Barriers and facilitators to the promotion of healthy eating lifestyles among adolescents at school: the views of school health coordinators

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Abstract

This study evaluates the perceptions of teachers in charge of coordinating health education in schools: the School Health Coordinators (SHCs). It addresses the success and barriers of the development and implementation regarding the first year of healthy eating programmes in their schools. This research is based on 16 face-to-face semi-structured interviews with SHCs from Portuguese public schools offering from fifth to ninth grades. A thematic analysis was performed and themes were identified, taking into consideration similarities and differences among the participants’ opinions. The results showed that the schools in this study often involved a set of separate healthy diet promotion activities with a low level of joint effort from all members of the school. Nevertheless, in Portugal, health education is based on the broad concept that school health promotion is compulsory for all schools. Two main barriers were identified in order to explain this divergence: structural and political idiosyncrasies among schools and the food environment inside and outside the schools. The results are discussed considering the wide range of factors influencing young people’s eating behaviours and recommendations are made for the different agents interacting with them in order to promote appropriate eating habits.

Introduction

Health and education are inextricably linked [1, 2]. Schools are increasingly called upon to target health concerns in their student population [2–4] by encouraging healthy lifestyles with a view to prevent chronic diseases [5, 6]. The basic principle underpinning this standpoint is that positive health behaviours can and should be integrated during childhood [7]. Schools provide the most effective and efficient means to reach a large segment of the population: students, teachers, staff, family and community members [8] and no other institution has as much continuous, intensive contact and influence on adolescents during the first stages of their life [9]. There were about 98.3 million pupils and students enrolled in educational establishments during the EU-27 in 2005 [10]. In Portugal, students from the fifth to ninth grades (aged 10–15 years) spend a weekly amount of time at school of up to ≥27 h, if lunch and other breaks are included [11].

In this context, many European countries have implemented school policies relating to education and health, namely by applying the concept of the Health Promoting School (HPS) [12, 13]. The HPS concept from the World Health Organization, in collaboration with the European Commission and the Council of Europe, is based on a setting or contextual approach and it has been advocated as an effective means to promote health-related behaviours and...
well-being in school communities by developing supportive environments [14, 15]. It is as multifactorial approach [16] that operates in three main domains [17]: (i) the formal health curriculum that gives students the essential knowledge and social skills that will enable them to make enlightened choices affecting their physical and psycho-social health; (ii) the school climate, which refers to the quality of the school’s physical and social environment; and (iii) the social–community interactions. To this end, schools should use their full organizational potential to promote health among the school community and community members [18].

This research has shown that the improvement of health focusing on healthy eating, physical exercise and mental health promotion is the most effective way to influence overall health attitudes and well-being of the school community as a whole [5]. This is particularly relevant for adolescents when eating at school. Therefore, there is a need to identify opportunities to promote the nutritional status of adolescents [19, 20]. In fact, health and nutrition are closely related [18], which is particularly relevant for young people, because the adequate intake of nutrients and energy is critical for growth [21]. Additionally, eating behaviour developed during childhood and adolescence has the potential to last a lifetime [22] and may have long-term implications on health.

Since 2005, health education is compulsory for all schools in Portugal [23]. The programme is based on the broad concept of the HPS and it is referred to as health education. In force since 2007, the promotion of health education in schools is considered part of the students’ personal and social development [24]. It is focused on developing their ability to make enlightened and responsible decisions [24]. Each school appoints a team of teachers to promote health education adjusted to the school community’s needs. The team and its coordinator are designated by the principal according to their profile, training and experience [25]. Schools have been granted greater autonomy to engage in health promotion activities beyond the curriculum as well as to involve the local communities. In this approach, schools should coordinate their actions with the local health centres [26, 27]. Priority themes were set by official guidelines, including: nutrition and physical activities, prevention of drug consumption, sexual education and prevention of sexually transmissible diseases such as HIV/AIDS, mental health and violence at school [24]. During the first years at most of the Portuguese schools, a focus was placed on healthy eating and physical activities when implementing their health intervention programmes [28], enhancing the need to analyse the effectiveness of these programmes.

The purpose of this qualitative study was to evaluate the perceptions of School Health Coordinators (SHCs): the teachers responsible for coordinating health education programmes at school level, regarding the successes and barriers of the development and implementation of the first year of healthy eating programmes in their schools.

