

Are health literacy and lifestyle of undergraduates related to the educational field? An Italian survey

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Abstract

Background. Health literacy is a fundamental ability that allows individuals to manage their health. This study was aimed to assess health literacy and lifestyles among healthcare undergraduates in comparison to students attending other degree courses from two Italian universities.

Methods. The Health Literacy Assessment Tool (HLAT-8) and the Newest Vital Sign (NVS) were used to assess health literacy. Demographic and anthropometric data, adherence to Mediterranean diet, physical activity levels and smoking habit were assessed in the enrolled sample to highlight possible associations.

Results. Adequate health literacy scores were registered in the sample (27.4 ± 4.4 HLAT-8; 4.2 ± 1.8 NVS), with higher values among healthcare students ($p < 0.01$). However, unhealthy behaviors were reported mainly by healthcare undergraduates. Significant associations were found between health literacy scores and adherence to the Mediterranean diet ($p < 0.01$).

Conclusions. Attending a healthcare related degree course was associated with higher health literacy scores but not with healthy behaviors. This issue should be addressed considering that the future healthcare professionals should represent a behavioral model for their patients.

Background

Health literacy (HL) was defined as the individual's ability to successfully deal with health and illness issues (1, 2). It is determined by a set of aspects related to knowledge, motivation and competences fundamental to make judgments and take decisions concerning health care, disease prevention, and health promotion (3, 4). According to Nutbeam, HL includes 3 levels: a functional literacy, which refers to basic reading and writing skills and the ability to apply these skills to health-related materials; interactive literacy, which implies more advanced cognitive and social skills in order to obtain and elaborate information from different sources; and critical literacy, which is needed to critically analyze information and use quality information to make informed decisions about health (5). In line with this, it is assumed that sufficient HL make individuals able to access, appraise, and use health-related information adequately, and to make good choices for their own health, while low levels of HL induce the inappropriate access and use of health resources (6, 7). The HL concept is context-specific: in public health, HL might be defined as the set of knowledge and skills needed to prevent disease and to promote health in everyday life, while in clinical settings it might refer to the personal resources patients need to successfully navigate health services (5, 8).

Poor HL has been associated with several health outcomes and factors that may impair the functioning of health care systems, such as inadequate access to care, reduced adherence to medication, poorer self-rated health status, higher hospitalization and mortality rates, lack of understanding and use of preventive services, greater use of emergency care, inequity and increase of health-care costs (9–14).

Based on these considerations, it seems fundamental to assess the levels of HL, in order to address public health policies and educational interventions. HL can be analyzed in several ways. Measured dimensions include health numeracy, the skill to use and interpret mathematical calculations for health purposes, such as taking medication as prescribed, and health prose literacy, which is necessary to follow written medical instructions; other dimensions include skills needed to seek communication and information regarding health (15).

Since its definition, several studies were carried out worldwide to estimate the HL levels of different populations (16–22). However, these studies were performed with a high geographical concentration, they used different measurement tools and showed heterogeneous results (17).

Lifestyles like physical activity (PA), diet, smoking and alcohol consumption, and lifestyle-related parameters such as body mass index (BMI), which have important effects on health outcomes, may mediate the association between HL and health status (23, 24). Since lifestyle is established in the first part of lifespan, developing an adequate HL together with healthy lifestyles at an early age is fundamental to improve health outcomes in adulthood (25). Indeed, a strong association between HL, high-risk behaviors and physical health outcomes was found in adolescents (26).

However, although HL in young people has gained increasing attention in the past decade, studies analyzing HL in adolescents and young adults are still limited (26–28).

As for university students, several investigations were performed to evaluate HL among students attending healthcare related courses in order to improve their core HL curriculum in the perspective of their future role in health education (29–31). However, the characterization of HL among undergraduates attending non healthcare-related courses may be important in order to identify possible aspects that should be addressed in university students, who frequently adopt unhealthy lifestyle. (32–35) The HL of graduates must be adequate so that they can guide others in maintaining and improving their health and well-being, and improve the economy of their country; therefore, educational curricula should consider this item (36).

To this aim, the use of multiple HL measures may highlight different issues related to specific HL skills requiring targeted educational interventions (26).

This study was aimed at assessing HL among undergraduates attending healthcare and non-healthcare related degree courses from two Italian universities, in order to highlight possible differences between these two subgroups. In order to characterize the different components of HL, two different questionnaires were used.

Furthermore, the association between HL and lifestyle behaviors of the undergraduates was also analyzed.

