bioRxiv preprint doi: https://doi.org/10.1101/630533; this version posted May 7, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.

Health literacy assessment of primary care patients in a Lower Middle Income Country

Flaka Pasha1, Dardan Dreshaj2, Adelina Ismaili3, Idriz Sopjani3, Shemsedin Dreshaj4

1Pharmacology and Toxicology and Clinical Pharmacology Department, University of Prishtina, Prishtina, Kosovo

2Researcher, Department of Clinical Medicine, University of Business and Technology, Prishtina, Kosovo

3Nurse Department, University of Prishtina, Prishtina, Kosovo

4Infectious Diseases Department, University of Prishtina, Prishtina, Kosovo

Corresponding author:
Dardan Dreshaj, University for Business and Technology, Prishtine, Kosovo
Email: dardan.ayd@gmail.com

bioRxiv preprint doi: https://doi.org/10.1101/630533; this version posted May 7, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.

Abstract

Background: Health literacy includes cognitive and social skills which help patients to access, understand and use medical information in ways that promote and maintain good health. Recently health literacy emerged as an important topic for public health and health policy makers.

Objectives: This study was designed to evaluate health literacy level among patients of primary care centers in Prishtina and its association with socioeconomic status, education level, hospitalization rates, self-perception on health and frequency of visits to the doctor.

Methods: Short Test of Functional Health Literacy in Adults was used to collect the data. S-TOFHLA administration criteria were strictly followed. 557 questionnaires were collected, filled by patients around Prishtina visiting primary healthcare centers, and further analyzed with SPSS.

Participants: Every third patient, older than 15 years old, who entered doctor's office, was asked to fulfill the test totaling 557 patients.

Results: From 557 surveyed patients, according to S-TOFHLA scoring criteria, 79 % of patients are considered as health literate, 9 % have moderate knowledge and 12 % are health illiterate. Results revealed statistically significant differences in test performance between patients with different levels of education ($p < .01$), between males and females ($p = .033$), or between patients with different hospitalization rates ($p < .05$).

Conclusions: From results obtained, we can conclude there is an association between health literacy level and variables like gender, socioeconomic status, education level and hospitalization rates.

Keywords: health literacy, LMICs, primary care, patient medical knowledge

Introduction

For the past decade health literacy emerged as an important topic for public health and health policy makers [White, Chen and Atchison, 2008; Nielsen-Bohlman, Panzer and David 2004]. Health literacy includes cognitive and social skills which help patients to access, understand and use medical information in ways that promote and maintain good health [Berkman, et al, 2015]. Health literacy requires a complex skill-set, like reading, listening, analytical skills and navigation of healthcare system, that lead to a clear communication with healthcare providers and proper decision making [Berkman, et al 2015].
Recently health literacy is being recognized as a "system issue" [Kutner, et al, 2006], thus moving health literacy from an "under-recognized silent epidemic to an issue of health policy and reform" [Kutner, et al 2006; Aguirre, Ebrahim and Shea 2005; Baker , et al 1999; Howard, Sentell and Gazmararian, 2006].
Patients with limited health literacy skills, lack knowledge on medical topics, which leads to a lifestyle and decisions that may harm their wellbeing [Schillinger, 2002]
People with low health literacy use healthcare services more frequently [Bains and Egede, 2011], less likely use preventative care [Bennett , Chen and Soroui, 2009], have greater likelihood of taking medicines incorrectly [Weiss, 2007], have higher chances of hospitalization and bad disease outcomes [Baker, et al , 2002], have higher incidence and ineffective treatment of cancer and diabetes [Bennett,2009; Davis , et al 2002; Wolf , Gazmararian , Baker 2005; Parker, Ratzan, 2010; Schillinger , Grumbach and Piette , 2002], utilize expensive services, like emergency care and inpatient admissions, which increase expenses and impact economy in general [Parker, Ratzan, 2010; Eichler, Wieser and Brügger, 2009].
Rather than just being related with medicine, health literacy is a broader concept including also environmental, political and social factors that determine health [Berkman, et al 2015].
Thus, health literacy can be used as an empowering tool for achieving internationally agreed health and development goals, as well as to control the emerging threats such as pandemic influenza, climate change and non-communicable diseases. [Nielsen-Bohlman 2004; Paasche-Orlow, et al , 2005; Rudd, 2010]
We aimed to assess health literacy of primary care patients in Kosovo as LMIC (lower middle-income country) and to analyze the association between health literacy level and patient education level, socioeconomic status, presence of chronic diseases, self-perception of health, frequency of visits to the doctor and hospitalization rates.

Methodology

Population

Our study population consisted of 557 participants, 57.85% females and 42.15% males.
16-25 and 26-35 group-ages had the highest participation rate on survey, consisting of 29.69%, respectively 28.54%.
97.13% of the surveyed population was Albanians, and the rest were Bosnians, Roma-Egyptians and Turkish.
0.74% of the surveyed population was unschooled, 4.44% finished their primary school, around 29.94% had finished high school, 54.53% completed their university degree and 10.35% of them declared to have a post-university degree.

