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REVIEW ARTICLE

Health Literacy in Children and Adolescents: A Review of the State of the Art

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ABSTRACT:

Health literacy has been defined as the ability of people to access quality health information and apply it, making appropriate decisions in the process of health and a correct use of health services. Despite the large body of literature produced since the first studies of this topic on the adult population, there is less scientific documentation regarding children and adolescents.

The research team conducted a literature review of health literacy in children and adolescents; as well as the role of digital health literacy and other divides in the health status of this specific group of the population.

The results of the literature review showed that health literacy is crucial to obtain a good physical, emotional and cognitive development. It is also related with the acquisition of healthy behaviors and lifestyles. The level of health literacy depends on many factors such as personal health status, the existence of health problems or diseases; as well as socio-economic status, cultural, social, and demographic determinants of health, among other variables. These aspects at the family level, friends, and school life, moreover, influence children and adolescents. In this group of the population, health status and healthy lifestyles are not only influenced by the level of individual (or parental) health literacy, but also by the social context in which the child or youth is immersed.

In addition, these variables related to socio-economic and cultural factors are associated with the existence of gaps or divides in certain groups. In this scenario, an adequate conceptualization of health literacy during childhood and adolescence is necessary when designing appropriate interventions and policies for this group of the population. In order to achieve this, it is necessary to define what we mean by health literacy and how we are going to measure it.

In summary, it is important not to focus only on an individual perspective; on the contrary, it is necessary to understand health literacy in the context where children and youth live and develop, as well as their interactions with the health, educational and social system. Further research is needed to explore more in depth the importance of health literacy in children and adolescence.

Keywords: Health literacy, digital health literacy, digital divide, children, adolescents.

Introduction

Health literacy (HL) has been defined as the ability of people to access quality health information and to apply it in self-care activities, making appropriate decisions and correct use of health services^{1,2}. As a research area, HL emerged in the 1990s at the international level, with studies based on population surveys in different countries. The first studies focused on the use of printed materials and, in general, a difficulty was shown in most of the adult population, when performing daily tasks^{3,4}. Based on these results, additional studies focused on the effect or impact that this situation could have on the individual's health, verifying the existence of a strong association between the level of HL and the observed health status⁵. For instance, people with low health skills participate less in health promotion and disease prevention activities, manage their disease worse and present a higher number of hospitalizations and readmissions, among other similar health results⁶⁻⁸.

Traditionally, researchers in this field placed special emphasis on the responsibilities of the patient or the person when acquiring a good level of HL and healthy behaviors. This way of understanding HL puts the burden of responsibility on the patient, without taking into account what, more recently, has also been valued as responsible for the level of HL: the health determinants that influence the personal ability to acquire a good level of HL⁹⁻¹⁰.

Subsequently, different studies also focused on assessing the professionals' skills in their communication with patients^{11,12}, as well as the characteristics of health centers and the physical spaces and signals in order to favor navigation and patient participation, overall¹³⁻¹⁵. Different studies related to this topic can be found on the website of the Harvard T. H. Chan School of Public Health¹⁶.

At this point, researchers classified HL at the individual and the contextual level. The individual HL level focuses on the person's knowledge, skills and attitudes when making decisions regarding health. In contrast, contextual HL focuses on the social, cultural or structural aspects and resources

that allow the person to be more or less competent. In this scenario, the concepts of "distributed health literacy", "social health literacy" and "organizational health literacy" also emerged¹⁷⁻¹⁹. Despite the large body of literature produced since these first studies on the adult population, there is less scientific documentation regarding the child and youth population, especially the youngest children⁹. The aim of this study was to review the state of the art regarding HL of children and adolescents.

Methods

The research team (RT) carried out a bibliographic search in the Medline database. It consisted on a generic search on HL, in order to obtain an overall idea of the state of the art in this area of knowledge. For this reason, studies focused on a specific disease or health condition were excluded from the search.

The RT looked for English and Spanish papers published in the last five years (from 2017 to 2022). Key words were "health literacy in children", "health literacy in adolescence", "digital health literacy in children", and "digital health literacy in adolescents". After this first search, the RT selected the systematic reviews published in the previous year (2021-2022).

Of the 48 systematic reviews found, the RT discarded some of them because of repetition of articles in the different searches or being disease-specific papers and not general. From the 23 systematic reviews about *health literacy in children*, the RT discarded 21 because the articles focused in specific health conditions. From the 14 systematic reviews about *health literacy in adolescents*, the RT discarded 10 because the articles focused in specific health conditions and three because of repetition.

From the six systematic reviews about *digital health literacy in children*, and the five systematic reviews about *digital health literacy in adolescents*, the RT discarded four articles in both cases because the articles focused in specific health conditions. Table 1 presents the summary of this search.