Methods

This cross-sectional study was carried out during the year 2019 involving students from the University of Naples Parthenope and the University of Rome “La Sapienza”. The investigation was performed anonymously in accordance with the Italian laws concerning the protection of personal data and with the World Medical Association Declaration of Helsinki.

By accepting to respond to the questionnaire, undergraduates expressed their informed consent to participate to the study.

Participants and settings

Participants were recruited from healthcare (Nursing) and non-healthcare (Economics and Movement Sciences) related degree courses. When the students were invited to take part to the investigation, the aim of the study was explained to them and the anonymity of data collection and treatment was guaranteed.

Questionnaires

The questionnaires included a general section regarding demographic characteristics such as gender, age, and degree course; in order to calculate the BMI, participants were also asked to self-report their weight and height values. The following two questionnaires were aimed to collect information regarding students' lifestyle. In order to explore their adherence to the Mediterranean diet (MD) model, participants were asked to provide information regarding their usual daily/weekly consumption of eight food groups (fruit, vegetables, legumes, cereals, fish, meat and meat products, dairy products, alcohol, olive oil) by filling in the questionnaire proposed by Sofi et al. (37). Students' PA levels were investigated by asking their current practice of vigorous PA (days per week and minutes per day), moderate PA (days per week and minutes per day), walking (days per week and minutes per day), and sedentary lifestyle (average daily time spent sitting), following the International Physical Activity Questionnaire (38). Finally, a question concerning tobacco smoking (non-smoker or quitter/smoker) was posed.

The participants' HL was investigated through two different questionnaires: the eight-item Health Literacy Assessment Tool (HLAT-8) developed by Abel et al. (39) and the Newest Vital Sign (NVS), introduced by Weiss et al. (40). The HLAT-8 was formulated specifically to explore HL for public health purposes and includes items specifically aimed at measuring the ability of accessing, understanding, evaluating and communicating health-related information. It assesses HL through eight Likert-scale items; a score is attributed to each answer, and the sum of the eight scores indicates the HL level of the respondent. The total score range was 0–37, with higher scores indicating higher levels of HL. The NVS is a quick screening instrument widely used to assess HL by using an ice cream nutrition label that the respondent may hold and review; then, 6 questions regarding that nutrition label are posed. Four or more correct answers indicate adequate literacy, while a score ≤ 3 indicates limited literacy. The NVS has been shown to be a valid tool to measure literacy and numeracy skills; it is short, accurate, and can be employed in settings where time of administration is limited (41).

Statistical analysis

A descriptive analysis was carried out on demographic characteristics, declared behaviors and HL levels of the sample. Continuous outcomes were reported as mean values \pm standard deviation (SD); data regarding gender and smoking habit were reported as number and percentages.

The comparison between students from healthcare and non-healthcare degrees was performed through the Student's t test for continuous outcomes and chi-squared test for non-continuous outcomes. The number of participants with a HLAT-8 score \geq the 75th percentile value, assumed as an indicator of better literacy, and that of the students reporting a NVS score \geq 4, corresponding to an adequate literacy, was also calculated for each group.

Pearson's correlation was performed either to analyze the association between the two questionnaires employed to assess HL or the association between HL levels and the lifestyle behaviors.

Multiple logistic regression analyses were performed to identify the significant predictors of each HL score. The dependent variables were built by considering if reported HL scores were \geq 75th percentile for HLAT-8 or \geq 4 for NVS.

A value of $p < 0.05$ was assumed as significance level. Data were analyzed with IBM SPSS version 26 for Windows (SPSS, Chicago, IL, USA).

Results

On a total of 877 university students who agreed to take part to the study, 806 (91.9%) completely fulfilled the questionnaires. The demographic characteristics, the lifestyle outcomes and the mean HL scores of the whole sample and those of the two subgroups are summarized in Table 1.

As for the variables related to lifestyle, the group of students from the healthcare related degree course showed a significantly lower mean BMI than the other participants, whereas the other variables indicated that a low adherence to MD, inactivity and smoking habit were more common in this group. In particular, nursing undergraduates reported significantly lower levels of moderate-vigorous PA and higher sitting time. As for the HL levels, the mean HLAT-8 and NVS scores as well as the percentages of individuals with better HL scores were significantly higher in nursing students than the other undergraduates.

The results of the correlation analyses are reported in Table 2. The scores from the two HL questionnaires exhibited several correlations with individual characteristics or lifestyle components in the whole sample and in the two subgroups. BMI appeared to be positively correlated with NVS score in undergraduates from non-healthcare related degrees. MD adherence was associated with both HL tools in the total sample and in the two subgroups independently of the questionnaire used, with the only exception of HLAT-8 in nursing students. PA resulted positively associated with HL only in nursing undergraduates: total PA correlated with HLAT-8 questionnaire scores, while moderate-vigorous PA correlated with NVS results. No correlations were found for age, smoking habit and sitting time.

