Health Literacy and Socioeconomic Characteristics among Older People in Transitional Kosovo

Ervin Toçi\textsuperscript{1,2,*}, Genc Burazeri\textsuperscript{1}, Kristine Sorensen\textsuperscript{1}, Naim Jerliu\textsuperscript{1,3}, Naser Ramadani\textsuperscript{3}, Enver Roshi\textsuperscript{2} and Helmut Brand\textsuperscript{1}

\textsuperscript{1}Department of International Health, School for Public Health and Primary Care (CAPHRI), Faculty of Health, Medicine and Life Sciences, Maastricht University, Netherlands. 
\textsuperscript{2}Institute of Public Health, Tirana, Albania. 
\textsuperscript{3}Institute of Public Health, Pristina, Kosovo.

Authors’ contributions

This work was carried out in collaboration between all authors. Authors ET, GB and HB contributed to the study conceptualization and design, analysis and interpretation of the data and writing of the article. Authors KS and ER contributed to the content and structure of the manuscript. Authors NJ and NR contributed to the acquisition of the data and commented on the manuscript. All authors have read and approved the submitted manuscript.

ABSTRACT

\textbf{Aims:} Health literacy among older people has received little attention in transitional countries of Southeast Europe. Our aim was to assess the level and socioeconomic correlates of health literacy among older people in Kosovo, a post-war country in the Western Balkans.

\textbf{Study Design:} Cross-sectional study.

\textbf{Place and Duration of Study:} Kosovo, between January-March 2011.

\textbf{Methods:} This nationwide survey, conducted in Kosovo in 2011, included 1753 individuals aged \( \geq 65 \) years (886 men, 867 women; mean age 73.4±6.3 years; response rate: 77%). Participants were asked to assess, on a scale from 1 to 5, their level of difficulty with regard to access, understanding, appraisal, and application of health information. Subscale scores and an overall health literacy score were calculated for each participant. Information on socioeconomic characteristics was also collected.

\textbf{Results:} Subscale scores of health literacy were strongly correlated with each-other.

\*Corresponding author: Email: ervintoci@maastrichtuniversity.com;
Mean values of the overall health literacy scores were significantly higher in men, urban residents, married individuals, the highly educated, and the better off participants.

Conclusions: This may be the first report from the Western Balkans addressing health literacy in a population-based sample. Future studies in Kosovo and other settings in the region should provide further insight into the magnitude and socioeconomic determinants of health literacy which is an under-researched topic in countries of Southeast Europe.

Keywords: Aging; health information; health literacy; Kosovo; older people.

1. INTRODUCTION

Access to better information is required to support people’s participation and enable them making their own health choices [1]. The decision-making process is impacted by people’s health competencies, which is linked to literacy, and entails the knowledge, motivation and competence to access, understand, appraise and apply information to make decisions in everyday life in terms of healthcare, disease prevention, and health promotion during the course of life. Various personal characteristics, demographic and social factors may as well have an impact on health literacy [2]. There are indications that low literacy leads to marked variation in an individual’s ability to obtain relevant health information, and in their opportunity and capability to apply the information in interactions with health professionals and health care services [3,4]. Consequently, low health literacy may lead to worse health outcomes, ranging from worse self-rated health status, longer hospitalization and higher use of healthcare services resulting in higher healthcare costs [2,5], difficulties to follow medical instructions [6-7], impaired ability to navigate the health system [8] and lower participation in screening programs [9].

Health literacy and its association with socio-demographic and socioeconomic factors have been mainly studied in USA and Canada and more recently in Australia, Asia and Europe [2,10].

On the other hand, data on health literacy in former communist countries of the Western Balkans including Kosovo are scarce. Kosovo is the newest state in Europe struggling to establish a functional democracy after the breakdown of former Yugoslavia and the subsequent war in the region. In the framework of a population-based survey, our aim was to assess the level and socioeconomic correlates of health literacy among older people in Kosovo in terms of accessing, understanding, appraising and applying the information related to health care, disease prevention and health promotion.

