

# Health Literacy Among University Students: Relationship With Sociodemographic Characteristics

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## ABSTRACT

Health Literacy (HL) conditions the way in which the individual is able to make the right decisions about health, affecting the quality of life, which may have implications for the expenses of Health Systems. So monitor HL it is a relevant tool in Health Promotion. This study aims to analyse the relationship between HL and the sociodemographic characteristics of students. This is a descriptive-correlational, cross-sectional study with a quantitative approach, with a sample of 351 university students. In collecting data we used a questionnaire filled out by students online. Data were processed using SPSS software (version 22.0). The majority of students were female (69.5%), belonged to the age group of 18 to 23 years (72.4%), attended a degree (65.1%) and reported a monthly income per capita between 1000 and 1999 euros (37.3%). The HL categories differed significantly between genders ( $\chi^2$ :  $p < 0,041$ ) and among students with different per capita income ( $\chi^2$ :  $p < 0,049$ ). The HL of students in this sample is predominantly limited and is related to gender and per capita income. In view of an identified low level of HL, there is a need for investment in health education in this population group.

**KEYWORDS:** Health Literacy; University students; Public health; Health Education; Healthy decisions.

# 1 INTRODUCTION

Health Literacy (HL) is a relatively recent concept, which was introduced in the 1970s of the last century, but has been gaining increasing importance in public health over time. This phenomenon is concerned with people's ability to assertively respond to the increasingly complex health demands in a society in constant transformation [1; 2].

The importance of this topic began to emerge when it was found that HL levels condition how citizens are or are not able to make correct decisions about their health, affecting, the quality of life of individuals, as well as those who depend on them. This importance, however, is not limited to the individual level, but covers the social level, having implications for health systems' expenses [3].

The World Health Organization (WHO) first defined HL as the set of cognitive and social skills that determine individuals' motivation and ability to access, understand and use information in order to promote and maintain good health. It implies the acquisition of knowledge, personal skills and confidence to act in a healthy way, through changes in lifestyle and living conditions [4].

Already in the 21st century, this author [5] conceptualized this concept as "the awareness of the person learning and acting in the development of their understanding, management and investment skills, favourable to health promotion" (p. 95).

Even more recently, HL has been defined as the ability to deal with health information, specifically, people's knowledge, access, understanding, interpretation, evaluation, application and use, promoting in the individual the personal management of their health status, so that they are able to make decisions regarding health care, disease prevention and health promotion, in their daily lives, in order to maintain or improve their quality of life, in various situations, throughout the life cycle [6; 3].

The author [7] linked the concept of HL to the notion of empowerment and outcomes in health education, and classified HL in a sense of increasing autonomy through three levels: i) Functional (basic) literacy: characterized by sufficient skills to read and write, allowing the individual to function effectively in their daily life activities; ii) Interactive (communicative) literacy: composed of cognitive and more advanced skills, which can be used in conjunction with social skills to obtain and interpret information through various sources of communication; iii) Critical literacy: consisting of more advanced cognitive skills that, in conjunction with social skills enable critical analysis of the information acquired, which is essential for responsible decision making about the various events of everyday life.

HL differs from health education (HE), since the latter allows increasing individuals' awareness of the social determinants of health, guiding actions that promote their modification, while HL is the result of HE [7]. In the opinion of this author [8], the concept of HL is distinguished from the concept of HE, because while HE aims to improve knowledge about health, HL allows for the understanding and application of knowledge, a view which we consider somewhat reductive about the role of HE.

The National School Health Programme (PNSE) of Portugal, following the objectives and strategies of the National Health Plan (NHP) - Revision and extension 2020, aims at achieving greater health gains, with the objectives of promoting healthy lifestyles and improving the HL level of the educational community [9]. To this end, it is necessary to focus on the effective empowerment of citizens in the National Health Service and health organizations as well as the professionals who train them [10].

According to WHO [11], limited HL is associated with lower participation in the process of health promotion and disease prevention of individuals. In turn, an inadequate level of HL is related to late screening activities, higher-risk health choices (such as higher rates of tobacco use), more accidents at work, poor management of chronic diseases (such as

diabetes, asthma and HIV infection), low adherence to medication, medication errors, misdiagnosis due to poor communication between providers and patients, increased rates of hospitalization and readmission, growth in premature morbidity and mortality.

Other author [12] reinforces that low HL is also associated with higher and longer hospitalisation rates over time, and ineffectiveness in dealing with emergency situations, which ultimately affects the doctor-patient relationship.

In terms of economic cost, the United States National Academy in 1998 estimated that the additional health care costs caused by HL limitations were about \$73 billion. In Canada in 2009, limited HL cost over \$8 billion [11].

