

## Special Article – Family Practice

# Relationship between Health Literacy and Women's Public Health: A Case Study of Health Centers in Neyshabour

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## Abstract

**Introduction:** Nowadays health and welfare of women not only recognized as human rights, but also have a significant effect on health of family and community. Promoting public health of women is affected by several factors including health literacy of women. Health literacy doesn't necessarily refer to years of study. But it is a set of skills such as analysis, decision-making and the ability to use knowledge in health situations. This study aimed to determine the relationship between health literacy and public health of women in Neyshabour health centers.

**Methods:** This study is a cross sectional research. The research population consists of women who referred to Neyshabour health centers from Dec, 2015 to May, 2016. The sample included 270 women referring to all health centers in Neyshabour city. The sequential method was also used. Data collection included the General Health Questionnaire (GHQ) and health literacy questionnaire Brief Test of functional health literacy in adults (TOFHLA). (Data were analyzed using descriptive and analytical statistics and by independent t-test, ANOVA, Pearson Correlation and Multiple Regression tests through SPSS 19. SPSS 19 was used for analyzing data.

**Findings:** The mean and standard deviation score of health literacy was (68/02±14/01). 54/2% of Persons has Inadequate and border health literacy. The mean and standard deviation of general health was (59/87±9/22). A meaningful relationship ( $p=0/001$ ) was observed between health literacy and general health. The variables were statistically significant, with high level education, Job (Employee) and Source of Health Information being the strongest predictor for health literacy and only level of high education and Job (Employee) for general health.

**Conclusion:** According to the results of this study, general health is increasing through health literacy development. Thus, better decisions will be made by using her own knowledge in health care positions. so education of women is necessary in that it promotes health literacy and also their general health which leads to general health of population.

**Keywords:** Health literacy; General Health; Women; Health center

## Introduction

Women make up half of the global population, as well as being family managers, trainers and community activists. Likewise, women's health and wellness support health of the families and society [1]. Women play a vital role in the society. considering their responsibilities in strengthening the family circle, their health should be quite provided [2]. General health is the quality of life including emotional, mental, spiritual states and biological fitness of a certain person which creates compatibility with her environment and make it possible to conduct physical, mental and social activities [3]. According to the World Health Organization, health is defined as feeling peace and tranquility of the body, mind and environment [4]. Accordingly, modern health care systems create various aspects of customer health. Since self-management of health care has been developed, individual have been seeking new methods to obtain

information, meet their rights, and also make health decisions for themselves and others. The prerequisite for such a task is to endorse a range of skills and knowledge, which came under concept of health literacy [5]. Nowadays health literacy is considered as a global issue in the 21<sup>st</sup> century. Health literacy includes individuals' capacity to obtain, process, and understand rudimentary health information and services required to make appropriate health decisions (for care) [6]. WHO on Health Promotion Global Conference in Mexico introduces the health literacy as social and cognitive skills which determine the motivation and capabilities of individuals to access, understand, and implement the information in a way that it culminates in improvement of their health. The committee also declares that the health literacy is not only an individual characteristic, but also a major determinant of health at the population level [7]. Inadequate health literacy is usually accompanied by poor individual health status, inappropriate use of

