Assessing the Level of Digital Health Literacy in Health Care Professionals in a Tertiary Care Hospital

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Abstract

Objectives: This study aimed to assess the digital health literacy of the healthcare workers in a tertiary care hospital.

Material and Methods: The study was conducted in Mayo Hospital, Lahore for duration of six months. It was a cross-sectional study. Healthcare practitioners, including medical doctors, nursing staff and other allied health professionals were included in the study. Following the ethical approval & informed consent, data was collected using a standardized pre-designed questionnaire the Digital health literacy instrument (DHLI). Statistical analysis was done using the SPSS 26.

Results: A total of 285 healthcare workers participated in the study. 69.1% were doctors, 30.9% were nurses and allied health professionals. Healthcare workers had desirable levels of skills in various domains of Digital health literacy instrument (DHLI) including navigation skills, protecting privacy, operational skills, information search and adding content. Scores were comparable between the physicians and the allied health professionals.

Conclusions: With the changing global environment and wide availability of online healthcare related information and applications, it is important to have the necessary skills to avail these opportunities. The results from our study show the health care professionals have good literacy related to digital health resources. A desirable level of DHL can help the health care workers to improve their patient care, communication skills and health literacy of their patients.

Keywords: Digital health literacy, health care providers, operational skills, protecting privacy, information searching.

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Introduction

The role of Digitization in health care is growing steadily in the last few decades. The global health environment is rapidly changing, and a lot of health-related information is available online. To make use of these opportunities doctors should have the necessary knowledge and skills related to these digital resources; these skills are called digital health literacy (DHL). Digital health literacy refers to the capability of individuals to read, understand, and use digital technologies and online health information effectively, to make their health related decisions.[1] In today's technology-driven world, where the internet and digital tools play a significant role in healthcare, digital health literacy is becoming increasingly important. It encompasses skills such as evaluating the credibility of health websites, navigating online health resources, utilizing health apps, and understanding electronic health records. Developing digital health literacy empowers individuals to take charge of

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their health, communicate effectively with healthcare providers, and make informed decisions about medical treatments and interventions. It is a cost-effective solution for emerging health challenges, especially in low- and middle-income countries.

Different instruments have been developed to assess the level of digital health literacy e.g., Digital health literacy instrument and e-health literacy instrument (e-HEALS). Results from previous studies show an ade-quate level of knowledge and information regarding DHL among different groups, i.e., students, patients, and healthcare workers.[4,5,7] Different factors influence the level of digital health literacy in a population. These include age, gender, and ethnicity. It has also been found to be positively associated with the level of education.[3,4]

A study conducted in various universities in Lahore showed that digital health literacy was related to the level of usage, educational status, and level of skill.[4]

Digital health literacy among healthcare professionals is paramount in the modern healthcare system. As technology continues to transform the way medical information is accessed and shared, healthcare professionals need to be adept at using these digital tools effectively. Desirable levels of digital health literacy in health care professionals can help in patient management and also influence the digital health literacy level of the patients. A study conducted in Iran using a digital health literacy instrument (DHLI) showed that healthcare professionals had adequate skills in various domains of DHL including navigational and operational skills and protecting the privacy of the patients.[5] There are various barriers to the digital heath literacy including inefficient skills in users, online scams, unconfirmed resources of information and power crises in low-income countries such as Pakistan.[6] There have been very few studies related to the digital healthcare related literacy in different population groups in Pakistan so far.

