

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15

# Health literacy and socioeconomic characteristics among older people in transitional Kosovo

Ervin Toçi<sup>1,2\*</sup>, Genc Burazeri<sup>1</sup>, Kristine Sorensen<sup>1</sup>, Naim Jerliu<sup>1,3</sup>, Naser  
Ramadani<sup>3</sup>, Enver Roshi<sup>2</sup>, Helmut Brand<sup>1</sup>

<sup>1</sup> Department of International Health, School for Public Health and Primary Care (CAPHRI),  
Faculty of Health, Medicine and Life Sciences, Maastricht University, The Netherlands  
<sup>2</sup> Institute of Public Health, Tirana, Albania  
<sup>3</sup> Institute of Public Health, Pristine, Kosovo

**ABSTRACT**

**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.

**Study design:** Cross-sectional study.

**Place and duration of study:** Kosovo, between January-March 2011

**Methods:** This nationwide survey, conducted in Kosovo in 2011, included 1753 individuals aged ≥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.

**Results:** Subscale scores of health literacy were strongly correlated with each-other (range of Spearman's rho: 0.8-0.9). 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.

16  
17  
18  
19  
20  
21  
22

*Keywords: aging; health information; health literacy; Kosovo; older people.*

## 1. INTRODUCTION

\* Tel.: +355 69 4050121.  
E-mail address: ervintoci@maastrichtuniversity.com.

23 Access to better information is required to support people's participation and enable them  
24 making their own health choices [1]. The decision-making process is impacted by people's  
25 health competencies, which is linked to literacy, and entails the knowledge, motivation and  
26 competence to access, understand, appraise and apply information to make decisions in  
27 everyday life in terms of healthcare, disease prevention, and health promotion during the  
28 course of life. Various personal characteristics, demographic and social factors may as well  
29 have an impact on health literacy [2]. There are indications that low literacy leads to marked  
30 variation in an individual's ability to obtain relevant health information, and in their  
31 opportunity and capability to apply the information in interactions with health professionals  
32 and health care services [3,4]. Consequently, low health literacy may lead to worse health  
33 outcomes, ranging from worse self-rated health status, longer hospitalization and higher use  
34 of healthcare services resulting in higher healthcare costs [2,5], difficulties to follow medical  
35 instructions [6-7], impaired ability to navigate the health system [8] and lower participation in  
36 screening programs [9].  
37 Health literacy and its association with socio-demographic and socioeconomic factors have  
38 been mainly studied in USA and Canada and more recently in Australia, Asia and Europe  
39 [2,10].  
40 On the other hand, data on health literacy in former communist countries of the Western  
41 Balkans including Kosovo are scarce. Kosovo is the newest state in Europe struggling to  
42 establish a functional democracy after the breakdown of former Yugoslavia and the  
43 subsequent war in the region. In the framework of a population-based survey, our aim was to  
44 assess the level and socioeconomic correlates of health literacy among older people in  
45 Kosovo in terms of accessing, understanding, appraising and applying the information  
46 related to health care, disease prevention and health promotion.  
47

## 48 **2. Material and methods**

### 49 **2.1 Study population**

50  
51 A nation-wide cross-sectional study among individuals aged 65 years or older was  
52 conducted in Kosovo in 2011. A population-based sample of 2400 individuals aged ≥65  
53 years was drawn based on the 2010 lists (sampling frame) available from the Kosovo  
54 Ministry of Labour and Social Welfare [11]. Twelve strata were established (based on sex-  
55 stratification [men vs. women], place of residence [urban vs. rural areas] and age-  
56 stratification [65-74 years, 75-84 years and ≥85years]). A simple random sample of 200  
57 individuals in each of the twelve strata was drawn [11]. Of the initial 2400 individuals  
58 targeted for inclusion, 135 participants were ineligible and further 375 individuals refused to  
59 participate, leading to 1890 study participants [11]. Of these, 137 participants were excluded  
60 from the current analysis due to incomplete information regarding health literacy. Therefore,  
61 this report is based on 1753 individuals, with an overall response rate of 77.4% (1753/2265).  
62

### 63 **2.2 Data collection**

64  
65 A structured interviewer-administered questionnaire (including 25 items) was used to assess  
66 four dimensions of health literacy: access (5 items), understanding (7 items), appraisal (8  
67 items) and application (5 items) of health information in three different situations/domains:  
68 health promotion, disease prevention and cure of disease. The health literacy instrument  
69 employed in the current study was developed in the framework of a large EU supported  
70 project [2].