Table 1. Results from the literature search

Key words	n 5 years ^I	n last year ^{II}	n systematic reviews ^{III}	n selected systematic reviews ^{IV}
<i>Health literacy in children</i>	2,573	673	23	2
<i>Health literacy in adolescents</i>	2,067	440	14	1
<i>Digital health literacy in children</i>	160	59	6	1
<i>Digital health literacy in adolescents</i>	133	42	5	1
TOTAL			48	5

^I Number of articles in the last 5 years

^{II} Number of articles in the last year

^{III} Number of systematic reviews in the last year

^{IV} Number of selected systematic reviews

The RT selected the resulting five systematic reviews from the articles published during the previous year (2021-22). Tables 2 and 3 summarize the

characteristics of the selected systematic reviews about HL in children and adolescents and about digital HL in children and adolescents, respectively.

Table 2. Characteristics of the selected systematic reviews about HL in children and adolescents

Author, year	Title	Number of included studies (time period)	Target (subjects' age)
Bánfai-Csonka et al., 2022 ²⁰	Health literacy in early childhood: A systematic review of empirical studies	n=12 (2013-2022)	3-10 years old
Areas of research			
	Different aspects of HL like food literacy, oral health literacy, etc.		
	Health promotion and healthy habits interventions		
Study limitations			
	Only English papers		
	Inclusion of parents		
	Wide age range without separating by age groups		
Conclusions			
	Child health education is based on activities in the daily routine		
	During habit development, emphasis is placed on developing skills and competencies through concrete actions		
	Messages based on pictures or stories can be appropriate tools for working with young children		
Author, year	Title	Number of included studies (time period)	Children's age
Riemann et al., 2021 ²¹	The role of health literacy in health behavior, health service use, health outcomes, and empowerment in pediatric patients with chronic disease: A systematic review	n=11 (July-November 2021)	Children and adolescents
Areas of research			
	Relationship between HL and healthy behavior, use of health services, health outcomes and empowerment		
Study limitations			
	Articles in English and German only		
	Heterogeneity of studies		
	Parents are also studied		
	Only observational studies		
Conclusions			
	There are no conclusive results, although a trend towards the relationship between HL and the health outcomes studied can be seen		
Author, year	Title	Number of included studies (time period)	Children's age
Bröder et al., 2017 ⁹	Health literacy in childhood and youth: a systematic review of definitions and models	n=30 (May-November 2015)	Less or equal to 18 years old
Areas of research			
	HL definitions and models		
Study limitations			
	Articles in English and German only		
	Heterogeneity of studies		
Conclusions			
	It is important not to focus only on an individualistic view of HL, but also on a contextual level		

Table 3. Characteristics of the selected systematic reviews about digital HL in children and adolescents

Author, year	Title	Number of included studies (time period)	Children's age
Möreljus et al., 2021 ²²	Digital interventions to improve health literacy among parents of children aged 0 to 12 years with a health condition: Systematic review	n=5 (January 2010-April 2021)	Parents
Areas of research			
	Effect of digital interventions in health		
Study limitations			
	Articles in English only		
	Few studies and heterogeneity		
Conclusions			
	Digital health interventions have the potential to improve parents' health knowledge and habits		
	Digital literacy interventions are effective in empowering adolescent girls to use health services and access educational resources		
Author, year	Title	Number of included studies (time period)	Children's age
Meherali et al., 2021 ²³	Does digital literacy empower adolescent girls in low-and middle-income countries: A systematic review	n=35	10-19 years old
Areas of research			
	Effect of digital interventions on health and educational behaviors in adolescent girls		
Study limitations			
	Includes observational studies		
Conclusions			
	The barriers that prevent teenagers from accessing digital information must be studied		

Findings

Health literacy during childhood and adolescence

The results from the reviewed scientific literature showed that HL is not a static concept; on the contrary, it develops during the individual's life through personal, educational and social factors. However, researchers do not usually consider these structural and contextual factors, much less when talking about childhood and adolescence. The characteristics and peculiarities of children and adolescents are not taken into consideration when defining the HL level of the population^{9,18}.

HL during childhood is crucial to obtain a good physical, emotional and cognitive development. Moreover, HL relates with the acquisition of healthy behaviors and lifestyles, obtained through a learning process that extends over time^{9,21}. During this same period in the development of the human being is when the implementation of actions to promote health and prevent disease becomes more important, not only in the child, but together with the family²⁰. In fact, a low level of HL in parents is associated with worse health outcomes in children²¹. Researchers have also observed that the level of HL of the parents influences three aspects of healthy behaviors: access and use of health services, communication between patients and professionals and self-management of the disease²⁴.

