REVIEW ARTICLE

Folia Cardiologica 2020
vol. 15, no. 1, pages 42–48

ISSN 2353–7752

# Health literacy — scientific statement from the American Heart Association (July 10, 2018) with commentary

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Artykuł jest tłumaczeniem pracy: Baska A, Śliż D. Stanowisko *American Heart Association* na temat alfabetyzmu zdrowotnego (*health literacy*) z 10 lipca 2018 roku z komentarzem. Folia Cardiol. 2020; 15(1): 34–41. DOI: 10.5603/FC.2020.0006. Należy cytować wersję pierwotną

## Abstract

In July 2018, the American Heart Association (AHA) released a statement on the relevance of health literacy in the prevention and treatment of cardiovascular diseases. As emphasised by the AHA, actions undertaken with the intention of improving health literacy status will be crucial in achieving the 2020 Impact Goal. They are also essential for designing and implementing prevention campaigns and in coordinating initiatives within the public health sector.

Health literacy is defined as "the degree to which individuals are able to access and process basic health information and services and thereby participate in health-related decisions". Skills and competencies related to health literacy include also an ability to understand physician's recommendations, hospital procedures, plan of treatment and visits, other principles within the healthcare system as well as the content of educational materials. Thus, a low level of health literacy might be reflected in practice by limited awareness of one's own health status or applied treatment, resulting from or contributing to ineffective doctor-patient communication as well as to further failure to use drugs as prescribed or delayed response to disease symptoms.

The aim of this article was to introduce Polish recipients to the key elements of the AHA's statement.

Key words: health literacy, health promotion, health education

Folia Cardiologica 2020; 15, 1: 42–48

## Introduction: health literacy

In July 2018, the American Heart Association (AHA) published an official statement on the importance of health literacy in the treatment and prevention of cardiovascular diseases [1]. This article aims to summarise the key conclusions presented.

At the very beginning, it is worth noting that the translation into Polish of the term *health literacy* has not yet been standardised — in the literature it appears, among others, under the term „kompetencje zdrowotne" ["health competencies"], „piśmienność zdrowotna" ["health literateness"], „funkcjonalna wiedza zdrowotna" ["functional health knowledge"] [2], or, the preferred term [3, 4], also used for the purpose of this article, „alfabetyzm zdrowotny" "health literacy".

As defined at the beginning of the analysed paper, health literacy specifies the extent to which the individual is able to obtain and interpret basic information about health and health services, and thus participate in decisions concerning his or her health. This definition may be extended to include the "cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health," as indicated by the World Health Organisation (WHO) [5].

Skills and competencies related to health literacy include also the ability to understand physician's

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recommendations, hospital discharge procedures, plan of treatment and visits, other principles within the healthcare system, as well as the content of educational materials. Thus, a low level of health literacy might be reflected in practice by limited awareness of one's own health status or applied treatment, resulting from or contributing to ineffective physician-patient communication as well as to a further failure to use medications as prescribed or a delayed response to symptoms of a disease. The high correlation between low levels of health literacy and significantly lower rates of participation in clinical trials observed in this group of patients is also remarkable.

**It is estimated that a level of health literacy enabling fully effective navigation and understanding of the principles of the healthcare system applies only to 12% of adult Americans [6].**

The research results confirm that the problem of the low level of health literacy constitutes a threat to the health of an individual as well as a social problem. Its adverse impact on morbidity rates, mortality, risk of rehospitalisation, or increased costs in the healthcare sector has been documented.

The level of health literacy is closely related to the overall level of education and socio-economic status, membership of an ethnic minority, or reaching old age.

From the perspective of developing effective strategies for counteracting the problem, it is significant that a low level of health literacy among parents translates directly into lower health competence in their children. It is also associated with the provision of poorer care in terms of prevention and favours the adoption of unfavourable patterns of health behaviour by their children (*e.g.* a predisposition to obesity [7]).

As emphasised by the AHA, actions undertaken with the intention of improving health literacy status are crucial for achieving the 2020 Impact Goal[1]. They are also essential for designing and implementing prevention campaigns or coordinating initiatives within the public health sector.

## Aim of the study

We, the authors of the study, defined the following aims:

- increasing awareness among healthcare system employees of the level of health literacy in society and the scale of this phenomenon in the context of cardiovascular diseases;
- summarising the documented relevance of health literacy in the healthcare system with respect to data on individual cardiovascular diseases, their prevention, risk factors, treatments;
- presenting proven and effective strategies for removing barriers to the prevention and treatment of cardiovascular diseases resulting from low levels of health literacy;
- emphasising the existing relationship between social determinants of health and the level of health literacy and its consequences — reinforcing inequalities in access to health;
- setting a new direction in research and measures aimed at improving patient care in the context of cardiovascular health and supporting public health initiatives by introducing actions on health literacy.

