I know how to use the Internet to answer my questions about health', while 83.4% gave their agreement for the statement like "I know how to use the health information" or "I find on the Internet to help me". Around 3/4th (73.4%) of the students agreed to have skills to evaluate health resources on the Internet. Interestingly, only 53.27% of respondents could differentiate

the high-quality health resources from low-quality health resources on the Internet, while 31.39% of students were undecided on this skill. About 15.33% of students responded of not having the skills to distinguish high-quality information from low-quality information resources. EHealth literacy is an exhaustive concept, which is incomplete in case of a deficit of even one aspect. Though the majority of the students responded positively towards their possession of eHealth Literacy skills, the replies of students reveal the inevitability of taking necessary measures for strengthening of eHealth Literacy skills of students.

The statistical test(s) *t*-Test and *Anova* were applied to find the difference in responses of students about eHealth Literacy, based on their gender, locale vis-à-vis subject stream. Table 4 depicts overall e-health literacy amongst male and female students.

Table 4: Differnce in e-Health Literacy based on gender

Variable	Group of Students	N	Mean ± S.D.	SE_M	*t*-ratio
e-health literacy	Male	499	36.61±4.485	.201	3.788
	Female	447	37.93±6.167	.292	

It was observed that there has been no significant difference in e-Health Literacy amongst respondents based on their gender (*t=3.788*) as both male (36.61±4.485) and female (37.93±6.167) have similar views on this skill.

Similarly it was observed that respondents from both rural (37.32±5.185) and urban (37.19±5.488) areas felt that it is important to know about e-health literacy.

Table 5: Differnce in e-Health Literacy based on geographical location

Variable	Group of Students	N	Mean±S.D.	SE_M	*t*-ratio
e-health literacy	Rural	325	37.32±5.185	.288	.357
	Urban	621	37.19±5.488	.220	

The results revealed no significant difference in responses of rural and urban students (*t*=.357) and between sciences, social sciences and humanities groups (*f*=.498) (table 5).

Table 6: Statistical analysis by using ANOVA on Stream of Study

Source of variation	Sum of	Df	Mean square	F-ratio
Between groups	43.380	3	14.460	.498
Within groups	27346.383	942	29.030	
Total	27389.763	945		

Statistical Analysis of variation in e-Health Literacy based on age groups has been depicted in table 7. It is visible from the table that the age of the students also did not influence their e-Health Literacy level.

Table 7: Statistical Analysis of variation in e-Health Literacy based on age groups

Variables	e-health literacy	Age
e-health literacy	1	.012
Age	.012	1

Conclusions:

The emergence of the Internet has transformed the information landscape. While all this has revolutionized information availability and accessibility, the relevance and authenticity of information have been of great concern to stakeholders. The vitality of these variables assumes more significance when the information is likely to influence the health decisions of users. Though the results of this study brought forward that majority of the respondents have a positive opinion about Internet-based information access and utilization, a significant segment of the students was found to be lagging in this arena. The lack of analytical skills amongst students to distinguish between authentic and non-authentic information reflects the seriousness of the problem. In this scenario, libraries and Library and Information Science Professionals (LISPs) have a lot to do for empowering students with eHealth Literacy skills. Organization of seminars, lectures, workshops, etc. vis-à-vis imparting skills through digital content, i.e. videos, audios, e-poster, etc. can be pivotal towards the attainment of health information empowered society. They need to work in close collaboration with health workers for strengthening e-Health literay skills of stakeholders.

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