The logistic regressions for HL scores were performed considering BMI, MD adherence, moderate-vigorous PA time, and field of study as independent variables. The analyses were corrected for age and gender. The results are shown in Table 3. Reporting a higher HL score by either the HLAT-8 questionnaire or the NVS was significantly associated with the attendance of a healthcare related degree course and with a higher MD adherence. No significant associations were found with BMI or PA.

Discussion

This study was aimed to assess the level of HL among Italian undergraduates with reference to their field of study and lifestyle.

Our findings show that attending a healthcare related degree course was associated with higher HL levels but this was not associated with healthy lifestyles.

As indicated by NVS score, the 68.8% of the whole sample showed adequate HL, with significantly higher levels registered in nursing students. In the United States, the 2003 National Assessment of Adult Literacy reported a 36% rate for low HL in a sample of 14,592 respondent adults (18), while more than 43% of American adults have been reported to have insufficient HL skills (16). In Europe, a research project entitled “European Health Literacy Survey” (HLS-EU) launched in 2011 to investigate HL in 8 European countries through a 86-item survey, showed limited HL skills in about 47% of respondents, with consistent differences (29–62%) across countries (19, 22). As for Italy, recent investigations have reported inadequate HL as a predominant phenomenon; Palumbo et al. investigated HL in a representative sample of 1,000 Italian individuals with the same tool used for the HLS-EU (21). The survey showed an insufficient level of HL in the 54.6% of the sample. A recent study by Lorini et al. carried out on a population-based sample of 223 adults by using three measurement tools reported values of inadequate HL ranging from 40.4 to 75.4% on the basis of the different questionnaire used (20). In particular, 59.6% of individuals showed an adequate literacy as resulting by the NVS. Therefore, our results suggest that undergraduates, especially those attending healthcare related degree courses, may have a better level of HL respect to the general population. This should be confirmed in future investigations.

Furthermore, we analyzed the associations between HL and lifestyle. In 2019, Rüegg and Abel showed that HL may be associated with many material, psychosocial and health-related factors, and with socioeconomic status. Among the covariates they considered, interest in health topics was included among the best predictors for a good HL level (42). This finding is in accordance with the results we registered among nursing undergraduates.

In our study, students from the healthcare related degree course reported lower adherence to MD, a higher percentage of smokers and significantly lower PA levels than those from the other courses. Anyway, the correlation analysis revealed a positive association between HL and MD in both subgroups, while a significant correlation with PA was detected only among nursing students. The positive association between HL and adherence to MD was confirmed by regression analyses.

The protective role of MD on multiple health outcomes has been widely demonstrated (43). Moreover, the adoption of this pattern is associated with other healthy habits such as having an active lifestyle and not smoking (44). In our study, the adherence to a MD pattern was not associated with other lifestyle behaviors (data not shown), but it was related to HL. Our results suggest the need to further explore this item in future studies.

The two questionnaires used in this study were used successfully in previous investigations to assess HL among young adults (36, 39). In our experience, they were well accepted and understood by participants, and their results showed a good level of concordance.

This study has some limitations. First of all, the limited size and composition of the sample does not allow to generalize our findings. Wider studies involving students from different degree courses are needed.

Second, all the data collected were self-reported. It is possible that, besides inaccurate information regarding weight and height, participants reported incorrect estimates of their own HL abilities.

Furthermore, we did not analyze the working condition of participants. Considering that being a working student may have effects on PA levels, it should have been investigated as a possible lifestyle predictor (33).

However, the use of two investigation tools and the involvement of undergraduates from two different educational fields represent new items that may contribute to characterize the domains and the determinants of HL. Furthermore, the analysis of the relationship between students' behaviors and HL opens new perspectives for future research.

Conclusions

The findings of this study testify an adequate HL level in undergraduates, mainly among those attending healthcare-related degree courses. However, the majority of these students did not report healthy behaviors. This represents an issue that should be addressed considering that the future healthcare professionals should represent a behavioral model for their patients.

Furthermore, in this study HL was associated with the adherence to the MD pattern. This suggests that having better knowledge and skills regarding health may lead to better food habits. Further investigations regarding these aspects are needed.

Declarations

Ethics approval and consent to participate

The study was performed in accordance with the ethical standards of the University of Naples Parthenope and University of Rome La Sapienza and with the 1964 Helsinki declaration and its later

amendments or comparable ethical standards. The study was approved by the Ethical Committee of the University of Campania “Luigi Vanvitelli” with the protocol number 478/2019.