## Identification of major barriers

Before discussing possible solutions and strategies to improve the level of health literacy and how to address the groups which are most at risk, the AHA authors thought it would be useful to identify the specific objectives of the planned interventions and to identify the obstacles that prevent patients with low levels of health literacy from contacting and accessing appropriate healthcare.

The authors of the statement stress firstly the challenges related to the mere availability of adequate health services. In the United States, this group of barriers identifies, inter alia, the need to complete applications for health insurance benefits — documents that use sophisticated language and require more than basic general knowledge.

Another obstacle are various types of 'health-related' materials, including educational leaflets — their language is often not appropriate to the abilities and educational level of the recipient, and contains medical and scientific nomenclature. The same applies to documents intended to provide a patient with an insight into the therapeutic process, including his or her participation in the choice of treatment, such as consent forms for medical procedures. In practice, these materials are very rarely fully comprehensible to a patient. Internet sources of medical and pseudo-medical knowledge, to which some patients resort in search of accessible communication, are also noteworthy. It is worth mentioning that individuals representing the group with the lowest level of health literacy may not have permanent access to information obtained from a reliable source or may have difficulties in assessing the reliability of the content and in differentiating it from sources that constitute a risk to health.

Another group of obstacles results from inappropriate ways of communicating with a physician and other health professionals. As indicated in the research cited in the statement, medical terminology used by physicians to communicate is a challenge, even for highly educated patients. An additional problem seems to be the attitude of patients with low levels of health literacy themselves — often not signalling the lack of understanding of the message, not searching for information regarding the ailment that affects them. Activities related to healthcare,

[1]Improving the cardiovascular health of Americans by 20% by 2020

such as proper dosage of medicines or reading enclosed leaflets, require skills that go beyond the very spectrum of health literacy. It is important to remember, inter alia, about basic skills in mathematics, verbal and written communication, and reading comprehension. Individuals from groups with the lowest level of health literacy may also show deficiencies in the above-mentioned areas, which should also be included when selecting actions aimed at improving health literacy.

The authors of the statement also stressed language and cultural barriers, especially important in communities with a high percentage of national or ethnic minorities, refugees or immigrants. These populations are particularly vulnerable to obstacles related to inappropriate communication or lack of access to medical services as a consequence of failure to understand how the healthcare system, procedures and documents function.

## Summary of most important links between level of health literacy and cardiovascular diseases and their prevention

Many studies confirm the key role of health literacy — both in primary and secondary prevention of cardiovascular diseases — and emphasise its impact on the effectiveness of the therapeutic process. This study is based on an analysis of all available publications in this area, in which the group of respondents comprised over 150 individuals, published between January 2004 and November 2016 (approx. 35 studies).

The first observation, consistent for several publications, is the incorrect self-assessment of health status or disease severity resulting from the low level of health literacy. One example may be a study involving patients with hypertension. In self-measurement of blood pressure (AH, arterial hypertension), a significant number were unable to interpret the results correctly, given that a result of 160/100 mm Hg is correct [8]. This is disturbing since knowledge of therapeutic goals in the treatment of AH (in this case specific blood pressure values) directly translates into better self-control of the disease [9]. In another quoted study, individuals with lower level health literacy had a 1.8–2.7 times higher risk of not reaching the arterial blood pressure values specified in the guidelines. Similar dependencies have been observed for diabetes mellitus. Lack of sufficient knowledge about the disease resulted in an as much as four times greater belief among patients that they were in proper control of the disease (despite abnormal values of glycated haemoglobin) compared to the self-assessment of patients with higher levels of health literacy [10]. On the other hand, especially in view of the increasing availability of telemedicine solutions, a lower frequency and degree of use of the electronic portal for diabetes mellitus patients by individuals with a lower level of health literacy has been observed [11, 12].

The level of health literacy also influences how medications are taken or compliance with other types of therapies. There are some examples of unintentionally incorrect administration of medications due, inter alia, to misunderstanding the dosage or route of administration recommendations, and the relationship between the implementation of instructions related to changing dietary habits in diabetes mellitus and the level of knowledge about the disease.

