

# Teaching children about hygiene: A primary prevention experience in Portugal

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## ABSTRACT

**Background:** Children's knowledge on hygiene is often considered to be provided by parents or schools. It is something with a direct impact on health and linked with socio-cultural factors. Primary care plays a vital role in health education and promotion, so focusing on hygiene habits is part of primary prevention. **Objectives:** Improving the knowledge on hygiene and promoting healthy behaviors in students from the 4<sup>th</sup> to the 6<sup>th</sup> grade. **Materials and Methods:** Longitudinal, prospective study. Hygiene habits were assessed through a questionnaire, followed by a brief health education session organized by healthcare professionals at schools. Hygiene habits were then reassessed using the original questionnaire. **Results:** A total of 812 questionnaires (354 in the pre-session phase and 458 in the post-session phase) were collected, filled in by students with ages ranging between 8 and 16 (average, 10.8), being 52% boys. There were significant increases in the score in both genders, but this increase was slightly higher for boys, with an average increase of 0.98 points ( $P < 0.05$ , independent samples t test). The 9 year old group (in the first evaluation; 10 years old post-talk) had the highest increase in score, with an average increase of 1.33 points in the questionnaire. **Conclusion:** Interventions conducted by healthcare professionals at schools have a positive effect for health education. The resulting scores revealed an improvement regarding hygiene habits namely in younger students. This may suggest that interventions on hygiene habits should take place at younger ages, so to have a greater impact in behavioral change.

**Keywords:** Child, health care, hygiene, primary prevention, quality assurance

## Introduction

In 1998, the World Health Organization (WHO) defined health education as a field comprising consciously of “constructed opportunities for learning involving some form of communication designed to improve health literacy, including improving knowledge, and developing life skills that are conducive to individual and community health”.<sup>[1,2]</sup> Thanks to this, the concept of health promotion that was already defined in the 1986 Ottawa Charter as “the process of enabling people to increase control over, and to improve, their health” was implemented.<sup>[3,4]</sup>

It requires the development and establishment of some basic infrastructures to be able to have control over one's health.

Several studies have already shown that the lack of access to safe drinking water and basic sanitation, associated with poor hygiene habits, leads to high rates of morbidity and mortality in low income and developing countries.<sup>[5,6]</sup> This idea is now widely established; thanks to the work that has been developed over the past few centuries in the areas of Public Health and Epidemiology, namely thanks to the work of John Snow in 1854 during the cholera epidemic in London, as well as of Louis Pasteur and Robert Koch in the microbiology field during the early twentieth century.<sup>[7]</sup>

In high income countries, there are still differences as to what may or should be considered as adequate hygiene habits. In addition, socio-cultural studies that have been conducted have shown that hygiene habits are closely linked to the culture and religious habits of a population.<sup>[8,9]</sup>

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In Portugal, bathing and domestic intimate hygiene as a social value became a widespread practice from the 19<sup>th</sup> century onwards. This new habit justified major changes both in the domestic and urban contexts: water supply and distribution systems were implemented at home, and specific spaces in the houses (the bathrooms) were built for this purpose.<sup>[10]</sup> At national level, the most recent data shows that in 2009, 96% of the population had access to a domestic public water supply system, and 84% of the population was covered by a waste water drainage system.<sup>[11]</sup>

At the same time, according to data from 2016, 10,508 years of life were lost in Portugal due to infectious and parasitic diseases, and 41.7% of the cases were registered in the Metropolitan area of Lisbon alone.<sup>[12]</sup> The reason for this may be because of the higher risk that is associated to areas with a higher population density that usually include people living with lower socio-economic conditions.

According to the 2011 census, the municipality of Seixal was the second municipality with the largest number of people residing in the Setúbal Peninsula. Of the 79,552 households, 18,902 households did not have access to piped water, 18,851 did not have a waste water drainage system, 18,905 did not have a toilet, and 19,241 did not have a bath or shower facility. Considering other socio-economic factors, in this municipality, the Amora locality had the largest number of inhabitants and the highest unemployment rate.<sup>[13]</sup>

In addition to the high population density, the municipality of Seixal is the second municipality in the Peninsula of Setúbal with the largest number of foreign residents, most of them coming from the Portuguese Speaking African Countries [Figure 1].<sup>[14]</sup>

Given the difficult context resulting from the recent socio-economic crisis in Portugal,<sup>[15]</sup> the authors considered it to be relevant to research and to understand the knowledge of children and young adolescents on hygiene habits in the Amora

municipality (located in Seixal). As these issues are part of the elementary education's curriculum, the authors decided to carry out this study in schools.