Including Criteria

Every third patient, older than 15 years old, who entered doctor's office, was asked to fulfill the test. If the patient agreed, patient's consent was read verbatim from the doctor and then was signed by patient. S-TOFHLA administration criteria were strictly followed. 7 minute time-limit S-TOFHLA test policy was rigorously respected, by using GP's smartphone stopwatch.

Exclusion Criteria

Excluded were emergency cases, illiterate patients, or patients unable to perform the test due to mental or physical disabilities.

bioRxiv preprint doi: https://doi.org/10.1101/630533; this version posted May 7, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.

Data collection

Data were collected by using Short Test of Functional Health Literacy in Adults [Agiurre et al 2005,Baker et al 1999], as the most appropriate tool for this purpose [Collins, et al, 2012].
Aside from the health literacy test, we added another 14 general questions regarding gender, age, socioeconomic status, education, language, self-perception on health, number of visits to the doctor and hospitalization rates, which we considered to be of important association with health literacy level.
The testing process was approved and monitored by Family Medical Center's Ethical Committee and Board of Directors in Municipality of Prishtina, Kosovo. Also patient consent was asked and signed before testing.
We handed out 560 tests in seven primary healthcare centers around Prishtina, and 557 out of 560 tests were completed.
The test was administered and monitored by randomly selected general practitioners. Each of the selected GP was given 20 tests, to complete in 20 working days.

Data analyses

Data collected from questionnaires were inputted and analyzed with SPSS software.
A one-way ANOVA test was used to measure differences between patient social status and their performance in health literacy test.
The ANOVA test was used to present the differences on test performance between diverse levels of educations among patients.
A Chi-square test was used to perform the correlation of frequency of visits to the doctor among patients with or without chronic diseases.

Results

From the 557 surveyed patients, based on S-TOFHLA scoring criteria, 79 % are considered as health literate, 12 % of them are health illiterate, and 9% have moderate knowledge.

Figure 1. Functional Health Literacy Level [n = 557]

Categorization is done by S-TOFHLA score, as having adequate health literacy if the score is 23-36, as marginal health literacy if the score is 17-22, and inadequate health literacy if the score is 0-16.

The results reveal, there is statistically significant difference ($p = .033$) between females ($M = 28.37$, $SD = 7.251$) and males ($M = 26.96$, $SD = 7.863$) in terms of their performance in the health literacy test.

Figure 2. Health literacy test performance - Breakdown by gender [n = 548]

As depicted in the graph below, there are no statistically significant differences between patients of different age groups in regard to their performance in the health literacy test.

Figure 3. Health literacy test performance - Breakdown by age group [n = 522]

A one-way ANOVA test shows that there are significant differences ($p < .01$) in terms of health literacy test performance between the unemployed ($M = 26.5$, $SD = 7.972$) and students ($M = 29.19$, $SD = 7.238$), with the latter group performing better on average.
There are no other statistically significant differences between patients with diverse social statuses.

Figure 4. Health literacy test performance - Breakdown by social status [n = 547]

The ANOVA test also revealed differences ($p < .01$) in test performance between patients with different levels of completed education. Further exploration of results through Tukey's HSD (honest significant difference) test showed that this difference is significant between those who are unschooled ($M = 18.75$, $SD = 8.5$) or with only a primary school education ($M = 24.38$, $SD = 9.016$) – who performed the worse in the health literacy test, and those with a Bachelor Degree ($M = 28.69$, $SD = 7.309$) or Masters/Doctoral degree ($M = 29.63$. $SD = 6.571$) – who performed the best in the test.

Figure 5. Health literacy test performance - Breakdown by level of education [n = 541]

While there are no significant differences in test performance between patients who visit the doctor at different rates, there are statistically significant differences ($p < .05$) between those who have never been hospitalized ($M = 29.43$, 6.764) and those who have been hospitalized at least once in their life ($M = 27.73$, $SD = 7.739$), with the latter group of patients performing worse.

Figure 6. Health literacy test performance - Breakdown by frequency of hospitalization [n = 431]

bioRxiv preprint doi: https://doi.org/10.1101/630533; this version posted May 7, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.

Aside from health literacy assessment, data analyses showed that patients who were never hospitalized were significantly more likely ($p < .01$) to perceive themselves as healthy people, compared to those who have been hospitalized once, twice or more times.
Similarly, those who visited doctor less often were again significantly more likely ($p < .01$) to report their health status as "healthy".

Results revealed that there are statistically significant differences ($p < .01$) in frequency of doctor visits between patients with and without a chronic disease. As expected, those with a chronic disease are significantly more likely to pay more visits to the doctor within a year, when compared to those who do not suffer from a chronic disease.
Data analyses showed there are statistically significant differences ($p < .01$) in the opinion of the affordability of the therapy prices between patients with different levels of education. Students were the most likely group to say that they can afford therapy prices (58%), followed by the employed patients (52%). On the other hand, only 13 % of the patients that are dependent on social aid reported that they can afford therapy prices.