However, for cardiovascular incidents in groups of patients with lower levels of health literacy, an increased percentage of rehospitalisation has been observed, and for cardiac and heart failure — higher (even doubled) overall mortality. It is estimated that in the group of patients with this disease, a limited level of health literacy applies to as much as 40%. This result is similar to the level of health literacy determined on the basis of a patient's ability to explain what his or her disease is in a study conducted in a group of individuals with atrial fibrillation, in which it amounted to approximately 50%. This is important because the level of awareness of the disease translates into further therapeutic process and adaptation to the medication administration scheme.

Knowledge concerning risk factors as well as the management of symptoms is particularly important for patients at risk of stroke. The authors noted especially stark differences in levels of education and awareness between different ethnic groups.

In the context of the prevention of cardiovascular diseases, the relationship between dietary choices, physical activity and the level of literacy also seems to be important — the higher this level is, the greater the range of self-care activities undertaken. Similar conclusions are drawn from research conducted in individuals with obesity. Observations in the group of patients with cardiac and heart failure also lead to consistent conclusions — the level of health literacy is an independent factor determining the frequency and effectiveness of self-care behaviours. For this reason, it is sometimes considered when assessing and selecting therapeutic options [13]. This may be related to the fact that a higher level of health literacy, which translates, inter alia, into improved understanding of the relevance and methods of treatment — both pharmacological and lifestyle changes — results in an increased sense of *self-efficacy* and responsibility for one's health status.

A low level of health literacy also positively correlates with higher tobacco dependence and reduced knowledge about the harmful effects of smoking. Furthermore, individuals showing lower knowledge levels are more than three times as likely to fall back into their habit following the completion of smoking cessation programmes.

## Review of recommended strategies and actions to improve health literacy

The influence of the level of health literacy on the course of the therapeutic process and prevention of numerous diseases is well documented, leaving no doubt as to the relevance and even necessity of actions aimed at increasing health competence. The conundrum is how to plan interventions and what strategies to use to make their impact on patients and their health as effective as possible, including from an economic perspective. Below is an overview of the activities presented in the AHA statement, along with an attempt to rank them according to the type of intervention.

One of the simplest and cheapest methods, yet one that brings significant improvements in terms of compliance with therapeutic recommendations (by as much as five times [14]) is the modification of medication packages to a form that is more legible and understandable for a patient (in the study quoted above, inter alia, the inscription concerning the times of taking successive doses was changed. Instead of indicating how many times a day (*e.g.* 4 × 1 tabl.), each dose was assigned to a specific time of day (morning, noon and so on). In addition, graphical instructions were applied in the middle of the package, and the content, (most important for a patient) was given in bold and enlarged font. Similar solutions in the form of illustrated medication dosage schemes and the use of 'postcard reminders' seem to be useful in the group of patients with low self-efficacy in the therapeutic process, in the event of combination therapy or with initial low compliance. Another method of procedures beneficial for *compliance* was the use of 'flashcards' and QR code videos provided for on the medication packages [15].

Illustrated materials also proved effective, although only to a limited extent, in patients with cardiac and heart failure (they contributed to a reduction in total hospitalisation rates). As far as the frequency of hospitalisations directly related to the disease or improved quality of life is concerned, the differences were not statistically significant [16]. The intervention focused on raising awareness of the symptoms associated with the disease that may be self-controlled by patients and encouraging them, inter alia, to regularly monitor their weight or observe their ankles for oedema. These activities were presented in a graphic form.

Among other communication techniques, it is also recommended to 'screen for comprehension' instead of passively expecting a patient to report a failure of understanding.

Another example of effective intervention concerning education, was the special, individualised diabetes mellitus health education programme for patients with low levels of health literacy [17]. This resulted in a statistically significant improvement compared to the standard therapy group. It is worth noting, however, that this intervention proved to be effective only in the group of patients with an initially low literacy level; in the group with a higher literacy level, patients obtained results similar to those of the control group. Therefore, it seems crucial, mainly in economic terms, to develop for this type of intervention a way of classifying the level of health literacy in order to address a particular group of patients using an appropriate therapeutic strategy. Targeting educational programmes has also proven relevant in raising awareness of stroke symptoms and their management. The authors of one of the interventions involved whole families, including children, in the programme [18].