Children and young adults aged 5 to 12 are in the age gap where they are more open to learning and to acquire more complex skills. As described in Erik Erikson's<sup>[16]</sup> work on the psychosocial development of children, this is the age gap where differences between individuals become clearer and children show a greater willingness to be responsible as well as to gain more autonomy. However, the phase of adolescence (around the ages of 13 to 19) is mostly characterized for the identity crisis, and the relevance that is given about the impression that may be caused on peers.<sup>[16]</sup>

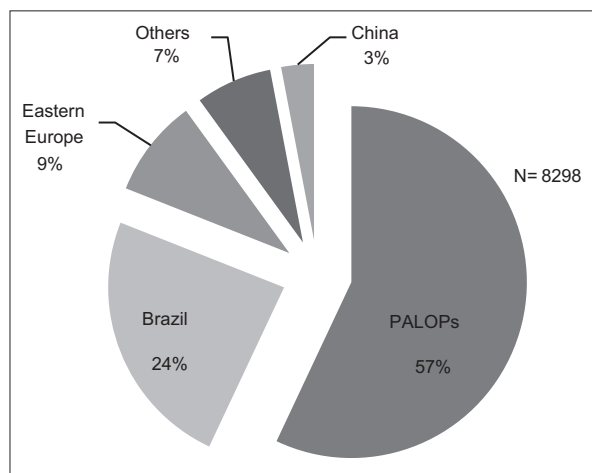
In Europe, the curriculum follows a similar structure during the first years of school (except what concerns the teaching of foreign languages, information technology, and religion).<sup>[17,18]</sup> At the end of the 90s, the European Commission, the European Council, and the World Health Organization Regional Office for Europe created the Schools for Health in Europe (SHE) network,<sup>[19]</sup> being its purpose to support the development and implementation of school health promotion in the European region and worldwide. The intention of this network is to provide all agents of the school community (students, teachers, and employees) with actions that promote and protect their health.<sup>[4,20]</sup>

In Portugal, hygiene is one of the curricular goals in school. It is integrated in the subject of "Study of the Environment" (given during the second and third year of the first school cycle) and topics such as body and food hygiene, as well as of healthy habits, are covered.<sup>[21]</sup> Further on, the topic of hygiene is again covered during the sixth year, where subjects related to "environmental aggression and organism integrity" are studied. This namely relates to the knowledge about the benefits and harms of microorganisms, as well as an assessment on the impact of pollution and hygiene habits for our health.<sup>[22]</sup>

This study was conducted as a primary prevention strategy so to reinforce the importance of healthy behaviors in the population. The authors believe that this intervention will have beneficial consequences for the quality of life of current and future generations as it will result in healthier lifestyle habits.

## Materials and Methods

The authors conducted a longitudinal, prospective study focusing the area of quality improvement. During two school years, the authors assessed students' hygiene habits through a questionnaire that was followed by a brief intervention on health education in the form of a small lecture during class. Finally, the same questionnaire was applied as a means to reassess the results. All data were collected anonymously, and the questionnaires were analyzed exclusively by the researchers.



**Figure 1:** Distribution of international residents in the Seixal municipality

The population was a random convenience sample of 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> grade students that attended two groups of public schools in Amora.

To carry out the study, approval was requested to the directors of the schools, as well as to those responsible for the child's education. At each school, this study had the collaboration of the teachers who were responsible for the "Health Education Project", a project that aims to "give children and young people knowledge, attitudes, and values that help them make choices and take decisions that are good for their health and for their physical, social, and mental well-being, as well as for the health of those around them."<sup>[23]</sup>

During 1 year, two assessments on hygiene habits were carried out through the questionnaires and, between them, the session on health education occurred. The questionnaire included 15 multiple-choice questions and each item on the responses was pre-classified ranging from 0 (minimum) to 2 (maximum) points. Bad hygiene habits were scored with a lower score and good ones had a higher score. So, from a total of 0 to 29 points, the authors established four different groups: from 23 to 29 points it was considered "good personal hygiene habits;" from 15 to 22 points "needs to improve daily hygiene;" from 7 to 14 points "little personal hygiene habits;" and finally, from 0 to 6 points "weak personal hygiene habits". For an initial validation of the questionnaire, it was applied to an initial cohort of 48 students.