Discussion

Health literacy was firstly introduced in 1970s. Since then more than 3000 publications on health literacy are listed in PubMed and 75% of those have been published in the last five years, emphasizing thus the great importance health literacy plays on public health. [Stephan Van den Broucke, 2014]
The 2003 National Assessment of Adult Literacy (NAAL), showed that a majority of adults 53% had Intermediate health literacy level, 12 % had Proficient health literacy, 22 % had Basic health literacy and 14 % had Below Basic health literacy levels. [Rikard, et al, 2016]
International Adult Literacy Survey (IALS) results [Kirsch, 2001] showed that between 19 and 23 % of U.S. adults performed highest levels on the three literacy scales at levels 4 and 5. On all three scales, only Sweden had higher percentages of their adults at these levels. [Binkley, Matheson and Williams, 1997, p. 9].The United States performed better than German-speaking Switzerland and Poland on the prose scale, similarly as Australia, Belgium, Canada, Germany, Ireland, French-speaking Switzerland and United Kingdom and performed worse than Sweden, Netherlands and New Zealand. [Binkley, Matheson and Williams, 1997]
LMICs like Bangladesh, Mozambique, India, Zambia and sub-Saharan countries also researched the association of health literacy with oral health, child nutritional status, cardiovascular mortality and HIV infection. [McClintock, et al, 2017; Tique et al, 2017; Johri et al , 2016; Ramandeep, et al, 2014; Schrauben and Wiebe, 2017; Das, et al, 2017].

Our study is the first one to assess health literacy among primary care patients in Kosovo. According to the results, patients who frequent primary care services in Prishtina are mostly literate. Out of 557 surveyed patients, 79 % are considered as health literate, 12 % of them are health illiterate, and 9% have moderate knowledge.
Results revealed there are significant differences on patient's health literacy level among gender, education, socioeconomic status and hospitalization rates.
Females performed better than males, students performed better than unemployed patients on health literacy test. Results revealed differences in test performance between patients with different levels of completed education. As well, at least once hospitalized patients performed worse on test than non-hospitalized ones.

An international systematic review which included 36 studies on health literacy also revealed that most of the studies investigated racial, ethnic and educational disparities. It has been stated a mediating effect of health literacy status, medication adherence and understanding of medication intake across racial, ethnic and educational disparities. [Mantwill, et al, 2015]
Our study has some limitations. The study was only conveyed in municipality of Prishtina, the capital city of Kosovo, thus we lack information from other regions. Patients did not report data they considered sensitive, therefore we had some missing data. S-TOFHLA does not assess all health literacy aspects (ex. spoken health literacy). Therefore, external validity to some extent might be a concern.

To conclude, knowing that patients with low health literacy use healthcare services more [Bains and Egede, 2011], have higher chances of hospitalization and bad outcomes [Baker et al , 2002], utilize expensive health services, like emergency care and inpatient admissions, which increases healthcare system expenses and impacts economy in general [Eichler et al ,2009; Paasche-Orlow et al, 2005], should arise the professional and public awareness on health literacy importance. [Clarke, et al, 2017; Brownlee et al , 2017].

We should be aware of the poor health literacy effect on patients' ability to communicate their history and understand medical information, and then start improving patient-physician communication skills by avoiding medical jargon, breaking down the instructions or the information into small steps and limit the focus of a visit to three key points or tasks. These interventions would increase patient's self-esteem, compliance, capacity to self-manage and most importantly improve safety patient and outcomes. [Williams, et al, 2002; Marshall, Sahm and McCarthy, 2012; Hersh, Salzman and Snyderman, 2015]

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

White S, Chen J, Atchison R. Relationship of preventive health practices and health literacy: a national study. American Journal of Health Behavior.2008; 32(3),227-242

bioRxiv preprint doi: https://doi.org/10.1101/630533; this version posted May 7, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.

Nielsen-Bohlman l, Panzer M.A, David A. Health Literacy A Prescription to End Confusion. Washington, US: National Academies Press (US).2004

Berkman N.D, Sheridan S.L, Donahue K.E, Halpern D.J, Crotty K. Low health literacy and health outcomes: an updated systematic review. Ann Intern Med.2015;155(2), 97-107.

Kutner, M., Greenberg, E., Jin,Y., & Paulsen, C. The Health Literacy of America's Adults: Results from the 2003 National Assessment of Adult Literacy Washington, U.S. Department of Education.2006

Aguirre AC, Ebrahim N, Shea JA. Performance of the English and Spanish S-TOFHLA among publicly insured Medicaid and Medicare patients. Patient Educ Couns.2005;56(3):332-339.

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(1),33-42

Howard DH, Sentell T, Gazmararian JA. Impact of health literacy on socioeconomic and racial differences in health in an elderly population. Journal of General Internal Medicine.2006; 21(8),857-861.