2. MATERIALS AND METHODS

2.1 Study Population

A nation-wide cross-sectional study among individuals aged 65 years or older was conducted in Kosovo in 2011. A population-based sample of 2400 individuals aged ≥65 years was drawn based on the 2010 lists (sampling frame) available from the Kosovo Ministry of Labour and Social Welfare [11]. Twelve strata were established (based on sex-stratification [men vs. women], place of residence [urban vs. rural areas] and age-stratification [65-74 years, 75-84 years and ≥85years]). A simple random sample of 200
individuals in each of the twelve strata was drawn [11]. Of the initial 2400 individuals targeted for inclusion, 135 participants were ineligible and further 375 individuals refused to participate, leading to 1890 study participants [11]. Of these, 137 participants were excluded from the current analysis due to incomplete information regarding health literacy. Therefore, this report is based on 1753 individuals, with an overall response rate of 77.4% (1753/2265).

2.2 Data Collection

A structured interviewer-administered questionnaire (including 25 items) was used to assess four dimensions of health literacy: access (5 items), understanding (7 items), appraisal (8 items) and application (5 items) of health information in three different situations/domains: health promotion, disease prevention and cure of disease. The health literacy instrument employed in the current study was developed in the framework of a large EU supported project [2].

Participants were asked to assess, in a scale ranging from 1 (unable – implying least health literacy score) to 5 (without any difficulty – maximal health literacy score), their level of difficulty with regard to access/understanding/appraisal/application of health information.

The health literacy instrument was pre-tested in a sample of older people (N=38) attending primary health care services in Kosovo and Albania before conducting the current survey.

A full version of the 25-item instrument used for the assessment of health literacy in our study is presented in Appendix 1.

An overall health literacy score (overall index) was calculated for each participant ranging from 25 (least health literacy score) to 125 (maximal health literacy score). In addition, four subscale scores (domain indexes) were calculated in line with the four domains explored namely: access (range: 5-25), understanding (range: 7-35), appraisal (range: 8-40) and application (range: 5-25) of health information.

In addition, we standardized the overall health literacy index in our sample with the overall health literacy score pertinent to the Test of Functional Health Literacy in Adults (TOFHLA) in order to compare our findings with previous studies [12].

Information on demographic factors (age and sex) and socioeconomic characteristics [place of residence (urban areas vs. rural areas), marital status (dichotomized into: married vs. not married), educational level (years of completed formal schooling), and self-perceived poverty (dichotomized into: not poor vs. poor)] was also collected.

2.3 Statistical Analyses

Age-sex and place-of-residence standardized/weighted percentages and their respective 95% confidence intervals (95%CIs) were calculated for the socioeconomic characteristics of study participants.

Cronbach’s alpha, used to assess the internal consistency of the health literacy instrument, ranged from 0.90 to 0.94 for the subscale scores and the overall health literacy score.
Mann-Whitney test was used to compare mean values of health literacy scores by different categories of demographic and socioeconomic characteristics.

Spearman’s correlation coefficient was used to assess the linear association between health literacy indexes (subscale scores).

General linear model was used to assess the association between the overall health literacy index and socio-demographic and socioeconomic factors. Age-adjusted and multivariable-adjusted mean values and their respective 95% CIs of the overall health literacy score according to different categories of the socioeconomic characteristics were calculated.

SPSS, version 15.0 was used for all the statistical analyses.

3. RESULTS AND DISCUSSION

Mean age of participants (54% women) was 73.4±6.3 years. On average, participants had 4.5 years of formal education, 62% resided in rural areas, and 48% regarded themselves as poor (Table 1).

Mean overall and subscale health literacy scores were all significantly higher in men, urban residents, married individuals, among those who had at least one year of formal schooling and the better off participants (P<0.001 for all) [Table 2].