In turn, in Europe millions of euros are spent on health care, and it is estimated that the costs of low HL may account for 3% to 5% of the total health care costs in the health care systems of countries on this continent [13].

Some studies have been conducted at the international level [14; 15], which sought to analyze the relationship between the level of HL and the sociodemographic characteristics of university students, in order to identify some factors related to that phenomenon, in which a relationship was found to exist with gender, household monthly income, and risk behaviors (alcohol consumption).

For all this, HL is considered a relevant tool to prevent diseases and complications, promote health, improve the level of quality of life, as well as assist in the ability and motivation for healthier choices [16; 2].

This study arose within the scope of this topic, with the general objective of analysing the relationship between HL and the sociodemographic characteristics of university students in Northern Portugal.

There are some international studies that analyse the relationship between this phenomenon and sociodemographic characteristics, but they are practically non-existent in Portugal, including the geographical area of this student population.

## **2 METHODOLOGY**

The methodological component is a key aspect in any research process, since it serves as a guide during the development of research, guiding the researcher to find answers to specific questions and, thus, acquire new knowledge.

This is an observational, descriptive-correlational and cross-sectional study of quantitative approach [17; 18].

### **2.1 Participants**

The population of a study is defined by the inclusion criteria. The inclusion criteria were: i) Being a student of a higher education institution in the Northern region of Portugal, in the 2018/2019 academic year; ii) Being aged 18 years or more. The population was composed of 1317 university students.

The sample is the fraction or subset of a population selected and on which the study is performed, and should be representative of the population, being defined by the exclusion criteria. We established as exclusion criteria: i) Students who were not present on the date of data collection; ii) Students who did not complete at least 80% of the questions. This is a non-probability convenience sample. The sample was composed of 351 students who attended the institution which was the context of this study, around 26.7% of the population.

Of the total sample (n=351), most were female (69.5%), aged between 18 and 23 years (72.4%), attending a degree course (65.0%) and the largest group of students (37.3%)

reported a household net monthly income per capita between 1000 and 1999 Euros (**Table 1**). The mean age was  $23.54 \pm 7.43$  years, the minimum was 18 years and the maximum 54 years of age.

Table 1 Sociodemographic characterization of the sample (n = 351)

Variables		Af	Rf (%)
<b>Gender</b>	Female	244	<b>69.5</b>
	Male	107	30.5
<b>Age group</b>	18-23 years old	254	<b>72.4</b>
	≥ 24 years old	97	27.6
<b>Study cycle</b>	Superior Technician Course	37	10.5
	Licence degree	228	<b>65.0</b>
	Master degree	86	24.5
<b>Monthly income</b>	Less than 500 Euros	61	17.4
	Between 500-999 Euros	123	35.0
	Between 1000-1999 Euros	131	<b>37.3</b>
	≥ 2000 Euros	36	10.3
<b>Total</b>		351	<b>100</b>

Legend: Af – Absolute frequency; Rf – Relative frequency.

## 2.2 Material

For data collection, we used a self-completion questionnaire designed for this purpose. It was validated for this population through a pre-test previously applied to a group of eight students with very similar characteristics to our target population. The questionnaire was organized into three parts: the first part included a group of questions for sociodemographic characterization; the second part integrated the European HL Scale (HLS.EU-EN) to assess the participants' level of HL; finally, the third part included questions about the perception of health status and use of health services. This article reports only on the first two parts.

The HLS-EU-PT Scale was translated and validated for the Portuguese population by research team [19], with items with five response options (Very Difficult, Difficult, Easy, Very Easy, and Don't Know/No Answer). These response options are scored, 1, 2, 3, 4 and zero points, respectively. This construct has 47 items and the score ranges between 0 and 50 points. A higher score corresponds to a better level of HL. To calculate the HL Index (HLI) the following formula was applied:  $LS\ Index = (mean - 1) * (50/3)$ . The authors defined the cut-off points that limit the four HL categories: i) Inadequate (0-25); ii) Problematic (>25-33); iii) Sufficient (>33-42); and iv) Excellent (>42-50). This scale has three dimensions: Health care, Health promotion and Disease prevention.

## 2.3 Procedures

During the data collection procedure of this research, the right to self-determination, intimacy, anonymity, confidentiality, as well as voluntary participation were safeguarded [17]. Ethical principles were respected in accordance with the Helsinki Convention. In order

to collect data, a request for authorization was made to carry out the study to the Ethics Committee of the University of Trás-os-Montes and Alto Douro which gave a favourable opinion (n°38/2018 September 10) and the Director of the School, who also authorized it.