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),475-482.

Bains S.S, Egede L.E. Associations between health literacy,diabetes knowledge, self-care behaviors, and glycemic control in a low income population with type 2 diabetes. Diabetes Technol Ther.2011; 13, 335-341.

Bennett IM, Chen J, Soroui JS. The contribution of health literacy to disparities in self-rated health status and preventive health behaviors in older adults. Annals of Family Medicine.2009;7(3),204-211.

Weiss, B. D., ed. Health literacy and patient safety: Help patients understand. Chicago,US. American Medical Association Foundation and American Medical Association.2007

Baker DW, Gazmararian JA, Williams MV, Scott T, Parker RM, Green D, Ren J, Peel J.Functional health literacy and the risk of hospital admission among Medicare managed care enrollees. Am J Public Health.2002;92(8).1278-1283.

Davis TC1, Williams MV, Marin E, Parker RM, Glass J.Health literacy and cancer communication. CA Cancer J Clin.2002;52(3):134-149.

Wolf MS, Gazmararian JA, Baker DW. Health literacy and functional health status among older adults. Arch Intern Med.2005; 165(17), 1946-1952.

Parker R, Ratzan SC.Health Literacy: a second decade of distinction for Americans.Journal of Health Communication.2010;15(Suppl 2)20-33.

Schillinger D, Grumbach K, Piette J.Association of Health Literacy with Diabetes Outcomes. Journal of the American Medical Association.2002;288(4):475-482.

Eichler K, Wieser S, Brügger U. The costs of limited health literacy: a systematic review. Int J Public Health.2009; 54(5): 313–324.

Paasche-Orlow M.K, Riekert KA, Bilderback A, Chanmugam A, Hill P, Rand CS, Brancati FL, Krishnan JA. (2005).Tailored education may reduce health literacy disparities in asthma self-management. American Journal of Respiratory and Critical Care Medicine.2005; 172(8), 980-986.

Rudd RE. Improving Americans' health literacy. New England Journal of Medicine.2010; 363(24),2283-2285.

Collins S., Currie L. ,Bakken S., Vawdrey D., Stone P. Health Literacy Screening Instruments for eHealth Applications: A Systematic Review.J Biomed Inform.2012; 45(3): 598–607.

Stephan Van den Broucke. Health literacy: a critical concept for public health. Arch Public Health.2014;72(1),10.

bioRxiv preprint doi: https://doi.org/10.1101/630533; this version posted May 7, 2019. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under a CC-BY 4.0 International license.

Rikard R.V, Thompson M, McKinney J, Beauchamp A. Examining health literacy disparities in the United States: a third look at the National Assessment of Adult Literacy (NAAL). BMC Public Health.2016;16(1), 975.

Binkley M, Matheson N, Williams T. Adult Literacy: An International Perspective,Working paper No:97-33.Washington, US. U.S. Department of Education. National Center for Education Statistics.1997

McClintock H, Schrauben S, Andrews A, Wiebe D. Measurement of health literacy to advance global health research: a study based on Demographic and Health Surveys in 14 sub-Saharan countries. The Lancet Global Health.2017; 5(1),18.

Tique J.A, Howard L.M, Gaveta S, Sidat M, Rothman RL, Vermund S.H, Ciampa P.J.Measuring Health Literacy Among Adults with HIV Infection in Mozambique: Development and Validation of the HIV Literacy Test. AIDS and Behavior.2017;21(3),822–832

Kirsch, I. The international Adult literacy Survey (IALS): Understanding what was measured. New Jersey US: Educational Testing Center.2001

Johri M, Subramanian SV, Koné GK, Dudeja S, Chandra D, Minoyan N, …Pahwa S. Maternal Health Literacy Is Associated with Early Childhood Nutritional Status in India. J Nutr.2016;146(7),1402-10

Ramandeep G, Arshdeep S, Vinod K, Parampreet P. Oral Health Literacy among Clients Visiting a Rural Dental College in North India-A Cross-Sectional Study. Ethiop J Health Sci.2014; 24(3), 261–268.

Schrauben SJ, Wiebe DJ. Health literacy assessment in developing countries: a case study in Zambia. Health Promot Int. 2017; 32(3): 475-481.

