Patient Education and Counseling xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Patient Education and Counseling

journal homepage: www.elsevier.com/locate/pateducou

Review article

Airway diseases and health literacy (HL) measurement tools: A systematic review to inform respiratory research and practice

Jessica Shum[a,b], Iraj Poureslami[a,b], Darrin Wiebe[b], Mary M. Doyle-Waters[b], Laura Nimmon[c], J. Mark FitzGerald[a,b,*], on behalf of the Canadian Airways Health Literacy Study Group

[a] Division of Respiratory Medicine, Department of Medicine, The University of British Columbia, Gordon and Leslie Diamond Health Care Centre, 7th floor, 2775 Laurel Street, Vancouver, BC, V5Z 1M9, Canada
[b] Centre for Clinical Epidemiology and Evaluation, Vancouver Coastal Health Research Institute, The University of British Columbia, 7th floor, 828 West 10th Avenue, Vancouver, BC, V5Z 1M9, Canada
[c] Centre for Health Education Scholarship (CHES), Department of Occupational Science and Occupational Therapy, The University of British Columbia, P.A. Woodward Instructional Resources Centre (IRC), 429-2194 Health Sciences Mall, Vancouver, BC, V6T 1Z3, Canada

ARTICLE INFO

Article history:
Received 12 May 2017
Received in revised form 24 July 2017
Accepted 19 October 2017

Keywords:
Health literacy
Health numeracy
Asthma
Chronic obstructive pulmonary disease
Measurement tools
Measures
Domains
Systematic review

ABSTRACT

Objective: To identify and evaluate asthma/COPD measurement tools that assess any of the five health literacy (HL) domains: (1) access, (2) understand, (3) evaluate, (4) communicate, and (5) use, as well as numeracy.
Methods: MEDLINE/Embase (via Ovid) databases from 1974 to 2016 were searched and complimented by grey literature. Study selection and data extraction were conducted by two reviewers independently.
Results: We identified 65 tools including 40 asthma, 22 COPD, and 3 asthma/COPD focused tools. Thirty tools had been validated and two assessed all five domains. The 'understand' domain was captured in 49 tools, followed by 'access' in 29 tools, 'use' in 24 tools, 'evaluate' in 20 tools, and 'communicate' in 10 tools. Two tools assessed 'numeracy'. Tool content comprised disease physiology, triggers, symptoms, inhaler technique, self-management practices, and rehab programs.
Conclusions: This review highlights paucity of HL tools that have been validated and/or assess the 'communicate' domain and makes a valuable contribution to filling an existing research gap in the field of HL by determining the deficiencies of such tools.
Practice implications: Our review uncovers which HL domains are under-measured, justifying the need to develop an airways HL measurement tool which applies the 5-domain model for asthma/COPD management.

Contents

* Corresponding author at: The Lung Centre, 7th floor, Gordon and Leslie Diamond Health Care Centre, 2775 Laurel Street, Vancouver, BC, V5Z 1M9, Canada.
E-mail addresses: jessica.shum@ubc.ca (J. Shum), iraj.poureslami@ubc.ca (I. Poureslami), darrin.wiebe@alumni.ubc.ca (D. Wiebe), mimi.doyle-waters@ubc.ca (M.M. Doyle-Waters), laura.nimmon@ubc.ca (L. Nimmon), mark.fitzgerald@vch.ca (J. M. FitzGerald).

https://doi.org/10.1016/j.pec.2017.10.011
0738-3991/

1. Introduction

The term health literacy (HL) was first used in 1974 in a discussion panel regarding health education as a social policy issue affecting burden on the health care system [1]. Since then, it has been discussed within the context of literacy and health [2] but as the concept evolved, more definitions were suggested by different health researchers and organizations [2,3]. Most commonly, HL is described as a spectrum of knowledge and skills a person may require to effectively obtain, process, and understand health information [3–6]. In 2009, the Calgary Charter on Health Literacy (CCHL) [4] conceptualized a model inclusive of five core domains; defining HL as a person's ability to: (1) access, (2) understand, (3) evaluate, (4) communicate, and (5) use health information to make informed decisions for one's health. Along with broadening the scope of patient competency in managing their chronic disease, the CCHL definition also underscores the importance of health care professionals' delivery of information, and furthers the inclusion of these concepts in the structure of the health care system [7]. Furthermore, the concept of 'numeracy' has been proposed as an important component of HL and refers to "the degree to which individuals have the capacity to access, process, interpret, communicate, and act on numerical, quantitative, graphical, biostatistical, and probabilistic health information needed to make effective health decisions"[8]. However, despite the importance of each HL domain being well-established and validated individually [7,9], significant limitations to the measurement of HL remains [10–12].