Scores of health literacy domains/indexes were highly and significantly correlated with each other (Spearman’s rho ranged from 0.8 to 0.9) [Table 3].

Age, sex, place of residence, education level, and self-perceived poverty, except marital status, were significant “predictors” of the overall health literacy score in unadjusted and multivariable-adjusted general linear models (Table 4). In multivariable-adjusted analysis, men and the “younger” participants reported a significantly higher mean health literacy score compared, respectively, to women (85.4 vs. 80.3, respectively) and the older participants (90.1 vs. 73.8, respectively). Furthermore, urban residents had a significantly higher mean overall health literacy score compared to rural counterparts (86.2 vs. 79.5, respectively). Education was strongly and linearly associated with health literacy score: individuals with ≥9 years of education had a (multivariable-adjusted) mean score of 101.5 compared to 80.1 among those with 1-8 years of education and 66.9 among individuals without any formal schooling. Furthermore, wealthier participants had a significantly higher mean health literacy score compared to their poorer counterparts (85.6 vs. 80.1, respectively) [Table 4].

Our study provides novel and important information regarding the socio-demographic and socioeconomic factors associated with health literacy level among the older population in Kosovo. We found significant associations of health literacy with sex, age, education, place of residence and self-perceived poverty.
Table 1. Distribution of socioeconomic characteristics in a representative sample of older people in Kosovo in 2011

| Variable                  | Men (N=886)       | Women (N=867)      | Total (N=1753)    |
|---------------------------|------------------|--------------------|------------------|
|                           | Number (percent) | Standardized       | Number (percent) | Standardized       | Number (percent) | Standardized       |
|                           |                  | percentage (95% CI)|                  | percentage (95% CI)|                  | percentage (95% CI)|
| **Age:**                  |                  |                    |                  |                    |                  |                    |
| <75 years                 | 278 (31.4)       | 66.1 (65.7-66.4)   | 278 (32.1)       | 62.9 (62.5-63.3)   | 556 (31.7)       | 64.4 (64.1-64.6)   |
| 75-84 years               | 325 (36.7)       | 30.2 (29.9-30.6)   | 308 (35.5)       | 31.4 (31.1-31.8)   | 633 (36.1)       | 30.8 (30.6-31.1)   |
| >84 years                 | 283 (31.9)       | 3.7 (3.6-3.9)      | 281 (32.4)       | 5.7 (5.5-5.9)      | 564 (32.2)       | 4.8 (4.7-4.9)      |
| **Residence:**            |                  |                    |                  |                    |                  |                    |
| Rural                     | 450 (50.8)       | 61.8 (61.4-62.2)   | 452 (52.1)       | 62.1 (61.7-62.4)   | 902 (51.5)       | 62.0 (61.7-62.2)   |
| Urban                     | 436 (49.2)       | 38.2 (37.8-38.6)   | 415 (47.9)       | 37.9 (37.6-38.3)   | 851 (48.5)       | 38.0 (37.8-38.3)   |
| **Education:**            |                  |                    |                  |                    |                  |                    |
| 0 years                   | 236 (26.8)       | 17.2 (16.9-18.5)   | 540 (63.2)       | 48.6 (48.3-49.0)   | 776 (44.7)       | 34.0 (33.7-34.2)   |
| 1-8 years                 | 476 (54.0)       | 60.5 (60.1-60.9)   | 297 (34.7)       | 48.7 (48.3-49.0)   | 773 (44.5)       | 54.2 (53.9-54.4)   |
| >8 years                  | 169 (19.2)       | 22.3 (22.0-22.7)   | 18 (2.1)         | 2.7 (2.6-2.8)      | 187 (10.8)       | 11.9 (11.7-12.0)   |
| **Marital status:**       |                  |                    |                  |                    |                  |                    |
| Married                   | 516 (59.1)       | 71.7 (71.3-72.1)   | 225 (26.4)       | 39.9 (39.6-40.3)   | 741 (42.9)       | 54.7 (54.4-55.0)   |
| Not married               | 357 (40.9)       | 28.3 (27.9-28.7)   | 628 (73.6)       | 60.1 (59.7-60.4)   | 985 (57.1)       | 45.3 (45.0-45.6)   |
| **Self-perceived poverty:** |                |                    |                  |                    |                  |                    |
| Not poor                  | 463 (53.6)       | 57.9 (57.5-58.3)   | 389 (45.6)       | 46.6 (46.3-47.0)   | 852 (49.6)       | 51.8 (51.5-52.1)   |
| Poor                      | 401 (46.4)       | 42.1 (41.8-42.6)   | 465 (54.4)       | 53.4 (53.0-53.7)   | 866 (50.4)       | 48.2 (47.9-48.5)   |

