Health Education and Health Promotion (HEHP) (2016) Vol. 4 (4)

Assessing Health Literacy and Its Relationship with Using Cell Phone among Adolescents

Samira Olyani[1], Nooshin Peyman[2]*

Abstract

Aim: One of the most significant outcomes of health education is health literacy (HL) so that it must be widely applied for achieving health promotion. The aim of this study was assessing HL and its relationship with using cell phone in adolescents in Mashhad City.

Methods: In this analytic-descriptive research, 445 high school adolescents selected with cluster sampling were assessed. For assessing HL, the Newest Vital Sign (NVS) was used. Cell phone use assessment tool was used for assessing the use of using cell phone. Data were analyzed by SPSS version 16.

Findings: Based on the obtained results, 82.1% and 86.2% of the female and male adolescents had not adequate HL, respectively. There was a negative correlation between the adolescents' HL and using cell phone ($p<0.0001$).

Conclusion: Most of the adolescents had limited HL, and the adolescents with higher rate of using cell phone had worse HL score. In fact, adequate HL has a significant role for promoting health in the society. Therefore, policy makers are suggested to design useful educational programs for adolescents, especially in non-medical settings such as schools, was most of the day, adolescents spend their time over there.

Keywords: Community health education, Health literacy, Adolescent, Cell phone, Mobile phone

1. M.Sc. Student of Health Education and Health Promotion, Department of Health Education and Health Promotion, School of Health, Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran Email: Alianis931@mums.ac.ir
2. Ph.D., Associate Professor, Department of Health Education and Health Promotion, School of Health, Social Determinants of Health Research Center, Mashhad University of Medical Sciences, Mashhad, Iran Email: peymann@mums.ac.ir

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

Introduction

Nowadays, due to the increasing production of communication tools and easy access to them, various groups of community people, mainly are teenagers and young people, tend to use these tools [1]. In the 21st century, teenagers will rely more on technology for communication, access to information, and overall life-long learning than adults [2].

In the last decade, the propagation of cell phones or mobile phones has been the highest among all the other types of communication tools [3]. The indiscriminate use of cell phone has raised concerns about the effects of cell phones on human somatic, psychological and social health. When using a cell phone, the users' ear is located near the source of electromagnetic field, which can be very dangerous [4]. Another complication of talking on a cell phone is induction of stress proteins due to cell phone waves that their harmful effects on brain activity have been proved [5]. Some scientific reports also mention cancer as a consequence of exposure to cell phones, and that the risk of skin cancer in people who apply long-term use of cell phone and exposed to mobile radio waves is three times more than in other people [6]. The habit of using cell phones and the risk of brain tumors is also a topic that is still globally explored. According to a recent report from the National Academy of Sciences, due to the increasing use of children from mobile phones, further studies in this field are needed [7]. Children and teenagers who use mobile phones for long hours throughout the day will develop problems such as depression, neglecting important activities due to addiction to mobile phone, lowered self-confidence, and ultimately, isolation from the society; also they will develop physical problems such as nutrition disorders, lack of sleep, etc., which are due to addiction to mobile phone. Due to the inevitable use of mobile phones in the current community, what matters is the scientific and informed dealing with new technological advances and minimizing the inevitable risks and harms, which may be beyond the benefits and applications of each product, as well as the technical and technological achievement [4]. In this regard, HL as a science and the capacity of individuals to make appropriate decisions to meet the complex health needs of today's modern society can be helpful [8]. HL refers to the degree of capacity and ability of individuals to acquire, interpret and understand basic health information and health services such as the ability to read and understand information, the ability to perform computations, and having social and communication skills necessary to make appropriate health decisions [9, 10]. This definition includes daily life at home,

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

community, work environment, health care system, shopping place, and the political environment. This is an important empowerment strategy for increasing the power of people's control over their health, increasing their ability to seek information, and assuming their health responsibilities [11]. HL is also a strong predictor of high-risk behaviors associated with health in adolescents [12]. Adolescence is a crucial period in every person's life; especially since adolescents must decide independently, empowering them to make decisions that determine their health conditions throughout their life is important because improving the health of this group can guarantee the community's health promotion [13]. In general, few studies have been done on adolescent HL, especially in educational settings [2].

