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Virtual Disparities and Educational Divide as Determinants of Online Health Literacy: A Cross-sectional Study of University Students in Lahore

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Abstract: *The study assumes that students belonging to diverse educational levels were dissimilar in the level of practicing and competence in online health literacy. The survey method used a questionnaire to measure the responses of students of 16 universities in Lahore, Pakistan. A sample of 1512 students was selected by using a 4-stage stratified cluster sampling strategy. Data were analyzed using the Kruskal-Wallis H test, Dunn test, and Mann-Whitney U test (non-parametric). The findings show that educational level does have a significant association with practicing level in online health literacy (P. Value.0041). Moreover, education level also has a significant association with competence level in online health literacy (P. Value.045). The study recommends that online health literacy should be encouraged among the students, and the universities should be well-equipped with adequate hardware and human resources to facilitate the students.*

Key Words: Online Health Literacy, Educational Divide, Universities, Virtual Disparities

Introduction

The bygone two decades have seen fast and persistent growth in the usage of digital technologies. These novelties in digitized technologies have the ability to have an optimistic influence on health. Digital technologies are emerging as an indispensable source for approaching health and solving medical issues. The enlargement and dissemination of ICTs are having a wider influence on contemporary life as well as health institution. Online health literacy (OHL) has many aspects, including the ability to read, comprehend, and transfer important health-related information to solve some health-related issues by using digital resources (Juvalta et al., 2020). OHL is crucial to numerous health systems, containing quality, care, cost-effectiveness, and patients' indulgence in health decisions (Dale et al., 2020).

Similar to several other countries in the world, Pakistan had also made certain exertions to promote OHL but still fronting certain barricades in this regard. According to the Constitution of Pakistan, it is the rudimentary right of every resident to enjoy equivalent health amenities. OHL can reinforce the

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health establishment in Pakistan (Ali et al., 2019), but still, there are certain barricades, e.g., dearth of traditional knowledge (read and write) (Saeed et al., 2018), availability and approachability of ICT properties (Aldahmash et al., 2019), and procedural supervision relating OHL (Ahmed et al., 2018), etc. Individual and structural level exertions are obligatory for their effective execution. A major footstep relating OHL in Pakistan was the launching of the electronic Health Association of Pakistan (eHAP) in 2009. The major goal of eHAP was to trace out diverse barricades in the execution of OHL in Pakistan. The eHAP portrayed that promoting educational level can expand the using level of OHL among patients as well as general members of society (Latif et al., 2016). The contemporary research is a determination to discover the connection between the education level and OHL level among the educated youth of universities.

Online health literacy is an addition to health literacy and practices a similar definition but in the background of technology. Technology solutions have the ability to both promote as well as hinder health knowledge (Eneanya et al., 2016). Knowledge to manipulate the technological devices promotes online health literacy, and a dearth of information results in a barrier to OHL (Rathnayake et al., 2019). According to Norman et al., (2006), ehealth literacy is connected with certain varieties of education, e.g., traditional education (potential to read and write), health education, scientific knowledge (aptitude of using scientifically grounded notions), media, and computer literateness.

Dynamic, health-literate patients can go online and attain up-to-date information on refined technological modernizations relating to health and can demand for latest treatment. Scientific studies have found a vibrant association between education and health literacy (Eneanya et al., 2016; Jordan et al., 2019). Education is indispensable for a flourishing society. It not only provides the grounds for effective involvement in our morality and economy but also a vital element for the promotion of OHL (Qureshi et al., 2014; Lahtiranta et al., 2018). Patients with a lower level of formal education are far away from the OHL tools, so they are deprived of the benefits of the latest advancements of medical sciences. Modern studies on understanding health inequalities across education groups propose that technological evolution in health institutions will worsen disparities over the period of time (Park et al., 2016). And such disproportions will be bigger for older, sicker, and more susceptible patients (Lopez et al., 2016).