Materials and methods

Subjects

To frame the study into the Portuguese Education System, it should be referred that compulsory schooling lasts for 9 years, from 6 to 15 years of age. It is divided into three successive cycles that last 4, 2 and 3 years, respectively, with this study focusing on the second and third cycles—fifth to ninth grades [29]. Participants were SHCs in public schools that included those grades in the municipality of Matosinhos (North of Portugal), from 2007 to 2008. The criterion to select the participants was based on the idea that people in charge of school health promotion are the most important source of information on school activities related to nutrition education and could provide valuable assistance in broadening the understanding of the matter [30–33].

Instruments and procedures

Face-to-face semi-structured interviews [34] were the method of choice to obtain in-depth descriptions of the opinions, perspectives and motivations associated to interventions carried out by SHCs. A semi-structured interview guide of open-ended questions was developed taking into account the following
dimensions: (i) principles and guidelines of nutrition education programmes integrated in the school health education approach; (ii) dynamics and drivers of the nutrition education programmes carried out in schools and (iii) constraints found during the conception, execution and evaluation stages of nutrition education interventions. Teachers were interviewed individually by the first author, at a time and place of their choice, usually at their school, between January and March 2009, ~15 months after the programme started. Interviews lasting, on average 25 (±9) min, were audio-recorded, anonymously transcribed verbatim and then handed to the participants to be read and validated [35]. Additionally, in July 2009, the schools’ surrounding environment was documented through direct observation to assess the availability of food around the schools: fast food restaurants, supermarkets, traditional grocery shops, coffee and cake shops. This definition is based on the basic assumption that food outlets in the schools’ surroundings would be accessible during school lunch breaks of ~30 min [36]. For the purposes of our study, only food outlets within a network buffer at a maximum walking distance of 300 m from the school were considered, and school premises have been visited accordingly.

Analysis
Interviews were analysed using a thematic analysis procedure [37]. Themes were identified inductively and the content was analysed both in terms of manifest and latent themes, an analytical process that involves a progression from description to interpretation data [38]. The transcripts of the interviews were entered into a qualitative data analysis software, QSR NVivo8 (Copyright® QSR International Pty Ltd, Melbourne, Australia) and a comprehensive process of data coding and identification of themes, consistencies and discrepancies across themes, was undertaken and explored to provide an in-depth understanding of the texts. Extracts were not exclusively assigned to separate themes and the overlap between themes in the data was used to inform the broader analysis [37]. Once groups of themes were created, constant comparison [39] was used to ensure the internal homogeneity and external heterogeneity of the categories. To support the analysis, calculation of the number of participants who mentioned a particular theme was performed, as the best indicator of prevalent theme [40]. To illustrate the analysis, direct quotes by the participants are transcribed, serving as a description of the topic explored. The quotes used in this text were translated into English.

Results
A total of 16 teachers, from 16 different schools, were interviewed, each a SHC at public schools with students from the fifth to ninth grades (aged between 10 and 15 years), in the municipality of Matosinhos. Only one interview with a SHC is missing, the first author of this study, to complete the municipality’s 17 public schools.

The majority of the SHCs had a degree in Biology (63%), whereas the others, representing slightly over one-third (38%), came from different backgrounds, such as chemical engineering, languages and literature, physical education, philosophy and nutrition sciences. About 69% were teaching the subject of natural sciences during the 2007–08 academic year. They were all female, aged between 28 and 60 years, with an average age of 48.1 (±2.3) years, had extensive teaching experience, with an average of 23.1 (±2.2) years and, with one exception, they had been working for not less than 3 years at that same school, averaging 10.8 (±1.8) years. The observed SHC feminization accompanies the general tendency in public Portuguese basic and secondary schools: in 2007–08, 70.4% of the Portuguese teachers and 80.5% of those teaching Biology were female [41]. In the 16 schools, the health promotion teams were, on average, composed of three teachers, varying between one (this was the case in seven schools) and nine members (for one school), and all had a team coordinator, the SHC.