The data collection process was performed via email, through a hyperlink, which referred to the anonymous self-completion questionnaire that could be answered online. This was sent by the Academic Services of the School in which this study was conducted, thus ensuring the required anonymity throughout the process, and the researchers did not have access to the participants' email address. This questionnaire was developed through Google® Forms and the participants' answers were sent to the researchers. The data collection period took place from October 23 to November 26 of 2018.

The data processing was made by SPSS Software (24.0). We used descriptive statistics, with absolute and relative frequency and mode calculations for all variables and the mean and standard deviation for the variables of measurement level ratio. We also used inferential statistics, using “ $\chi^2$ ” test to compare the HL category distributions. We considered the 5% as a level of significance [20].

### 3 PRESENTATION AND DISCUSSION OF RESULTS

The presentation of results includes the measures of central tendency and dispersion of the HL index and its three dimensions, then the distribution of absolute and relative frequencies of the HL categories and, finally, the results of the statistical tests between HL and sociodemographic characteristics, which allowed us to assess the existence of relationships between these variables.

#### 3.1 Health Literacy

Of the total sample (n= 351), the mean HLI ranged from 31.17 points of the HLI of the "Disease Prevention" Dimension to 31.47 points of the HLI of the "Health Care" Dimension. The median of the HLI had the same trend. The minimum value of the HLI was zero and the maximum value was 50 points (**Table 2**).

Table 2 Measures of central tendency and dispersion of the Global HLI and its dimensions

Variables	Mean	SD	Median	Minimum	Maximum
Global Health Literacy Index	31.30	8.19	30.85	0	50
Health Literacy Index of the Health Care Dimension	31.47	8.08	31.25	0	50
Health Literacy Index of the Disease Prevention Dimension	31.17	8.99	31.11	0	50
Health Literacy Index of the Health Promotion Dimension	31.26	9.45	31.25	0	50

Legend: SD – Standard deviation

The highest percentages of the HLI categories were in the Problematic category, both in the Global HLI and in all indices of the HL dimensions. The highest value in that category

was in the Global HLI (47.9%) and the lowest in the HLI of the Disease Prevention Dimension (34.8%). The percentages of the HLI category Inadequate were in all HLIs higher than those of the HLI category Excellent (**Table 3**). Grouping the two lower HL categories into the designated 'Limited Health Literacy' category and the two higher categories into the 'Unlimited Health Literacy' category found that most students (> 57%), fell into the 'Limited Health Literacy' category in both the Global HLI with all dimensions.

Table 3 Distribution of frequencies of Global HLI categories and their dimensions

Variables	Inadequate		Problematic		Sufficient		Excellent	
	Af	Rf	Af	Rf	Af	Rf	Af	Rf
Global Health Literacy Index	65	8.5	168	47.9	77	21.9	41	11.7
Health Literacy Index of the Health Care Dimension	72	20.5	138	39.3	106	30.2	35	10.0
Health Literacy Index of the Disease Prevention Dimension	78	22.2	122	34.8	104	29.6	47	13.4
Health Literacy Index of the Health Promotion Dimension	83	23.6	125	35.6	91	25.9	52	14.8

Legend: Af – Absolute frequency; Rf – Relative frequency.

### 3.2 Relationship between Health Literacy and sociodemographic characteristics

There were no statistically significant differences between the proportions of the categories of the Global HLI of students with different age group ( $\chi^2$ :  $p \geq 0.765$ ) and of students attending different study cycles ( $\chi^2$ :  $p \geq 0.171$ ).

The proportion of the Global HLI categories differed significantly among students of different gender ( $\chi^2$ :  $p < 0.041$ ), with female students obtaining an Adjusted Residual (AR) of + 2.4 cases than expected in the HL Sufficient category, with a percentage of 25.4% in this category versus 14.0% of males. In turn, male students obtained an AR of +2.0 cases than expected, in the HL Excellent category, with a percentage of 16.8% versus 9.4% of females. Females fell more into the HL Sufficient category, while males fell into the HL Excellent category.

The proportion of the Global HLI categories differed significantly among students who had different monthly household income ( $\chi^2$ :  $p < 0.049$ ), with students whose household was between 1000 to 1999 getting an AR of -2.4 cases than expected in the HL Problematic category with a percentage of 39.7% and +2.2 cases than expected in the HL Sufficient category, with a percentage of 28.2% versus an AR of -2.1 cases than expected and a percentage of 11.1% in the HL Sufficient category and 55.6% in the HL Problematic category of students whose household had a per capita Income between 250 and 499 Euros. That is, the former students fall more into the HL Sufficient category than the latter, who fall more into the HL Problematic category (**Table 4**).