71 Participants were asked to assess, in a scale ranging from 1 (unable – implying least health  
72 literacy score) to 5 (without any difficulty – maximal health literacy score), their level of  
73 difficulty with regard to access/understanding/appraisal/application of health information.  
74 The health literacy instrument was pre-tested in a sample of older people (N=38) attending  
75 primary health care services in Kosovo and Albania before conducting the current survey.  
76 A full version of the 25-item instrument used for the assessment of health literacy in our  
77 study is presented in Appendix 1.  
78 An overall health literacy score (overall index) was calculated for each participant ranging  
79 from 25 (least health literacy score) to 125 (maximal health literacy score). In addition, four  
80 subscale scores (domain indexes) were calculated in line with the four domains explored  
81 namely: access (range: 5-25), understanding (range: 7-35), appraisal (range: 8-40) and  
82 application (range: 5-25) of health information.  
83 In addition, we standardized the overall health literacy index in our sample with the overall  
84 health literacy score pertinent to the Test of Functional Health Literacy in Adults (TOFHLA)  
85 in order to compare our findings with previous studies [12].  
86 Information on demographic factors (age and sex) and socioeconomic characteristics [place  
87 of residence (urban areas vs. rural areas), marital status (dichotomized into: married vs. not  
88 married), educational level (years of completed formal schooling), and self-perceived poverty  
89 (dichotomized into: not poor vs. poor)] was also collected.

## 90 **2.3 Statistical analyses**

91  
92 Age-sex and place-of-residence standardized/weighted percentages and their respective  
93 95% confidence intervals (95% CIs) were calculated for the socioeconomic characteristics of  
94 study participants.  
95 Cronbach's alpha, used to assess the internal consistency of the health literacy instrument,  
96 ranged from 0.90 to 0.94 for the subscale scores and the overall health literacy score.  
97 Mann-Whitney test was used to compare mean values of health literacy scores by different  
98 categories of demographic and socioeconomic characteristics.  
99 Spearman's correlation coefficient was used to assess the linear association between health  
100 literacy indexes (subscale scores).  
101 General linear model was used to assess the association between the overall health literacy  
102 index and socio-demographic and socioeconomic factors. Age-adjusted and multivariable-  
103 adjusted mean values and their respective 95% CIs of the overall health literacy score  
104 according to different categories of the socioeconomic characteristics were calculated.  
105 SPSS, version 15.0 was used for all the statistical analyses.  
106

## 107 **3. RESULTS AND DISCUSSION**

108  
109 Mean age of participants (54% women) was 73.4±6.3 years. On average, participants had  
110 4.5 years of formal education, 62% resided in rural areas, and 48% regarded themselves as  
111 poor (Table 1).  
112

113  
114 **Table 1. Distribution of socioeconomic characteristics in a representative sample of**  
115 **older people in Kosovo in 2011**

116

Variable	Men (N=886)		Women (N=867)		Total (N=1753)	
	Number (percent)*	Standardized percentage (95% CI)†	Number (percent)	Standardized percentage (95% CI)	Number (percent)	Standardized percentage (95% CI)
<b>Age:</b>						
<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)
<b>Residence:</b>						
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)
<b>Education:</b>						
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)
<b>Marital status:</b>						
Married						
Not 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)
	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)
<b>Self-perceived poverty:</b>						
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)

117

118 \* Absolute numbers in the sample and column percentages (in parentheses). Discrepancies

119 in the totals are due to missing covariate values.

120 † Age- sex and-residence standardized percentages in accordance with the respective strata  
 121 weights in the sampling frame.

122  
 123 Mean overall and subscale health literacy scores were all significantly higher in men, urban  
 124 residents, married individuals, among those who had at least one year of formal schooling  
 125 and the better off participants (P<0.001 for all) [Table 2].  
 126

127 **Table 2. Distribution of the overall health literacy score and subscale scores by**  
 128 **socioeconomic characteristics\***  
 129

130

Health literacy	Total	Sex		Age-group (years)		Residence		Education (years)		Marital status		Poverty level	
		Men	Women	65-74	≥75	Urban	Rural	0	≥1	Married	Not married	Poor	Not poor
<b>Overall score</b>	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 ±
	29.9 <sup>†</sup>	29.2	28.9	26.9	29.4	28.3	30.3	25.6	±	28.1	29.6	±	29.4
<b>Access</b>	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
<b>Understanding</b>	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
<b>Appraisal</b>	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
<b>Application</b>	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

131

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

134 † Crude mean values ± standard deviations.