**Table 1:** Comparing the mean score of health literacy and general health in terms of demographic characteristics.

Demographic Characteristics	Abundance number (percentage)	health literacy mean± SD	health literacy	general health mean± SD	general health
<b>Age</b>				22.57±8.68	
25<	56(20.7)	72.15±16.10	p<0/001	23.08±8.18	p<0/001
35-25	140(51.9)	69.90±13.13		28.44±7.36	
45-35	65(24.1)	57.04±12.88	F=3/15	21.77±6.81	F=2/20
45>	9(3.3)	69.80±14.64			
<b>Job</b>					
housewife	179(66.3)	63.75±14.39	p<0/001	25.51±8.06	p<0/001
Self-employed	47(17.4)	67.23±12.86		25.34±8.54	F=16/12
Employee	44(16.3)	80.69±10.47	F=29/05	18.25±6.76	
<b>Marital status</b>					
Single	21(7.8)	76.51±16.32		22.14±10.10	
Married	233(86.3)	66.50±14.67	p=0/02	24.38±8.26	p=0/66
Divorced	9(3.3)	64.93±13.57		23.88±7.04	
Widow	7(2.6)	67.96±12.70	F=3/04	25.57±8.54	F=0/52
<b>Level of Education</b>					
without High school diploma	52(19.3)	51.66±8.91	p<0/001	30.57±7.17	p<0/001
High school diploma	151(55.9)	66.23±12.34	F=75/18	24.25±7.54	F=23/08
BA degree	62(23)	80.89±9.39		19.17±7.71	
Master degree or higher	5(1.9)	92.12±3.35		18±3.46	
<b>Employed health system</b>					
yes	29(10.7)	79.49±14.29	p<0/001	20.06±6.29	p=0/004
No	241(89.3)	65.80±14.31	t=4/7	24.72±8.45	t=-3/61
<b>Number of Children</b>					
0	41(15.2)	77±14.32	p<0/001	21.43±8.60	p<0/001
1	72(26.7)	69.91±13.44	F=10	22.61±9.02	F=5/88
2	98(36.3)	66.52±14.95		24.02±7.21	
3and more	59(21.9)	58.52±11.77		28.47±7.73	
<b>Economic situation</b>					
good	48(17.8)	72.24±13.47	p<0/001	20.20±5.46	p<0/001
Average	178(65.9)	69.20±14.06	F=25/43	23.59±8.47	F=24/89
Low income	44(16.3)	54.03±12.43		31.15±6.37	
<b>Insurance type</b>					
Health insurance	48(17.8)	68.59±15.42	p=0/06	22.12±7.29	p<0/001
Social security	162(6)	68.36±15.09	F=2/82	23.55±8.44	F=7/60
Other insurance	60(22.2)	63.27±13.43		27.71±8.05	
<b>Source of Health information</b>					
media	87(32.2)	67.98±13.30		23.42±8.35	
internet	48(17.8)	72.43±14.83	p<0/001	21.70±8.07	p=0/004
Family and friends	28(10.4)	54.89±9.43	F=4/7	30.42±6.56	F=7/33
Health workers	107(39.6)	67.61±15.70		24.38±8.22	

medications, reckless disregard of doctors' orders, limited health knowledge, passive participation in treatment decision-making process, lack of concern regarding health, and unfriendly connections

with the doctors. Besides, people with lack of health literacy skills are not well informed about health, they also receive less health services and get into difficulties with chronic disease. Such people give a poor

performance in mental and physical health. In addition, emergency hospital services have been offered to them more [8,9].

According to studies conducted by the Center of American Health Care, individuals with low health literacy are less likely to understand written and spoken information provided by health experts and incur more medical costs [10]. The studies show that a patient quickly forgets 40-80% of medical information that he receives and half of the remaining data is incorrect [5]. In this regard, based on a study conducted in Iran 56.6% of the research population lacks health literacy and only 28.1% of higher levels enjoys it [11]. Further research entitled "study of health literacy of pregnant women in health centers at Shahid Beheshti university of medical sciences" in Iran demonstrated that 53.6% of the pregnant women have inadequate health literacy [12]. Likewise, health service providers are unaware of the patients' reading capabilities [13]. Furthermore, limited health literacy not only leads to difficulties for patients but also a challenge for health care suppliers [14]. Although it is important to recognize people who fail to have adequate health literacy, health system staff gives a poor performance in this regard [10].

Health literacy is a significant maternal element to engage the mother and her children with health promotion and preventive activities. Similarly, without sufficient understanding of health care information, it would be impossible to make informed decisions that result in favorable outcomes for the health of family [15]. Consequently, women are identified as the initial population to increase health literacy since their proper education can adjust a person's health literacy capacity – which is influenced by culture, language, and health related positions [16]. Thus, health literacy is essential for health and modern lives of citizens and should be considered not only in health section, but also throughout the whole system [17]. Due to the fact that women's public health, health literacy and other related factors can be vital for planners and health authorities to provide education programs in association with women's needs, the present study aims to investigate the relationship between health literacy and women's general health.

