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Inadequate Health Literacy in Patients with Arterial Vascular Disease

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WHAT THIS PAPER ADDS

Knowledge of the health literacy of the patient population is important in the context of supplying medical information, shared decision making, and improving care and health outcomes. Patients with arterial vascular disease are a large subset of the population visiting the vascular surgeon with specific characteristics that are associated with inadequate health literacy. This is the first large scale cross sectional study providing data about the prevalence of inadequate health literacy in patients with arterial vascular disease.

Objective: The aim was to identify the prevalence of inadequate health literacy in patients with arterial vascular disease. This was a cross sectional study.

Methods: Patients with arterial vascular disease visiting the outpatient clinic between January 5, 2015 and December 28, 2016, were randomly included and screened for inadequate health literacy with the Newest Vital Sign—Dutch (NVS-D), a validated health literacy assessment measure. A score of <4 out of six identified individuals with inadequate health literacy. Age, gender, highest education level, and reason for consultation were also registered. Data analysis was performed using Student's *t*-test or the Mann—Whitney *U* test and chi-square test. Logistic regression with backward elimination was applied to identify independent predictors.

Results: A total of 202 patients were included. The mean NVS-D score was 1.91 (SD ± 1.948, median 1). The prevalence of inadequate health literacy was 76.7%. A significantly higher prevalence of inadequate health literacy was found in patients ≥65 years ($p < .001$) and patients with a lower education level ($p < .001$). No significant difference was found between female/male patients ($p = .056$), nor between participants with peripheral arterial occlusive disease and abdominal aortic aneurysm ($p = .116$). Age (OR 1.060; 95% CI 1.017—1.104; $p = .005$) and education level (OR 0.164; 95% CI 0.078—0.346; $p < .001$) were identified as independent predictors of inadequate health literacy.

Conclusion: This study shows a prevalence of inadequate health literacy of 76.7% in patients with arterial vascular disease, with a significantly higher prevalence in patients ≥ 65 years and patients with a lower education level. The high prevalence of inadequate health literacy should be considered when information is provided, and suggests the need to further investigate the best methods to convey medical information to this group of vulnerable patients.

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INTRODUCTION

Despite modern education, low literacy skills are still a common problem in The Netherlands and other parts of Europe and the United States.[1–3] A recently published international survey, the PIAAC (Program for the International Assessment of Adult Competencies), shows that in The Netherlands 1.3 million adults between 18 and 65 years (approximately 30%) have low literacy skills.[1] The ability to write and read is an important condition for adequate health literacy.[4] Health literacy is defined as the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Every medical situation requires several generic or specific skills, so the term health literacy consists of different capabilities, for example reading and numeracy skills.[5]

Knowledge about the health literacy of a patient population is important in the context of providing medical information in a comprehensible way, shared decision making, and increasing patient satisfaction. Moreover, several studies have already shown that inadequate health literacy is consistently associated with poorer health outcomes and poorer use of healthcare services.[6,7] Also, different studies show evidence of the association between low health literacy and adverse clinical events and increased healthcare use in specific patient groups, such as patients

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with chronic kidney disease[8] and coronary artery disease.[9] Furthermore, a current meta-analysis revealed the importance of health literacy and the efficacy of health literacy interventions in adherence to medical treatment in chronic and acute illness.[10] Nevertheless to date, relatively little is known about health literacy among the general population in Europe.

Patients with arterial vascular disease are an important and specific subset of the population visiting the department of vascular surgery. Arterial vascular disease is linked to diabetes mellitus,[11] smoking,[12] ageing,[13] lower socio-economic status and lower education level.[14] Previous studies have shown that inadequate health literacy is associated with these factors as well.[15–18] The relationship between health literacy and ethnic/racial disparities on health outcomes remains rather limited and mixed.[19] The hypothesis is that inadequate health literacy may be a common problem in the group of patients with arterial vascular disease. There is no literature describing the extent of the problem of inadequate health literacy in patients with arterial vascular disease. Understanding this problem and its magnitude could influence the way information is provided. The aim of this study was to identify the prevalence of inadequate health literacy in patients with arterial vascular disease.