The nominal variables that were collected in the questionnaire were age and gender. The authors also collected information on access to basic sanitation and the occurrence of pediculosis among the responders.

The intervention on health education was carried out in nine schools, comprising of a total of 21 sessions. It consisted on a brief presentation of approximately 1 h made by Family Medicine residents, directed to two to three school classes simultaneously. Residents participated in this project voluntarily, and to assure the intervention followed the same pattern, it was previously discussed by all presenters, and the same projection was used in the session.

After 3 months, the health education session; the students who had completed the questionnaire in the first year and who had attended the session were asked to complete the questionnaire once again.

The collected data were analyzed in the IBM SPSS Statistics © program, applying the independent samples t test and the Pearson linear correlation for the association of the study variables.

## Results

A total of 812 questionnaires were collected (354 in the pre-intervention phase and 458 in the post-intervention phase) of students aged 8 to 16 years (mean of 10.8), of which 52% were male students.

The prevalence of access to sanitation of these students was 100%, and the prevalence of pediculosis was of 49.9% (63% female, mainly in the 10–11 age group).

When comparing the distributions from the pre- to the post-intervention [Table 1] and analyzing the mean values, overall (both school groups combined) a significant improvement in the questionnaire scores was achieved, with a mean increase of 0.8 points ( $P < 0.001$ , independent samples t test).

In both genders, there were significant increases in the score, but this was slightly higher in boys. For boys, there was a mean increase of 0.98 points ( $P < 0.05$ , independent samples t test), and in girls, the mean increase was of 0.59 points ( $P < 0.05$ , independent samples t test). When analyzing age groups, the authors found a tendency for younger students to have lower scores on the questionnaires, which may mean that they have less healthy habits.

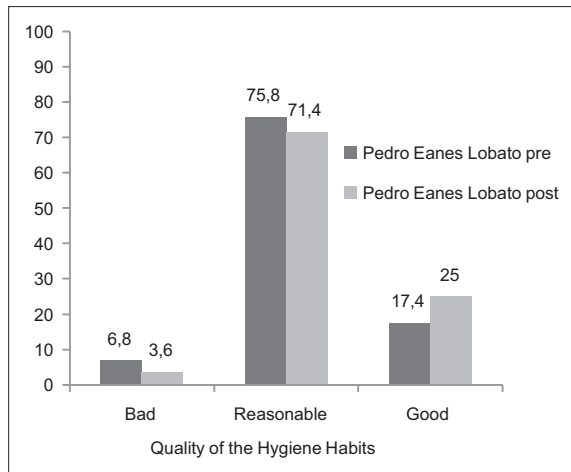
Despite this apparent relationship between "age and score", when applying Pearson's linear correlation test, we can see that only in the first assessment (before the health education session) were the results statistically significant ( $P = 0.01$ ,  $R = 0.02$ ), and they were not as significant in the second assessment ( $P = 0.99$ ;  $R = 0.006$ ). The children who were aged 9 years during the first assessment had the highest score increase, with an average increase of 1.33 points in the questionnaire.

Analyzing each school individually, results show that in both schools there were significant differences in the pre- and post-intervention moments. In the "Paulo da Gama" school group, the mean increase was 0.65 points, with a statistical significance ( $P < 0.05$ , independent samples t test). In the "Pedro