## Methods

This research is a cross sectional study conducted within six months from Dec, 2015 to May, 2016. The present study focused on the women referred to health centers under the supervision of Neyshaboor university of medical science. The process of sampling has been taken from the women who have the criteria for the research (180) and all urban health centers (9 centers). Criteria for research were as follows: reading and writing ability, tendency to study and having no diseases. The research excludes those candidates who suffered from sever auditory, visual, mental, or perceptual problems and also fail to fill the questionnaires. For assessment of health literacy, Brief-TOFHLA was used. It is an abridged version of the questionnaire TOFHLA and included both reading and calculation. The calculation section measures person's ability in terms of recommendations of his doctor for understanding and acting. The section is comprised of four explanation or health instructions on prescribed drugs, doctors' appointment dates, and also an example of result of a medical experiment. Reliability and validity of this questionnaire were studied by Parker et al. who found test result a Chronbach's  $\alpha$  of 0.68 for calculation, aspects of the questionnaire

and 0.97 for its reading aspects [18]. In addition, Koushyar et al. in 2013 calculated its Chronbach's  $\alpha$  to be 0.77-0.71.

These explanations were submitted to the subject in the form of printed cards and then the related questions were asked women. The scores were considered in a range of 0-28. In reading comprehension section, the women demonstrate their ability to read and understand two research units in the context of health care. The forms have 36 multiple-choice questions with 2 points per question, totally 0-72 scores. The total number was between 0-100. Regarding this number, health literacy was divided into three levels: inadequate health literacy (0-53), marginal health literacy (54-66), and 67-100 adequate health literacy (67-100). Demographic features of candidates included age, occupation, marital status, education, family size, economic status, insurance status, source of medical information, and employment status of her immediate family. In this study, the second tool used to measure general health was General Health Questionnaire (GHQ). Although the original questionnaire contains 60 questions, it has been used in the forms of 30, 12, and 28 questions. In this research, the questionnaire included 28 questions. Reliability and validity of this questionnaire were studied by Thomas & Douglas. They found a Chronbach's  $\alpha$  of 0.91. In addition Taghavi et al. in 2008 calculated its Chronbach's  $\alpha$  to be 0.90. In addition to total score of individual's health status, the present paper consists of four subscales: physical symptoms, anxiety, social dysfunction, and depression. Test scores are based on Likerth scale (0,1,2,3), in which each individual gains five scores, that is four scores to sub-scale and 1 score to the whole questionnaire. Therefore, an individual's total score ranges from 0-84 and subscale scores ranges from 0-21. Accordingly, it has been divided into four levels: no or minimal level (0-22 score), mild (23-40), medium (41-60) and intense level (61-84 score). It is worth mentioning that, in the test, low and high levels indicate health and non-health, respectively.

Statistical Package for Social Scientists (SPSS19) was used to analyze the data including descriptive (percentages, mean score) and inferential statistics (i.e., ANOVA: *t*-test independent sampling assuming no equal variances; and Pearson Product Moment Correlation Coefficient). To evaluate the effect of each variable in the presence of other variables, multiple linear regressions were used to control their effects. Multiple regression analysis using was done and only statistically significant variables. Comparisons were considered significant at the  $P < 0.05$ .

## Findings

The findings indicated that the average age of participants was  $30.7 \pm 7.24$ . The minimum age was 18 and the maximum was 53. Most of them were housewives (65%). 16/7 percent were self employed and 18/3 percent of them were clerks. Most participants (86.3%) were married, 7/2% were single, 3/3% were divorced, and 1/7% were widowed. Education degree of most of candidates were diploma (55.9%), 24.9% had bachelor's degree, 6% had master's degree and 19.3% had low literate (Table 1).

The mean and standard deviation of the participants' health literacy were ( $67.27 \pm 14.90$ ) of 100. 34.1% had marginal health literacy, 19.3% inadequate health literacy, and 46.7% had adequate literacy. The mean and standard deviation of the participants' general health were adequate ( $8.36 \pm 24.22$ ). Among participants, 42.2% of

**Table 2:** Mean and standard deviation of health literacy and general health in women referred to health centers in Nishabur.