The ICT revolution has made gigantic changes into the health industry in the past decades through hundreds of webs, android apps, and health caring devices. However, such technology resulted into increased disparities among the literates and illiterates (Lopez et al., 2016). It is evident that individuals with a lack of knowledge could not get the advantage of technological advancements. Recent researches have proven the positive association between education and health. The research of Jordan et al., 2019 had shown that a number of school years had a relationship with health literacy.

While keeping in mind the contextual background, the contemporary study intended to probe the association between educational level and online health literacy. The previous studies were primarily interested in calculating the difference between the literate and non-literate respondents' views relating to health literacy. The present research made focused only to educated ones, but their educational level was varying (BS, MPhil, PhD). The prime objective of the recent research was to estimate, even if, educational level was associated with OHL or not? The research hypothesized that educational level had an influence upon (1) practicing level and (2) competence level in online health literacy. The first hypothesis (Ho) stated that the three diverse educational levels (BS, MPhil, PhD) have a similar distribution for practicing level in online health literacy. In the same manner, the second hypothesis (Ho) assumed that the three diverse educational levels have the same distributions for practicing level in OHL.

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Materials and Methods

Participants

The survey was conducted at four universities of Lahore, specializing in fields of technology, veterinary sciences, medical, and multidisciplinary. The sampling strategy used in this study was convenient sampling and voluntary. The participation were ensured anonymity and confidentially. Written consent of the participants also taken". The participants were a student of BS, MPhil and PhD.

Measures

The study was comprised of one independent (educational level) and two dependent (practicing level in OHL, and competence level in OHL) variables. The response for the dependent variable (DV) was measured through different indicators. Practicing level and competence level in OHL were calculated by using a scale of 6 items for each, and the rating of responses for practicing and competence was measured through the Likert scale. During routine university activities, the respondents completed a self-administered questionnaire that included questions relating to practicing level and competence level in OHL. Confirmatory Factor Analysis (CFA) observed the validity of scale/factors items of the questionnaire. CFA declared that the factors were consistent with researchers' understanding of the nature of that factor. Then, the Value of Cronbach's Alpha ($\alpha > 0.7$) showed the tau-equivalent reliability of the instrument.

Study Setting

A prospective and cross-sectional investigation was conducted in Lahore, Pakistan. The research population (16 Higher Education Commission recognized private and state universities) was heterogeneous in characteristics, including four major strata (i.e., technology universities, medical universities, veterinary sciences universities, and multidisciplinary universities). A stratified 4-stage cluster sample design (Random) was used. From the total strength of 16, HEC acknowledged universities of Lahore (N=89648), Research Advisor Table (RAT) 2006 (considering, 95 % confidence interval and 2.5 % margin of error) helped out in specifying the sample size (n=1512). The proportionate allotment formula determined the magnitude of the sample from each university. The formula is mentioned below: $ni = n\left(\frac{Ni}{N}\right)$

While:

ni= Magnitude of sample for each category, n = sample size, Ni= Magnitude (Stratum), N= Total Population

Table 1. Sample proportionate allocation

Nature of Institution	Name of University (Lahore)	Students	Sample Size
Technology Universities	UET, Lahore	9398	157
Multidisciplinary Universities	Punjab University	24960	422
	Beaconhouse University	1177	19
	Hajvery University	2757	46
	Minhaj University	1463	26
	University of Lahore	11460	192
	University of South Asia	1170	21
	Lahore College (for Women) University	4581	76
	GC University, Lahore.	7437	126
	University of Education	10368	173
	LUMS	2355	41
	UMT Lahore	3307	55
	UCP, Lahore	4236	72
Veterinary Sciences Universities	University of Veterinary Sciences	2999	50

Medical Universities	King Edward (Medical) University	1825	32
	UHS, Lahore	155	4
	Total	N=89648	n=1512

Statistical Analysis

The data gathered through the survey method was not normally distributed (Lilliefors Significance correction). Considering the study targets and statistical data suppositions, the Kruskal-Wallis H test (non-parametric Statistics) was employed to estimate the association between categorized independent variables (IV) and continuous dependent variables (DV). Further, to observe the difference in the groups of IV, during their effect upon DV, the Dunn test was employed. For such purpose value of chi-square was divided by√ . Then, Mann-Whitney U test calculated the significance difference among the groups of IV through SPSS.