Understanding and improving HL in adolescents is important for several reasons. The first one is as health-related habits and behaviors that are formed in adolescents become stable throughout their life; therefore, HL skills can help them to increase their awareness of the adoption of a healthy life-style. The second one is that adolescents in the future should use health care system independently and young adults with inadequate HL are more likely to encounter poor health outcomes due to poor HL in adulthood [14-16]. The third is that since most health systems provide online services, adolescents need to know how to get health services online [17]. Finally, few studies have been conducted on the relationship between HL in adolescents and health outcomes. There is a meaningful relationship between low HL and adopting high-risk behaviors such as smoking, behavioral problems (aggression and weapon delivery), obesity and low levels of uplifting health behaviors [2].

Considering the effects and consequences of cell phones on the physical, psychological and social health of adolescents and the importance of HL in adopting appropriate health-centered decisions, this study aimed to investigate the relationship between HL and the amount of daily use of cell phones in a sample of Iranian teenager girls and boys.

Materials and Methods

Study design and population:

This descriptive-analytic cross-sectional study was done on all high school adolescents in Mashhad. For this purpose, four high schools (two for each sex) were randomly selected from two educational districts in Mashhad. Then they were divided into six grades based on educational levels, including: seventh, eighth, ninth, tenth, eleventh and twelfth grades, respectively.

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

Methods

In this study, cluster sampling was used. Based on a related study [18], with d= 0.32, σ^2 =1.84 and confidence interval (CI) 95%, the sample size was calculated as 71 adolescents. Regarding the kind of sampling, which was cluster, the sample size for achieving the mentioned d was increased 6 times higher so (including the 10% probability of sample loss), the final sample size was calculated as 470 adolescents. Sample size estimation was based on the following formula:

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} \times \sigma\right)^2}{d^2}$$ = (1/96)2 × (1/36)2 / (0/32)2= 71

Measuring tools

In this study, to assess the adolescents' HL, the Persian version of NVS questionnaire was used (its reliability and validity have been calculated by Javadzadeh et al. [19]). This assessment tool includes a nutritional label of an ice cream container with 6 questions (Figure 1), and people should refer to the information provided in the label for answering the questions [12, 20]. NVS questionnaire requires 3 minutes for completing and not only tests the reading and understanding skills, but also tests the numeracy skills of adolescents. Each correct answer in the questionnaire has one point, and the score of questionnaire is the sum of the points achieved in the questionnaire, which is a number between 0 and 6.

According to the HL levels' classification in NVS questionnaire, people are divided into three groups. Scores between 0 and 1 belong to those who are more likely to have inadequate HL, scores between 2 and 3 belong to those who are more likely to have border HL, and scores between 4 and 6 belong to those who have adequate HL [21]. In this study, the adolescents did not use calculators or consult others and responded to the questions as self-report. To check the educational status of the student's parents, the information contained in the adolescents' records were used based on the high schools' demand.

In this study, for assessing the rate of using cell phone, the questionnaire with previously calculated reliability and validity by Hasanzadeh et al. [22] was been used. After completing the questionnaires, the obtained data were analyzed by SPSS 16 software. To analyze the data, descriptive statistics (frequency and percentage) and for comparison of HL levels in the subgroups such as parental educational status, adolescents' educational level and rate of using cell phone, Chi-square test (x^2) was used. In addition, Spearman's correlation was used to find out the relation between HL and the rate of using cell phone.

[Downloaded from hehp.daneshafarand.org on 2026-11-14]



Nutrition Facts		
Serving Size		½ cup
Servings per container		4
Amount per serving		
Calories 250	Fat Cal	120
		%DV
Total Fat 13g		20%
Sat Fat 9g		40%
Cholesterol 28mg		12%
Sodium 55mg		2%
Total Carbohydrate 30g		12%
Dietary Fiber 2g		
Sugars 23g		
Protein 4g		8%

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

Ingredients: Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

Question 1: If you eat the entire container, how many calories will you eat? _____

Question 2: If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have? _____

Question 3: Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have 42 grams of saturated fat each day, which includes 1 serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day? _____

Question 4: If you usually eat 2500 calories in a day, what % of your daily value of calories would you be eating if you eat one serving? _____

Question 5: Pretend that you are allergic to the following substances: Penicillin, peanuts, latex gloves, and bee stings. Is it safe for you to eat this ice cream? Circle YES or NO

If your answer to Question 5 is YES, then you are DONE!

