



# Health literacy and health among the elderly: status and challenges in the context of the Polish population aging process

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**ABSTRACT:** Introduction: Poland is a country which is characterized by the process of population aging resulting in a dynamic growth of the old-age dependency ratio. Thus, along with the aging process, we can expect, both at the individual and at the societal level, the intensification of the problems related to coping with worsening health and social dependency of the growing number of the elderly. One of the most necessary action contributing to the prevention of the above-mentioned threats is the development of health literacy. Study aim: The aim of the study is to describe and analyze, in the context of the process of aging, the status, the structure and the role of health literacy among the elderly in Poland.

Material and methods: The analyzed data come from the Polish part of the European Health Literacy population-based, cross-sectional survey (HLS-EU). Field work was carried out by the TNS OBOP Research Institute in July 2011. Data were collected in Polish by a standardized questionnaire, using a Computer Assisted Personal Interview (CAPI).

Results and conclusions: Almost every second person in the Polish adult population aged 15+ (44,6%) had low health literacy (inadequate + problematic). First of all the oldest people aged 65+ were at risk of low health literacy. 61,3% of Poles aged 65+ had low levels of general health literacy and only 12% of excellent, in contrast to people aged 50 years and below where these percentages were 39.9% and 21.5% respectively. In the context of this unsatisfactory level of health literacy, particularly in the elderly and the intensifying process of aging in the Polish population, health literacy development should occupy a very high position on the political agenda.

**KEY WORDS:** health literacy, self-assessed health, the elderly

## Introduction

Poland is a country which is characterized by a dynamic process of population

aging caused by lengthening in life expectancy and lowering in fertility rates. In 2050 the people aged 65+ will account for 35% of the population in ur-

ban areas and about 30% in rural areas (CSO 2014).

The aging process of the Polish population is internally varied what is reflected in the faster growth of the share of people aged 80 years and more. In 2050 individuals belonging to that category of age will account for 10.4% of the Polish general population (CSO 2014). As a result of the changes described, in 2050 the old-age dependency ratio, calculated as the number of people aged 65 and more per 100 persons aged 15–64 years, will be 66 in the urban areas and 53 in the rural areas (CSO 2014). Increase in the old-age dependency ratio is accompanied by the wide range of the health problems, like: epidemics of chronic diseases and disability and social and socioeconomic problems i.e. financial deprivation, loneliness, dependence on the help of others, difficulties with financing care services, social marginalization and exclusion (Błędowski 2013). In view of the current and upcoming changes the preventive actions should be taken in the field of social and health policy, to empower people to meet challenges related to health and population aging. One of the most necessary action is to develop health literacy, which is considered to be a tool of empowering people in the area of health (Rubinelli, Schulz and Nakamoto 2009) and can be defined as ‘the ability of citizens to make sound decisions concerning health in daily life – at home, at work, in health care, at the market place and in the political arena’ (Kickbusch and Maag 2008)

Historically, the development of the concept of ‘health literacy’ includes two phases which correspond to two different theoretical approaches,- a clinical approach and a public health approach (Nutbeam 2008). Clinical approach

means the reduction of theory, research and practice of health literacy just to individuals and clinical issues. It focuses on patients and health consequences of their deficits in reading and numeracy skills and not paying sufficient attention to the root causes of health illiteracy, such as socioeconomic disparities.

The public health approach to health literacy is based on the premise that health literacy is ‘not only a personal resource which leads to personal benefits, e.g. healthier life choices and effective use of available health services’ (Nutbeam 2000) but also a community resource which enables community action for health and allows better control of social and environmental determinants of health. In the above sense health literacy can be considered a product of health promotion (Abel et al. 2007) and a factor contributing to the empowerment of individuals and communities in the field of health. Individual with an adequate health literacy, is not only able to properly manage its health but also to change health relevant living conditions. Dissemination of the public approach to the low health literacy is essential, because of its significant role in contributing to the formation and persistence of inequalities in health (Rootman and Ronson 2005) and its negative influence on the proper functioning of individuals in the treatment processes, their engagement in healthy behaviors and use of preventive services (Dolan et al. 2004). During the last couple of years there were attempts to integrate an individual approach (focused on patients) with a public health approach to health literacy (Van den Broucke 2014).

The last approach has been applied in the European Health Literacy Survey (HLS-EU) the selected results of which,

in part related to the Polish population are presented in this text. The purpose of the study is to identify and analyze, in the context of the Polish population aging, the status, the structure and the role of health literacy among the elderly in Poland.