Two broad levels of analysis were identified which combined many dimensions and themes, cutting across the different topics of discussion: the school environment and outside school
environment. All of the 16 participants reported these two broad levels in their interviews. The school environment level (606 references) represents the various agents participating in all the multiple ways schools think and promote nutrition education. It includes the following dimensions: students, school health promotion team, fellow teachers, school board and staff. The outside school environment level (146 references) represents the external social forces that hinder or reinforce the nutrition education strategies implemented by the school and includes the following dimensions: schools’ surrounding environment, family and local school community (stakeholders) in the immediate surroundings. The family takes part at these two levels, considering that the students’ parents (school environment perspective) and the students’ nuclear family (outside school environment perspective) represent the same sociological reality. Therefore, this dimension will be presented under the second level, considering that according to respondents’ narratives, direct parents involvement with school health education activities was low.

Each of these themes is described below.

**School environment**

**Students**

When the 16 SHCs were asked globally about the students’ eating habits, 75% deemed their food choices as unhealthy; students’ diets tend to be characterized by the regular consumption of processed foods, high energy dense foods, rich in fat and sugar and the low consumption of fish, fruits and vegetables. Taste was identified as an important determinant of adolescents’ food choices: ‘(…) they keep making the same mistakes and they don’t correct them because those very mistakes taste better, don’t they?’ (SHC14). Missing or substituting meals was also identified as an inappropriate eating habit by 31% of the SHCs. As a result, participants reported different nutritional imbalances and consequences, namely excess weight/obesity (25%) and loss of self-esteem, peer discrimination and social isolation (19%). To reverse those consequences, 75% of them suggested that schools should offer more healthy food choices as part of the school cafeteria menu; 44% highlighted the importance of involving students in school activities and 31% stressed the importance of developing the students’ food choice skills: ‘Basically, we should train children to make good options, good choices. We shouldn’t merely eliminate them; when faced with several options, they should choose the best one’ (SHC15).

**School health promotion team**

About 63% of the participants reported that they had nutrition education experience from occasional activities regarding the subject they taught within previous health education programmes set before the 2007–08 academic year. Moreover, most of the participants (81%) were in favour of promoting healthy eating habits, expressing a special interest towards nutrition education. The majority of the participants assumed that they were well acquainted with nutrition topics. This could be explained by the fact that nutrition was the aspect of the health education approach with which they were most familiar. As mentioned previously, most of the participants held a biology degree. Moreover, at the fifth to ninth grades in Portugal, various topics on nutrition are included in the natural sciences curriculum.

In fact, within schools, a focus was placed on nutrition education as a means to help schools to implement health education in 15 of the 16 schools in the study (a major focus was placed on sexual education in one of the schools). Some examples of nutrition education activities are provided in Table I. The World Food Day, on the 16 October, was the most common event described related to nutrition education in schools, mentioned by 87% of the participants and included different activities, such as conferences, free distribution of fruit or exhibition of students’ work.

Although 67% of the 15 participants identified changes in students’ nutrition at different levels (student’s nutrition knowledge, eating habits, students’ involvement in nutrition activities and development of skills related to the topic), by applying questionnaires to students or through informal indications
from students, 20% recognized that change took place very gradually over time, suggesting the need for the programme’s long-term evaluation: ‘I mean… I’m sure we’ll see some success in the future. We can’t identify the impact it has had. There was some momentary impact certainly; we saw results in the students’. (SHC14).

When analysing the health promotion team’s work organization, participants reported barriers and facilitators that are related to the school structure and to the SHC’s culture itself. At all schools, the board gave the SHCs a reduction of 2 weekly hours in their teaching duties, nevertheless, the nine participants that discussed the topic regarding their nutrition education teamwork complained essentially about the lack of time allocated to teamwork members, excessive work and overlapping tasks. The SHCs were also teachers at their schools and they were responsible for managing their time between teaching activities and health education tasks. On the other hand, they highlighted the main facilitators for their engagement in promoting health at schools: the convergence of views among team members, good communication and collaborative work among the team members to develop new projects.

**Fellow teachers**

SHCs recognized that colleagues’ collaboration was crucial to the successful implementation of healthy eating practices into schools (for 44% of participants), particularly through the intervention of the class directors. SHCs asked other teachers to participate identifying additional nutrition activities relevant to students’ needs and nutrition activities implementation: 25% of them reported that nutrition activities have a larger impact when they count with the collaboration of Physical Education (P.E.) teachers, and a few cited the collaboration with colleagues that worked with additional subjects: ‘We have a team of teachers in the canteen assigned to encourage the students to eat salads, to eat everything, to eat soup’. (SCH15). Nevertheless, participants identified a number of factors that seriously hindered their efforts to implement activities, such as: teachers’ lack of time to balance competing priorities in the classroom, teachers’ lack of interest.