Materials and Methods

This cross-sectional study was conducted at Mayo Hospital, Lahore and involved healthcare professionals, including medical doctors and allied health practitioners. Non-probability sampling technique was used to recruit the participants. All the participants who were health care providers, were working at Mayo Hospital, Lahore at the time of study and gave consent for participation were included in the study. Data was collected after the ethical approval from the institutional review board (vide letter no 112/RC/KEMU, dated 28-2-2023) for a period of six months (1-03-2023 to 31-08-2023). Informed consent was taken from participants and data was collected using a standardized questionnaire known as the Digital Health Literacy Instrument (DHLI) to assess digital literacy levels.[2] Permission to use the questionnaire was obtained from the author of the questionnaire via email. Demographic information including the gender, age, specialty and level of education were collected from the participants. Questions related to frequency of internet usage, device preference and reason for use of internet were included in the questionnaire as well. The second part was comprised of 21 questions covering seven main categories of the digital health literacy instrument. All items were scored on a 4-point likert-type scale. The categories include operational skills, information searching, navigation skills, evaluating reliability, determining relevance, adding self-gene-rated health content, and protecting privacy. Descriptive analysis was done using the SPSS version 26. Mean scores were calculated for all the categories of DHLI. Mean score of different groups was compared using the Independent Sample T-test.

Results

350 questionnaires were circulated among the hospital staff of Mayo Hospital. Out of 350 questionnaires, 292 were filled and returned by the study participants, and 7 incomplete forms were rejected. After removing the incomplete forms a total of 285 participants were included in the study. 197(69%) were doctors and 88(30.9%) were nurses and allied health professionals. 125 (43%) were male and 160 (56.1%) were females. The mean age of respondents was 30.49 years(S.D= 6.88). the table 1 shows the demographic characteristics of all the participants. Table 2 shows the pattern of internet usage among the participants. 80% of the participants reported using the internet 'almost every day'. Only one participant reported having 'almost never' used the internet services. Mobile Phone was found to be the most used device, followed by laptop, whereas public devices such as computers were least preferred by the participants. Most of the participants (53.1%) self-rated their internet skills as 'Good'. Various health-related reasons to use the internet were also assessed. Information searching for health and various disorders was the most reported reason for internet usage. Descriptive statistics of diffe-rent categories of DHLI are shown in table 3. The Inde-

pendent T-test, used to compare the DHLI mean scores, showed significant statistical difference (p value <0.05) between the two genders for one variable only i.e. the mean score for 'determining data relevance' was higher in males. The T-test showed no significant statistical difference (p value<0.05) between the two participant groups(doctors and nurses/allied health professionals). The ANOVA test suggested statistical significance (p value<0.05) between the mean DHLI scores of few variables and level of education and work experience. The result was significant for 'adding content' and level of education, and 'adding content' and 'navigational skills' and years of work experience.

Discussion

A high level of digital health literacy enables healthcare professionals to provide accurate information to patients, collaborate efficiently with colleagues, make well-infor-

Table 1: *Demographic features of study participants:*

Category		number of participants (n)	Percentage (%)
Gender	Female	160	56.1%
	Male	125	43.9%
Age (years)	30.49 years (S.D=6.88)		
Work Experience	Less than 5 years	147	51.6%
	5-10 years	89	31.2%
	11-15 years	22	7.7%
	16-20 years	19	6.7%
	More than 20 years	8	2.8%
Designation	Doctors	197	69.1%
	Nurses and allied health professionals	88	30.9%
Specialty	Medicine and allied	161	56.5%
	Surgery and allied	86	30.2%
	Basic sciences	38	13.3%
Level of education	Diploma	45	15.8
	Bachelors	25	8.8%
	Masters or higher	16	5.6%
	MBBS	90	31.6%
	Post graduate qualification	107	37.5%
	others	2	0.7%

med decisions, and support the integration of technology into clinical practice. This study aims to assess the level of digital health literacy in doctors and paramedical staff.[8]

The results of our study show that nearly all healthcare

Table 2: *Internet usage among the participants.*

Category	N (number of participants)	Percentage
Frequency of Internet use		
(Almost) every day	230	80.7%
Several days a week	37	13%
About once a week	17	6%
(Almost) never	1	0.3%
Means of Internet access		
Mobile phone	263	92.3%
Laptop	69	24.2%
Computer device at home	7	2.5%
Tablet	13	4.6%
Work related computer	7	2.5%
Public computer	1	0.4%
Self-rated Internet skills		
Excellent	45	15.8%
Good	152	53.3%
Average	75	26.3%
Reasonable	10	3.5%
Poor	3	1.1%
Number of respondents who have ever used the Internet to…		
Information search on health and illness	281	98.6%
Appointment scheduling with a health care provider	144	50.5%
Read/post a health-related review on internet	200	70.2%
Use any health-related application	195	68.4%
Query about their healthcare provider	117	41.1%
Monitoring symptoms of disease	191	67%
Sharing personal health related information	127	44.6%
Accessing your own medical record.	94	33%
Take an online self-management course	83	29.1%
Post a message on a health related forum or social media platform.	112	39.3%