*Absolute numbers in the sample and column percentages (in parentheses). Discrepancies in the totals are due to missing covariate values.
† Age- sex and-residence standardized percentages in accordance with the respective strata weights in the sampling frame.
Table 2. Distribution of the overall health literacy score and subscale scores by socioeconomic characteristics

| Health literacy | Total | Sex | Age-group (years) | Residence | Education (years) | Marital status | Poverty level |
|----------------|-------|-----|-------------------|-----------|-------------------|----------------|---------------|
|                |       |     |       |                       |               |                |               |
|                |       | Men | 65-74 | ≥75 | Urban | Rural | 0 | ≥1 | Married | Not married | Poor | Not poor |
| Overall score  | 76.5± | 83.6± | 69.3± | 89.2± | 70.6± | 70.4± | 82.9± | 62.0± | 88.2± | 84.6± | 70.1± | 80.7± | 72.4± |
| Access         | 15.6± | 16.9± | 14.2± | 18.1± | 14.4± | 14.3± | 16.9± | 12.8± | 17.8± | 17.2± | 14.3± | 16.4± | 14.8± |
|                | 6.4±  | 6.2±  | 6.4±  | 5.8±  | 6.3±  | 6.0±  | 6.6±  | 5.7±  | 6.0±  | 6.1±  | 6.3±  | 6.3±  | 6.4±  |
| Understanding  | 19.1± | 21.5± | 16.6± | 23.1± | 17.2± | 17.3± | 20.9± | 14.3± | 22.9± | 21.6± | 17.0± | 20.0± | 18.1± |
|                | 8.6±  | 8.7±  | 7.8±  | 8.4±  | 8.1±  | 7.6±  | 9.1±  | 6.1±  | 8.5±  | 8.5±  | 8.1±  | 8.8±  | 8.4±  |
| Appraisal      | 26.0± | 28.0± | 23.9± | 29.8± | 24.2± | 24.1± | 28.0± | 21.6± | 29.5± | 28.4± | 24.1± | 27.4± | 24.7± |
|                | 10.3± | 9.9±  | 10.4± | 9.0±  | 10.4± | 10.1± | 10.2± | 9.8±  | 9.3±  | 9.4±  | 10.6± | 10.2± | 10.2± |
| Application    | 15.9± | 17.1± | 14.6± | 18.3± | 14.8± | 14.7± | 17.1± | 13.3± | 18.0± | 17.4± | 14.7± | 16.9± | 14.9± |
|                | 6.3±  | 6.1±  | 6.3±  | 5.5±  | 6.3±  | 6.2±  | 6.2±  | 6.0±  | 5.7±  | 5.8±  | 6.4±  | 6.2±  | 6.3±  |

*Mann-Whitney test was used to compare the categories of individuals distinguished by sex, age-group, residence, education, marital status and poverty level (all P-values: <0.001).