Inferential Statistics

Statistics depicted in table 2 are revealing the socio-demographic characteristics of university students (n=1512). From the view point of educational level, the majority of the respondents (48.29%) were studying in BS class, while 44.9 % were in MPhil, and only 6.81% were in Ph.D. class. Types of educational institutions were categorized into four major strata. Statistics in the table illustrate that the majority of the respondents (83.92%) were from multidisciplinary universities (as this category included 12 universities), 10.38% were from technology universities, and the remaining 5.7% were studying in medical and veterinary sciences universities.

Participants Characteristics

Table 2. Descriptive Analysis for Socio-Demographics (n=1512)

Demographics	Gender			Percentages
Level of Education	**M**	**F**	**Total**	
PhD	61	42	103	6.81%
MPhil	395	284	679	44.90%
BS	358	372	730	48.29%
Total	814	698	1512	100%
Type of Institution	**M**	**F**	**Total**	
Medical Universities	21	14	35	2.32%
Technology Universities	92	65	157	10.38%
Veterinary Sciences Universities	30	21	51	3.38%
General (Multidisciplinary)	671	598	1269	83.92%
Total	814	698	1512	100%

Descriptive Analysis

Data in table 3 described the influence of categorized IV (educational level) on DV (practicing level in OHL). I had three diverse strata, i.e., MA, MPhil, and Ph.D., while DV was continuous. The objective was to note, even if diverse educational levels had any influence upon the practicing level in OHL (DV) or not? The distance in the means ranking (622 to 772) portrayed that all three categories of IV were differently affecting the DV. The P. value (.0041) excluded the null hypothesis and specified that students belonging to diverse educational levels (IV) had a diverse practicing level in OHL (DV). Then, the Dunn test (0.29) value was calculated (by dividing $\chi 2$ value to$\sqrt{n}$) to quantify the magnitude of the effect of IV (educational level) on DV (practicing level in OHL) on the dependent variable. The Dunn test value (0.29) pointed out that IV had a medium-size effect on the DV.

Table 3. Educational level and Practicing level in OHL

	Education Level	Mean Ranking
Practicing level in OHL	BS.	762.01
	MPhil.	772.10
	PhD.	622.23
Chi- Square(χ2): 11.002, P. value: .0041, df: 2 Dunn Test Value. 0.29		

The statistics of the Mann-Whitney U test in table 4 show the significant difference among all the three categories of IV, during their effect on the DV. Mann-Whitney U test was used to judge which categories of IV had a significant variance from each other during their effect upon DV. The difference of only two categories of IV can be calculated through the Mann-Whitney U test at one point of time. That's why pair-wise classification of categories of IV was designed, and further, their influence was examined on the DV. The values portrayed that practicing level in OHL was significantly dissimilar among Ph.D. level students and BS level students. Likewise, students of Ph.D. were also significantly dissimilar to MPhil students in OHL practicing level. Aforesaid findings strengthened the argument that students of different educational levels (IV) were dissimilar in OHL practicing level (DV).

Table 4. Educational level and Practicing level in OHL (Mann-Whitney U test)

	Educational Level	P-Value
Practicing level in OHL	BS–MPhil.	.696
	BS–PhD	.001
	MPhil–PhD	.002

Statistics of table 5 are portraying the consequences of the categorical independent variable (educational) upon the dependent variable (competence level in OHL). The target was to investigate, even if, educational level (IV) had any influence upon the competence level in OHL (DV) or not? Statistics of the Kruskal-Wallis H. test (non-parametric) disclosed that means ranking for all three sets of IV were varying from 681 to 783 during their influence upon DV. It concluded that varied educational levels (IV) had an effect upon competence level in OHL (DV). Students of diverse educational levels had diverse competence levels in OHL. P. value (0.045) furthermore excluded the null hypothesis and established the viewpoint that students of diverse educational levels (IV) were different in their competence level in OHL. Then, the Dunn test value (0.10) projected that educational levels (IV) had a smaller magnitude of effect upon competence level in OHL (DV).

