Research Article

Functional health literacy among undergraduate pharmacy students: a cross-sectional study from Pakistan

Abstract

Most of the medical and pharmacy students will work as health professionals after graduation and will have more opportunities to interact with patients. Therefore, they should possess adequate health literacy levels to enhance the health literacy of the patients.

Objective: The present study was designed to assess functional health literacy among undergraduate Pharm.D students studying at Hamdard University, Islamabad, Pakistan.

Methodology: A descriptive cross-sectional study design was used. A pre-validated tool S. Tofhla was self-administered to a sample of 400 Pharm.D students of Hamdard University, Islamabad, Pakistan. After data collection, data was cleaned coded and entered in SPSS version 21.0. Descriptive statistics comprising of frequency and percentages was calculated. The non-parametric tests including Mann-Whitney and Kruskal-Walis ($p \geq 0.05$) were performed to find out the difference among different variables.

Results: The results highlighted that female students had higher scores of functional health literacy (29.03, ±4.14). Undergraduate students living in urban settings (28.69, ±4.66) had high functional health literacy scores than students living in rural areas (26.46, ±6.48). Students having English language as medium of instruction during their schooling had better scores (28.53, ±5.11) than students having Urdu language as medium of instruction in high school.

Conclusion: The results of the present study concluded that the level of functional health literacy among undergraduate pharmacy students was adequate. High level of health literacy is required to assist pharmacists to manage self-care activities, and the care of their patients, future research should be designed to explore whether improved health literacy amongst pharmacists transforms into improved self-care and better patient outcomes.

Keywords: health literacy, health behavior, university students, pharmacy education, pakistan, s-tofhla

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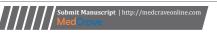
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Introduction

Health literacy is considered to be a matrix of cognitive abilities comprised of four competency areas which include accessing, understanding, judging and applying information related to health. Each of these proficiencies is framed within three domains of health that characterize both individual and societal level interactions within the health system. These are healthcare, disease prevention and health promotion.[1] The quality of health services and healthcare providers may be affected by health literacy levels of individuals.[2] Most of the individuals have difficulty in navigating healthcare options and are unable to understand the information provided by health care professionals regardless of their education and social status.[3] The inability to comprehend health related information by the patient leads to ineffective self-management of their medical problems. Lack of knowledge and appropriate clinical skills among medical and nursing graduates required for addressing the needs of individuals with low health literacy leads to further aggravation of the health issue.[4] Healthcare providers should possess adequate levels of health literacy for establishing an effective patient-provider communication relationship, as healthcare professionals can help

in improving literacy levels of patients. Limited research has been conducted regarding levels of health literacy among healthcare professionals. Major gaps have been identified in the current literature among health professionals regarding their knowledge and clinical recognition of low health literacy. Great attention is required towards improving health literacy levels of medical and pharmacy students as after graduation they are involved in direct patient care. Interventions have been designed to improve health literacy levels in many countries but mostly have focused on patients, residents, and non-medical students.[5] The current literacy rate in Pakistan is only 54.9% but little focus has been given to the issue of health literacy in the country. Globally one of the key players and readily available healthcare professionals are pharmacists. During their course of study, pharmacists must be equipped with the necessary clinical skills required to evaluate and address health literacy issues of patient's.[6] Review of the existing literature has revealed that limited studies have been conducted regarding assessment of health literacy levels of pharmacy students. Studies have mostly focused on levels of health literacy of undergraduate students acquiring non-healthcare degrees in developed countries. Low levels of health literacy among pharmacy students may have negative impacts on the self-care abilities as well as

on pharmaceutical care activities provided by them. There is a dire need for assessment of levels of health literacy among pharmacy students.[5] To the best of our knowledge, no research has been conducted till date which has assessed health literacy among undergraduate pharmacy students. Thus, the present study was designed to assess functional health literacy among undergraduate Pharm.D students studying at Hamdard University, Islamabad, Pakistan.

Methodology

A descriptive cross-sectional study design was used to assess functional health literacy among undergraduate Pharm.D students studying at Hamdard University, Islamabad, Pakistan. National bioethical committee is present for this type of research and it states that only institutional head approval is required for this type of study. For data collection approval from Head of the Institute was taken. Informed and verbal consent for participation was also taken from the respondents. Respondents were ensured for the confidentiality of information verbally as well as confidentiality under taking was signed by the principal investigator. All the current Pharm.D students at Hamdard Institute of Pharmaceutical Sciences willing to participate were included in the study.