The effectiveness of educational programmes, properly selected to meet the needs of the recipients, was also confirmed by a study in which the intervention concerned reducing calories by limiting the consumption of sweetened drinks in the group of individuals with obesity with a low level of health literacy. The programme comprised, inter alia, group classes, the teach-back[2] method as well as interactive voice responses. Intervention in the form of repeated telephone conversations to increase a patient's awareness and knowledge was used for the study in the group of individuals with cardiac and heart failure and with low levels of health literacy. Patients involved in such activities were less likely to require hospitalisation [19]. Similar results and additionally better compliance were obtained in the educational programme conducted by nurses, concerning the principles of proper pharmacotherapy in atrial fibrillation [20]. For this disease (in contrast to other previously presented statements), the authors stressed the greater benefits of facilitating access to adequate healthcare for all patients (regardless of the level of health literacy) instead of adjusting therapeutic methods to the level of patients' awareness.

However, conclusions regarding a positive correlation between the state of knowledge and **treatment compliance**, dietary choices, and self-monitoring of disease progression, including recognition of its key symptoms, are consistent.

The authors also stress the importance of interventions conducted multidimensionally, in a cross-disciplinary manner by representatives of various medical professions or centres providing various types of services in the healthcare sector — from outpatient clinics to pharmacies. Such measures have the potential to exert a longer-term impact on a patient. One example of such a strategy could be the availability of pressure meters in pharmacies to encourage regular check-ups, and reminding patients to take medications on a regular basis — another option could be the close cooperation of the pharmacist in the process of educating a patient about the treatment administered after he or she leaves hospital, supported by telephone follow-up after the

[2]For instance, asking patients to explain the recommendations in their own words

discharge. These actions resulted in a 60% reduced risk of rehospitalisation within 30 days [21].

Technological solutions, in the form of phone apps or Internet educational platforms, whose use is quite limited in groups particularly at risk of low levels of health literacy — with low socio-economic status or without permanent access to the Internet and/or smartphones are also of significance. Therefore, other methods of reaching these communities are being tested, on a smaller scale but with proven effectiveness, directly aimed at specific recipients. Such examples include educational campaigns, such as 'Tailored Approaches to Stroke Health Education' [22], concerning the recognition of stroke symptoms and their management, addressed to minorities *e.g.* the African-American population conducted in hairdressing salons via previously educated hairdressers, and Spanish-speakers through lectures and films held in venues of religious gatherings.

## Summary

Considering the prevalence of the phenomenon of limited health literacy with simultaneous good documentation of its important role in the treatment and prevention of most cardiovascular diseases, it seems reasonable to promote actions which take the level of health literacy as one of the risk factors influencing the success of the therapy or a barrier in complying with therapeutic recommendations, and thus the aim of the intervention. To this end, an attempt has been made to develop universal guidelines based on good practice (partly presented above) in the most standardised form possible — so that they can be implemented at the level of each medical centre, regardless of the country or activity profile. This document, entitled 'AHRQ Universal Precautions Toolkit for Health Literacy' [23], is available for public use. As its co-authors write, the purpose of the publication is:

— to facilitate communication and ensure that all patients are able to understand medical information, so as to minimise the risk of communication errors;
— to facilitate orientation in healthcare facilities;
— to support patients' efforts aimed at improving their health.

This 'Toolkit' consists of 21 steps, and the authors of the AHA scientific statement particularly emphasise the role of the physician himself or herself in creating a model of healthcare tailored to issues related to health literacy. Its most important competencies and skills in this area include: listening, slow and calm speech, using non-medical language in contact with a patient, creating opportunities and actively encouraging the asking of questions using the *teach-back* technique [19], graphical aids or models.

## 21 steps — a set of tools to improve health literacy

1. Build a team — preferably interdisciplinary — to jointly promote and develop best practices related to health literacy.
2. Develop a programme to improve health literacy — include short- and long-term objectives to address the challenges of health literacy in the context of cardiovascular diseases.
3. Raise awareness — educate health professionals on health literacy, its relevance and challenges in relation to cardiovascular diseases.
4. Communicate clearly and understandably — use simple language, avoid medical jargon; tailor language in materials such as patient consent; adapt to language used by a patient; use graphical aids when translating examination procedures or stages of the disease.
5. Use the *teach-back* method [19] — applying it, document the progress in a patient's education and the degree of their involvement between individual visits.
6. Ensure continuity of patient care (provide follow-up) — involve a patient in the process of monitoring symptoms and comply with therapeutic recommendations.
7. Make it possible to speak to a patient by phone — make it easier for a patient to contact you or the medical centre.
8. Use the 'brown bag review' approach — always seek to know all the medications a patient is taking, for example by encouraging a patient to bring them to the appointment; encourage patients to record (either manually or by means of an application) the medications he or she is taking to monitor *adherence*; establish a partnership with pharmacists.
9. Note the language barriers — provide education and language assessment together with a translator.
10. Consider differences in culture, customs or religious beliefs — attend cultural competence training; take into account the fact that patients' backgrounds or beliefs may affect their attitude towards treatment and medical care itself.
11. Evaluate, select or develop educational materials tailored to a patient's abilities — forms, applications, consents, brochures on medical procedures and treatments.
12. Make effective use of health education materials — develop the necessary *clinical order sets* or provide them with the collected resources on the subject.
13. Greet patients in the appropriate way, ensure the right attitude and approach — create an environment in which patients feel comfortable asking questions.
14. Encourage questions — make it possible for a patient to ask questions regarding cardiovascular diseases