Children and adolescents are usually exposed to different environments and contexts. In addition, they frequently depend on parents or caregivers in terms of health decisions. Although HL interventions must be designed taking into account the needs of the target population, it is difficult to assess these needs in children and adolescents, assuming that the needs of this group of the population are similar to those of adults¹⁸.

The age of the child determines the agents to whom the interventions must be addressed. With the youngest, one must work directly with their parents or caregivers and incorporate the child, depending of his/her age, in concrete actions. The opposite would happen in adolescence, where actions are taken directly with the young person and the family would participate in specific actions if necessary. Thus, most of the research in the health environment has been developed around the impact that the level of parents' HL would have on the children and young people's health⁹.

The HL level of a person depends on many factors such as the personal situation, the health status, the existing diseases, the socio-economic and, cultural level, as well as demographic determinants, among others. These aspects at the level of parents, friends, and school, moreover, influence children. Therefore, these groups are considered agents of the child's socialization. There are many models where HL

exceeds the healthcare environment. Thus, HL in children and adolescents is important in many aspects and contexts of daily life and has a potential impact on the well-being and promotion of one's own health⁹.

Table 4 presents the socio-ecological model of HL in children and adolescents. This model considers three levels (intrapersonal, interpersonal and community level) when characterizing HL in this population group.

Table 4. Socio-ecological model of HL during childhood and adolescence

Management level	Health literacy characteristics
Micro (intrapersonal factors)	<ul style="list-style-type: none"> • Knowledge • Skills • Self-management • Attitudes, confidence, motivation
Meso (interpersonal factors)	<ul style="list-style-type: none"> • Family, caregivers • School, teachers • Social context, professionals
Macro (community factors)	<ul style="list-style-type: none"> • Internet access and technologies • Health policies • Other resources

Adapted from: Schulenkorf et al., 2022¹⁹; Higgins et al., 2009²⁵.

Despite the diversity of instruments and approaches to measure the level of HL in children and adolescents, some studies have provided categories when analyzing this area. These categories would

be cognitive, behavioral or operational and affective attributes⁹. Table 5 presents the relationship between these categories and the different dimensions of HL.

Table 5. Categories and dimensions of health literacy

Categories	Dimensions
Cognitive attributes	Knowledge Health related skills Understanding Evaluation Critical thinking
Behavioral or operational attributes	Search and access to information Communication and interaction Application of the information Citizenship
Affective attributes	Attention and reflection Self-control and self-regulation Self-efficacy Interest and motivation

Adapted from: Bröder et al., 2017⁹

Digital health literacy

One of the aspects discussed within this topic in the literature was the different types of existing HL gaps. Thus, not only are differences in access and understanding of digital information, for example, but there are also other ways to distance the person and not access the information. These other gaps are social and economic, attitudes and intolerances, previous knowledge, cultural diversity, vulnerability, according to age or emotional gap, among others^{10,19,23}.

Nowadays, digital technologies are a frequent way of sharing information overall and about health.

This information can be accessible to users at any time and place, which makes it highly used²². The level of digital literacy of the population, or the ability of the person to use digital platforms and resources when obtaining and evaluating information, is increasingly influencing society. For example, in the educational or in the social areas, individuals connect, learn and relate to others through the digital world²³.

This also happens in the child and youth population, where the level of digital literacy of children and adolescents will largely determine their inclusion in online education, their learning, their access to

information about health and well-being or about leisure activities, among many other topics of their daily activities^{23,26}.

From this point of view, nowadays, the fact of searching, creating and sharing information and knowledge can be very easy and fast in addition to favoring a certain comfort and privacy when connecting online. However, it is necessary to assess the quality of the information available on the internet^{27,28}. Children and adolescents face great challenges when accessing information via the internet, such as discerning whether information and sources are reliable, understanding technical terms, or managing one's own beliefs²⁶. Nevertheless, despite having good information, there are still people and groups in the population who may have difficulties accessing and understanding the information given in digital format²⁸.

There are other kinds of gaps in accessing good quality information to make informed decisions about health. For instance, healthcare and the existing barriers with regard to the agility in responding to what patients need or the gap in access to care and treatments; as well as the gap in training and communication between the different health agents. These are among the observed gaps in today's society^{29,30}.

However, among all the different divides one can find, the social gradient is one of the most frequent causes of the gap in the general population and also in children and adolescents³¹. In addition, being part of this group of the population and having a complex chronic disease, make the child or adolescent even more vulnerable to health^{21,32}.

Some of the characteristics of this body of the literature are the variability of the study designs and their heterogeneity in terms of the studies' subjects (children, adolescents or parents), age groups included, small sample sizes, focus in different aspects (disease-specific versus general topics), among other (tables 2 and 3).