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<table>
<thead>
<tr>
<th>Topics</th>
<th>Activities</th>
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<tbody>
<tr>
<td>Actions that promote a better theoretical knowledge of nutrition</td>
<td>Conferences (e.g. about milk consumption)</td>
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<tr>
<td></td>
<td>Video projections (e.g. ‘Super-size me’ movie)</td>
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<td></td>
<td>Slide presentations (e.g. about food safety)</td>
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<tr>
<td></td>
<td>Leaflet distribution (e.g. about World Food Day)</td>
</tr>
<tr>
<td>Actions that put the nutrition education curriculum into practice</td>
<td>Supply of healthier snacks at the school cafeteria (e.g. increase of bread type varieties)</td>
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<tr>
<td></td>
<td>Occasional offer of fruit and fruit juices</td>
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<td></td>
<td>Healthy vending machines (e.g. to end the sale of candy)</td>
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<tr>
<td></td>
<td>Healthy canteen meals (e.g. to promote a wider variety of salads)</td>
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<tr>
<td></td>
<td>Sale of organic products</td>
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<td></td>
<td>Sale of fair trade products</td>
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<tr>
<td>Activities involving the participation of students</td>
<td>Cultivation of aromatic plants</td>
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<td></td>
<td>Games and pastimes (e.g. about dietary rules)</td>
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<td></td>
<td>Production and exhibition of school projects developed by students</td>
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<td></td>
<td>(e.g. ‘Evaluation of the intake of sweeteners in a group of Portuguese young people’)</td>
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<td></td>
<td>Coverage of events by the school radio station</td>
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<tr>
<td></td>
<td>Collection of food products for charities (e.g. for retirement homes)</td>
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<tr>
<td></td>
<td>Recreations of the Portuguese Food Wheel [42] using different techniques</td>
</tr>
<tr>
<td></td>
<td>(visual arts, 3D, digital media)</td>
</tr>
<tr>
<td></td>
<td>Healthy Soup Fair (organized by the City Hall)</td>
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</tbody>
</table>
towards the subject, and teachers’ lack of recognition of the need to change food offered at school.

School board

The intervention of the school board in the development and implementation of the nutrition programme was referred to by the SHCs at two levels: the school’s nutrition education policy and the school’s food environment. According to 38% of the participants, the support from both the principal and the school board was essential to implement health promotion in the school, insofar as all the groups in the school are relevant agents in the project: ‘(...) there have to be guidelines from the school for everyone’ (SHC11). However, different factors that hindered the health coordinator’s task were referred, namely the teachers’ numerous responsibilities in terms of teaching and supporting other school board’s extra-curricular activities. Moreover, 31% of the participants reported the general lack of financial resources as an impediment to accomplishing the health promotion programme: ‘And then, the lack of resources, there’s never any money for anything’ (SHC15). Three of the participants also reported that, for students in the fifth to ninth grades, nutrition is taught intermittently at the sixth and the ninth grades, masked as a continuous learning process and they also mentioned that the time allocated to teaching nutrition was insufficient to truly promote healthy eating habits.

Considering the school’s food environment, participants distinguished between the nationally regulated school meal programme and the foods and beverages sold at the school outside the formal meal programmes (competitive foods). About 80% of the participants considered that the canteen food supply was well adjusted to the adolescents’ nutrition needs and in accordance with the contents being taught in classes, meaning that it is important for students to have lunch at the school canteen. Participants pointed out the different strategies implemented in their schools to increase the number of meals eaten at the school canteen, such as: closing the school cafeteria at lunch time, making lunch at the school canteen compulsory, improving the canteen to be more comfortable and pleasant and making the canteen menus more attractive by involving students in their design. In contrast, vending machines in schools were identified by 56% of the participants as a constraint to healthy eating, not only because of the type of foods supplied, mostly high energy density products, but also because of the difficulties in controlling the restocking activity of companies: ‘(...) often, when these companies re-stock the machines, they don’t pay any heed ... before we know it, they’re putting chocolate in there’ (SHC13). SHCs believe that these vending machines are kept in schools mainly because students find them practical and because they represent a source of revenue for the schools themselves. Accordingly, 25% of the participants reported the need to change the food supplied at school canteens, considering the unhealthy food items they offer. Interestingly, only three of the participants judged the school’s pricing policy inadequate, because the high price of some healthy products (e.g. natural fruit juices) was referred to as a constraint to the adolescents’ food choice.