General health Domains	Items	Score	SD±mean	Health literacy Domains	Items	Score	SD±mean	Pearson
physical symptoms	1-7	0-21	2.79±6.75	Calculation	1-8	0-28	7.04±14.87	
anxiety	8-14	0-21	2.84±6.65	reading comprehension	9-94	0-72	10.08±52.39	
social dysfunction	15-21	0-21	2.24±7.64	-	-			
depression	22-28	0-21	2.78±3.16	-	-			
Total	28	0-84	8.36±24.22	-	44	0-100	14.90 ±67. 27	10.08±52.39 p<0/001 r=0/54

them are perfectly healthy, 54.8% sufficiently, and 3% moderately healthy. Also, the researcher finds a meaningful relationship between the public health and health literacy ( $p < 0.001$ ) (Table 2). So Table 3 presents the results of the multivariate models predicting health literacy with higher degree education and employing people.

## Discussion

Some studies have shown that inadequate health literacy is associated with unhealthy behaviors, as well as led to a reduction in the quality of healthcare and general health [8]. The present study showed that limited health literacy is a significant problem among women referring to health centers. It's noteworthy that half of the subjects had inadequate or marginal health literacy. The results of this study render consistency with those who conducted a research on pregnant women covered by health centers [12]. Also, the results of the study on health literacy of adults in Isfahan colleagues demonstrated that more than 50% of the individuals had adequate or marginal health [10]. The results of other studies generally displayed a wide range of inadequate health literacy. For example, a systematic review carried out on 85 health literacy cases in North America, using various tools, and concluded that about 46% of people had inadequate and marginal health literacy [19].

In another study in Brazil on 312 adults revealed that more than 32% had inadequate and marginal health literacy [20]. Also, the study results on female patients referring to health centers in Siberia showed that 44% of them had inadequate and marginal health literacy [21]. Results of the only survey study conducted in five provinces in Iran, reported a much lower rate of health literacy in women [22]. The health literacy study of patients admitted to hospitals in Bushehr showed that only 22% had adequate health literacy [23]. 68% of the participants in the population in Balochistan had inadequate and marginal health literacy that displayed a nominal percentage of adequate health literacy [24]. The current research's outcome is different from others due to the fact that those were tested here enjoyed basic health care and had higher health literacy. However, other conducted studies carried out on pregnant women with diabetes as well as mothers after delivery revealed that the adequate health literacy rate was higher than that of the current findings (between 56.3% to 80%) It is due to the higher level of education of the participants in the studies [25-27]. Also, one study reported 11.4% inadequate and marginal health literacy level of adults in the UK [28], which is inconsistent with the present study. The findings of this study demonstrated a significant relationship between health literacy, education, and economic status, in a way that low health literacy rose in individuals with less education and worse economic status, also

it is consistent with other studies [9,11]. The survey on the above-mentioned five provinces also came to the conclusion that health literacy average rose with the increase of socioeconomic status [22]. The study of health literacy of patients in Bushehr, concluded that high education ensures high level of health literacy in patients [23], where the results of these studies confirmed the relationship [29-31]. This research suggested that 66% of individuals with limited health literacy were among high school or higher graduates [32]. Other findings of the current study also demonstrated that older patients had lower health literacy, as reflected in other studies [9,12,21-23]. Consequently, age is a factor that should be taken into consideration when reading comprehension is needed to acquire the information. For example, in crowded clinics, service providers sometimes rely on their pamphlets or other printed media to educate patients. this training method is not useful for older people with lower health literacy [9]. No significant relationship was found between age and health literacy in pregnant women [25]. Also, no significant relationship found between age and health literacy among 5 to 7 months infant caregivers [33]. This study revealed a significant relationship between health literacy and social-related occupations where they had higher health literacy. But it is mentioned in a similar study that the limited number of employed participants in their case is the important reason why they could not find any significant relationship between occupation and health literacy in pregnant women [12]. This study displayed that health care workers and, then, the media were the main sources of health information, which are consistent with similar study results [24]. The result of an investigation revealed that 57% of their participants typically acquired needed health information from doctors and 25.4% from health centers [34]. In this study, individuals evaluated themselves with higher health literacy to have better general health status [11,24,35]. Another study also confirmed that people with higher health literacy had more information about their health status. In general, there is a direct correlation between health literacy and health status [36,37]. According to adult Medicare population, inadequate health literacy is associated with poor mental health and physical functioning [38]. It is similar to Japanese study that ensured inadequate health literacy is in a direct connection with poor health [39]. However, unlike the present study, there is no statistically significant relationship between the health literacy mean score and health status in other research [5,40]. The results of the multivariate models predict health literacy and general health. According to that, people's health literacy and general health with higher degree education and also their recruitment has been better than the reference group predicting health literacy and general health.