## Methods

The analyzed data come from the Polish part of the European Health Literacy population-based, cross-sectional survey (HLS-EU). The purpose of the HLS-EU survey was to determine the level and the structure of health literacy, and to identify its determinants and outcomes in the populations of eight European countries including Poland. The HLS-EU survey was conducted by the TNS Opinion via its national agencies in summer 2011 in all partner countries. In Poland, the field work was carried out by the TNS OBOP Research Institute in July 2011. Data were collected in Polish by a standardized questionnaire, using a Computer Assisted Personal Interview (CAPI).

### Sampling and sample weighting

A sample in the size of  $n=1000$  was drawn from the Polish general population aged 15+ using of a multi-stage random sampling procedure concordant with the Eurobarometer methodology, which included: stratification by administrative units and type of area (EUROSTAT NUTS II); the choice of sampling points with a probability proportional to population size and density using systematic sampling in each of the strata, to guarantee that the number of interviews which were to be realized would make up the same fraction of this strata as in the population aged 15+. Thus they rep-

resent the whole country according to EUROSTAT NUTS II and the distribution of the resident population in terms of metropolitan, urban and rural areas; random selection of a starting address in each drawn sampling point; the selection of further addresses (every Nth address) by a standard "random route" procedure, from the initial address and the random selection of a respondent in each household using the "closest birthday" method.

During sampling 1493 individuals meeting the inclusion criteria, i.e. aged 15+; citizenship of a member state of the European Union, were contacted. Of these, 493 people (33%) refused to be interviewed. Number of interviews was 1000, which accounted for 67% of a randomly selected sample. The sample structure according to sex, age and place of living (metropolitan, urban and rural area) was almost the same as the structure of the Polish population. Slight differences were corrected by weighting. Data for Poland as all HLS-EU data were weighted by gender, age, region (NUTS II) and degree of urbanization. The weighting process used the latest available census data and standard weights used in the Eurobarometer. It was decided to include into the analysis only data from the respondents who answered validly at least 38 questions out of the 47 questions dedicated to health literacy measurement. The number of respondents ultimately included into analysis in Poland was 921 (92% of the total number of interviews). Those excluded from the analysis were not significantly different in terms of age and place of living from respondents included into analysis. Only education and gender proved to be a differentiating factor. The very small differences between categories of education as

well as of categories of gender were assessed to have no influence on the value of the indexes .

### **Health Literacy Measurement Instrument HLS-EU-Q**

The questionnaire to measure health literacy was a product of a joint work of the HLS-EU Consortium (2012). The basis for the creation of the HLS-EU-Q was the definition and conceptual model developed by the HLS-EU Consortium. The detailed description of the definition and the model development can be found elsewhere (Sørensen et al. 2012). In accordance with this definition, health literacy entails 'people's knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course.' The conceptual model of health literacy (HL), based on the above-mentioned definition, covers three key health areas i.e. health care, disease prevention and health promotion and four information processing stages, i.e. access, understand, appraise and apply. The combined areas and stages create a matrix, which includes 12 dimensions of health literacy. For each of the dimensions respective indicator questions were assigned. All of them in the number of 47 made up a core part of the questionnaire and were used to develop the HL indexes. The indicator questions have the same initial part, i.e. ' On a scale from very easy to very difficult, how easy would you say it is to....' which was followed by a part of the changing content and related to a specific HL problems e.g.'.. find

information about symptoms of illnesses that concern you ?'(health care); '..judge if the information about illness in the media is reliable? (disease prevention)'; judge when you need to go to a doctor for a check-up? ( health care) or ' ..find out about efforts to promote your health at work? (health promotion). The details on the HLS-EU-Q construction can be found elsewhere (Sørensen et al. 2013).

### **Statistical analysis**

In order to test the relationship between general health literacy and age a contingency table with Pearson's Chi Square tests and Kendall's Tau-b coefficients was made (Table 1). To measure the influence of age on general health literacy, the multivariate linear regression model (Table 2) was used. In the model, general health literacy was an explained variable, age occurred as an explanatory variable. Gender, education, self-assessment of social position, status of employment were introduced as controlled variables.

In order to describe the importance of age, self-assessment of social position and general health literacy for health in the Polish population aged 15 and more the logistic regression model (Table 3) was created for health self-assessment as a dependent variable and age, general health literacy, self-assessment of social position as independent variables. Gender, education and status of employment were included into the model as possible confounders. The analogical logistic regression models were used to describe the relationship between health self-assessment and: age, self-assessment of social position and general health literacy in the Polish adult population aged 50 and below (Table 4) and aged 51 and more (Table 5).