The results of the review showed that, although HL plays an important role in disease management behavior, health service utilization and health outcomes in pediatric patients; especially in cases of children and adolescents with complex chronic diseases, the scientific evidence to date is still limited. It would be necessary to conduct more studies in order to find out the existing relationship between the level of HL and health outcomes in the child and youth population in general, and with complex chronic diseases in particular²¹. Equally, it is necessary to continue studying the role of HL, moving from its more functional aspects based on competences and skills to those models that focus HL in the context in which people live and develop their social practices^{9,33}.

Overall, there is a lack of studies and models that value HL in younger children (under 10 years old), as well as at transition ages, for example, from primary to secondary, or from high school to university. In the first case, the HL is studied through the characteristics usually of the mother, who most frequently provides a response to the child's needs. Therefore, the child must be seen as an active social agent who continuously develops and changes with the process of socialization and interaction with the environment, including his/her parents and other relatives, teachers or friends⁹.

There is a tendency to focus on the cognitive development of the child, thinking that HL will be achieved at different consecutive ages or stages of development. This approach tends to give little importance to sociological approximations that take place during this period of the individual's development⁵. In fact, different studies about the Life Course Health Development suggest that health development can be affected by risk and protective factors occurring during childhood, adolescence and adult life in family, community, and society³⁴.

Another aspect to highlight for future research is the extent to which families, communities and society will allow children and young people to take an active role and participate in the practice of HL. These ages in humans are considered the most permeable, where information about health can be transformed into concrete actions⁹.

Collective HL plays an important role in this age group as well. Moreover, although in the youngest the parents or caregivers are the ones who determine the child's access to health resources, as the child grows older, social support, friends or classmates are the ones who will help he/she to do or understand homework and activities related to lifestyles. Therefore, it is necessary to recognize the role of the child's environment (apart from the family), the school, and the cultural and social context when designing improvement actions, without focusing solely on actions at the individual level of the child or youth.

Another aspect is to keep in mind that the way we see the child/adolescent depends largely on our adult viewpoint, our perception and the social role we attribute, for example, between pediatrician and patient or between teacher and student. Therefore, it is necessary to incorporate the child and young person actively in the study of HL and health promotion from their point of view⁹.

Apart from the lack of definition, HL is difficult to measure in young children. There is a heterogeneity in measuring the level of HL in children and young people and there is no consensus regarding the appropriate age for children to participate actively

in the management of their health²⁰. Therefore, and in order to obtain valid results, it is necessary to develop measuring instruments adapted to this population and to the differences that may be related to age²¹. An adequate conceptualization of HL during childhood and adolescence is also necessary when designing appropriate interventions and policies for this population group. To do that, it is necessary to define what is meant by HL and how it will be measured¹⁹.

It is also necessary to develop guidelines that help in the research of HL, in its application in different groups of the population, including children and adolescents, its adaptation to specific cases, and in the measurement of results³⁵. In addition, researchers should also notice the importance of health professionals' communication and the characteristics of health institutions in order to find different ways to improve HL of patients³⁶.

The literature highlighted the role played by the gaps in vulnerability and precariousness of the population, and those of the health systems. The digital divide can still leave people behind if we do not try to include them in all actions so they can access the information they need about their health. As some studies concluded, it is important to know the role that HL plays in the reduction of disparities in the health of children and adolescents³⁷.

There are many models where HL exceeds the healthcare environment. Thus, HL in children and adolescents is important in many aspects and contexts of daily life and has a potential impact on the well-being and promotion of one's own health⁹. However, it is necessary to go deeper into how these other factors influence the health of children and adolescents; as well as in terms of HL measurement instruments for children and adolescents³⁸.

Conclusions

As conclusions of this review, it is important not to focus only on an individual perspective; on the contrary, it is necessary to understand HL in the context where the child and youth lives and

develops and with his/her interactions with the health, educational and social system.

In children and adolescents, the health status and healthy lifestyles are not only influenced by the level of individual (or parental) HL, but also by the social context in which the child is immersed.

It is necessary to strengthen personal motivation, knowledge and skills to be able to make appropriate health decisions; but it is necessary to help to reduce the complexity of the child's environment (family, school, social aspects), to facilitate his/her empowerment.

It is necessary to promote research on the role of HL in children and adolescents, as well as on the measurement of health outcomes.

Health professionals play an important role in preparing children with chronic diseases and their families to understand what is happening to them and what they need to do to improve their health and well-being.

Health is a key element in people's lives and in their ability to develop their potential and contribution to society. Thus, the quality and social justice of the society of the future depends, in part, on the health of today's children and young people. The HL of pediatric age populations is an issue that should deserve the highest consideration.

Conflict of interest statement

The authors have no conflicts of interest to declare

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