If your answer to Question 5 is NO, then why not? _____

Inclusion criteria

Inclusion criteria were considered as being seventh to twelfth high school adolescent and being satisfied to participate in the current study.

Exclusion criteria

Exclusion criteria were just partial completing of the questionnaire and unwillingness to continue cooperation in the current study.

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

Results

Table 1 shows that among the 279 female adolescents participating in the study, most of them (31.9%) were from the tenth grade, and among the 166 male adolescents participating in the study, most of them (33.1%) were from the eleventh grade. The majority of female adolescents' father and mother, with (65.9%) and (72.0%), respectively, had a diploma. The majority of male adolescents' father and mother, with (52.4%) and (56.5%), respectively, had a diploma (Table 1).

Table 1: Characteristics of the study sample (n=445)

Variable		Study sample	
		Female (n=279)	Male (n=166)
		Number (%)	Number (%)
Grade in school	Seventh	27(9.7)	31(18.7)
	Eighth	16(5.7)	12(7.2)
	Ninth	77(27.6)	25(15.1)
	Tenth	89(31.9)	33(19.9)
	Eleventh	66(23.7)	55(33.1)
	Twelfth	4(1.4)	10(6.0)
Educational status (Father)	Illiteracy and primary school	16(5.8)	27(16.3)
	Middle school or diploma	184(65.9)	87(52.4)
	Collegiate	79(28.3)	52(31.3)
Educational status (Mother)	Illiteracy and primary school	15(5.4)	36(21.7)
	Middle school or diploma	201(72)	93(56)
	Collegiate	63(22.6)	37(22.3)

The results of Table 2 shows that the majority of girls participating in the study (26.9%) spoke less than one hour a day on cell phones, and most of the boys in the study (40.4%) spoke between one to two hours a day on cell phones. Most of the girls and boys were deprived of sufficient HL with (82.1%) and (86.2%), respectively (Table 2).

Table 2: Health literacy and daily mobile phone use (n=445)

Variable		Study sample	
		Female (n=279)	Male (n=166)
		Number (%)	Number (%)
Health literacy	Inadequate HL(0-1)	137(49.2)	81(48.8)
	Limited HL(2-3)	92(32.9)	62(37.4)
	Adequate HL(4-6)	50(17.9)	23(13.8)
Daily mobile phone use	Less than one hours	75(26.9)	56(33.7)
	One to two hours	73(26.2)	67(40.4)
	Two to three hours	43(15.4)	24(14.5)
	Three to four hours	37(13.3)	8(4.8)
	Four to five hours	51(18.3)	11(6.6)

The results given in Table 3 represent that most of the girls (42.7%) who spoke on cell

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

phones less than one hour a day had adequate HL, and most of those girls (68.6%) who talked with cell phones between four and five hours had inadequate HL. The table further show that there is a significant statistical relationship between daily use of cell phones and HL levels in female adolescents ($p<0.0001$) while there is a significant negative correlation between the quantitative levels of HL and the daily use of cell phones among girls ($p<0.0001$, $r_s = -0.350$ (Table 3).

Table 3: Relationship between health literacy and daily mobile phone use among female adolescents

Variable	Health literacy			x^2	P-value
	Inadequate HL (0-1)	Limited HL (2-3)	Adequate HL (4-6)		
	Number (%)	Number (%)	Number (%)		
Daily mobile phone use					
Less than one hours	15(20.0)	28(37.3)	32(42.7)		
One to two hours	43(59.0)	23(31.5)	7(9.5)		
Two to three hours	26(60.4)	11(25.6)	6(14.0)	80.791	P<0.0001
Three to four hours	19(51.3)	17(46.0)	1(2.7)		
Four to five hours	35(68.6)	12(23.5)	4(7.9)		

The results provided in Table 4 show that most of the boys (42.8%) who spoke less than one hour per day with cell phones had border HL, and most of the boys (63.6%) who spoke on cell phones between four to five hours a day had inadequate HL. The table further shows a significant relationship between the daily use of cell phones and HL in male adolescents ($p=0.003$), and a significant negative correlation between the quantitative levels of HL and the daily use of cell phones among boys ($p<0.0001$, $r_s = -0.400$ (Table 4).