† Crude mean values ± standard deviations.
Table 3. Correlational matrix of the overall and subscale health literacy scores

|                        | Overall score | Access    | Understanding | Appraisal |
|------------------------|---------------|-----------|---------------|-----------|
| Access                 | 0.932 (<0.00) | -         | -             | -         |
| Understanding          | 0.931 (<0.01) | 0.855 (<0.01) | -             | -         |
| Appraisal              | 0.968 (<0.01) | 0.873 (<0.01) | 0.844 (<0.01) | -         |
| Application            | 0.933 (<0.01) | 0.810 (<0.01) | 0.804 (<0.001) | 0.926 (<0.01) |

*Spearman’s correlation coefficients and their respective p-values (in parentheses).

Table 4. Association of the overall health literacy score with socioeconomic characteristics; unadjusted and multivariable-adjusted mean values from the general linear model

| Variable                | Unadjusted models | Multivariable-adjusted models† |
|-------------------------|-------------------|--------------------------------|
|                         | Mean (95% CI)     | P                | Mean (95% CI)     | P                |
| **Sex:**                |                   |                  |                  |
| Male                    | 83.6 (81.6-85.5)  | <0.001           | 85.4 (83.6-87.2)  | <0.001           |
| Female                  | 69.3 (67.4-71.2)  |                  | 80.3 (78.0-82.5)  |                  |
| **Age group:**          |                   |                  |                  |
| <75 years               | 89.2 (86.9-91.6)  | <0.001           | 90.1 (87.8-92.4)  | <0.001           |
| 75-84 years             | 77.2 (75.0-79.4)  | <0.001           | 84.6 (82.4-86.8)  | <0.001           |
| >84 years               | 63.1 (60.8-65.4)  |                  | 73.8 (71.2-76.4)  |                  |
| **Place of residence:**|                   |                  |                  |
| Rural                   | 70.4 (68.5-72.4)  | <0.001           | 79.5 (77.4-81.6)  | <0.001           |
| Urban                   | 82.9 (81.0-84.9)  |                  | 86.2 (84.4-88.0)  |                  |
| **Education level:**    |                   |                  |                  |
| 0 years                 | 62.0 (60.2-63.8)  | <0.001           | 66.9 (64.9-68.9)  | <0.001           |
| 1-8 years               | 83.2 (81.3-85.0)  | <0.001           | 80.1 (78.3-82.0)  | <0.001           |
| >8 years                | 109.1 (105.4-112.8) | <0.001         | 101.5 (97.6-105.4) |                  |
| **Marital status:**     |                   |                  |                  |
| Married                 | 84.6 (82.6-86.7)  | <0.001           | 83.4 (81.3-85.6)  | 0.396            |
| Not married             | 70.1 (68.3-71.9)  |                  | 82.3 (80.3-84.2)  |                  |
| **Self-perceived poverty:** |               |                  |                  |
| Not poor                | 80.7 (78.7-82.7)  | <0.001           | 85.6 (83.7-87.5)  | <0.001           |
| Poor                    | 70.5 (70.5-74.4)  |                  | 80.1 (78.1-82.0)  |                  |

† Range of health literacy score from 25 (least health literacy) to 125 (maximal health literacy).

‡ This model, including 1676 individuals, was simultaneously adjusted for all covariates presented in the table.

As a potential tool for improving decision making on health, health literacy could be of particular importance among older persons which are often regarded as a disadvantaged population group. Furthermore, health literacy deteriorates with age, as demonstrated in a study where the score of functional health literacy declined by 0.9 for every year of increase in age, controlling for a number of socio-demographic variables [13]. Conversely, another report indicated that older persons with lower health literacy levels had significantly higher rates of chronic conditions and worse physical health compared to people with adequate health literacy [14]. Also, a study conducted in the USA reported that older individuals had a lower average health literacy compared to younger adults [15].
Our results are generally in concordance with those reported by previous research conducted in the region and beyond, which have highlighted negative associations of health literacy with age and education [15-20]. The rate of inadequate or marginal health literacy was found in 81.8% of primary care patients aged ≥65 years in a study in Serbia [19], whereas 59% of adults aged 65 years or older in USA reported below basic or basic health literacy levels [15] compared to 73.6% in our study. Furthermore, health literacy level was reported to be significantly lower among women [19] and those below the poverty line or with a lower income [15,17,19]. The association of health literacy with sex is controversial since some population-based surveys have reported mean health literacy scores to be higher among women than men [15,17]. These sex discrepancies might be influenced by the distribution of gender education gap and educational attainment through the life course. For example, our survey included people aged ≥65 years whereas other studies have surveyed people aged ≥16 years [15] and 18-90 years [17]; usually females are overrepresented among tertiary education students and graduates [21] and they perform better compared to males [22] in developed countries. On the other hand, almost two-thirds of female participants in our survey had no formal schooling and this fact, giving the strong association between health literacy and education, might explain the different sex health literacy results between our study and those reported elsewhere.