Table 4 Relationship between Global Health Literacy and sociodemographic characteristics

Sociodemographic variables	Global Health Literacy index categories				Test value	P value			
	Inadequate AR	Inadequate %	Problematic AR	Problematic %			Sufficient AR	Sufficient %	Excellent AR
<b>Gender</b>									
Female	-0.7	17.6	-0.2	47.5	<b>+2.4 5.4</b>	<b>-2.0 9.4</b>	$\chi^2=8,247$	<b>0,041</b>	
Male	+0.7	20.6	+0.2	48.6	<b>-2.4 14.0</b>	<b>+2.0 16.8</b>			
<b>Age group</b>									
18-23 years old	+0.3	18.9	+0.6	48.8	-0.2 1.7	-1.0 10.6	$\chi^2=1,150$	0,765	
≥ 24 years old	-0.3	17.5	-0.6	5.4	+0.2 2.7	+1.0 14.4			
<b>Study cycle</b>									
Superior							$\chi^2=9,053$	0,171	
Technician Course	+0.1	18.9	-2.0	32.4	+2.1 5.1	+0.4 13.5			
Licence degree	+1.4	20.6	+1.1	50.0	-1.9 8.9	-0.9 10.5			
Master degree	-1.6	12.8	+0.2	8.8	+0.6 4.4	+0.8 4.0			
<b>Monthly income</b>									
Less than 500 Euros	+1.5	25.9	+1.2	55.6	<b>-2.1 1.1</b>	-1.1 7.4	$\chi^2=21,003$	<b>0,049</b>	
500-999 Euros	-0.5	17.1	+0.3	48.8	+0.5 3.6	-0.5 10.6			
1000-1999 Euros	-0.1	18.3	<b>-2.4 39.7</b>	<b>+2.2 8.2</b>	+0.9 13.7				
≥ 2000 Euros	-1.7	8.3	+1.7	61.1	-1.2 3.9	+1.0 16.7			

Legend: AR – Adjusted Residual;  $\chi^2$  – Qui-square.

The results showed that there was a predominance of female students (69.5%) compared to male students, which coincides with the data from the Directorate-General of Higher Education of 2017 that identify 46.2% males and 53.8% females in higher education [21]. The results also converge with the studies conducted by Espanha et al. [3] and Pedro et al. [22] and other researcher [23], in which the sample was mostly composed of female elements.

On the other hand, 27.6% of the sample under study was aged 24 years or more, which is similar to the data presented by the survey on the Registration of Registered Students and Graduates of Higher Education (RAIDES) [24], which mentions that 24% of higher education students are in this age group.

Regarding the monthly per capita household income of the students in the sample, the largest group of participants mentioned values between 1000 and 1999 euros per month, i.e. they present values higher than the national averages [25]. These data can be justified by the region of coverage of the institution in the north of the country, is located in a very industrialized area, where exports are predominant, reporting a growth of 60% in the last three years, with the creation of two thousand jobs [26].

With regard to HL, for the sample under study, the average obtained in the Global HLI reveals a problematic HL level, but, almost at the limit of a sufficient HL, with an average of 31.3 points. The results show that 66.4% of respondents had Limited HL (inadequate or problematic HL). These results are in line with those reported by Pedro et al. [22] when the authors mention that, in Portugal, approximately 61% of the surveyed population presents a level of Global HL in problematic or inadequate health, with a mean Global HLI of 31.5. Similar results were obtained in Silva's [23] research, where the mean Global HLI was 32.15, with more than 50% of the participants presenting Limited HL. However, in the present study, it was expected that, in the case of Higher Education students, the results would be better. This fact may be explained by the fact that all students did not attend health courses,

are a healthy group, do not attend health services regularly, and do not participate in health education programs, which may justify some lack of knowledge in this area.

#### 4 CONCLUSION

The profile of the students in the sample is characterised by being female students, aged between 18 and 23 years old, attending an undergraduate course and by their household having a per capita monthly income between €1000 and €1999.

The average Global HLI of the students reveals Problematic HL levels, with most students presenting a Limited HL. This level is similar to that of other studies conducted with the general population. A higher level of HL was expected, which did not happen in this study.

We found that there is a relationship between the categories of the Global HLI and gender, as well as with the per capita monthly income of the household.

This study contributed to knowing the HL level of this sample of students, having highlighted the need for health services to intervene in this population of students, with the purpose of increasing their HL, empowering them to manage their health and that of this student community, thus achieving health gains.

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