135

136

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

139  
 140  
 141

**Table 3. Correlational matrix of the overall and subscale health literacy scores**

142

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

143

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

145

146 Age, sex, place of residence, education level, and self-perceived poverty, **except** marital  
 147 status, were significant “predictors” of the overall health literacy score in unadjusted and  
 148 multivariable-adjusted general linear models (Table 4). In multivariable-adjusted analysis,  
 149 men and the “younger” participants reported a significantly higher mean health literacy score  
 150 compared, respectively, to women (85.4 vs. 80.3, respectively) and the older participants  
 151 (90.1 vs. 73.8, respectively). Furthermore, urban residents had a significantly higher mean  
 152 overall health literacy score compared to rural counterparts (86.2 vs. 79.5, respectively).  
 153 Education was strongly and linearly associated with health literacy score: individuals with ≥9  
 154 years of education had a (multivariable-adjusted) mean score of 101.5 compared to 80.1  
 155 among those with 1-8 years of education and 66.9 among individuals without any formal  
 156 schooling. Furthermore, wealthier participants had a significantly higher mean health literacy  
 157 score compared to their poorer counterparts (85.6 vs. 80.1, respectively) [Table 4].

158

159

160

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

<b>Variable</b>	<b>Unadjusted models</b>		<b>Multivariable-adjusted models<sup>†</sup></b>	
	<b>Mean (95% CI)*</b>	<b>P</b>	<b>Mean (95% CI)</b>	<b>P</b>
<b>Sex:</b>				
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)	
<b>Age group:</b>		<b>&lt;0.001 (2)<sup>‡</sup></b>		<b>&lt;0.001 (2)</b>
<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)	-
<b>Place of residence:</b>				
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)	
<b>Education level:</b>		<b>&lt;0.001 (2)</b>		<b>&lt;0.001 (2)</b>
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)	-
<b>Marital status</b>				
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)	
<b>Self-perceived poverty:</b>				
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)	

163

164 \* Range of health literacy score from 25 (least health literacy) to 125 (maximal health

165 literacy).

166 † This model, including 1676 individuals, was simultaneously adjusted for all covariates

167 presented in the table.

168 ‡ Overall p-values and degrees of freedom (in parentheses).

169

170 Our study provides novel and important information regarding the socio-demographic and  
171 socioeconomic factors associated with health literacy level among the older population in

172 Kosovo. We found significant associations of health literacy with sex, age, education, place  
173 of residence and self-perceived poverty.  
174 As a potential tool for improving decision making on health, health literacy could be of  
175 particular importance among older persons which are often regarded as a disadvantaged  
176 population group. Furthermore, health literacy deteriorates with age, as demonstrated in a  
177 study where the score of functional health literacy declined by 0.9 for every year of increase  
178 in age, controlling for a number of socio-demographic variables [13]. Conversely, another  
179 report indicated that older persons with lower health literacy levels had significantly higher  
180 rates of chronic conditions and worse physical health compared to people with adequate  
181 health literacy [14]. Also, a study conducted in the USA reported that older individuals had a  
182 lower average health literacy compared to younger adults [15].  
183 Our results are generally in concordance with those reported by previous research  
184 conducted in the region and beyond, which have highlighted negative associations of health  
185 literacy with age and education [15-20]. The rate of inadequate or marginal health literacy  
186 was found in 81.8% of primary care patients aged  $\geq 65$  years in a study in Serbia [19],  
187 whereas 59% of adults aged 65 years or older in USA reported below basic or basic health  
188 literacy levels [15] compared to 73.6% in our study. Furthermore, health literacy level was  
189 reported to be significantly lower among women [19] and those below the poverty line or with  
190 a lower income [15,17,19]. The association of health literacy with sex is controversial since  
191 some population-based surveys have reported mean health literacy scores to be higher  
192 among women than men [15,17]. These sex discrepancies might be influenced by the  
193 distribution of gender education gap and educational attainment through the life course. For  
194 example, our survey included people aged  $\geq 65$  years whereas other studies have surveyed  
195 people aged  $\geq 16$  years [15] and 18-90 years [17]; usually females are overrepresented  
196 among tertiary education students and graduates [21] and they perform better compared to  
197 males [22] in developed countries. On the other hand, almost two-thirds of female  
198 participants in our survey had no formal schooling and this fact, giving the strong association  
199 between health literacy and education, might explain the different sex health literacy results  
200 between our study and those reported elsewhere.  
201 The two most widely used tests for measuring health literacy are the Rapid Estimate of Adult  
202 Literacy in Medicine (REALM) and TOFHLA. The first one mainly tests the recognition of  
203 medical and health related terms [23], whereas TOFHLA assesses numeracy and  
204 comprehension skills thus determining whether subjects can read or understand a written  
205 prescription [12]. Upon a standardized measurement scale with TOFHLA, in our study,  
206 inadequate and marginal health literacy was found in 58.7% and 14.9% of participants,  
207 whereas the remaining 26.4% of individuals had an adequate level of health literacy.  
208 Health literacy among old adults has been measured in different settings and using various  
209 health literacy tools [13-14,19,24-25] whereas other studies have explored the health literacy  
210 in relation to health care, disease prevention and health system navigation [15,18].  
211 We used a new instrument trying to capture the areas embedded in the current broader  
212 concept of health literacy which covers both personal abilities and health system  
213 characteristics determining one's ability for making sound health decisions. Our tool was a  
214 preliminary version of the HLS-EU instrument, developed by the European Health Literacy  
215 Consortium and discussed elsewhere [2].  
216 It is important to study the socioeconomic correlates of health literacy as they can partly  
217 explain the pathway to unfavorable health outcomes. The personal socioeconomic and  
218 demographic characteristics of a person together with personal aspects such as vision and  
219 hearing skills, or verbal ability determine the level of health literacy at a point in time. This  
220 level of health literacy then determines the interactions of the individual with the health  
221 system in terms of access and utilization of health care, the quality of doctor-patient  
222 interaction and self-care, leading finally to various health outcomes [26]. Therefore, it is  
223 logical to assume that, the better the health literacy level, the better the health outcomes. In  
224 this context, the aim should always be toward improvement of the health literacy level of