## Results

### General health literacy and the elderly

As shown in Table 1 almost every second person in the Polish adult population aged 15+ had a limited level of health literacy. The highest percentage (61.3%) of people with limited health literacy (inadequate + problematic) was found in the elderly aged 65 and more. It was much

higher than that for people aged 50 and below (39.9% ).

Results of the multivariate linear regression analysis indicated (Table 2) the existence of the relationship between general health literacy and age and confirmed that in Poland the elderly aged 65 and more were at highest risk of low health literacy. The relationship remained statistically significant when it was controlled for possible confounders, namely: gender, education, self-assessment of social position and status of employment.

Table 1. Level of general health literacy index by age in the Polish adult population in 2011

Levels of general health literacy index	Age			
	≤ 50	51–64	≥ 65	Total
Limited (inadequate + problematic) (0–33)	39.9%	46.0%	61.3%	44.6%
Sufficient (> 33–42)	38.6%	34.7%	26.8%	35.9%
Excellent (> 42–50)	21.5%	19.2%	12.0%	19.5%

Pearson's Chi Square:  $\chi^2=21.669$  df=4  $p\leq 0.001$ ; Kendall's Tau-b:  $\Gamma_b=-0.122$   $p\leq 0.001$ .

Table 2. Predictors of general health literacy. The results of the multivariable linear regression analysis

Predictors of general health literacy (GenHL – index from 0=minimal HL to 50=maximal HL)	Standardized regression coefficient $\beta$
Gender (1 – male; 2 – female)	0.046
Age up to 50 (ref. cat. 51–64 )	–0.063
Age 64 and more (ref. cat. 51–64)	–0.110*
Education – vocational (ref.cat primary)	0.058
Education – secondary (ref.cat primary)	0.127**
Education – university (ref.cat primary)	0.177***
Self-assessment of social position (1 – the lowest; 10 – the highest)	0.181***
Status of employment – pupils and students (cat.ref full-time job)	0.088*
Status of employment – unemployed (cat.ref full-time job)	0.076*
Status of employment – full-time homemaker and inactive (ref.cat full-time job)	0.048
Status of employment – retired and permanently disabled (ref.cat full-time job)	–0.066
Status of employment – part-time job (cat.ref full-time job)	0.003
Adjusted R square	0.11

\* $p\leq 0.05$ ; \*\* $p\leq 0.01$ ; \*\*\* $p\leq 0.001$ ;  $F(13, 881)=12.232$   $p\leq 0.001$ .

### Health literacy and health self-assessment

As shown in Table 3 age, self-assessment of social position and general health literacy were important predictors of health self-assessment in the Polish adult population aged 15 and more. Results of logistic regression analysis confirmed the relationship between health self-assessment and the above-mentioned variables, which remained statistically significant when controlled for possible confounders. Logistic regression coefficients  $\text{Exp}(b)$  for each of the relationships were 0.953, at  $p \leq 0.001$ ; 1.321, at  $p \leq 0.001$  and 1.066, at  $p \leq 0.001$  respectively. The findings meant that the higher age the lower self-assessed health; the higher self-assessed position the higher health self-assessment; and the higher level of general health literacy, the better health self-assessment.

To describe more in detail the relationships between health self-assessment and its predictors namely: age, self-assessment of social position and general health literacy, a model of logistic

regression analysis, analogous to that applied in the case of the Polish population aged 15 and more, was used in relation to the two subpopulations of the entire studied group, one covering people aged 50 and below (Table 4) and another aged 51 and more (Table 5).

As we can see in the Tables 4 and 5 general health literacy had a similar, positive effect on health self-assessment in both subpopulations. The results of the analysis indicated that the higher level of general health literacy the better health self-assessment both in the case of younger and older adults.