METHODS

In this cross sectional study, patients with established peripheral arterial occlusive disease (PAOD) or an abdominal aortic aneurysm (AAA) were included between January 5, 2015 and December 28, 2016. The first cohort included the period between January 5, 2015 and January 16, 2015. In addition, a second cohort with unique patients was included spread over a period between April 21, 2016 and December 30, 2016, in order to create a larger and more representative sample. There was a total of 21 inclusion days in this aforementioned period of time. The researchers scheduled their inclusion dates without of the knowledge of the staff at the outpatient clinic. Moreover, patients were randomly selected by the researchers from a list of names at the outpatient clinic (without access to their medical charts or any other patient information). These precautions were taken in order to create a random sample. There was no formal randomisation.

All patients, both initial consults and follow up contacts, were visiting the outpatient clinic of the department of vascular surgery in a large Dutch teaching hospital. Exclusion criteria were a recent stroke (within 1 year), congenital or traumatic brain damage, and blindness or deafness. People who needed an interpreter to communicate were also excluded. After the appointment with their surgeon, patients were asked to participate in the study.

The diagnosis of arterial vascular disease in patients was established in accordance with the applicable (inter)national guidelines. Peripheral arterial occlusive disease was diagnosed in patients with an abnormal ankle brachial index in rest (<0.9) or a drop of the ankle brachial index of >0.15 during exercise. An abdominal aortic aneurysm was confirmed when there was focal dilatation of the blood vessel that was 50% larger than the normal aortic diameter on computed tomography angiography (CTA) or ultrasound.

The validated Dutch version of the widely used US and UK *Newest* Vital Sign (NVS),[20] the Newest Vital Sign—Dutch (NVS-D), was used as screening instrument. This short questionnaire consisted of six brief questions, which the patient had to answer orally. A score of <4 out of 6 identified individuals with inadequate health literacy, because this cut off point distinguished best between individuals with adequate versus inadequate health literacy.[21] The original (English) version of the Newest Vital Sign is shown in Fig. 1. Age, gender, highest education level, and reason for consultation were also ascertained as background characteristics. Finally, the medical charts of the patients were reviewed for smoking, diabetes, ischaemic heart disease, and hypertension as characteristics of the population.

The analysis of health literacy and NVS-D scores, in the context of the patient characteristics, was performed with the Student *t*-test if there was a normal distribution or the Mann—Whitney *U* test if there was no normal distribution. To determine if there was a normal distribution, the Kolmogorov—Smirnov test was used. If the outcome was a proportion, the chi-square test was performed or the Fisher exact test if appropriate. The level of significance applied was $p = .05$. In order to identify independent predictors for inadequate health literacy, a logistic regression with backward elimination was applied. Backward selection started with all of the variables (age, gender, education level, and reason for consultation; i.e., abdominal aortic aneurysm or peripheral arterial occlusive disease) in the model, and the variables were removed one by one as they were found to be insignificant in predicting the outcome. A backward selection (starting with all covariates) was performed with a significance level of $\alpha = 0.10$ for staying in the model; all factors significant at $p \leq .10$ were retained in the final model. The goodness of fit (Hosmer and Lemeshow test), adjusted odds ratios, and 95% confidence interval were calculated from the final logistic regression model. All analyses were performed using Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Armonk, NY; IBM Corp), version 23.0.

Ethics

The regional Medical Ethics Committee stated that this study did not require formal approval of the Netherlands Medical Research Involving Human Subjects Act. All potential respondents were informed about the aim of the study by a written form and orally, with implementation of interventions for patients with limited health literacy skills (see also the Discussion). The participation was voluntary. The potential respondents could opt out of the study at any time. By participating, respondents consented to the research procedure.

RESULTS

Patients

A total of 202 patients with arterial vascular disease were included. There were seven patients who declined

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