Curiously, in the context of the school food supply, the relevance of interventions by school food service professionals was marginally reported by participants (only 13 references reporting this aspect within six of the interviews).

Outside school environment

Schools’ surrounding environment

Participants discussed the influence of food outlets around the school. About 56% considered that it hindered healthy eating behaviours among students because they offer a variety of attractive and enjoyable but many times unhealthy food products. They reported that students shopped there for high energy density food products, such as deep-fried food, hotdogs, croissants, soft drinks, pizza, hamburgers, chips, cakes and confectionary. The number of food outlets within 300 m of the schools ranged from one to eight. In this study, 69% of the schools had at least three food outlets within a 300 m street network buffer (Table II).
Schools feel helpless in the face of this kind of competition and have no idea as how to overcome this situation, leading to a feeling of resignation confessed by three of the participants who discussed this topic: ‘(...) maybe closing the coffee shops in front and those shops selling candies... and that pre-packaged food... I mean, it would help but it is impossible to do... we cannot close the shops on the street’ (SHC2). Nevertheless, SHCs reported a wide array of activities implemented individually or by their schools in order to modify the food supply near the schools or to dissuade their purchase, such as banning unhealthy food products bought outside once the students entered the school, drawing the students’ attention when they ate unhealthy foods and persuading food outlets to change their unhealthy food offer to a healthier one.

Additionally, only four participants discussed the intervention of the media on healthy eating of young people, pointing out that the majority of the foods advertised during young people’s television viewing hours conflicted with current recommendations for a healthy diet. As is the case in other countries [43], in Portugal, children’s televised food advertising was found to be dominated by a ‘big four’ of food items: breakfast cereals, confectionary, savoury snacks and softs-drinks [44]. Nevertheless, those SHCs believed that the media should be driven to promote healthy products like fruits and vegetables.

**Family**

Participants discussed the influence of the family on healthy eating of young people. According to 38% of them, greater coherence between what is taught at school and food behaviour at home as well as greater parental monitoring of adolescents’ consumption, were considered to be helpful in nutrition education: ‘(...) I think good habits should begin at home. The school can help or encourage some degree of change, but what’s the point if they change in here, and then go back to wrong habits when they go home...’ (SHC8). Moreover, family eating habits were perceived by half of the participants as inadequate and as an obstacle to balanced food consumption among adolescents, mainly derived from: lack of time to prepare healthy meals, lack of family knowledge about nutrition content, lack of money to purchase healthy food and unstructured families. These perceptions came from informal conversations with students and/or parents and by observing the students’ snack composition.

SHCs considered that it is necessary to act within the family circle, in order to encourage families to adopt a healthy diet and to promote a more effective control of what adolescents eat.

The SHCs reported different strategies as a means to involve parents when they planned their health education activities, namely implementing nutrition information sessions/seminars and developing activities driven by students as a means to involve their parents. Despite the efforts undertaken, family participation was considered to be rather low by the interviewees.

**Local school community**

During the interviews, SHCs involved in the nutrition education programmes also highlighted the

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**Table II.** Frequency of food outlets around schools in the municipality of Matosinhos, considering a street network buffer of 300 m from the school entrance

<table>
<thead>
<tr>
<th>Food outlets around schools</th>
<th>Schools</th>
<th>mean (±SD)</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee shop</td>
<td>5 3 5 7 1 5 2 2 5 3 4 1 2 5 1 2</td>
<td>3.3 (±1.9)</td>
<td>3.0</td>
</tr>
<tr>
<td>Supermarkets</td>
<td>1 1 1 2 1 1 2</td>
<td>1.3 (±0.5)</td>
<td>1.0</td>
</tr>
<tr>
<td>Traditional markets</td>
<td>2 1 1 1 1</td>
<td>1.3 (±0.5)</td>
<td>1.0</td>
</tr>
<tr>
<td>Fast-food restaurants</td>
<td>1 1 1 1 1</td>
<td>1.0 (±n.a.)</td>
<td>1.0</td>
</tr>
<tr>
<td>Total food outlets</td>
<td>8 3 7 8 2 7 3 2 6 3 5 1 3 7 1 2</td>
<td>4.3 (±2.5)</td>
<td>3.0</td>
</tr>
</tbody>
</table>

