

COMPETENCES IN ENVIRONMENTAL HEALTH ACQUIRED BY YOUNG VALENCIANS DURING THEIR COMPULSORY EDUCATION

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Abstract

Why is it important to address the environmental health competences that our young students acquire? Mainly for two reasons: 1) The environment is a health determinant. Changes in the state of our environment pose significant implications on our health, many of them negative, such as respiratory diseases, neurodevelopmental disorders, cancer, etc. It is imperative that citizens, as modifying agents of the environment, become aware of the important implications of environmental degradation on our health –included in the concept of environmental health- as an essential prerequisite to the implementation of solutions to environmental health problems. 2) The current educational proposals are established in a competence-based formative approach. Addressing environmental health competences from the educational sphere enables resource mobilization to address the existing and emerging environmental health problems of today's society.

What have we done to approach this view of young people? Students from three public secondary schools in Valencia were asked to answer a questionnaire including different open questions related to environmental health. The first question focused on the concept of health, the second on the relationships they were able to establish between health and the environment and, finally, the questionnaire focused on five open questions corresponding to the three sub-competences that define the environmental health competence (the student knows the problem, knows what to do to deal with it and is able to express an opinion or show a predisposition for action). A total of 176 students from different educational levels answered the questionnaire, comprising students in their last year of Primary Education -6th grade- and the last year -4th grade- of Compulsory Secondary Education, and considering different variables as gender and area of origin (rural and urban areas). A qualitative and quantitative analysis of the responses was made, carrying out likewise a comparison of the different variables of the Valencian students considered.

What environmental health competences have Valencian students acquired on their way through compulsory education? In a first approximation, we conclude that the interviewed students are still far from establishing complete relationships between health and the environment. Environment is not included in their concept of health and they are not capable of specifying environmental health problems. Nevertheless, the improvement throughout the education system is remarkable, with a great progress throughout the education system since: only about 17% of the students who have completed Primary Education have proved competency in environmental health, while 50% of the students who have completed Secondary Education have acquired that competence. These data of the progressive acquisition of environmental health competences as educational level rises support the argument of the need to complete compulsory education. Furthermore, different results have been obtained regarding other variables analysed: it seems that students from rural areas are more capable to face environmental health problems than those from urban areas while no significant differences have been found in the responses when comparing gender.

Keywords: health, environment, environmental health, competences, compulsory education.

1 INTRODUCTION AND ANTECEDENTS

In recent years, there has been increasing public concern about the health implications of environmental problems. Our current development model, which is unsustainable and does not include environmental costs, increases the pressure on the state of the environment. These pressures generate changes that have repercussions not only in the natural, but also personal, social and economic sphere.

Our health is an example of this, because it is intimately related to the environment [1]. There are numerous studies that establish a relationship between health of the environment and human health (Martín-Chaves (sf) [2]; Ordóñez (2000) [3], Piedrola, & Del Rey (2003) [5], so that it can be affirmed that our health is determined by environmental factors as well as others that, as Lalonde (1974) [6] states, can be biological, due to the lifestyle and the health system itself. We talk about the concept of environmental health. According to the World Health Organization (WHO, 1993, in MSSSI, 2003) [1].

According to the World Health Organization (WHO, 1993, in MSSSI, 2003) [1], this term encompasses environmental factors (external and internal to the person) that affect personal and collective health and is based on disease prevention and in the creation of environments conducive to health. To put an end to these pressures and their negative repercussions requires a change in our development towards what is known as sustainable development and it becomes necessary to raise awareness of the influence of the environment on our health, as a prior and indispensable step in the implementation of Solutions to these effects. At this point, the initiatives within the educational system are transcendental, since it allows interaction with the new generations and is a social transformation tool that, focused on environmental health, can and should favour the acquisition and development of competences based on knowledge, attitudes and habits necessary for the defense and promotion of individual and collective health.