225 individuals and, to achieve this objective, the following potential routes are suggested: a)  
226 improve health literacy in the population; b) improve written and multimedia communication;  
227 c) improve oral communication in health care visits; and, d) alter the system of care by  
228 making the task or situation less demanding through, for instance, simplifying or making the  
229 system more “readable” [2,27]. Education seems to be vital for increasing the level of health  
230 literacy which consequently leads to behavioral change. Thus, it has been suggested that  
231 educating diabetic patients about disease self-management may result in higher  
232 engagement in healthy behaviors and preventive health care services [28]. Yet, changing  
233 behaviors is a complex process and different behavioral change theories have been  
234 suggested to explain the attitudes-to-behavior change transition, either through a series of  
235 attitude changes, or consequential behavioral change [29]. However, caution is needed  
236 about the education-age relationship and attitudes and behavior change.  
237 Our study has several limitations in line with its cross-sectional design which is susceptible  
238 to biases of selection and information. Our study included a large population-based sample  
239 and the response rate was quite high. Furthermore, the instrument we used for assessment  
240 of health literacy was based on a vigorous research work conducted in the framework of a  
241 large EU supported project [2]. In addition, we pre-tested our health literacy tool in a sample  
242 of older people in Kosovo and Albania before conducting the current survey. Yet, we cannot  
243 dismiss the possibility of differential reporting among categories of older people differing in  
244 socioeconomic characteristics. Finally, findings from cross-sectional studies should be  
245 interpreted with caution.

246  
247

#### 248 **4. CONCLUSION**

249

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

255  
256

#### 257 **ACKNOWLEDGEMENTS**

258

259 The authors wish to thank the study participants for their contribution to the research, as well  
260 as all investigators and staff involved.

261  
262  
263

264 **COMPETING INTERESTS**

265

266 None declared.

267

268

269 **AUTHORS' CONTRIBUTIONS**

270

271 ET, GB and HB contributed to the study conceptualization and design, analysis and  
272 interpretation of the data and writing of the article. KS and ER contributed to the content and  
273 structure of the manuscript. NJ and NR contributed to the acquisition of the data and  
274 commented on the manuscript. All authors have read and approved the submitted  
275 manuscript.

276

277

278 **CONSENT**

279

280 All authors declare that 'written informed consent was obtained from the patient (or other  
281 approved parties) for publication of this case report and accompanying images. A copy of  
282 the written consent is available for review by the Editorial office/Chief Editor/Editorial Board  
283 members of this journal.'