Further analysis of the results covered by Table 4 and Table 5 indicated the existence of a significant difference between the described subpopulations. While, in the case of persons aged 15–50, age affected the health self-assessment (the younger the person, the higher self-assessment of health) in the case of people aged 50 and more it did not play a significant role. In this context, it seems interesting, dependent on age, the influence of 'self-assessment of social position' on 'health self-assessment' which was

Table 3. Predictors of health self-assessment in the Polish adult population aged 15 and more. Results of logistic regression analysis

Predictors of health self-assessment (0 – fair, bad and very bad; 1 – very good and good)	$\text{Exp}(b)$
Gender (1 – male; 2 – female)	0.896
Age	0.953**
Education – vocational (ref.cat primary)	1.381
Education – secondary (ref.cat primary)	1.708*
Education – university (ref.cat primary)	1.615
Self-assessment of social position (1 – the lowest; 10 – the highest)	1.321**
Status of employment – pupils and students (cat.ref full-time job)	0.798
Status of employment – unemployed (cat.ref full-time job)	0.671
Status of employment – full-time homemaker and inactive (ref.cat full-time job)	1.107
Status of employment – retired and permanently disabled (ref.cat full-time job)	0.430**
Status of employment – part-time job (cat.ref full-time job)	0.477*
General health literacy index (GenHL – index from 0=minimal HL to 50=maximal HL)	1.066**

\* $p \leq 0.05$ ; \*\* $p \leq 0.001$ ; Hosmer and Lemeshow Test:  $\chi^2 = 8.368$   $df = 8$   $p = 0.398$ .

Table 4. Predictors of health self-assessment in the Polish adult population aged 50 and below. Results of logistic regression analysis

Predictors of health self-assessment (0 – fair, bad and very bad; 1 – very good and good)	Exp(b)
Gender (1 –male; 2 – female)	0.714
Age	0.971*
Education – vocational (ref.cat primary)	1.196
Education – secondary (ref.cat primary)	1.874
Education – university (ref.cat primary)	1.430
Self-assessment of social position (1 – the lowest; 10 – the highest)	1.209*
Status of employment – pupils and students (cat.ref full-time job)	0.870
Status of employment – unemployed (cat.ref full-time job)	0.625
Status of employment – full-time homemaker and inactive (ref.cat full-time job)	1.235
Status of employment – retired and permanently disabled (ref.cat full-time job)	0.093***
Status of employment – part-time job (cat.ref full-time job)	0.356**
General health literacy (GenHL – index from 0=minimal HL to 50=maximal HL)	1.075***

\* $p \leq 0.05$ ; \*\* $p \leq 0.01$ ; \*\*\* $p \leq 0.001$ ; Hosmer and Lemeshow Test:  $\chi^2 = 4.602$  df=8  $p = 0.799$ .

Table 5. Predictors of health self-assessment in the Polish adult population aged 51 and more. Results of logistic regression analysis

Predictors of health self-assessment (0 – fair, bad and very bad; 1 – very good and good)	Exp(b)
Gender (1 –male; 2 – female)	1.017
Age	0.971
Education – vocational (ref.cat primary)	1.941
Education – secondary (ref.cat primary)	1.607
Education – university (ref.cat primary)	2.207
Self-assessment of social position (1 – the lowest; 10 – the highest)	1.420*
Status of employment – unemployed (cat.ref full-time job)	1.092
Status of employment – full-time homemaker and inactive (ref.cat full-time job)	1.165
Status of employment – retired and permanently disabled (ref.cat full-time job)	0.785
Status of employment – part-time job (cat.ref full-time job)	1.141
General health literacy (GenHL – index from 0=minimal HL to 50=maximal HL)	1.070*

\* $p \leq 0.001$ ; Hosmer and Lemeshow Test:  $\chi^2 = 9.196$  df=8  $p = 0.326$ .

stronger in older adults (those aged 50 and more) than in younger ones (those aged 50 and below). Logistic regression coefficients Exp(b) for each of the relationships were 1.209, at  $p \leq 0.05$ ; 1.420, at  $p \leq 0.001$  respectively. The found difference suggested the increasing with age the influence of social inequalities on the adults' self-assessed health.

Considerable attention should be paid on the existence in the elderly a particularly vulnerable category of persons

who experience co-occurrence disadvantages such as low education, suffering from a chronic disease, low income and low health literacy. Whereas in the Polish adult population aged 15 and more the percentage of such persons was 3.7% amongst persons aged 65+ it was 14.4%.