with respect to their experience in this area and existing therapeutic methods.

15. Develop action plans with your patients — choose realistic objectives together (*e.g.* following the recommendations concerning the right dosage, paying attention to specific risk factors such as smoking).
16. Help patients remember how and at what times to take their medication — familiarise a patient with aids such as phone apps or diary keeping, even a medicine box; be prepared for mistakes and failures.
17. Make sure you get feedback from a patient — collect information about his or her experience of being a patient, of contacting you, or of received benefits (*e.g.* through questionnaires); listen to his or her suggestions.
18. Indicate to a patient where he or she can access non-medical support — specify facilities or institutions already operating in the local community (*community-based resources*).
19. Advise a patient on 'navigating' through the healthcare system — support a patient on formal issues related to health insurance or his or her rights.
20. Provide a patient with materials that would help him or her to improve their literacy or basic mathematical skills — pay attention to how the level of health literacy affects a patient's quality of life and functioning; identify and point to community-based resources.
21. Simplify referrals to other professionals — make sure a patient understands the way he or she is referred to another specialist; when you consult other patients, give feedback to both a patient and an attending physician.

With the strategies already developed and partly presented in this paper, the greatest challenge and priority is to establish effectiveness of methods of their implementation and to ensure their efficiency in real-world medical facilities.