The two most widely used tests for measuring health literacy are the Rapid Estimate of Adult Literacy in Medicine (REALM) and TOFHLA. The first one mainly tests the recognition of medical and health related terms [23], whereas TOFHLA assesses numeracy and comprehension skills thus determining whether subjects can read or understand a written prescription [12]. Upon a standardized measurement scale with TOFHLA, in our study, inadequate and marginal health literacy was found in 58.7% and 14.9% of participants, whereas the remaining 26.4% of individuals had an adequate level of health literacy.

Health literacy among old adults has been measured in different settings and using various health literacy tools [13-14,19,24-25] whereas other studies have explored the health literacy in relation to health care, disease prevention and health system navigation [15,18].

We used a new instrument trying to capture the areas embedded in the current broader concept of health literacy which covers both personal abilities and health system characteristics determining one’s ability for making sound health decisions. Our tool was a preliminary version of the HLS-EU instrument, developed by the European Health Literacy Consortium and discussed elsewhere [2].

It is important to study the socioeconomic correlates of health literacy as they can partly explain the pathway to unfavorable health outcomes. The personal socioeconomic and demographic characteristics of a person together with personal aspects such as vision and hearing skills, or verbal ability determine the level of health literacy at a point in time. This level of health literacy then determines the interactions of the individual with the health system in terms of access and utilization of health care, the quality of doctor-patient interaction and self-care, leading finally to various health outcomes [26]. Therefore, it is logical to assume that, the better the health literacy level, the better the health outcomes. In this context, the aim should always be toward improvement of the health literacy level of individuals and, to achieve this objective, the following potential routes are suggested: a) improve health literacy in the population; b) improve written and multimedia communication; c) improve oral communication in health care visits; and, d) alter the system of care by making the task or situation less demanding through, for instance, simplifying or making the system more “readable” [2,27]. Education seems to be vital for increasing the level of health
literacy which consequently leads to behavioral change. Thus, it has been suggested that educating diabetic patients about disease self-management may result in higher engagement in healthy behaviors and preventive health care services [28]. Yet, changing behaviors is a complex process and different behavioral change theories have been suggested to explain the attitudes-to-behavior change transition, either through a series of attitude changes, or consequential behavioral change [29]. However, caution is needed about the education-age relationship and attitudes and behavior change.

Our study has several limitations in line with its cross-sectional design which is susceptible to biases of selection and information. Our study included a large population-based sample and the response rate was quite high. Furthermore, the instrument we used for assessment of health literacy was based on a vigorous research work conducted in the framework of a large EU supported project [2]. In addition, we pre-tested our health literacy tool in a sample of older people in Kosovo and Albania before conducting the current survey. Yet, we cannot dismiss the possibility of differential reporting among categories of older people differing in socioeconomic characteristics. Finally, findings from cross-sectional studies should be interpreted with caution.

4. CONCLUSION

This is probably the first report from the Western Balkans addressing health literacy in a population-based sample. Health literacy is an under-researched topic in countries of Southeast Europe and future prospective studies should be conducted in order to determine the magnitude and determinants of health literacy among the older population in Kosovo and other transitional settings.