Das S, Mia MN, Hanifi SM, Hoque S, Bhuiya A. Health literacy in a community with low levels of education: findings from Chakaria, a rural area of Bangladesh. BMC Public Health.2017; 17(1),203

Mantwill S, Monestel-Umaña S, Schulz PJ.The Relationship between Health Literacy and Health Disparities: A Systematic Review. PLoS One.2015;10(12):e0145455

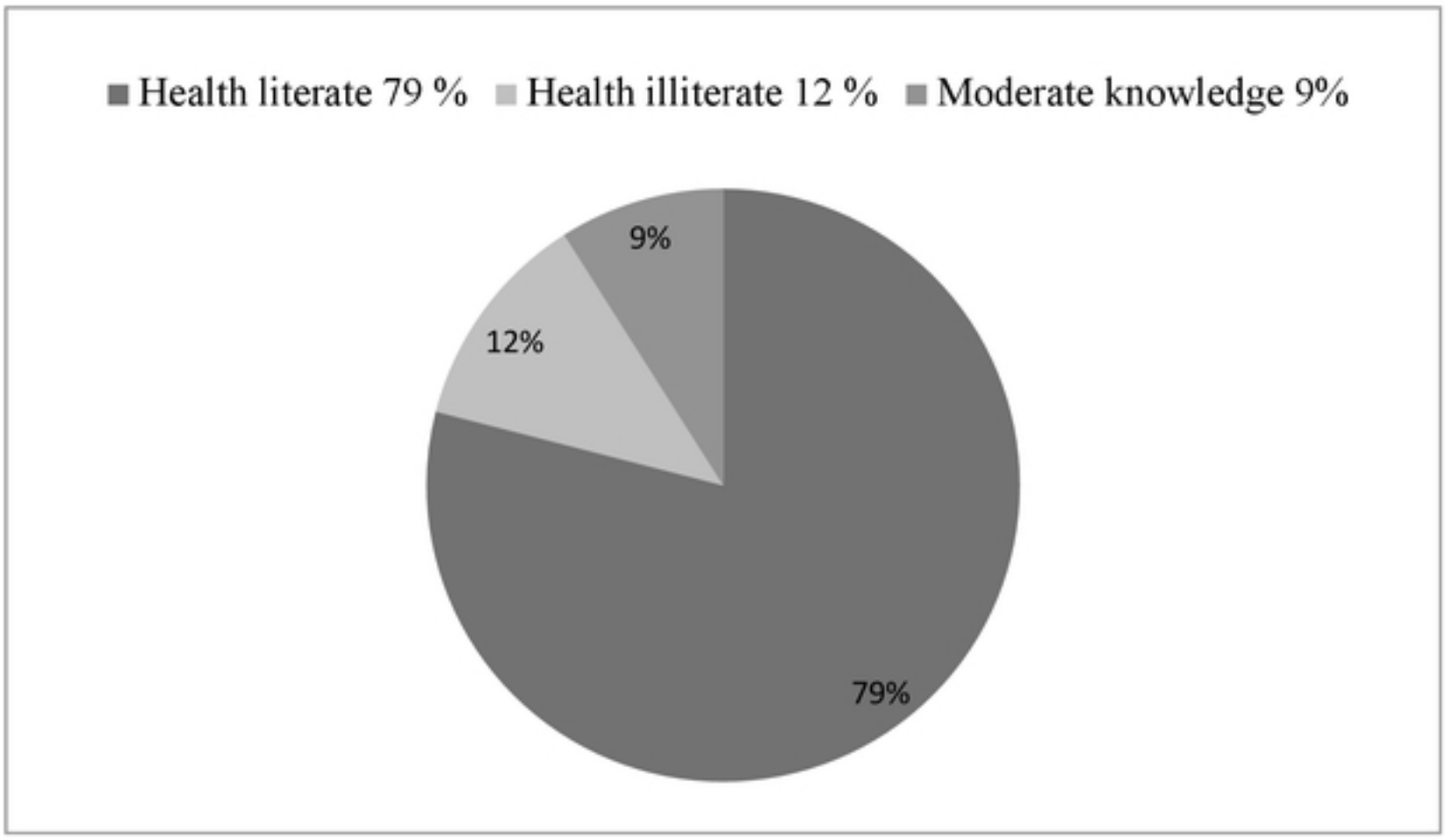
Clarke J, Bourn S, Skoufalos A, Beck E, Castillo D. An Innovative Approach to Health Care Delivery for Patients with Chronic Conditions. Popul Health Manag.2017;20(1), 23–30.

Brownlee Sh, Chalkidou K, Doust J, Elshaug A, Glasziou P, Heath F, …Korenstein D. Evidence for Overuse of Medical Services Around the World. The Lancet.2017;390 (10090), 156–168.