## References


1. Magnani JW, Mujahid MS, Aronow HD, et al. American Heart Association Council on Epidemiology and Prevention; Council on Cardiovascular Disease in the Young; Council on Cardiovascular and Stroke Nursing; Council on Peripheral Vascular Disease; Council on Quality of Care and Outcomes Research; and Stroke Council. Health literacy and cardiovascular disease: fundamental relevance to primary and secondary prevention: a Scientific Statement from the American Heart Association. Circulation. 2018; 138(2): e48–e74, doi: 10.1161/CIR.0000000000000579, indexed in Pubmed: 29866648.
2. Iwanowicz E. „Health literacy" współczesnym wyzwaniem zdrowia publicznego. Med Pr. 2009; 60(5): 427–437.
3. Kowalska ME, Kalinowski P, Bojakowska U. The concept of health literacy in health promotion. J Educ Health Sport. 2017; 7(9): 430–438.
4. Olejniczak O. Practical use of health-literacy as a tool for achieving health goals. J Educ Healt Sport. 2016; 6(2): 238–243, doi: 10.5281/zenodo.46654.
5. 7th Global Conference on Health Promotion. http://www.who.int/health-promotion/conferences/7gchp/track2/en/ (25.09.2017).
6. Kunter M, Greenberg E, Jin Y, Paulsen C. The health literacy of America's adults: results from the 2003 National Assessment of Adult Literacy (NECS 2006-483). US Department of Education, National Center for Education Statistics, Washington 2006.
7. Chari R, Warsh J, Ketterer T, et al. Association between health literacy and child and adolescent obesity. Patient Educ Couns. 2014; 94(1): 61–66, doi: 10.1016/j.pec.2013.09.006, indexed in Pubmed: 24120396.
8. Williams MV, Baker DW, Parker RM, et al. Relationship of functional health literacy to patients' knowledge of their chronic disease. A study of patients with hypertension and diabetes. Arch Intern Med. 1998; 158(2): 166–172, doi: 10.1001/archinte.158.2.166, indexed in Pubmed: 9448555.
9. Wright-Nunes JA, Luther JM, Ikizler TA, et al. Patient knowledge of blood pressure target is associated with improved blood pressure control in chronic kidney disease. Patient Educ Couns. 2012; 88(2): 184–188, doi: 10.1016/j.pec.2012.02.015, indexed in Pubmed: 22459637.
10. Ferguson MO, Long JA, Zhu J, et al. Low health literacy predicts misperceptions of diabetes control in patients with persistently elevated A1C. Diabetes Educ. 2015; 41(3): 309–319, doi: 10.1177/0145721715572446, indexed in Pubmed: 25699568.
11. Woodard LD, Landrum CR, Amspoker AB, et al. Interaction between functional health literacy, patient activation, and glycemic control. Patient Prefer Adherence. 2014; 8: 1019–1024, doi: 10.2147/PPA.S63954, indexed in Pubmed: 25092966.
12. Fransen MP, Beune EJ, Baim-Lance AM, et al. Diabetes self-management support for patients with low health literacy: perceptions of patients and providers. J Diabetes. 2015; 7(3): 418–425, doi: 10.1111/1753-0407.12191, indexed in Pubmed: 25042519.
13. Matsuoka S, Tsuchihashi-Makaya M, Kayane T, et al. Health literacy is independently associated with self-care behavior in patients with heart failure. Patient Educ Couns. 2016; 99(6): 1026–1032, doi: 10.1016/j.pec.2016.01.003, indexed in Pubmed: 26830514.
14. Wolf MS, Davis TC, Curtis LM, et al. A patient-centered prescription drug label to promote appropriate medication use and adherence. J Gen Intern Med. 2016; 31(12): 1482–1489, doi: 10.1007/s11606-016-3816-x, indexed in Pubmed: 27542666.
15. Yeung DL, Alvarez KS, Quinones ME, et al. Low-health literacy flashcards & mobile video reinforcement to improve medication adherence in patients on oral diabetes, heart failure, and hypertension medications. J Am Pharm Assoc (2003). 2017; 57(1): 30–37, doi: 10.1016/j.japh.2016.08.012, indexed in Pubmed: 27816544.
16. DeWalt DA, Malone RM, Bryant ME, et al. A heart failure self-management program for patients of all literacy levels: a randomized, controlled trial [ISRCTN11535170]. BMC Health Serv Res. 2006; 6: 30, doi: 10.1186/1472-6963-6-30, indexed in Pubmed: 16533388.
17. Rothman RL, DeWalt DA, Malone R, et al. Influence of patient literacy on the effectiveness of a primary care-based diabetes disease management program. JAMA. 2004; 292(14): 1711–1716, doi: 10.1001/jama.292.14.1711, indexed in Pubmed: 15479936.
18. Skolarus LE, Zimmerman MA, Murphy J, et al. Community-based participatory research: a new approach to engaging community members to rapidly call 911 for stroke. Stroke. 2011; 42(7): 1862–1866, doi: 10.1161/STROKEAHA.110.609495, indexed in Pubmed: 21617148.
19. DeWalt DA, Schillinger D, Ruo B, et al. Multisite randomized trial of a single-session versus multisession literacy-sensitive self-care

intervention for patients with heart failure. Circulation. 2012; 125(23): 2854–2862, doi: 10.1161/CIRCULATIONAHA.111.081745, indexed in Pubmed: 22572916.

20. Hendriks JML, de Wit R, Crijns HJ, et al. Nurse-led care vs. usual care for patients with atrial fibrillation: results of a randomized trial of integrated chronic care vs. routine clinical care in ambulatory patients with atrial fibrillation. Eur Heart J. 2012; 33(21): 2692–2699, doi: 10.1093/eurheartj/ehs071, indexed in Pubmed: 22453654.
21. Bell SP, Schnipper JL, Goggins K, et al. Pharmacist Intervention for Low Literacy in Cardiovascular Disease (PILL-CVD) Study Group. Effect of pharmacist counseling intervention on health care utilization following hospital discharge: a randomized control trial. J Gen Intern Med. 2016; 31(5): 470–477, doi: 10.1007/s11606-016-3596-3, indexed in Pubmed: 26883526.
22. Ravenell J, Leighton-Herrmann E, Abel-Bey A, et al. Tailored approaches to stroke health education (TASHE): study protocol for a randomized controlled trial. Trials. 2015; 16: 176, doi: 10.1186/s13063-015-0703-4, indexed in Pubmed: 25927452.
23. Brega AG, Barnard J, Mabachi NM et al. AHRQ Health Literacy Universal Precautions Toolkit, Second Edition. (Prepared by Colorado Health Outcomes Program, University of Colorado Anschutz Medical Campus under Contract No. HHSA290200710008, TO#10.) AHRQ Publication No. 15-0023-EF. Agency for Healthcare Research and Quality. Rockville, January 2015.