Consent to publish

Not applicable.

Availability of data and materials

The datasets generated during the current study are available from the corresponding author on reasonable request.

Competing interests

Francesca Gallè is a member of the editorial board of the journal (associate editor).

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Authors' contributions

GV and FG conceived and designed the study and managed the activities.

GL and GBO participated to the organization of the activities.

FG, CN and GV managed the activities and collected the data.

FG, PC and GV analyzed and interpreted the data.

FG and GV drafted the article.

FG, PC, CN, FL, GBO, GL and GV revised the manuscript critically for important intellectual content. All authors read and approved the final article.

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Abbreviations

HL: Health Literacy; BMI: Body Mass Index; MD: Mediterranean Diet; PA: Physical Activity; HLAT-8: Health Literacy Assessment Tool; NVS: Newest Vital Sign.

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Tables

Table 1. Demographic characteristics and lifestyle of the study participants in the total sample and grouped for educational field with related *p* values

	Total sample <i>n=806</i>	Health-related degree <i>n=262</i>	Non health- related degree <i>n=544</i>	<i>p</i> value
Gender				
<i>n</i> (%)				
female	435 (54)	191 (73)	245 (45)	0
male	371 (46)	71 (27)	299 (55)	
Mean age ± SD				
<i>Years</i>	21.01±1.78	21.03±2.02	21.01±1.61	0.831
Mean BMI ± SD <i>kg/m²</i>	22.74±3.13	21.95±2.99	23.11±3.13	0
Mean MD adherence score ± SD	8.1±2.9	7.9±3.1	8.1±2.8	0.291
Smokers				
<i>n</i> (%)	240 (29.7)	80 (30.5)	160 (29.4)	0.332
Total PA time ± SD (<i>min/week</i>)	837±2,292	643±775	930±2,730	0.098
Moderate-vigorous PA time ± SD (<i>min/week</i>)	352±625	239±329	407±720	0
Walking time ± SD (<i>min/week</i>)	484±2148	402±614	523±2576	0.456
Sitting time ± SD (<i>min/day</i>)	268±267	332±225	238±280	0
HL score ± SD (HLAT-8)	27.4±4.4	28.7±4.5	26.7±4.2	0
Mean HL score ± SD (NVS)	4.2±1.8	4.9±1.5	3.9±1.8	0
Subjects with HLAT-8 score ≥ 75° percentile <i>n</i> (%)	178 (22.0)	92 (35.1)	86 (15.8)	0
Subjects with adequate literacy (NVS) <i>n</i> (%)	556 (68.8)	215 (82.1)	341 (62.8)	0

Table 2. Results of Pearson's correlations between HL scores and students' information in the total sample and in the two subgroups

	Total sample		Health-related degree		Non health-related degree	
	<i>n=806</i>		<i>n=262</i>		<i>n=544</i>	
	HLAT-8 score	NVS score	HLAT-8 score	NVS score	HLAT-8 score	NVS score
HLAT-8	-	0.191**	-	0.240**	-	0.103*
Age	0.034	0.026	0.069	0.064	0.012	0.053
BMI	-0.035	-0.013	0.020	-0.010	-0.011	0.121**
MD adherence	0.125**	0.154**	0.101	0.159*	0.156**	0.178**
Smoking	0.054	0.049	0.073	0.091	0.033	0.019
Total PA time	0.034	-0.015	0.123*	0.087	0.042	-0.009
MVPA time	0.015	-0.024	0.110	0.123*	0.030	-0.008
Walking time	0.032	-0.009	0.095	0.046	0.036	-0.007
Sitting time	0.031	0.050	-0.048	0.056	0.006	-0.012

HL: Health Literacy; MD: Mediterranean Diet; PA: Physical Activity; MVPA: Moderate/Vigorous Physical Activity; * $p < 0.05$; ** $p < 0.001$

Table 3. Results of the multiple logistic regression performed on HLAT-8 and NVS scores as outcomes

Dependent variables

HL score (HLAT-8) >75th percentile HL score (NVS) ≥4

OR (95%CI)

Educational field	2.876 (2.006-4.124)**	2.859 (1.956-4.180)**
BMI	0.967 (0.695-1.346)	1.258 (0.927-1.706)
MD adherence	1.092 (1.028-1.159)**	1.111 (1.050-1.175)**
MVPA time	1.000 (1.000-1.000)	1.000 (1.000-1.000)

HL: Health Literacy; MD: Mediterranean Diet; PA: Physical Activity; MVPA: Moderate/Vigorous Physical Activity;

**p<0.05; **p<0.001*