Due to the importance of environmental health problems and the role of the educational system in its resolution, this research is related to the three dimensions discussed here: health, environment and education, but considering them as a whole. It intends to carry out an approximate analysis of the competences in environmental health acquired by young people throughout compulsory education in the Valencian Community. Compulsory Education in Spain consists of two stages: Primary Education Compulsory and Compulsory Secondary Education (ESO), corresponding to the ages between 6 and 16 years.

In order to identify the competences in environmental health acquired by students during compulsory education previous studies focused on this problem were analysed. The concept of competence in environmental health has been defined, and established the problems in environmental health that young people must be able to solve.

Regarding the definition, the competence in health is "the capacity and determination to solve the problems related to personal and collective health" or "the capacity and the purpose to use the resources (skills, attitudes, knowledge, experiences, behaviours, etc.) to adequately solve an individual or collective health problem in a defined context and contribute to creating an environment in which healthy choices are easier to be taken" (Gavidia et al., 2012) [7]. It should be noted that in this definition, competence is understood as the capacity and purpose of solving a problem adequately and implies knowledge, skills ("know how") and attitudes and behaviours ("know how to be" and "know how to act") integrated with each other (Bisquerra, & Pérez, 2007, page 63) [8].

Taking into account this definition and in order to establish the environmental health competencies to be acquired by young people, Fernández, Álvaro, Gavidia and Mayoral [in the press] [9] established the following problematic situations related to environmental health that young people should be able to solve (Table1):

Table 1: Problematic situations related to environmental health.

Problematic situations related to environmental health	Consequence of water, air and soil pollution
	Derived from consumption
	Facing possible catastrophes

Source: Fernández, Álvaro, Gavidia, & Mayoral (in press) [9]

These authors also divided the environmental health competence into three sub-competences related to the field of knowledge, know-how and know-how-to-be or know how-to-act (Table 2).

Table 2: Environmental Health Competence.

Competence	<i>"To know, value and contribute to the creation of a healthy environment"</i>
Know	Know the characteristics of a healthy environment and the signs of its deterioration. Effects of the environment on human health
Know-how	Caring for the environment, contributing to its improvement and avoiding unhealthy environments
Know-how-to-	Commit to the creation of a healthy environment. Solidarize with those who share the Earth and with those who will inherit it

Source: Fernández, Álvaro, Gavidia, & Mayoral, (in press) [9]

Once the competences in environmental health have been defined and the problems affecting them have been analysed, our research addresses the relationship between human and environmental health and whether the students acquire the necessary competences to recognize the environmental problems that affect their health and if they know how to act and how to be in relation to them.

2 METHODOLOGY

In the approach of the present investigation problem, a distinction has been made in the acquisition of competences in environmental health according to different variables: the educational level of the study students, their gender and the typology of the educational centre of the study sample.

A questionnaire was developed and validated by the COMSAL team, made up of a group of experts and passed several pilot tests. It was then completed by 176 students from three educational centres representing compulsory education in order to find out the environmental health competences acquired by students during their compulsory education. The educational centres in which the analysis was carried out are the following Institutes of Secondary Education (IES): IES Conselleria (outskirts of Valencia), IES San Vicente Ferrer (center town of Valencia) and IES la Vall de Segó (Benifairò de les Valls, village of about 2000 inhabitants).

2.1 Data Collection Instrument

The questionnaire used in this research is part of the COMSAL research project entitled "Analysis, design and evaluation of educational resources for the development of competencies in health". It comprises the following 4 sections that include simple and short questions:

- a) **Personal data:** Age, gender and school, which allow obtaining the study variables: educational level, gender and typology of the school (rural or urban).
- b) **Concept of health:** Students are asked to write at least five words that are related to their idea of health in order to check if they include the environment in their idea of health.
- c) **Identification of environmental health problems:** They are asked to point out problems related to environmental health to find out if they are able to relate environmental health to human health.
- d) **Actions on Environmental Health Problems:** Five environmental health factors related to the problematic environmental health situations established in the background were selected. These were: hunger, consumerism, climate change, pollution of cities and allergies.

Each problem consisted of three interrelated questions to try to find out if the students: 1) know the problem, 2) know what to do, 3) are able to express an opinion or indicate a predisposition for action, according to the three dimensions of established environmental health competences.