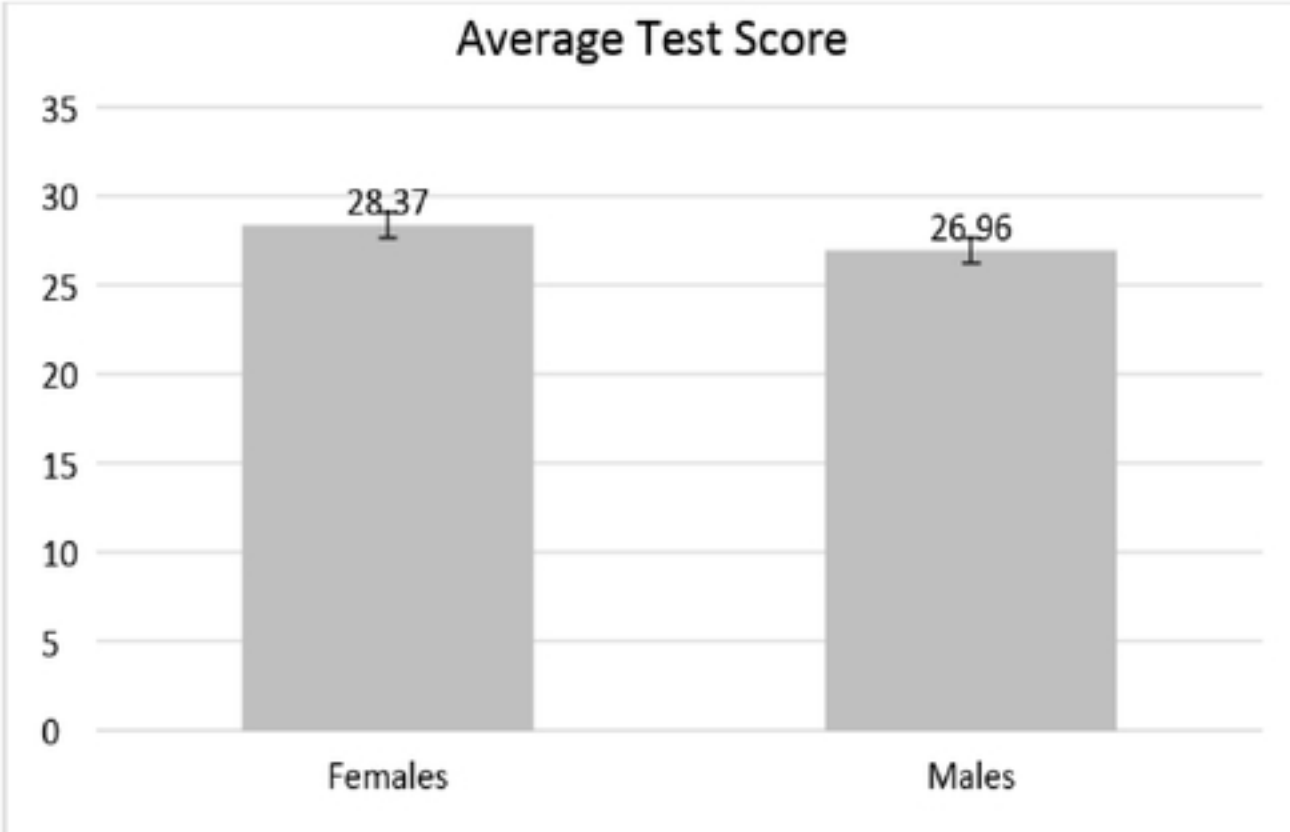
Williams M.V, Davis T, Parker R.M, Weiss B.D. The role of health literacy in patient-physician communication. Fam Med.2002;34(5),383-389.

Marshall S, Sahm L, McCarthy S.Health literacy in Ireland: reading between the lines. Perspect Public Health.2012;132(1),31-38.

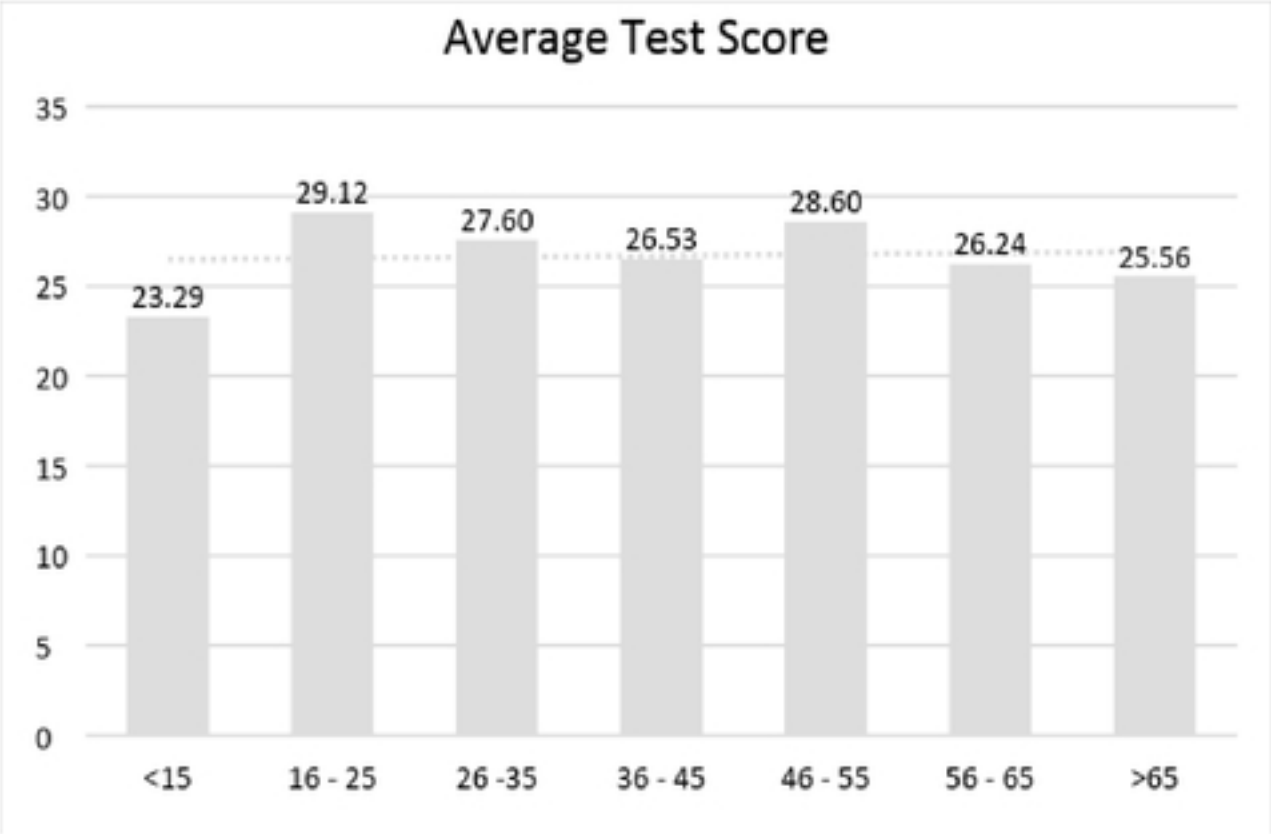
Hersh L, Salzman B, Snyderman D.Health Literacy in Primary Care Practice. Am Fam Physician.2015; 92(2), 118-124.