284

285

286 **ETHICAL APPROVAL**

287

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

290

291

292 **REFERENCES**

293

294 1. NHS Department of health. The NHS Improvement Plan: putting people at the heart of  
295 public services. Department of Health, London; 2004. Accessed 16 December 2012  
296 Available:  
297 [http://www.dh.gov.uk/prod\\_consum\\_dh/groups/dh\\_digitalassets/@dh/@en/@ps/documents/](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_118572.pdf)  
298 [digitalasset/dh\\_118572.pdf](http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/digitalasset/dh_118572.pdf) .).

299

300 2. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, Brand H,  
301 (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.

302

303 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.

304

305 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-  
306 400.

307

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

308

309 6. Kirsch I. The International Adult Literacy Survey (IALS): Understanding what was  
measured. Princeton, NJ: Statistics and Research Division of the Educational Testing

- 310 Service; 2001:61. Accessed 20 December 2012. Available:  
311 <http://www.ets.org/Media/Research/pdf/RR-01-25-Kirsch.pdf>.
- 312 7. Chew L, Bradley K, Flum D, Cornia P, Koepsell TD. The impact of low health literacy on  
313 surgical practice. *Am J Surg*. 2004;188(3):250-3.
- 314 8. Kripalani S, Henderson L, Chiu E, Robertson R, Kolm P, Jacobson TA. Predictors of  
315 medication self-management skill in a low-literacy population. *J Gen Intern Med*.  
316 2006;21(8):852-6.
- 317 9. Dolan NC, Ferreira MR, Davis TC, Fitzgibbon ML, Rademaker A, Liu D, Schmitt BP,  
318 Gorbey N, Wolf M, Bennett CL. Colorectal cancer screening knowledge, attitudes, and beliefs  
319 among veterans: Does Literacy make a difference? *J Clin Oncol*. 2004;22(13):2617-22.
- 320 10. Paasche-Orlow MK, McCaffery K, Wolf MS. Bridging the international divide for health  
321 literacy research. *Patient Educ Couns*. 2009;75(3):293-4.
- 322 11. Jerliu N, Toci E, Burazeri G, Ramadani N, Brand H. Socioeconomic conditions of elderly  
323 people in Kosovo: a cross-sectional study. *BMC Public Health*. 2012;12:512.
- 324 12. Parker R, Baker D, Williams M, Nurss J. The Test of Functional Health Literacy in Adults:  
325 A new instrument for measuring patients' literacy skills. *J Gen Intern Med*. 1995;10(10):537-  
326 41.
- 327 13. Baker DW, Gazmararian JA, Sudano J, Patterson M. The association between age and  
328 health literacy among elderly persons. *J Gerontol B Psychol Sci Soc Sci*. 2000;55(6):S368-  
329 74.
- 330 14. Wolf MS, Gazmararian JA, Baker DW. Health literacy and functional health status among  
331 older adults. *Arch Intern Med*. 2005;165(17):1946-52.
- 332 15. Kutner M, Greenberg E, Jin Y, Paulsen C. The health literacy of America's adults: results  
333 from the 2003 national assessment of adult literacy (NCES 2006-483). US Department of  
334 Education. Washington, DC: National Center for Education 2006.
- 335 16. Gazmararian JA, Baker DW, Williams MV, Parker RM, Scott TL, Green DC, Fehrenbach  
336 SN, Ren J, Koplan JP. Health literacy among Medicare enrollees in a managed care  
337 organization. *JAMA*. 1999;281(6):545-51.
- 338 17. von Wagner C, Knight K, Steptoe A, Wardle J. Functional health literacy and health-  
339 promoting behaviour in a national sample of British adults. *J Epidemiol Community Health*.  
340 2007;61(12):1086-90.
- 341 18. Murray S, Rudd R, Kirsch I, Yamamoto K, Grenier S. Health Literacy in Canada: Initial  
342 results from the International Adult Literacy and Skills Survey 2007. Ottawa: 2007. Accessed  
343 24 December 2012. Available: [http://www.ccl-](http://www.ccl-cca.ca/pdfs/HealthLiteracy/HealthLiteracyinCanada.pdf)  
344 [cca.ca/pdfs/HealthLiteracy/HealthLiteracyinCanada.pdf](http://www.ccl-cca.ca/pdfs/HealthLiteracy/HealthLiteracyinCanada.pdf).
- 345 19. Jovic-Vranes A, Bjegovic-Mikanovic V, Marinkovic J. Functional health literacy among  
346 primary health-care patients: data from the Belgrade pilot study. *J Public Health (Oxf)*.  
347 2009;31(4):490-5.