**Table 3:** Linear Multivariate Regression Models Predicting Health Literacy and General Health.

Variable	Characteristic	B(SE)	C.I %95	P- Value
Health literacy	<b>Constant</b>	47.33 (10.7)	26.2,68.45	0
	<b>Age</b>	8.48(1.54)	-2.21,3.9	0.584
	<b>Marital status</b>	1.89(2.35)	-2.75,6.54	0.422
	Single			
	Married			
	Divorced			
	Widow	-5.07(1.32)	2.5,7.64	0.000**
	<b>Job</b>			
	housewife			
	Self-employed			
	Employee	10.26(1.63)	7.05,13.47	0.000**
	<b>Level of Education</b>			
	Without			
	High school diploma			
	High school diploma			
	Bs degree	26.2(68.45)	-10.46,1.45	0.137
	Master degree or higher			
	<b>Employed health system</b>			
	yes	-2.59(1.59)	-5.109,0.9	0.42*
	<b>Number of Children</b>			
	0			
	1			
	2	0/70(1.89)	-3.05,4.45	0.712
	<b>3 and more</b>			
	<b>Economic Situation</b>			
	good	-2.13(0.73)	-3.573,0.99	0.71
	Average			
	Low income			
<b>insurance type</b>	-4.50(3.016)	-10.46,1.45	0.004	
Health insurance				
Social security				
Other insurance	-4.50(3.016)	-10.46,1.45	0.004	
<b>Source of Health Information</b>				
media				
internet				
Family and friends	-4.50(3.016)	-10.46,1.45	0.004	
Health workers				
general health	<b>Characteristic</b>	<b>B (SE)</b>	<b>C.I %95</b>	<b>P- Value</b>
	<b>Constant</b>	27.52(6.05)	15.57, 39.47	0
	<b>Age</b>	0.28(0.87)	-1/44, 2/01	0/945
	<b>Marital status</b>	0.57(1.33)	-2.57,2.68	0.97
	Single			
	Married			
	Divorced			
	Widow	-1.58(0.74)	-3.04, -0.13	0/033*
	<b>Job</b>			
	housewife			
	Self-employed			
	Employee	-4.95(0.92)	-06.76, -3.13	0.000**
	<b>Level of Education</b>			
	without High school diploma			
	High school diploma			
Bs degree				
Master degree or higher	-0.67(1.71)	4.04,2/69	0/694	
<b>Employed health system</b>				
yes				
no				

	<b>number of children</b>	0.68(0.72)	-0.74,0.10	0/346
	0			
	1			
	2			
	<b>3and more</b>	2.47(1.08)	0.35, 4.09	0.22
	<b>Economic situation</b>			
	good			
	Average	1.35(0.90)	0.43 ,3.13	0.694
	Low income			
	<b>Insurance type</b>			
	Health insurance	1.83(0.41)	0.63 , 0.99	0.658
	Social security			
	Other insurance			
	<b>Source of health information</b>	1.83(0.41)	0.63 , 0.99	0.658
	media			
internet				
Family and friends				
Health workers				

\*p<0.05,\*\*p<0.01.

Since the study is a cross-sectional research, acquiring causal relationships was entirely impossible. Besides, although the research participants were randomly selected and their willingness to participate in the study were considered as criteria, it was likely that women who wished to participate in the study had already higher health literacy. The findings can be generalized to other groups since only women involved in the study; this is one of the limitations of the present study. Generally speaking, the findings of the study can be employed in the micro and macro levels which can pose a huge influence on health improvement and ultimately enhancement of health community.

### Conclusion

The study displayed women's inadequate health literacy and since limited health literacy can prevent from understanding the necessary health information, it seems essential for the health workers to employ fresh effective methods and also adjust the information with the individuals' health literacy. In other words, if health experts render required educational information that is consistent with level of people's health literacy, they will have a better understanding of their health status. Thus, utilizing media, simplified information, and comprehensible teaching materials can be helpful. Besides, benefiting from communication strategies and health educators can be highly effective in order to plan and implement training programs which is consistent with target groups.