**Table 1: Distribution of attained results in the questionnaire and analysis of the mean values**

	Pre-intervention phase	Post-intervention phase	P
Means	18.63 (±3.13)	19.43 (±2.7)	<0.001*
Gender			
Boys	18.35 (±3.33)	19.34 (±2.68)	0.001*
Girls	18.93 (±2.85)	19.52 (±2.73)	0.039*
Age			
8 years	18,0 (±0) <sup>†</sup>	NA	NA
9 years	17,77 (±3.06)	NA	NA
10 years	19,06 (±2.95)	19,1 (±2.95)	NA
11 years	18,89 (±3.28)	19,37 (±2.82)	NA
12 years	NA	19,86 (±2.46)	NA
13 years	NA	19,48 (±2.33)	NA
14 years	NA	19,6 (±2.26)	NA
15 years	NA	19,67 (±1.97)	NA
16 years	NA	20,25 (±2.87)	NA
School group			
Pedro Eanes Lobato	18.51 (±3.05)	19.38 (±2.84)	0.008*
Paulo da Gama	18.8 (±3.23)	19.45 (±2.64)	0.033*

\*Independent samples t-test. <sup>†</sup>Only one student answered. NA - Not available



**Figure 2:** Distribution of hygiene habits before and after the intervention in the “Pedro Eanes Lobato” school group

Eanes Lobato” school group, the average increase was of 0.87 points, being also statistically significant ( $P < 0.05$ , independent samples t test) and slightly higher than in the other school group [Table 1].

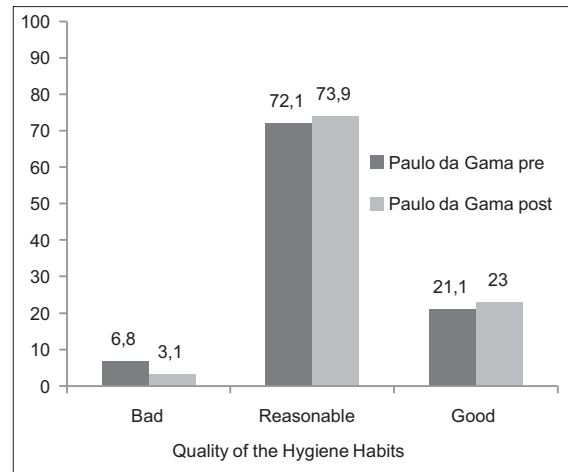
Finally, analyzing the classification variation of good or bad hygiene habits [Figures 2 and 3] pre- and post-intervention in both schools, results showed an increase in the percentage of students that scored higher than “good hygiene habits” (>21 points) and a reduction of students with “bad habits” (<14 points).

## Discussion

The results of this study show that interventions carried out by healthcare professionals in schools, which aim to promote good hygiene habits, have a positive effect on the level of health literacy in children and young adolescents. After the health education session, the results obtained at schools show an improvement of the hygiene habits, and younger students show greater improvements. Considering that age seems to play a factor when it comes to hygiene habits, this may suggest that an intervention on this topic should be performed as soon as possible, thus increasing the impact when it comes to changing a child’s habit.

However, one cannot undermine the possible Hawthorne effect when analyzing these results, as children and young adolescents first contacted with healthcare professionals at school when the health education session took place. This, in turn may have boosted their ability to concentrate and to retain information.

The fact that the relationship between age and hygiene habits was not verified during the second assessment may imply that all age groups benefitted from the intervention. Scores that were more heterogeneous and disparate in the first assessment became more homogeneous and close after the health education session.



**Figure 3:** Distribution of hygiene habits before and after the intervention in the “Paulo da Gama” school group

Despite the significant improvements, there was a high percentage of students with reasonable hygiene habits (more than two-thirds), which demonstrates that work has yet to be done in this context. This result can be because of socio-economic and cultural aspects owing to the high prevalence of children and young adolescents from that are originally from other countries.

As for the prevalence of head lice, the value is slightly higher than in other published studies, which show a prevalence of 25%.<sup>[24]</sup> Age and sex are in agreement with other publications, as it is a condition that affects more the girls aged 5 to 11 closer relationships and activities at school.<sup>[25,26]</sup>

## Conclusion

The results of this study show the importance of establishing partnerships between organizations that are involved in education and health. The collaboration between healthcare and education institutions can be a crucial point when it comes to improving the quality of life of current and future generations.

As hygiene habits are one of the cornerstones in primary prevention, it will be important to cover hygiene habits and offer advice when children come to visits in primary care (especially, the age groups between 8t and 10 years).

Further research at national level is needed to ascertain whether the results obtained are only regarding the Amora locality or whether they may eventually extend to other regions of the country where sociocultural, religious and population characteristics are different.

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## Conflicts of interest

There are no conflicts of interest.



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