- 348 20. Kamberi H, Hysa B, Toci E, Jerliu N, Burazeri G. Functional health literacy in primary  
349 care users in Kosovo: a validation study. *Albanian Medical Journal*. 2012;4:21–5.
- 350 21. Pekkarinen T. Gender differences in education. IZA Discussion paper No.6390. The  
351 Institute for the Study of Labor, 2012. Accessed 25 December 2012. Available:  
352 <http://ftp.iza.org/dp6390.pdf>.
- 353 22. Gibb SJ, Fergusson DM, Horwood LJ. Gender differences in educational achievement to  
354 age 25. *Aust J Educ*. 2008;52:63-80.
- 355 23. Davis TC, Long SW, Jackson RH, Mayeaux EJ, George RB, Murphy PW, Crouch MA.  
356 Rapid Estimate of Adult Literacy in Medicine: a shortened screening instrument. *Fam Med*.  
357 1993;25(6):391-5.
- 358 24. Mosher HJ, Lund BC, Kripalani S, Kaboli PJ. Association of health literacy with  
359 medication knowledge, adherence, and adverse drug events among elderly veterans. *J*  
360 *Health Commun*. 2012;17(Suppl 3):241-51.
- 361 25. Sahm LJ, Wolf MS, Curtis LM, McCarthy S. Prevalence of limited health literacy among  
362 Irish adults. *J Health Commun*. 2012;17(Suppl 3):100-8.
- 363 26. Paasche-Orlow K, Wolf MS. The causal pathways linking health literacy to health  
364 outcomes. *Am J Health Behav*. 2007;31(Suppl 1):19-26.
- 365 27. DeWalt DA. Low health literacy: epidemiology and interventions. *N C Med J*.  
366 2007;68(5):327-30.
- 367 28. Strine TW, Okoro CA, Chapman DP, Beckles GL, Balluz L, Mokdad AH. The impact of  
368 formal diabetes education on the preventive health services and behaviours of persons with  
369 type 2 diabetes. *Prev Med*. 2005;41(1):79-84.
- 370 29. Noar SM, Chabot M, Zimmerman RS. Applying health behavior theory to multiple  
371 behavior change: Considerations and approaches. *Prev Med*. 2008;46(3):275-80.

372

373

374

## **APPENDIX**

375

376

### **Appendix 1 – Instrument for assessment of health literacy**

377

#### *Access:*

378

1. Are you able to find information about diseases?

379

2. Are you able to inform yourself about treatments?

380

3. Are you able to find information about risks such as e.g. smoking, obesity?

381

4. Are you able to find information on how to stay healthy?

382

5. Are you able to obtain information on e.g. healthy food and how to stay fit?

383

384

#### *Understand:*

385

1. Are you able to understand the content of leaflets that come with medications?

386

2. Are you able to understand medical prescriptions?

387

3. Are you able to read risk information brochures found at pharmacies, in hospitals or at a

388

doctor's clinic?

- 389 4. Are you able to understand information about risky behavior as e.g. driving drunk, using  
 390 drugs and smoking?  
 391 5. Are you able to understand the content of food labels?  
 392 6. Are you able to understand the importance of a healthy lifestyle?  
 393 7. Are you able to understand the importance of a healthy environment e.g. at school, at the  
 394 workplace, at home and in the neighborhood?

395

396 *Appraise:*

- 397 1. Are you able to discuss medical information with your doctor/pharmacist?  
 398 2. Are you able to consider risk and benefit of treatment options?  
 399 3. Are you able to judge what medical advice is best for you?  
 400 4. Are you able to identify your own risk actions?  
 401 5. Are you able to learn from other people's risky behavior?  
 402 6. Are you able to critically appraise risk information from health authorities/friends,  
 403 family/media?  
 404 7. Are you able to appraise your own health related habits?  
 405 8. Are you able to consider risk and benefit of healthy choices with regards to e.g. food and  
 406 exercise?

407

408 *Apply:*

- 409 1. Are you able to follow instructions that a doctor/nurse/pharmacist gives you?  
 410 2. Are you able to follow instructions that health authorities give you e.g. get a vaccination;  
 411 take part in screening; drive safely?  
 412 3. Are you able to change your risk-related habits, if you want to?  
 413 4. Are you able to get access to healthy products?  
 414 5. Are you able to use health information to your own benefit?

415

416 *Answer categories:*

- |                            |   |   |
|----------------------------|---|---|
| 417 Without any difficulty | 5 |   |
| 418 With little difficulty |   | 4 |
| 419 With some difficulty   |   | 3 |
| 420 Very difficult         |   | 2 |
| 421 Unable to              |   | 1 |