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### References

1. Parvizi S, Seyed Fatemi M, Kiani KD. Family dynamism & women's health. J Women's Soci Psychol Stud Quarterly. 2009; 7: 45-57.
2. Solhi M, Yazdani G, Kazemi S. The Effect of Educational Intervention Based on Self-efficacy Theory on General Health Status of Women in Chaloos, Iran. Journal of Health & Development. 2014; 3: 150-162.

3. Ghasemi E, Mohammad Aliha J, Bastani F, Samiei N, Haghani H. General health status in women with coronary artery disease. *Journal of Koomesh*. 2013; 14: 474-482.
4. Bakhshayesh A. The Relationship Between Personality Types And General Health With Job Satisfaction Of Yazd Health Center Staffs. Faculty of Allied Health Sciences, Tehran University of Medical Sciences (Health Payavard). 2013; 7.
5. Karimi S, Keyvanara M, Hosseini M, Jafarian Jazi M, Khorasani E. Health Literacy, Health Status, Health Services Utilization and Their Relationships in Adults in Isfahan. *Health Inf Manage*. 2014; 10: 875.
6. Kumar D, Sanders L, Perrin EM, Lokker N, Patterson B, Gunn V, et al. Parental Understanding of Infant Health Information: Health Literacy, Numeracy and the Parental Health Literacy Activities Test (PHLAT). *Academic Pediatrics*. 2010; 10: 309-316.
7. Reisi M, Mostafavi F, Hassanzadeh A, Sharifirad GH. Relationship between health literacy and general health status and health behavior of the elderly. *Journal of Health Care*. 2011; 7: 1-11.
8. Peerson A, Saunders M. Health literacy revisited: what do we mean and why does it matter? *Health Promotion International*. 2009; 24: 285-296.
9. Reisi M, Mostafavi F, Javadzade H, Mahaki B, Tavassoli E, Sharifirad GH. Communicative and critical health literacy and self-care behaviors in patients with type 2 diabetes. *Iranian journal of Diabetes and Metabolism*. 2015; 14.
10. Javadzadeh H, Sharifirad GH, Reisi M, Tavassoli E, Rajati F. Health literacy among Adults of Isfahan, Iran. *J Health Syst Res*. 2013; 9: 540-549.
11. Reisi M, Mostafavi F, Hassanzadeh A, Sharifirad GH. The Relationship between Health Literacy, Health Status and Healthy Behaviors among Elderly in Isfahan, Iran. *Journal of Health Care*. 2011; 7: 469-480.
12. Ghanbari SH, Majlessi F, Ghaffari M, Mahmoodi M. Evaluation of health literacy of pregnant women in urban health centers of Shahid Beheshti Medical University. Daneshvar (medicine) shahed University. 2012; 19: 1-12.
13. Chew LD, Bradley KA. Brief questions to identify patients with inadequate health literacy. *Fam Med*. 2004; 36: 588-594.
14. Paasche-Orlow MK, Wolf MS. Promoting health literacy research to reduce health disparities. *Journal of Health Communication*. 2010; 15: 34-41.
15. Shieh C, Halstead JA. Understanding the impact of health literacy on women's health. *JOGNN*. 2009; 38: 601-612.
16. Osborn CY, Cavanaugh K, Wallston KA, Elasy TA, Rothman RL, et al. Health literacy explains racial disparities in diabetes medication adherence. *J Health Commun*. 2011; 16: 268-278.
17. Rubin DL, Parmer J, Freimuth V, Kaley T, Okundaye M. Associations between Older Adults' Spoken Interactive Health Literacy and Selected Health Care and Health Communication Outcomes. *J Health Commun*. 2011; 16: 191-204.
18. Baker DW, Williams MV, Parker RM, Gazmararian JA, Nurss J. Development of a brief test to measure functional health literacy. *Patient Educ Couns*. 1999; 38: 33-42.
19. Paasche-Orlow MK, Parker RM, Gazmararian JA, Nielsen-Bohman LT, Rudd RR. The prevalence of limited health literacy. *J Gen Intern Med*. 2005; 20: 175-184.
20. Carthery-Goulart MT, Anghinah R, Areza-Fegyveres R, Bahia VS, Brucki SM, Damin A, et al. Performance of a Brazilian population on the test of functional health literacy in adults. *Rev Saude Publica*. 2009; 43: 631-638.