## Discussion

Polish part of the HLS-EU project was the first national study providing popula-

tion data on health literacy in Poland. Although in the entire Polish adult population the share of people with low health literacy (44.6%) was close to the mean (47.6%) counted for all countries covered by the HLS-EU (Sörensen et al. 2015), in the case of the elderly it was even higher than those in some other countries e.g. the Netherlands, where age had not so strong influence on the population health literacy level. In 2011 61.3% of Poles aged 65 and more had low levels of general health literacy (inadequate + problematic) and only 12% of them had general health literacy on the excellent level. In contrast in the people aged 50 years and below these percentages were 39.9% and 21.5% respectively. The partial reason of this difference was probably the known relationship between the older age and an experience of the negative consequences of social inequalities, like poor socioeconomic conditions leading to low health literacy and then to negative health outcomes (Findley 2015). To some extent this hypothesis can be supported by, the found in the Polish study, the phenomenon of increasing with age the impact of self-assessed social position on health self-assessment. The relationship between social position and health literacy were confirmed by other authors (van der Heide et al 2013; Tiller et al. 2015; Furuya et al. 2015).

As was previously presented in the introductory part, the aging process in the Polish population is accompanied by decrease in health literacy and increase in the old-age dependency ratio, what potentially creates a wide range of health and social problems being a great burden for individuals and social systems, including health system. The increase in the ratio means on the one hand, an increase in the number of people in need of

care and decrease in the number of those who may offer it. In Poland in care for the elderly are engaged mostly the family members and much less medical and social institutions (Błędowski 2012). Given the growth of dynamics of the population aging process and decreasing of the caring potential of families, to start in Poland the development of an effective, easy accessible caring system for the elderly where health literacy plays an important role is of great importance.

Health literacy is widely regarded as critical for managing personal and population health (Nutbeam and Kickbusch 2000; Schloman 2004; Van den Broucke 2014; Kamran et al. 2015).

Low health literacy can lead to many negative consequences amongst the elderly like: more hospitalizations, greater use of emergency care, poorer ability to demonstrate taking medications appropriately, poorer ability to interpret labels and health messages and poorer overall health status and higher mortality rates (Berkman et al. 2011).

As we could see previously (see Results) health literacy was confirmed to be an important predictor of health self-assessment (the higher literacy the higher health self-assessment) both for older and younger adults.

As it is well known, along with age, the social dependency increases (Błędowski 2012; Findley 2015) and health literacy decreases. 80 years is the age at which the social dependency of the elderly increases rapidly. In Poland the growth in the number of people aged 80 and more is higher than in the rest of the population. In 2050 the share of these people in the general population will increase to 10.4%. As showed the results of POLSENIOR study already in the population aged 80–84 al-



most half persons needed help (48.6%) (Błędowski 2012).

In the context of the above information the elderly in Poland may be treated as a vulnerable group. The existence of vulnerable subgroups of the general population having higher proportion of people with low health literacy was confirmed in the European countries covered by HLS-EU project i.e. Austria, Bulgaria, Germany, Greece, Ireland, the Netherlands, and Spain (Sörensen et al. 2015).

The results from Poland added to this important observation another one, which draws attention to those in the elderly, who experience co-occurrence of disadvantages, such as low education, suffering from a chronic disease, low income and low health literacy. As was mentioned previously, whereas in the Polish adult population aged 15 and more the percentage of such persons was 3.7%, amongst persons aged 65+ it was 14.4%. This fact can be interpreted in terms of stronger then in the entire adult population the influence of social factors on health and social situation of the elderly in Poland.

## Conclusions

In the context of the unsatisfactory level of health literacy, particularly in the elderly, and the intensifying process of aging in the Polish population, the development of health literacy should occupy a very high position on the political agenda. The results of the presented study together with the results of other studies (Sörensen et al 2015; Grundy 2005) allow to consider the elderly as a vulnerable group. The special threatening positions occupy those in the elderly, who experience co-occurrence of disadvantages, such as low education, suffer-

ing from a chronic disease, low income and low health literacy. In Poland in 2011 amongst the adult population aged 65 and more such persons was 14.4%. As was confirmed, also in the Polish study, a high level of health literacy affects health positively. Existence of this relationship provides an important argument for the health literacy development as an important path to empower the Polish population, including the elderly, in the health area. Starting this process is of great importance, especially in the context of coming in Poland the demographic, social and economic challenges related to aging. The more so, as demonstrated in the study, a social position is closely connected with self-assessed health in the elderly just now. Given the growth of dynamics of the population aging process and decreasing of the caring potential of families, to start in Poland and other countries being in the similar situation, the development of an effective, easy accessible caring system for the elderly where health literacy plays an important role is of great importance.

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### Authors' contributions

ZAS initiated and wrote the manuscript, took part in the literature review. AAB performed statistical analysis of data. AEA contributed to the literature review.

### Conflict of interest

Authors declare that there is no conflict of interest regarding publication of this paper.

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