Table 5. Educational level and Competence level in OHL (Kruskal Wallis H test)

	Educational Level	Mean Ranking
Competence level in OHL	BS.	744.01
	MPhil.	783.00
	PhD.	681.90
Chi- Square (χ2): 6.251, P. value: .045, df: 2 Dunn Test Value: 0.10		

Further, the Mann-Whitney U test (depicted in table 6) was used to estimate which categories of IV were significantly dissimilar to each other during their influence upon DV. The statistics depicted that MPhil scholars were significantly dissimilar to Ph.D. scholars, from the view point of competence level in OHL, which again strengthened the argument that categories of IV were differently affecting the DV.

Table 6. Educational level and Competence level in OHL (Mann-Whitney U Test) Results

	Educational Level	P-Value
Competence level in OHL	BS – MPhil	.089
	BS – PhD	.181
	MPhil – PhD	.027

The study started with the assumption that the educational level (categorized independent variable) was associated with (1) practicing level in OHL and (2) competence level in OHL (continuous dependent variables). The first hypothesis (Ho) assumed that the three diverse educational levels (BS, MPhil, Ph.D.) (IV) have the same distribution for practicing level in OHL (DV). Similarly, the second hypothesis (Ho) assumed that the three

diverse educational levels (IV) have identical distributions for practicing level in OHL (DV).

The questionnaire (declared valid by CFA, and reliable by the value of α) was used to quantify the responses of four diverse natures of educational institutes (i.e., technology universities, veterinary sciences universities, medical universities, and multidisciplinary universities) in Lahore. The sample size (n=1513) was allocated to each university through stratified sampling and proportionate allocation. Kruskal-Wallis H test, Dunn test, and Mann Whitney U test (non-parametric) were used to assess the consequences of IV on the DV. Socio-demographics depicted that majority of scholars were from multidisciplinary universities and from BS level classes.

While testing the first hypothesis in inferential statistics, the mean ranks (621 to 771), P. value (.004), and Dunn test value portrayed the variety of categories of IV during their effect on DV. This condition overruled the first null hypothesis (Ho) and authenticated the alternative hypothesis (H_1). This situation made it obvious that respondents belonging to diverse educational levels (BS, MPhil, Ph.D.) had a dissimilar practicing level in OHL. The statistics of the Mann-Whitney U test illustrated that students of Ph.D. classes were significantly dissimilar to BS level students from the viewpoint of their practicing level in OHL (DV). Similarly, the practicing level in OHL was significantly dissimilar among students of Ph.D. and MPhil. Such outcomes reinforced the argument that students of diverse educational levels (IV) had diverse practicing levels in OHL (DV).

While testing the second null hypothesis, Kruskal-Wallis H. test (mean ranks 682 to 782), P. value (0.04), and Dunn test value (0.1) excluded the null hypothesis and specified that students of diverse educational levels were dissimilar in their competence level in OHL. The statistics of the Mann-Whitney U test depicted that MPhil students were significantly dissimilar from Ph.D. students in their competence level in OHL. The situation established the viewpoint that students of diverse educational levels (BS, MPhil, PhD) were having diverse level of (1) practicing and (2) competence in OHL.

Discussion

The current research made an exertion to explore the association between the educational divide and the digital divide. While taking into consideration the functionality of online health literacy, the contemporary study made efforts to investigate diverse factors associated with practicing level and competence level in online health literacy (OHL) among the educated youth of universities in Lahore. The research assumed that students belonging to diverse educational levels (IV) had diverse (1) practicing level and (2) competence levels in OHL. Students of BS, MPhil, and PhD, of 16 diverse universities were focused on the quantitative survey.