Sample size and sampling procedure

Calculation of sample size was performed by using Rao soft sample size calculator to determine the size of sample representing the population of Pharm.D students. Sample size was calculated as 400 to achieve 95% confidence interval with 5% margin of error. Convenience sampling technique was used to select the respondents. According to convenience sampling all the respondents that were available at time of data collection were selected.

Data collection tool

A pre-validated tool named S-TOFHLA was used to assess the functional health literacy among undergraduate students. S-TOFHLA (Reading Comprehension) tests a person's ability to read materials from the health care setting. It comprises of 2 functional health reading comprehension passages. Passage A is regarding X-ray preparation and passage B is about Medicaid rights and responsibilities. The passages are ordered by increasing difficulty. This is a timed test and should be stopped at the end of 7minutes. Test comprises of 36 blanks (16 blanks in passage A, 20 blanks in passage B) to be filled by the most appropriate word among the 4 options given below each blank. Section one comprising of demographics was filled by the respondents. Section two is where the S-TOFHLA test started. The test was printed in 14 point font (large print) in order to avoid difficulty in reading. Scoring of tool is done by comparing the answers with the appropriate scoring key provided. In the score box, "1" was circled for correct and "0" for incorrect for each blank. Correct answers were summed for each page and total was recorded on the last scoring column page as the Reading Comprehension Raw Score and then it was seen that the score lies in which of the mentioned ranges given in the TOFHLA Functional Health Literacy Levels (Table 1).

Reliability and validity of the tool

Two focused group discussions had been conducted at different time intervals with experts from hospitals, regulatory authorities and academia for face and content validation of the tool. Beside this pilot testing was conducted at 10% of the sample size to test the reliability of the tool. Value of Cronbach alpha for the tool was 0.88 which was satisfactory.

Table 1 TOFHLA functional health literacy levels

Levels	Tofhla score	Functional health literacy description
Inadequate Functional Health Literacy	0-16	Unable to read and interpret health texts
Marginal Functional Health Literacy	17-22	Has difficulty reading and interpreting health texts
Adequate Functional Health Literacy	23-36	Can read and interpret most health texts

Data collection and analysis

Data was collected by the investigators. The respondents were identified and after obtaining written/verbal consent from them, the questionnaire was hand delivered to them. The questionnaire was collected back on the same day to avoid study biasness. After data collection, data was cleaned coded and entered in SPSS version 21.0. Skewness test was performed and histograms with normal curves were used to check the normal distribution of data. Descriptive statistics comprising of frequency and percentages was calculated. The non-parametric tests including Mann-Whitney and Kruskal-Walis ($p \geq 0.05$) were performed to find out the difference among different variables.

Results

Demographic characteristics

Out of 400 respondents, 30.5% (n=122) were males and 69.5% (n=278) were females. Of the total respondents 44.2% (n=177) were less than 20years of age whereas 55.7% (n=223) were between 20-30years of age. Of the total respondents, 77.2% (n=309) had studied in an English medium high school whereas 22% (n=88) had studied in an Urdu medium high school. Of the total respondents, 23.7% (n=95) were studying in 1st professional, 18.5% (n=74) in 2nd professional, 17.7% (n=71) in 3rd professional, 22% (n=88) in 4th professional and 18% (n=72) in 5th professional (Table 2).

Levels of health literacy by different demographic characteristics among undergraduate pharmacy students

The results highlighted that majority of the males had adequate health literacy (78.6%, n=96), 8.1% (n=10) had marginal whereas 13.1% (n=16) had inadequate health literacy. Among female respondents, 93.5% (n=260) had adequate health literacy, 3.5% (n=10) had marginal and 2.8% (n=8) had inadequate health literacy. Majority of students aged less than 20years had adequate health literacy (88.1%, n=156) whereas 89.6% (n=200) of the students aged between 20-30years had adequate health literacy. The results highlighted that majority of the students residing in Islamabad had adequate health literacy (91.9%, n=148) whereas only 4.9% (n=8) had inadequate literacy levels. Majority of the students living in Rawalpindi had high literacy levels (86.9%, n=133) whereas only 5.8% (n=9) had inadequate literacy levels. About 90.2% (n=279) having English as medium of instruction had adequate literacy levels whereas 85.2% (n=75) having Urdu language as medium of instruction had adequate health literacy levels. The results highlighted that 86.3% (n=82) of students studying in 1st professional had adequate health literacy, 81.08% (n=60) in 2nd professional, 87.3% (n=62) in 3rd professional,

94.3% (n=83) in 4th professional and 95.8% (n=69) in 5th professional had adequate health literacy levels (Table 3).