21. Jovic-Vranes A, Bjegovic-Mikanovic V. Which women patients have better health literacy in Serbia? *Patient Educ Couns*. 2012; 89: 209-212.
22. Banihashemi SA, Amirkhani MA, Haghdoost AA, Alavian SM, Asgharifard H, Baradaran H, et al. [Health literacy and the affecting factors: a study in five provinces of Iran]. *Journal of Medical Education Development Center*. 2007; 4: 1-9.
23. Khosravi A, Ahmadzadeh KH. Investigating health literacy Level of patients referred to Bushehr hospitals and recognizing its effective factors. *ISMJ*. 2016; 18: 1245-1253.
24. Izadirad H, Zareban I. The Relationship of Health Literacy with Health Status, Preventive Behaviors and Health Services Utilization in Baluchistan, Iran. *Journal of Education and Community Health*. 2015; 2: 8.
25. McLaghlin R A. [Association among health literacy levels and health outcomes in pregnant women with pregestational and gestational diabetes in an urban setting] PhD Dissertation. Health science center University of Tennessee. 2009.
26. Pati S, Feemster K A, Mohamad Z, Fiks A, Grundmeier R, Cnaan A. Maternal Health Literacy and Late Initiation of Immunizations Among an Inner-City Birth Cohort. *Maternal and Child Health Journal*. 2011; 15: 386-394.
27. Pati S, Mohamad Z, Cnaan A, Kavanagh J, Shea JA. Influence of Maternal Health Literacy on Child Participation in Social Welfare Programs: The Philadelphia Experience. *Am J Public Health*. 2010; 100: 1662-1665.
28. von Wagner C, Knight K, Steptoe A, Wardle J. Functional health literacy and health-promoting behaviour in a national sample of British adults. *J Epidemiol Community Health*. 2007; 61: 1086-1090.
29. Noblin AM, Wan TTH, Fottler M. The impact of health literacy on a patient's decision to adopt a personal health record. *Perspect Health Inf Manag*. 2012; 9: 1-13.
30. Muir KW, Lee PP. Health literacy and ophthalmic patient education. *Surv Ophthalmol*. 2010; 55: 454-459.
31. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Viera A, Crotty K, et al. Health literacy interventions and outcomes: An updated systematic review. Evidence Report/ Technology Assessment No. 199. (Prepared by RTI International—University of North Carolina Evidencebased Practice Center under contract No. 290-2007-10056-I. AHRQ Publication Number 11-E006. Rockville, MD Agency for Healthcare Research and Quality March. 2011.
32. Sanders LM, Federico S, Klass P, Abrams MA, Dreyer B. Literacy and child health a systematic review. *Arch Pediatr Adolesc Med*. 2009; 163: 131-140.
33. Hironaka LK, Paasche-Orlow MK, Young RL, Bauchner H, Geltman PL. Caregiver health literacy and adherence to a daily multi-vitamin with iron regimen in infants. *Patient Education and Counselling*. 2009; 75: 376-380.
34. Downey LV, Zun LS. Assessing adult health literacy in urban healthcare settings. *Journal of the National Medical Association*. 2008; 100: 1304-1308.
35. Jovic-Vranes A, Bjegovic-Mikanovic V, Marinkovic J. Functional health literacy among primary health-care patients: data from the Belgrade pilot study. *J Public Health*. 2009; 31: 490-495.
36. Walker J, Pepa C, Gerard PS. Assessing the Health Literacy Levels of Patients Using Selected Hospital Services. *Clin Nurse Spec*. 2010; 24: 31-37.
37. Agency for Healthcare Research and Quality. Health literacy interventions and outcomes: An updated systematic review. 2011.
38. Hardie NA, Kyanko K, Busch S, Losasso AT, Levin RA. Health Literacy and Health Care Spending and Utilization in a Consumer-Driven Health Plan. *J Health Commun*. 2011; 16: 308-321.
39. Tokuda Y, Doba N, Butler JP, Paasche-Orlow MK. Health Literacy and Physical and Psychological Wellbeing in Japanese Adults. *Patient Educ Couns*. 2009; 75: 411-417.
40. Lee SY, Tsai TI, Tsai YW, Kuo KN. Health literacy, health status, and healthcare utilization of Taiwanese adults: results from a national survey. *BMC Public Health*. 2010; 10: 614.