The findings were statistically induced through different statistical tests. The findings explored that students of diverse educational levels had diverse practicing levels in online health literacy (OHL). The findings clarified that students of BS and Ph.D. were significantly dissimilar to each other in practicing level in OHL. Likewise, MPhil and Ph.D. students were also significantly dissimilar to each other in OHL practicing level. The judgments are quite rational and balanced, as students of different educational levels have different tendencies towards the usage of ICTs (Saeed et al., 2018). The erstwhile studies had also concluded that a number of school years were associated with the usage of ehealth literacy (Kutcher et al., 2015). The research of Cherid et al., (2020) had also pointed out that knowledge to operate high-tech devices endorses health literacy, and a dearth of knowledge results in a barrier to health literacy. The detailed review of the literature makes it evident that the findings are rational and having accordance with the established narrations of the previous studies (Hanik et al., 2011; Aldahmash et al., 2019). The variation among practicing a level of OHL was also observed among low literate and high literate individuals (Mcinnes et al., 2011).

In accordance with former studies, the study also found that competence in OHL was dissimilar among students of diverse levels of education. (Kozma et al., 2014; Ansari et al., 2012). The statistics portrayed that MPhil and PhD students were significantly dissimilar to each other in their competence level in OHL. The findings are logical

and have a resemblance with the previous research that educational level was associated with OHL expertise.

The findings of the second hypothesis also validate the findings of the first hypothesis, as it seems a matter of commonsense that increased practicing level is associated with increased competence level. The findings of the current research have accordance with previous ones, still, the study filled certain methodological gaps of literature. The study included highly educated youth of higher institutions to obtain a detailed and mature outlook of the topic. The study is unique in the sense that a large number of respondents (n=1512) were studied, and both publicly-owned and privately-owned institutions were focused. The scope of the research has gone beyond the existing literature as the study had focused on respondents of both genders, from diverse nature educational institutions.

Further, the existing research has noteworthy health policy suggestions. As health knowledge is positively associated with health improvement, so the outcomes of the contemporary study will be helpful for health policymakers by suggesting different determinants of health knowledge. As the upcoming health structure will be reliant on technology and internet portal health services, the narrow knowledge of ehealth amenities can be costly for patients in the future. Therefore, structural level exertions are desirable to enlarge the notion of online health literacy, and the institutions should refine the skills of individuals in this regard.

Conclusion

The contemporary study established the view point that there is an association between educational level and online health literacy. The results depicted that students of diverse educational levels were having diverse practicing levels and competence levels in online health literacy (OHL). The study suggested that level of OHL can be promoted through educational level. This study has strong repercussions for health policymakers, however, the study has also certain limitations e.g. (1) results can only be generalized to the highly educated segment of society, (2) the sample represented only one city (Lahore), and (3) the study excluded school, colleges, hospitals and general members of society etc. Therefore, future researchers are advised to reduce the effect of these limitations in their researches.

References

Ahmed, W., Shaikh, Z. N., Soomro, J. A., Qazi, H. A., & Soomro, A. K. (2018). Assessment of health literacy in adult population of Karachi: a preliminary investigation for concept-based evidence. *International Journal of Health Promotion and Education, 56*(2), 95-104.

Aldahmash, A. M., Ahmed, Z., Qadri, F. R., Thapa, S., & AlMuammar, A. M. (2019). Implementing a connected health intervention for remote patient monitoring in Saudi Arabia and Pakistan: explaining 'the what'and 'the how'. *Globalization and health, 15*(1), 1-7.

Ali, R., & Abbas, M. (2019). User's E-Readiness for E-Health and Traditional Healthcare: A Case of Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan. *International Transaction Journal of Engineering, Management, & Applied Sciences & Technologies, 10*(5), 607-615.

Ansari, B., Shaikh, A., Khan, R., & Hamirani, N. (2012). Telemedicine enlightenment: A smart health care system for rural areas. *Journal of Emerging Trends in Computing and Information Systems, 3*(2), 145-149.

Cherid, C., Baghdadli, A., Wall, M., Mayo, N. E., Berry, G., Harvey, E. J., Albers, A., Bergeron, S. G., & Morin, S. N. (2020). Current level of technology use, health and eHealth literacy in older Canadians with a recent fracture—a survey in orthopedic clinics. *Osteoporosis International*, *31*(7), 1333–1340. https://doi.org/10.1007/s00198-020-05359-3.