CONSENT

All authors declare that ‘written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL APPROVAL

An ethical approval from the Professional Ethical Board of the Ministry of Health of Kosovo is available.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.
REFERENCES

1. NHS Department of health. The NHS Improvement Plan: putting people at the heart of public services. Department of Health, London; 2004. Accessed 16 December 2012. Available: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_118572.pdf. 

2. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, Brand H, (HLS-EU) Consortium Health Literacy Project European. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012;12:80.

3. DeWalt DA, Berkman ND, Sheridan S, Lohr KN, Pignone MP. Literacy and health outcomes: a systematic review of the literature. J Gen Intern Med 2004;19(12):1228-39.

4. Thomson R, Murtagh M, Khaw FM. Tensions in public health policy: patient engagement, evidence-based public health and health inequalities. Qual Saf Health Care. 2005;14(6):398-400.

5. The Lancet. The health illiteracy problem in the USA. The Lancet. 2009;374(9707):2028.

6. Kirsch I. The International Adult Literacy Survey (IALS): Understanding what was measured. Princeton, NJ: Statistics and Research Division of the Educational Testing Service; 2001:61. Accessed 20 December 2012. Available: http://www.ets.org/Media/Research/pdf/RR-01-25-Kirsch.pdf.

7. Chew L, Bradley K, Flum D, Cornia P, Koepsell TD. The impact of low health literacy on surgical practice. Am J Surg. 2004;188(3):250-3.

8. Kripalani S, Henderson L, Chiu E, Robertson R, Kolm P, Jacobson TA. Predictors of medication self-management skill in a low-literacy population. J Gen Intern Med. 2006;21(8):852-6.

9. Dolan NC, Ferreira MR, Davis TC, Fitzgibbon ML, Rademaker A, Liu D, Schmitt BP, Gorby N, Wolf M, Bennett CL. Colorectal cancer screening knowledge, attitudes, and beliefs among veterans: Does Literacy make a difference? J Clin Oncol. 2004;22(13):2617-22.

10. Paasche-Orlow MK, McCaffery K, Wolf MS. Bridging the international divide for health literacy research. Patient Educ Couns. 2009;75(3):293-4.

11. Jerliu N, Toci E, Burazeri G, Ramadani N, Brand H. Socioeconomic conditions of elderly people in Kosovo: a cross-sectional study. BMC Public Health. 2012;12:512.

12. Parker R, Baker D, Williams M, Nurs J. The Test of Functional Health Literacy in Adults: A new instrument for measuring patients’ literacy skills. J Gen Intern Med. 1995;10(10):S37-41.

13. Baker DW, Gazmararian JA, Sudano J, Patterson M. The association between age and health literacy among elderly persons. J Gerontol B Psychol Sci Soc Sci. 2000;55(6):S368-74.

14. Wolf MS, Gazmararian JA, Baker DW. Health literacy and functional health status among older adults. Arch Intern Med. 2005;165(17):1946-52.

15. Kutner M, Greenberg E, JinY, Paulsen C. The health literacy of America’s adults: results from the 2003 national assessment of adult literacy (NCES 2006–483).US Department of Education. Washington, DC: National Center for Education; 2006.

16. Gazmararian JA, Baker DW, Williams MV, Parker RM, Scott TL, Green DC, Fehrenbach SN, Ren J, Koplan JP. Health literacy among Medicare enrollees in a managed care organization. JAMA. 1999;281(6):545-51.
17. 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(12):1086-90.

18. Murray S, Rudd R, Kirsch I, Yamamoto K, Grenier S. Health Literacy in Canada: Initial results from the International Adult Literacy and Skills Survey 2007. Ottawa: 2007. Accessed 24 December 2012. Available: http://www.ccl-cca.ca/pdfs/HealthLiteracy/HealthLiteracyinCanada.pdf.