2.2 Data Collection

Table 3 provides information on the number of surveys obtained according to the different variables of this study: the gender variable (with male and female values), type of school (rural -IES the Vall de Segó- and urban - IES Conselleria and IES San Vicente Ferrer) and the educational level: Primary Education (represented by surveys completed by students of the 1st year of Compulsory Secondary

Education –ESO-) and Compulsory Education (represented by the surveys completed by students of the 1st year of Bachelor/Vocational Training –in Spanish Formación Profesional, FP-).

Table 3: Number of surveys according to the variables considered.

	Number of surveys						Total
	Gender		Type of school		Educational level		
	male	female	rural environment	urban environment	1 st ESO	1ºBach/FP	
IES Conselleria	38	17	-	55	49	6	55
IES San Vicente Ferrer	23	27	-	50	29	21	50
IES La Vall de Segó	41	30	71	-	41	30	71
Total	102	74	71	105	119	57	176

The open-ended questionnaire allowed obtaining quantitative and qualitative data, enhancing students to express themselves without hindrance. A statistical correlation study was performed between the study variables with the Chi square test (X^2).

2.2.1 Data collection by quantitative analysis: Study of the environmental health questionnaire according to the problems

The data obtained for the quantitative analysis are those of sections A and D of the questionnaire.

The variables "educational level", "gender" and "type of school" were obtained directly from section A of the questionnaire, using binary codes. The procedure for obtaining data in section D has required a consensus model of evaluation that has allowed us to quantify data of a qualitative nature, assigning to the questions a score of 1 when the answer was not valid, 2 when it was partially correct and 3 for the correct ones. Correct answers were those that included two or more possibilities or that showed the personal and collective aspects of environmental health.

The use of this model of evaluation allowed analysing the subcompetences in environmental health: if the student knows, knows what to do and contributes to the creation of a healthy environment through the evaluation of the quantity and quality of his arguments ("yes" = 3; "partially" = 2 and "no" = 1). Thus, if the students did not know how to answer any of the three questions, they obtained 3 points and 9 if all their answers were correct, considering the three dimensions studied. Subsequently, the points obtained were categorized, following the criterion shown in the Table 4 in these three categories: "acquisition of the competence in environmental health", "non-acquisition of the competence in environmental health" or "competence in environmental health partially acquired":

Table 4: Scoring system used for each environmental health problem of the questionnaire.

Scoring Values	Categories
9	Acquisition
8	
7	Partial acquisition
6	
5	Non-acquisition
4	
3	

2.2.2 Data collection by quantitative analysis: Study for all the problems of the environmental health questionnaire

The data obtained for qualitative analysis are those corresponding to sections B, C and D of the questionnaire. The responses were considered as a whole, including the expressions used by the students, categorizing them and indicating those that had been more or less used, and in what percentages. The establishment of the categories for each section is explained below:

- The question about the concept of health (section B) was categorized according to the five levels of complexity of the concept of health established by Gavidia (1997, pp. 141-142) [10]: Level I (health as absence of illness), Level II (health as well being), Level III (includes the environment in its concept of health), Level IV (health as a lifestyle) and Level V (more complex level that includes personal and social development).
- The identification of the environmental health problem (section C) has been categorized according to problematic environmental health situations.
- The categorization of the five environmental health problems (section D) has been done according to the students' answers to the questions.

After obtaining the data, a comparison was made based on the study variables: "educational level", "gender" and "type of school".

3 RESULTS

The results of the Chi square test (X^2) confirm the correlation between the variables compared in the present study. Those corresponding to the quantitative and qualitative analysis are shown below:

3.1 Concept of health

Figure 1 reflects how the majority of students are placed in level II of the concept of health: most students define health in positive terms and include, in addition to the physical, a psychic and social dimension. Health at this level is understood as a state of ideal life and students mention two concepts frequently: "well-being" and "nutrition". The next most frequent level is level I, where the students define health from their physical appearance, only as absence of disease. Almost 20% of all respondents do not know or do not answer the question that has been raised and very few are at higher levels of complexity that take into account the community and progressive environmental factor in their idea of health. This means that they do not relate the environment to their health and they do not consider the idea of healthy environments.