Chung, J. E., & Lee, C. J. (2019). The impact of cancer information online on cancer fatalism: education and eHealth literacy as moderators. *Health education research, 34*(6), 543-555.

Dale, J. G., Lüthi, A., Fundingsland Skaraas, B., Rundereim, T., & Dale, B. (2020). Testing Measurement Properties of the Norwegian Version of Electronic Health Literacy Scale (eHEALS) in a Group of Day Surgery Patients. *Journal of Multidisciplinary Healthcare*, *13*, 241–247. https://doi.org/10.2147/jmdh.s242985.

Eneanya, N. D., Winter, M., Cabral, H., Waite, K., Henault, L., Bickmore, T., Hanchate, A., Wolf, M., & Paasche-Orlow, M. K. (2016). Health Literacy and Education as Mediators of Racial Disparities in Patient Activation Within an Elderly Patient Cohort. *Journal of Health Care for the Poor and Underserved*, *27*(3), 1427–1440. https://doi.org/10.1353/hpu.2016.0133.

Hanik, B., & Stellefson, M. (2011). E-Health Literacy Competencies among Undergraduate Health Education Students: A Preliminary Study. *International Electronic Journal of Health Education, 14*, 46-58.

Jordan, D. M., Bush, J. S., Ownby, D. R., Waller, J. L., & Tingen, M. S. (2019). The impact of traditional literacy and education on health literacy in adolescents with asthma. *Journal of Asthma, 56*(8), 882-890.

Juvalta, S., Kerry, M. J., Jaks, R., Baumann, I., & Dratva, J. (2020). Electronic health literacy in Swiss-German parents: cross-sectional study of eHealth literacy scale unidimensionality. *Journal of Medical Internet Research, 22*(3), e14492.

Kozma, R. B., & Vota, W. S. (2014). *ICT in developing countries: Policies, Implementation, and Impact. In Handbook of Research on Educational Communications and Technology (pp. 885-894)*. Springer New York.

Kutcher, S., Bagnell, A., & Wei, Y. (2015). Mental health literacy in secondary schools: a Canadian approach. *Child and adolescent psychiatric clinics of North America, 24*(2), 233-244.

Lahtiranta, J., & Majanoja, A. M. (2018). Industry-oriented education in eHealth. *In CSEDU 2*, 411-419.

Latif, N., Alam, A. N., & Abdullah, S. (2016). Knowledge and attitude of dentists towards teledentistry in Pakistan. *Pakistan Oral & Dental Journal, 36*(2).

Lopez, L., Tan-McGrory, A., Horner, G., & Betancourt, J. R. (2016). Eliminating disparities among Latinos with type 2 diabetes: effective eHealth strategies. *Journal of Diabetes and its Complications, 30*(3), 554-560.

Mcinnes, N., & Haglund, B. J. (2011). Readability of online health information: implications for health literacy. *Informatics for health and social care, 36*(4), 173-189.

Norman, C. D., & Skinner, H. A. (2006). Essential Skills for Consumer Health in a Networked World. *Journal of Medical Internet Research*, *8*(2), e9. https://doi.org/10.2196/jmir.8.2.e9

Park, H., Cormier, E., Gordon, G., & Baeg, J. H. (2016). Identifying health consumers' eHealth literacy to decrease disparities in accessing eHealth information. *CIN: Computers, Informatics, Nursing, 34*(2), 71-76.

Qureshi, Q. A., Shah, B., Nawaz, A., Khan, I., Waseem, M., & Muhammad, F. M. (2014). E-Health in Pakistan: Issues and Prospects. *Journal of Biology, Agriculture and Healthcare, 4*(17), 106-115.

Rathnayake, S., & Senevirathna, A. (2019). Self-reported eHealth literacy skills among nursing students in Sri Lanka: A cross-sectional study. *Nurse education today, 78*, 50-56.

Saeed, H., Saleem, Z., Naeem, R., Shahzadi, I., & Islam, M. (2018). Impact of health literacy on diabetes outcomes: a cross-sectional study from Lahore, Pakistan. *Public Health, 156*, 8-14.