19. Jovic-Vranes A, Bjegov-Mikanovic V, Marinkovic J. Functional health literacy among primary health-care patients: data from the Belgrade pilot study. J Public Health (Oxf.). 2009;31(4):490-5.

20. Kamberi H, Hysa B, Toci E, Jerliu N, Burazeri G. Functional health literacy in primary care users in Kosovo: a validation study. Albanian Medical Journal. 2012;4:21-5.

21. Pekkarinen T. Gender differences in education. IZA Discussion paper No.6390. The Institute for the Study of Labor, 2012. Accessed 25 December 2012. Available: http://ftp.iza.org/dp6390.pdf.

22. Gibb SJ, Fergusson DM, Horwood LJ. Gender differences in educational achievement to age 25. Aust J Educ. 2008;52:63-80.

23. Davis TC, Long SW, Jackson RH, Mayeaux EJ, George RB, Murphy PW, Crouch MA. Rapid Estimate of Adult Literacy in Medicine: a shortened screening instrument. Fam Med. 1993;25(6):391-5.

24. Mosher HJ, Lund BC, Kripalani S, Kaboli PJ. Association of health literacy with medication knowledge, adherence, and adverse drug events among elderly veterans. J Health Commun. 2012;17(Suppl 3):241-51.

25. Sahm LJ, Wolf MS, Curtis LM, McCarthy S. Prevalence of limited health literacy among Irish adults. J Health Commun. 2012;17(Suppl 3):100-8.

26. Paasche-Orlow K, Wolf MS. The causal pathways linking health literacy to health outcomes. Am J Health Behav. 2007;31(Suppl 1):19-26.

27. DeWalt DA. Low health literacy: epidemiology and interventions. N C Med J. 2007;68(5):327-30.

28. Strine TW, Okoro CA, Chapman DP, Beckles GL, Balluz L, Mokdad AH. The impact of formal diabetes education on the preventive health services and behaviours of persons with type 2 diabetes. Prev Med. 2005;41(1):79-84.

29. Noar SM, Chabot M, Zimmerman RS. Applying health behavior theory to multiple behavior change: Considerations and approaches. Prev Med. 2008;46(3):275-80.
APPENDIX

Appendix 1 – Instrument for assessment of health literacy

Access:
1. Are you able to find information about diseases?
2. Are you able to inform yourself about treatments?
3. Are you able to find information about risks such as e.g. smoking, obesity?
4. Are you able to find information on how to stay healthy?
5. Are you able to obtain information on e.g. healthy food and how to stay fit?

Understand:
1. Are you able to understand the content of leaflets that come with medications?
2. Are you able to understand medical prescriptions?
3. Are you able to read risk information brochures found at pharmacies, in hospitals or at a doctor’s clinic?
4. Are you able to understand information about risky behavior as e.g. driving drunk, using drugs and smoking?
5. Are you able to understand the content of food labels?
6. Are you able to understand the importance of a healthy lifestyle?
7. Are you able to understand the importance of a healthy environment e.g. at school, at the workplace, at home and in the neighborhood?

Appraise:
1. Are you able to discuss medical information with your doctor/pharmacist?
2. Are you able to consider risk and benefit of treatment options?
3. Are you able to judge what medical advice is best for you?
4. Are you able to identify your own risk actions?
5. Are you able to learn from other people’s risky behavior?
6. Are you able to critically appraise risk information from health authorities/friends, family/media?
7. Are you able to appraise your own health related habits?
8. Are you able to consider risk and benefit of healthy choices with regards to e.g. food and exercise?
Apply:
1. Are you able to follow instructions that a doctor/nurse/pharmacist gives you?
2. Are you able to follow instructions that health authorities give you e.g. get a vaccination; take part in screening; drive safely?
3. Are you able to change your risk-related habits, if you want to?
4. Are you able to get access to healthy products?
5. Are you able to use health information to your own benefit?

Answer categories:
Without any difficulty   5
With little difficulty    4
With some difficulty     3
Very difficult           2
Unable to                1

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