The most often used HL research measurement tools are the Test of Functional Health Literacy in Adults [13]; the Rapid Estimate of Adult Literacy in Medicine [14]; and the Newest Vital Sign [15,16]. These tools mainly focus on an individual's comprehension and reading ability (e.g., word pronunciation [14]) and do not assess other important elements of HL, for example, the ability to critically evaluate and apply such information in day-to-day life [12]. More specifically, the ability of these tools in capturing how individuals interpret and develop an understanding of print information has been questioned. Not surprisingly, these measurement tools fail to address the need for including the CCHL's 5-domain model [2,17]. Another limitation of existing tools is the challenge of differentiating between 'health literacy' and 'basic literacy' as the majority of these tools are not disease-specific and thus, often lack relevance to a specific chronic condition [10,18–20]. These deficiencies prevent researchers and clinicians from effectively measuring and identifying possible mechanisms and interventions (e.g., knowledge enhancement, skill improvement, and behaviour modification strategies) needed to improve HL, as it has been shown by different studies that HL is a major determinant of health outcomes [21–23]. Ideally, a comprehensive measurement tool that assesses the five domains of HL and includes numeracy is needed to adequately assess HL, identify the weaknesses and gaps between each of the domains, and determine where targeted interventions may be needed [24].

To our knowledge, there is currently no evidence in the literature on HL measurement tools containing the CCHL's 5-domain model and numeracy as related to asthma and chronic obstructive pulmonary disease (COPD) management. During the 'Creating a Knowledge Hub in Health Literacy and Chronic Disease Management International Research Roundtable' held at the University of British Columbia, Vancouver, Canada in 2013, a call for action regarding the development of a globally comparable and reliable population-based HL measurement tool for chronic disease management was stressed by participating scholars, clinicians, and policy makers [25]. To build on this call for action and further explore existing HL tools related to asthma and COPD management, we conducted a systematic review looking at tools that measured any of the five HL domains as well as the numeracy domain using the following research questions:

- How well do the items in the tools map onto the domains?
  - To what extent are the domains covered in the existing tools?
- How many of the tools have been validated and out of the validated tools, how well do they address key components (e.g., complete assessment of the five HL domains, a conceptual model/framework behind item development, and detailed

Table 1
Definitions of HL domains.

Domain	Definition/example
Access	Being able to navigate and find health information – it is more than the availability of information and services. It is mediated by education, culture and language, by the communication skills of professionals, by the nature of materials and messages, and by the settings in which health-related supports are provided – CEPHL [4]. o e.g., I have the skills to FIND the health information I want.
Understand	Knowledge about a subject or situation, and comprehension of the health condition and information – Cambridge Dictionaries [27]. o e.g., How confident do you feel you are able to follow the instructions on the label of your inhaler?
Evaluate	To be able to determine whether information/service is applicable to self – to judge or calculate the quality, importance, truthfulness, or value of information – Cambridge Dictionaries [28]. o e.g., I have the skills to JUDGE which health information can be trusted.
Communicate	To share information with others (doctor, caregiver, family members, etc.) by speaking, writing, and body language – Cambridge Dictionaries [29]. o e.g., I have the skills to DESCRIBE my health concerns to others.
Use	Adapting and applying information to daily life for disease management – to take, hold, or deploy information as a means of accomplishing or achieving health outcome – Oxford Dictionaries [30]. o e.g., I can use the information received from doctor/hospital to set my disease management goal.
Health numeracy	The degree to which individuals have the capacity to access, process, interpret, communicate, and act on numerical, quantitative, graphical, **biostatistical**, and probabilistic health information needed to make effective health decisions [8].

Please cite this article in press as: J. Shum, et al., Airway diseases and health literacy (HL) measurement tools: A systematic review to inform respiratory research and practice, Patient Educ Couns (2017), https://doi.org/10.1016/j.pec.2017.10.011