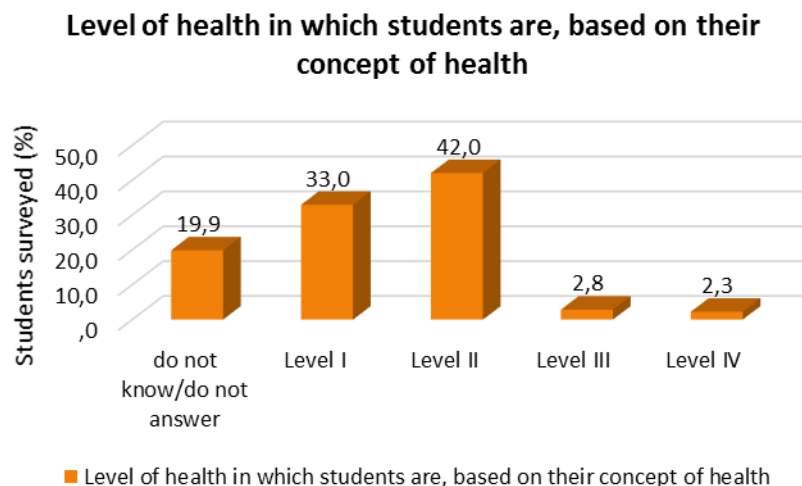


Figure 1: Level of health in which students are, based on their concept of health.

3.2 Identification of environmental health problems

Figure 2 shows the problems related to environmental health that students have considered. Most of the responses have focused on problems that have been categorized as "pollution-derived". In

addition, a high percentage of students (about 30%) have not been able to respond, have not answered or didn't relate environmental problems to human health.

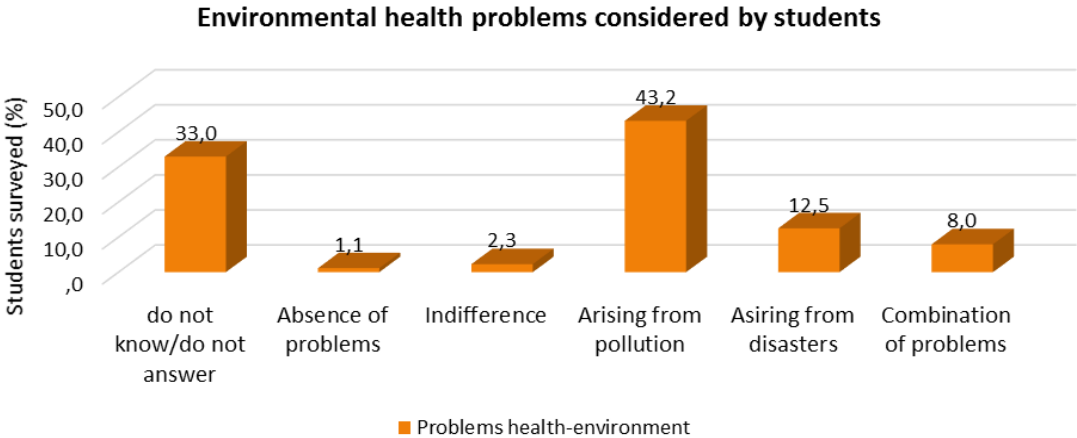


Figure 2: Environmental health problems considered by students.

3.3 Actions to address environmental health problems

In Figure 3 the acquisition of environmental health competence has been related to the variable "educational level", "gender" and "type of school".

The students who have completed compulsory education are more competent in environmental health than those who have only completed primary education. This highlights the importance of completing compulsory education in the acquisition of competencies in environmental health. 63% of Primary students did not acquire the competence in environmental health, compared to 18% in Secondary Education, while 51% of Secondary students acquired completely this competence as opposed to 17% of Primary school.