Table 2 Demographic characteristics

Variable	n(%)
Gender	
Male	122(30.5%)
Female	278(69.5%)
Age	
<20 years	177(44.2%)
20-30years	223(55.7%)
City	
Islamabad	161(40.2%)
Rawalpindi	153(38.2%)
Wah/Taxila	20(5%)
Other(KPK and other cities of Punjab)	66(16.5%)
Setting	
Urban	327(81.7%)
Rural	73(18.2%)
Medium of instruction in high school	
English	309(77.2%)
Urdu	88(22%)
Current professional of Pharm.D	
1st professional	95(23.7%)
2nd professional	74(18.5%)
3rd professional	71(17.7%)
4th professional	88(22%)
5th professional	72(18%)
Parents income	
<Rs.10,000	17(4.2%)
Rs.10,000-20,000	28(7%)
Rs.21,000-30,000	27(6.7%)
Rs.31,000-40,000	16(4%)
Rs.41,000-50,000	17(4.2%)
>Rs.50,000	33(8.2%)
Not responded	262(65.5%)

Mean scores of health literacy by different demographic characteristics among undergraduate pharmacy students

The results highlighted that female students had higher scores of functional health literacy (29.03 ±4.14). Students aged between 20-30years had slightly higher score (28.37±5.21). Students living in Wah and Taxila had higher scores (29.60, ±2.72) than students living in other cities. Undergraduate students living in urban settings (28.69, ±4.66) had high functional health literacy scores than students living in rural areas (26.46, ±6.48). Students having English language as medium of instruction during their schooling had better scores (28.53, ±5.11) than students having Urdu language as medium of instruction in high school (Table 4).

Table 3 Levels of health literacy by different demographic characteristics among undergraduate pharmacy students

Variables	Inadequate functional health literacy n(%)	Marginal functional health literacy n(%)	Adequate functional health literacy n(%)
Gender			
Male	16(13.1%)	10(8.1%)	96(78.6%)
Female	8(2.8%)	10(3.5%)	260(93.5%)
Age			
<20years	9(5%)	12(6.7%)	156(88.1%)
20-30years	15(6.7%)	8(3.5%)	200(89.6%)
City			
Islamabad	8(4.9%)	5(3.1%)	148(91.9%)
Rawalpindi	9(5.8%)	11(7.1%)	133(86.9%)
Wah/Taxila	0	1(5%)	19(95%)
Other(KPK and other cities of Punjab)	7(10.6%)	3(4.5%)	56(84.8%)
Setting			
Urban	15(4.5%)	14(4.2%)	298(91.1%)
Rural	9(12.3%)	6(8.2%)	58(79.4%)
Medium of instruction in high school			
English	17(5.5%)	13(4.2%)	279(90.2%)
Urdu	6(6.8%)	7(7.9%)	75(85.2%)
Current professional of Pharm.D			
1st professional	7(7.3%)	6(6.3%)	82(86.3%)
2nd professional	6(8.1%)	8(10.8%)	60(81.08%)
3rd professional	7(9.8%)	2(2.8%)	62(87.3%)
4th professional	4(4.5%)	1(1.1%)	83(94.3%)
5th professional	0	3(4.1%)	69(95.8%)
Parents income			
<Rs.10,000	3(17.6%)	2(11.7%)	12(70.5%)
Rs.10,000-20,000	2(7.1%)	2(7.1%)	24(85.7%)
Rs.21,000-30,000	1(3.7%)	2(7.4%)	24(88.8%)
Rs.31,000-40,000	1(6.2%)	2(12.5%)	13(81.2%)
Rs.41,000-50,000	2(11.7%)	1(5.8%)	14(82.3%)
>Rs.50,000	6(18.1%)	1(3%)	26(78.7%)
Not responded	9(3.4%)	10(3.8%)	243(92.7%)

Table 4 Mean scores of health literacy by different demographic characteristics among undergraduate pharmacy students