Table 4: Relationship between health literacy and daily mobile phone use among Male adolescents

Variable	Health literacy			x^2	P-value
	Inadequate HL (0-1)	Limited HL (2-3)	Adequate HL (4-6)		
	Number (%)	Number (%)	Number (%)		
Daily mobile phone use					
Less than one hour	13(23.2)	24(42.8)	19(34.0)		
One to two hours	36(53.7)	27(40.3)	4(6.0)		
Two to three hours	19(79.2)	5(20.8)	0	47.023	P=0.003
Three to four hours	6(75.0)	2(25.0)	0		
Four to five hours	7(63.6)	4(36.4)	0		

Discussion

The purpose of this study was to investigate the HL status of high school adolescents and its relationship with the daily use of cell

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

phones in Mashhad City. The results showed that most of the girls and boys participating in the study did not have adequate HL with (82.1%) and (86.2%), respectively. In line with the results of the present study, the results of another study showed that 81% of the adolescents did not have adequate level of HL [23].

One of the reasons for the low level of HL in adolescents can be the lack of need sensation. Since most of adolescents are healthy and have no problems with health issues, except for a limited number of adolescents with specific or chronic diseases, they have less interaction with the health care system than adults [10]; therefore, they do not feel the need to get information related to health issues. So they do not even try to read the information on their edible foods. Other reasons can be the lack of discussion about the prevention of diseases and the maintenance and promotion of health in the educational environment of the country. Inadequate HL has a significant impact on the screening and prevention of diseases and even on the diagnosis of diseases. If the outcome of high-risk and harmful behaviors such as long-term cell phone conversations or inappropriate use of this tool for adolescents is determined, they would certainly be more willing to be informed and make correct health-related decisions. Economic conditions, marital status, cultural conditions and occupation can also affect HL [24]. Contrary to the results of this study, the results of other studies that assessed the HL of adolescents using NVS questionnaire showed that most of the adolescents had sufficient HL [12, 25, 26]. The reason for this can be the differences in the characteristics of the sample cases in these studies, such as educational, cultural and social differences as all of them have been done in the developed countries, which are pioneer in health issues.

Despite the importance of HL in adolescents, there are very few studies on adolescent HL, especially in educational settings [2, 10, 27,28]; globally, only adult HL is given importance and there have been many studies on adult HL [26]. However, community health promotion is not improved by HL promotion in adults and the best time to think about HL interventions is adolescence. Promoting HL at an early age has a direct impact on HL in adulthood. Adolescents are less likely under the influence of their parents and decide independently; therefore, behaviors that are established in adolescence become stable until adulthood. Hence, efforts to improve the HL of individuals should be established from adolescence [10]. Various studies have been conducted on adult HL, the results of which show that most of today's adults, who are yesterday's teenagers are deprived of adequate HL [18, 19, 29]. In general, it can be said that

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

high school adolescents in Mashhad City are not well-educated in HL.

Most of the girls participating in the present study (26.9%) talked with a cell phone less than one hour a day, and most of the boys participated in the study (40.4%) talked with cell phone between one to two hours a day. There was a significant statistical relationship between HL and daily use of cell phones by adolescents.