Taking into account the gender variable for the study sample, the acquisition of this competence is greater in female students than in male students. The variable "gender" is the one that shows the lowest difference among its categories, with the percentage of female students who acquire competence in environmental health (32%) slightly higher than male students (25%).

Considering the type of school, the majority of the students who live in urban environments do not have the competence in environmental health, while the majority of students from rural environments show competence in this area; students who live in rural environments are more competent in environmental health than those living in urban areas. While approximately 50% of rural students are proficient in this field of health, it represents only about 13% of urban students.

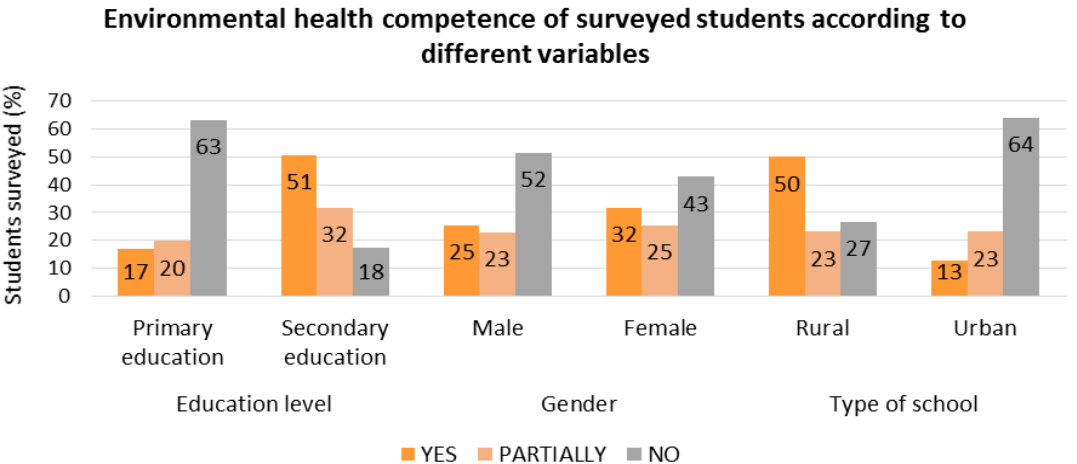


Figure 3: Percentage of students that acquire the competence in environmental health according to the variables "educational level", "gender" and "type of school."

Much of the present study has focused attention on the results obtained for students who have completed secondary education, since they are students who may lose contact with the education system.

In order to delve deeper into the analysis of results, the competence in environmental health has been broken down into the three sub-competences established. Figure 4 shows that only 55% of students know the environmental health problems presented in this study. 60% know what to do in order to deal with them and less than 50% is able to express opinion or indicate predisposition to action. There are more students who know what to do to face these problems, and their shortcomings are focused on "knowing how to do" and "knowing how to be" (judging and acting), representing only 55 and 50% of these students, respectively. We see, therefore, that few students acquire this competence, that is, they know, know how to do and be before problems. Although in our opinion the percentage of students who are competent to these environmental health problems is not enough, it should not be overlooked that during compulsory education the acquisition of this competence really takes place.