Health literate 79 %
Health illiterate 12 %
Moderate knowledge 9%
9%
12%
79%

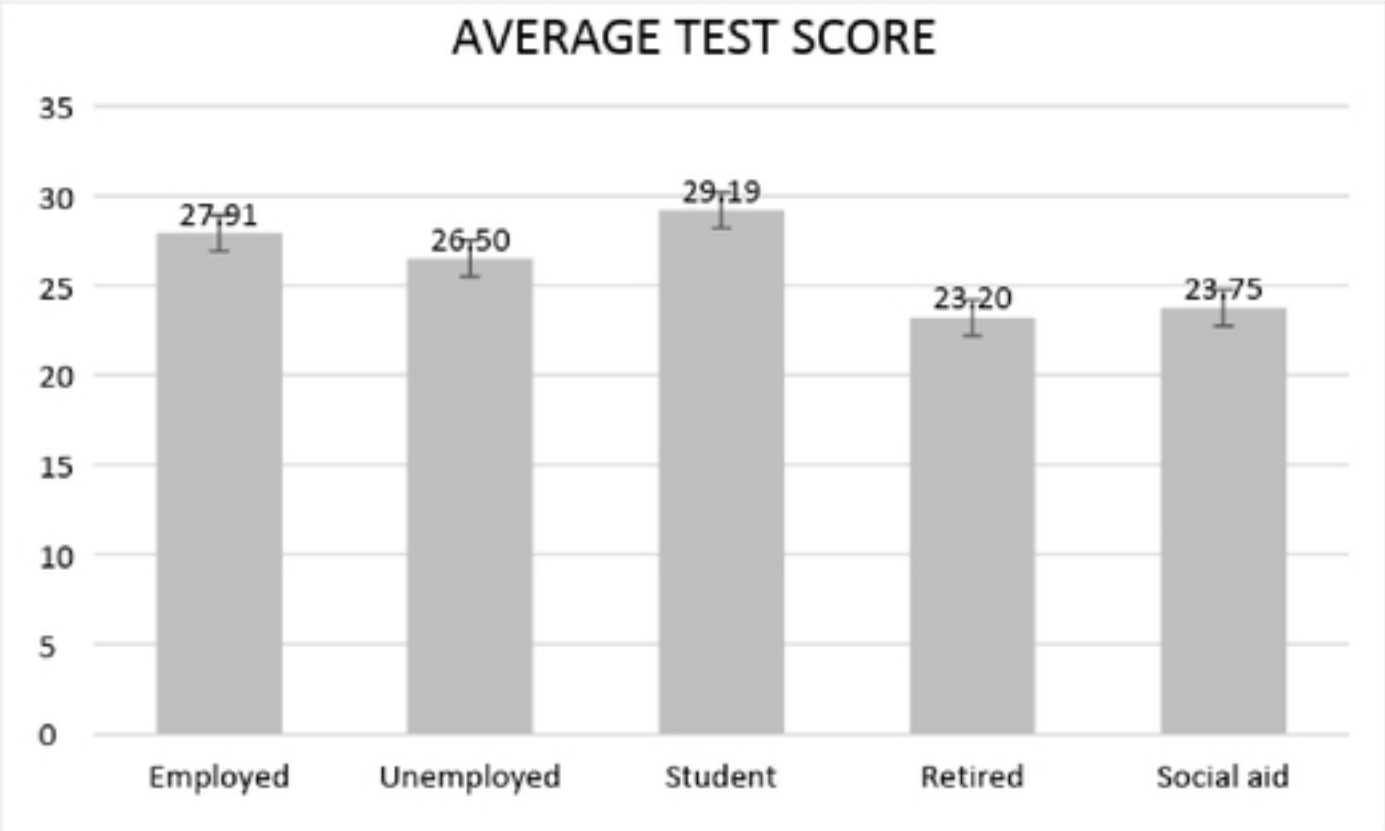
Figure


Average Test Score
35
30
25
20
15
10
5
0
28.37
26.96
Females
Males

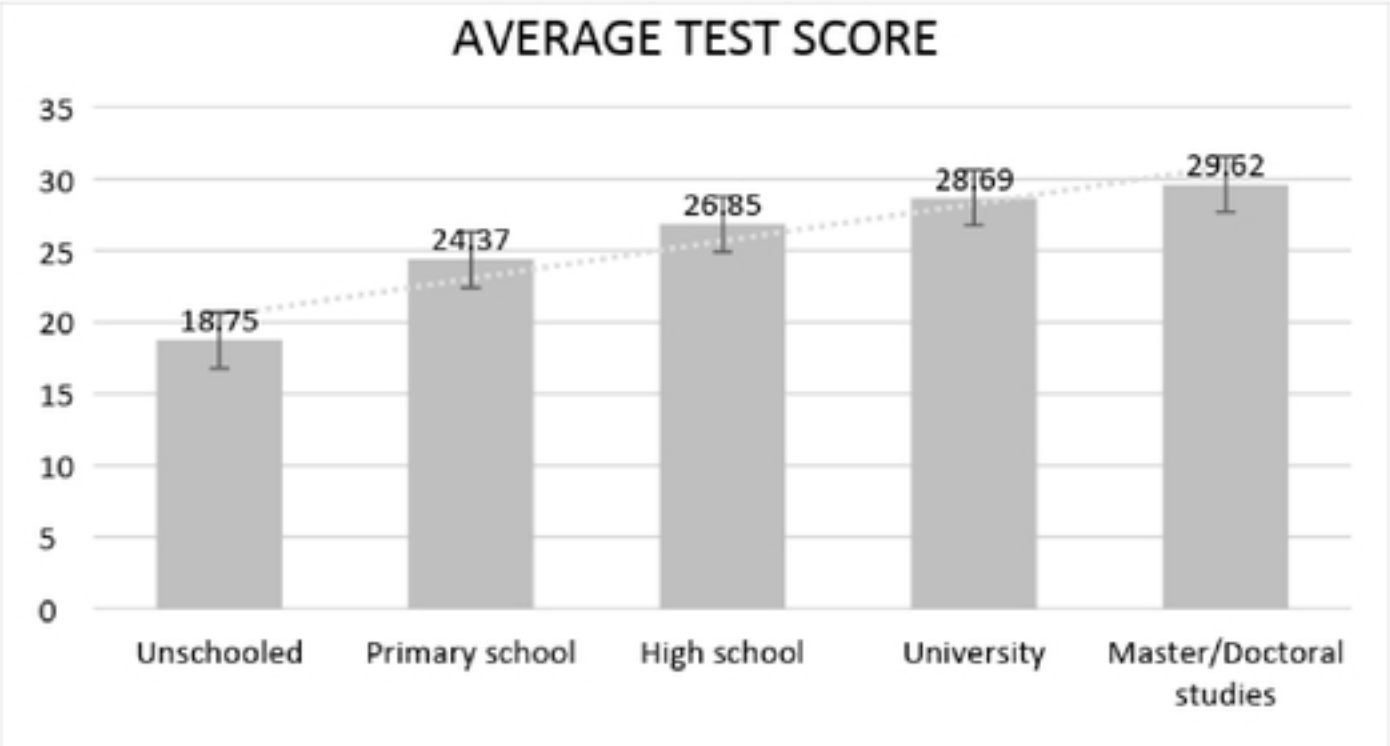
Figure


Average Test Score
35
30
25
20
15
10
5
0
23.29
29.12
27.60
26.53
28.60
26.24
25.56
<15
16 - 25
26 -35
36 - 45
46 - 55
56 - 65
>65

Figure


AVERAGE TEST SCORE
35
30
25
20
15
10
5
0
27.91
26.50
29.19
23.20
23.75
Employed
Unemployed
Student
Retired
Social aid

Figure


AVERAGE TEST SCORE
35
30
25
20
15
10
5
0
18.75
24.37
26.85
28.69
29.62
Unschooled
Primary school
High school
University
Master/Doctoral studies

Figure

AVERAGE TEST SCORE
35
30
25
20
15
10
5
0
29.43
27.23
Never hospitalized
Hospitalized at least once

Figure