A definition for hazards of health has been developed in the international electromagnetic fields: a biological effect outside the normal physiological remuneration that is harmful to health or well being is considered as a health hazard; a biological effect results in a physiological response to exposure, which leads to adverse consequences for health [6]. Some studies in the field of the relation between HL and high-risk behaviors have also shown that there is a significant relationship between higher HL and adopting less harmful health behaviors. As an example, it has been revealed that the risk of obesity is higher for adolescents with lower HL rates [23]. The results of Sharif's study also showed that there is a positive correlation between nutritional self-efficacy in adolescents and HL, which results in more healthy nutritional behaviors and lower body mass indexes [30]. Zollner found a significant positive correlation between the adoption of health-related behaviors and higher HL [29]. The results of various studies have indicated that there is a significant positive correlation between the level of HL and online health information searches [2, 31]. However, people with low levels of HL use cell phones to acquire health-related information. They prefer text messages, radio, and written communication networks to increase their health information because they do not have the ability to search for health-related information [31]. Among all people, teenagers use technology and media more than others, and they are the target group of many health-based educational interventions [10]. Therefore, public health practitioners should implement interventions to develop health-related information search skills, while providing intelligible and usable information so that teenagers can use cell phones to improve their health knowledge [31]. Since children and teens spend half a day at school and are less under the influence of their parents, they must decide independently. So education authorities can take important steps to improve the health of adolescents. Unfortunately, there are few studies on HL and its implications for health outcomes across Iran, and the researchers did not find a study that makes a link between HL and health outcomes in adolescents.

Conclusion

The results of this study showed that adolescents with higher level of HL are less

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

likely than others to use cell phones, probably due to health outcomes as a result of their increased awareness of the possible side effects of cell phones. Therefore, the likelihood of adopting health-related behaviors is higher in people with higher HL.

Acknowledgment

The authors need to acknowledge their gratitude and appreciation from the General Education Department of Mashhad and the directors and officials of the study target high schools who worked enthusiastically and sincerely at all stages of the study, especially Mrs. Rahimzadeh Toosi and her colleagues.

Funding acknowledgment

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sector.

Conflicting interests

There is no conflict of interest.

Authors contribution

Samira Olyani: Making plan and implementing

Nooshin Peyman: Making plan and implementing

References

1. Hasanzadeh R, Rezaii A. Pathology of information and communication technology application between university students. ICTEDU 2010; 1(1): 79-91.
2. Ghaddar SF, Valerio MA, Garcia CM, Hansen L. Adolescent health literacy: the importance of credible sources for online health information. JOSH 2012; 82(1): 28-36.
3. Abedini Y, Zamani E. Investigating motivation, type and rate of mobile use in university students. Contemporary Psychology 2013; 7(2): 73-86.
4. Atadokht A, Hamidifar V, Mohammadi L. Over-use and type of mobile phone users in high school students and its relationship with academic performance and achievement motivation. 2014; 3(2): 253-66.
5. Kizilay A, Ozturan O, Erdem T, Kalcioglu MT, Miman MC. Effects of chronic exposure of electromagnetic fields from mobile phones on hearing in rats. Auris Nasus Larynx 2003; 30(3): 239-45.
6. Repacholi MH. Health risks from the use of mobile phones. TLJ 2001; 120(1): 323-31.
7. Patrick K, Griswold WG, Raab F, Intille SS. Health and the mobile phone. AJPM 2008; 35(2): 177.
8. Sorensen K, Van den Broucke S, Pelikan JM, Fullam J, Doyle G, Slonska Z, Kondilis B, Stoffels V, Osborne RH, Brand H. Measuring health literacy in populations: illuminating the design and development process of the European Health Literacy

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

Survey Questionnaire (HLS-EU-Q). BMC Public Health 2013; 13(1): 1.