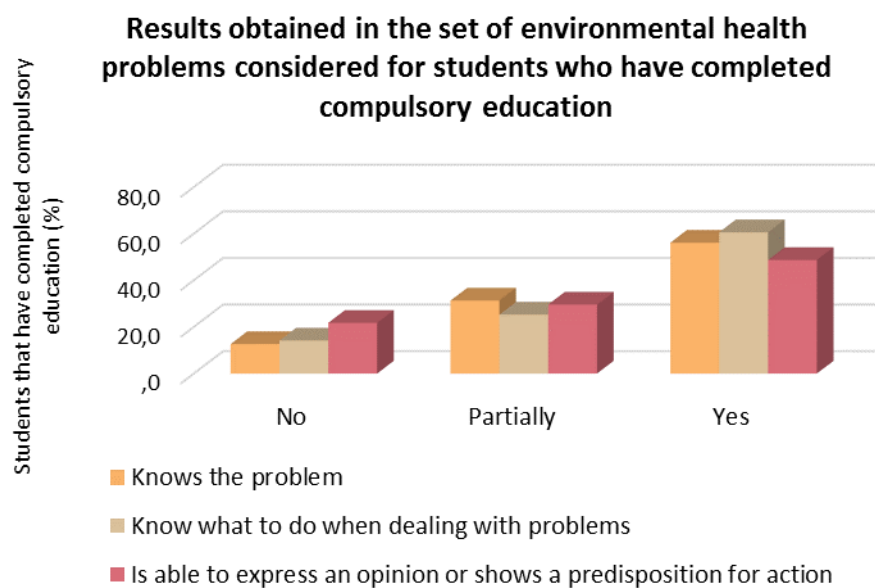


Figure 4: Results obtained on whether the student knows, knows what to do and is able to express an opinion or carry out actions in the set of environmental health problems considered.

The results of the quantitative analysis are supported by those obtained in the qualitative analysis. When students have been asked what they know of a particular problem, many have not been able to respond and have resorted to explaining the possible cause or effects of the problem, or have mentioned a single example of the problem. In the question related to knowing what to do in relation to an environmental health problem, students have shown to know what to do. However, their responses have focused on personal and individual actions, far from a *global* perspective, which is essential to address the present "planetary emergency" situation (Vilches & Gil, 2009) [11]. Taking into account the opinion or action of the students in relation to environmental health problems, the most frequent situation was that the students did not answer the questions or did not know how to justify their own answers. This situation confirms the absence, especially, of the dimensions to know and to know what to be in environmental health.

4 CONCLUSIONS

This research constitutes an exploratory study that has contributed to improve the knowledge of the competences in environmental health acquired by Valencian students through compulsory education, constituting a study of a prior approach to a social reality. The competence in environmental health, based on three dimensions (knowledge, know-how-be and know-how-to-do) has been concreted. Using a validated environmental health questionnaire, it has been studied whether the students, after passing through compulsory education, understand the relationship between human and environmental health and acquire the necessary competences to recognize environmental problems affecting their health and know how to act and be in relation to them.

The questionnaire used is composed of different questions related to environmental health. The first one focused on the concept of health, the second on the relationships that students were able to establish between health and the environment and the last one on the five environmental health problems, that were addressed considering the three defined sub-competences. In this sense it is important to bear in mind that the present study addresses some specific problems. It is clear that there are many environmental problems, but five were chosen to delve into them, since it would be impossible to consider all existing environmental problems with this type of analysis.

The results obtained show that students at the end of their compulsory studies acquire competences in environmental health, but not those necessary to recognize environmental problems that affect health and show a predisposition to act in relation to them.

Only 17% of primary students have been proficient in environmental health, while this percentage is 50% in secondary school students, which demonstrates the importance and necessity of completing the mandatory studies.

Considering the students who have completed compulsory education, the most developed dimension (60%) is the one corresponding to "know-how", while deficiencies in "knowing" and "know-what-to-be" have been shown to be acquired by 55% and 50% of the students, respectively. For this reason, 60% of the students who have completed compulsory education may know what to do, but they would rarely have deep knowledge of the problem or would not be able to express an opinion or indicate a predisposition for action.

The results have also shown how the surveyed students do not include the environment in their idea of health and do not establish relationships between health and the environment nor have a vision of this problem beyond the person: they do not have a *glocal* perspective, which is needed to cope with the current environmental problems, encouraging citizen mobilizations that in today's society still do not take place.

There have also been notable differences in the acquisition of environmental health competence according to the type of school. The environmental health competence is bigger in the students of rural schools than urban. Differences have also been found, although not as relevant, in the acquisition of this competence according to the gender of the students, with females being predominant in this acquisition.

The students surveyed are still far from linking the importance of the environment in relation to human health and current society requires a competent citizenship in environmental health, capable of facing and contributing to the achievement of a healthier environment and a better quality of individual and collective life. A citizenship capable of recognizing a problem, knowing how to deal with it and being able to mobilize to resolve it with autonomy, which is still one more step towards sustainability.

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