Table 3: *Mean of different variables of DHLI questionnaire.*

Variables	Percentage of total score	Mean ±S.D	Interpretation
Protecting Privacy	83.80	10.0526 ± 1.73	Very Desirable
Operational Skills	65.6%	7.8702 ± 2.09	Desirable
Navigational skills	74%	8.8912 ± 2.76	Desirable
Adding Content	73%	8.7614 ± 2.08	Desirable
Determining Data Relevance	77.9%	9.3474 ± 1.97	Desirable
Evaluating Data	73.5%	8.8314 ± 2.18	Desirable
Information Searching	81%	9.7263 ± 2.41	Very Desirable

professionals rely on digital resources for health-related information daily or several times a week. This aligns with earlier research; for instance, a study conducted in the UK demonstrated that approximately 81% of primary healthcare personnel utilize electronic health resources.[9] Similarly, a survey in Ethiopia found that 60% of healthcare professionals exhibited a high level of e-health literacy.[10,11] Since more than 90% of our country's population has access to mobile phones, it was the most used device for health information search in our study.[12,13]

Scores on the Digital health literacy instrument (DHLI) showed that healthcare professionals have desirable or very desirable scores on all the domains of the instrument. It is a known fact that health literacy is related to the education level of the individuals.[6,14] Since healthcare professionals such as nurses and doctors, have a college degree or higher, they are expected to have good health literacy as well. Moreover, easy access to online health resources may also contribute to a better digital health literacy as well. A study conducted in Iran showed that physicians have higher scores on DHLI compared to allied health professionals (nurses and other paramedical staff).[15,16] Our study, however, showed comparable scores on DHLI between medical doctors and allied health professionals.

In digital health care, ensuring the privacy and security of data is not only a legal and ethical obligation but also vital for maintaining patient trust, maintaining successful doctor-patient relationships, and promoting the widespread adoption of digital health solutions.[17,18] HCPs in our study have a desirable score on 'protecting privacy' on the DHLI. Operational and Navigational skill item scores also showed desirable levels among the health care professionals. As the trends are shifting more and more towards digital healthcare, having strong operational and navigational skills among healthcare professionals is crucial for improving patient care, optimizing management plans, and staying up to date with technological developments.[14,19] The skills to search the online sources efficiently, evaluate their credibility and find relevant information empower the health care professionals to stay informed about health conditions, treatment options, and preventive measures, enabling them to make decisions about their health and the health of their patients in the digital age. Scores on 'Information search' showed a 'very desirable level' of digital health literacy among the health care professionals. The variables 'Evaluating Data, ' 'adding content', and 'deter-mining data relevance' were also scored in the desirable range by our study participants. This study had some limitations. Being a cross-sectional study, it does not help establish causal relationships based on the results. Furthermore, the research was confined to a single healthcare facility and relied on convenience sampling for participant recruitment which limits the generalizability of our results. Additionally, digital health literacy was assessed using a self-administered scale instead of an objective assessment tool. Nevertheless, despite these limitations, the study recruited a substantial number of participants and gathered data through a standardized questionnaire.

Conclusion

Our findings suggest that healthcare professionals including doctors and allied health professionals have a high level of digital health literacy, possibly due to their higher educational level and frequent utilization of the internet for e-health resources.

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Authors Contribution

FN: Conceptualization of Project
ZP, NI, MGB: Data Collection
FN: Literature Search
ZP, NI, FN: Statistical Analysis
MGB, FN: Drafting, Revision
ZP, NI: Writing of Manuscript