9. Hoffman S, Marsiglia FF, Lambert MC, Porta M. A Psychometric Assessment of the Newest Vital Sign among Youth in Guatemala City. J Child Adolesc Behav 2015; 3(2).
10. Manganello JA. Health literacy and adolescents: a framework and agenda for future research. Health Education Research 2008; 23(5): 840-7.
11. Ibrahim S, Reid F, Shaw A, Rowlands G, Gomez G, Chesnokov M, Ussher M. Validation of a health literacy screening tool (REALM) in a UK population with coronary heart disease. Journal of Public Health 2008; 30(4): 449-55.
12. Linnebur LA, Linnebur SA. Self-Administered Assessment of Health Literacy in Adolescents Using the Newest Vital Sign. HPP 2016; 4(2): 1-6.
13. Ghanbari SH , Ramezankhani A, Mehrabi Y, Montazeri A. The Health Literacy Measure for Adolescents (HELMA): Development and psychometric evaluation. IHSR 2016; 15(4): 388-402.
14. Cho YI, Lee SYD, Arozullah AM, Crittenden KS. Effects of health literacy on health status and health service utilization amongst the elderly. Social Science & Medicine 2008; 66(8): 1809-16.
15. Dewalt DA, Hink A. Health literacy and child health outcomes: a systematic review of the literature. JPeds 2009; 124(3): 265-74.
16. Schillinger D, Grumbach K, Piette J, Wang F, Osmond D, Daher C, Palacios J,Sullivan GD, Bindman AB. Association of health literacy with diabetes outcomes. JAMA 2002; 288(4): 475-82.
17. Moreno MA, Ralston JD, Grossman DC. Adolescent access to online health services: perils and promise. JAH 2009; 44(3): 244-51.
18. Azimi S, Ramezankhani A, Rakhshani F, Ghaffari M, S G. Comparison of health literacy between medical and non-medical students in Shahid Beheshti Universities in the academic year 92-93. Pejouhandeh 2015; 20(2): 78-85.
19. Javadzade H, Sharifirad G, Reisi M, Tavassoli E, Rajati F. Health Literacy among Adults of Isfahan. Iran J Health Syst Res 2013; 9(5): 540-9.
20. Tavousi M, Ebadi M, Fattahi E, Jahangiry L, Hashemi A, Hashemiparast M, Montazeri A. Health Literacy Measure: A Systemathic Review of the Literature. Payesh 2015; 14(4): 485-96.
21. 21.Weiss BD, Mays MZ, Martz W, Castro KM, DeWalt DA, Pignone MP, Mockbee J, Hale FA. Quick assessment of literacy in primary care: the newest vital sign. Ann Fam Med 2005; 3(6): 514-22.

[Downloaded from hehp.daneshafarand.org on 2026-11-14]

22. Hasanzadeh R, Lotfi A, Hoseyni SSH, Ebrahimi A. A Study on the Frequency and Type of Using Cell-Phone by High School Students in Mazandaran Province. ICTEDU 2012; 2(2): 95-114.
23. Chari R, Warsh J, Ketterer T, Hossain J, Sharif I. Association between health literacy and child and adolescent obesity. PEC 2014; 94(1): 61-6.
24. Sun X, Shi Y, Zeng Q, Wang Y, Du W, Wei N, Xie R, Chang CH. Determinants of health literacy and health behavior regarding infectious respiratory diseases: a pathway model. BMC Public Health 2013; 13(1): 261-8.
25. Driessnack M, Chung S, Perkhounkova E, Hein M. Using the "Newest Vital Sign" to assess health literacy in children. JPEDHC 2014; 28(2): 165-71.
26. Warsh J, Chari R, Badaczewski A, Hossain J, Sharif I. Can the Newest Vital Sign be used to assess health literacy in children and adolescents? CLP 2014; 53(2): 141-4.
27. Ghanbari S, Ramezankhani A, Montazeri A, Mehrabi Y. Health Literacy Measure for Adolescents (HELMA): Development and Psychometric Properties. PLoS One 2016; 11(2).
28. Shih SF, Liu CH, Liao LL, Osborne RH. Health literacy and the determinants of obesity: a population-based survey of sixth grade school children in Taiwan. BMC Public Health 2016; 16(1): 280.
29. Zoellner J, You W, Connell C, Smith-Ray RL, Allen K, Tucker KL, Davy BM, Estabrooks P. Health literacy is associated with healthy eating index scores and sugar-sweetened beverage intake: findings from the rural Lower Mississippi Delta. JADA 2011; 111(7): 1012-20.
30. Sharif I, Blank AE. Relationship between child health literacy and body mass index in overweight children. PEC 2010; 79(1): 43-8.
31. Manganello J, Gerstner G, Pergolino K, Graham Y, Falisi A, Strogatz D. The relationship of health literacy with use of digital technology for health information: implications for public health practice. JPHMP 2017; 23(4): 380-7.

[Downloaded from hehp.daneshafarand.org on 2026-11-14]