Variables	Mean functional health literacy scores (Score: inadequate-0-16, marginal-17-22, adequate-23-36)
Gender	
Male	26.72(±6.43)
Female	29.03(±4.14)
Age	
<20 years	28.20(±4.97)
20-30 years	28.37(±5.21)
City	
Islamabad	28.62(±4.92)
Rawalpindi	28.16(±5.28)
Wah/Taxila	29.60(±2.72)
Other(KPK and other cities of Punjab)	27.9(±6.26)
Setting	
Urban	28.69(±4.66)
Rural	26.46(±6.48)
Medium of instruction in high school	
English	28.53(±5.11)
Urdu	27.40(±5.03)
Current professional of Pharm.D	
1st professional	27.67(±5.47)
2nd professional	27.37(±6.24)
3rd professional	28.30(±5.32)
4th professional	29.04(±4.43)
5th professional	29.22(±3.29)
Parents income	
<Rs.10,000	25.05(±8.34)
Rs.10,000-20,000	27.57(±5.17)
Rs.21,000-30,000	28.00(±4.80)
Rs.31,000-40,000	28.37(±6.11)
Rs.41,000-50,000	27.64(±6.37)
>Rs.50,000	26.24(±7.17)
Not responded	28.89(±4.25)

Comparison of functional health literacy of Pharm.D students by demographic characteristics

A significant difference (p≥0.05) in functional health literacy of Pharm.D students was observed among different gender, setting and medium of schooling. Female students had relatively better functional health literacy than male students while students living in urban areas and having English language as medium of schooling possessed better functional health literacy. On the other hand, no significant difference (p≥0.05) with respect to different professionalyears, city of residence and parent's income was observed (Table 5).

Table 5 Comparison of functional health literacy of Pharm.D students by demographic characteristics

Demographics	Functional health literacy score			
	n	Mean rank	Test statistics	p-value
Gender	Male=122	172.6	13747.500[a]	0.001
	Female=278	213.1		
Setting	Rural=73	166.8	9099.500[a]	0.004
	Urban=327	207.5		
Medium of schooling	English=309	208.8	11250.0[a]	0.005
	Urdu=88	171.5		
Professional Year	1st Prof=95	188.77		
	2nd Prof=74	188.9		
	3rd Prof=71	201.56	4.26[b]	0.371
	4th Prof=88	217.63		
	5th Prof=72	207.91		
City of residence	Islamabad=161	204.18		
	Rawalpindi=153	197.98		
	Wahcantt=20	130.87	8108.0[b]	0.88
	KPK=20	214.35		
	Punjab=46	192.3		

Mann Whittney[a]; Kruskal Wallis Test[b](p≥0.05)

Discussion

The overall success in achieving desired treatment outcomes profoundly relies on high literacy levels of individuals. Inadequate health literacy contributes to diminished treatment outcomes owing to patient's inability to evaluate and utilize health care system, to attend health appointments, to comprehend health related documents, and to follow prescription directions and drug therapy plan. There is a requirement of improved health literacy training for all students acquiring healthcare degree as students must be prepared effectively for communicating with low health literacy patients in order to achieve maximum clinical outcomes.[7] The results of the present study are quite encouraging as they showed that majority of the undergraduate pharmacy students had adequate functional health literacy. The results of the current study highlighted that female students had relatively better functional health literacy as compared to male students. This might be due to the fact that females are more conscious regarding their health and generally possess better academic scores. The results are in line with findings of a study conducted in china where female

college students reported higher knowledge regarding health.[8] The results of the study highlighted that students living in urban areas and having English as their medium of instruction at high school had higher health literacy scores than students living in rural areas. This might be due to the fact that people living in urban areas have more access and better healthcare & education facilities due to which they are comparatively well informed and conscious regarding their health. Similar findings were reported from studies conducted in colleges and medical universities of China.[5–8] The results of the present study highlighted that students studying in the final professional had better functional health literacy than students studying in first and second professionals of Pharm.D. Similar findings were reported in studies conducted in Britain, Indonesia and china which concluded that health literacy scores were linked with year of study.[5–9] The results of the current study revealed that students whose parents income was between Rs.31,000-40,000 had highest scores of functional health literacy whereas students having lower financial income had low scores. The results are in line with studies conducted in Britain, china and Greece.[8–10]

Conclusion

The results of the present study concluded that the level of functional health literacy among undergraduate pharmacy students was adequate. Students living in urban areas and with better educational background possessed better functional health literacy. Health literacy is one of the basic foundations of public health policy; therefore, collaborative working of different stakeholders is required to develop effective interventions for improving functional health literacy among residents of rural areas. Furthermore, based on the premise that a high level of health literacy is required to assist pharmacists to manage self-care activities, and the care of their patients, future research should be designed to explore whether improved health literacy amongst pharmacists transforms into improved self-care and better patient outcomes.

Acknowledgements

Conflict of interest

Author declares that there is no conflict of interest.

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