n.a., not applicable
collaboration between school and the outside community when considering the development and the implementation of health education programmes, setting up links with health care services, universities and local authorities. According to 47% of those participants, health care services have contributed to the success of school nutrition education programmes. In Portugal, the provision of school health services is a community-based approach. Although health professionals did not work inside schools, they were well placed to act as a bridge between actions carried out by schools and those undertaken at community level [45]. In this study, participants reported that collaboration with community health services (nutritionists and nurses) took on special relevance, as they supported specialized advice, that may be taken by supervising the composition of the food offered at school or accompanying students with nutritional problems [26]; shown greater proneness to collaborate in nutritional activities with students, parents and teachers; supported specific links with other health care services, promoted greater audience awareness regarding nutritional issues, taken as a free cost service and allowing the development of a greater number of activities: ‘(...) We are very concentrated on what we’re thinking, on our own ideas, which may not always be the most appropriate. But then, once I had trainees (nurses) working with me, it was a little bit better’ (SHC3).

Table III depicts a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis reflecting the SHCs’ positions and viewpoints on the school’s internal strengths and weakness and its environmental opportunities and threats regarding healthy eating programmes in a school setting. It can be used to support future decisions and actions to be taken by school agents involved in the implementation of healthy eating programmes.

**Discussion**

This study shows that, similar to previous research results [32, 46–51], teachers and SHCs in particular have a positive attitude towards promoting healthy eating. When exploring the main reasons for this commitment, the role of the SHCs emerges as fundamental, insofar as the matter of nutrition is a cause they are vested in and which is familiar to them. Additionally, the SHCs believe their interventions can foster positive changes in young people’s lifestyles, even though these changes take place gradually over time. The teachers’ perceptions of the usefulness of healthy eating education at schools in the lives of young people had already been reported by Deschesnes et al. [30], Viig et al. [51] and Jourdan et al. [31].

The emerging epidemic of overweight and obesity among young people in the last few decades may explain this concern. The prevalence of overweight and obesity among Portuguese adolescents (aged 10–18 years) ranges from 21.6% to 32.7% for girls and from 23.5% and 30.7% for boys, based on International Obesity Task Force (IOTF) and WHO criteria, respectively [52]. Portugal ranks midway in estimates of the prevalence of overweight and obesity (using IOTF criteria) in schoolchildren (aged 10–16 years), within 34 countries [53]. Additionally, SHCs perceived inappropriate eating habits by adolescents, namely the consumption of high energy density food, the omission or substitution of meals and the fact that taste is operating as a food choice determinant. Accordingly, SHCs identify the need of developing a health education programme on healthy eating with a larger field of action, namely the offer of healthier food choices at the school cafeteria and the involvement of students in school activities that would help them to develop food choice skills. Regarding this subject, it is important to refer that taste is even more important for food choice among young consumers [54–56], for whom cost, nutritional value and ease of preparation are irrelevant factors [54]. At this point, views on the way young people deal with the binomial food choice versus food availability, in relation to healthy and unhealthy foods, were perceived by the SHCs as an important determinant of the students’ diet in at least three settings: family, school and school surroundings.
Family environment

Although the participants considered that parents can influence the eating patterns and food intake of their children, they reported that many times parents were not receptive to encourage their children to engage in healthy behaviours. Three main barriers were identified by the SHCs that hindered parents from promoting healthy eating at home: lack of time, lack of nutrition knowledge and lack of money to purchase healthy food. These barriers were previously described in the literature [57–59]. Taking Birch and Davison’s advice [60], that effective prevention programmes must focus on providing anticipatory guidance on parenting to foster patterns of preferences that are more consistent with healthy diets in adolescents, SHCs should help parents to discover: how to increase children’s healthy food preferences and how to encourage their acceptance of new foods, how to prepare healthy food on a limited budget, how to provide recipes for convenient healthy snack alternatives and how to develop strategies to limit the access and availability of unhealthy foods at home [58]. However, the SHCs reported that parents showed low interest in health nutrition activities developed at school, a major obstacle for a successful approach.

School environment

Moreover, students at school can purchase food or beverages at different places, each actively competing with healthy guidelines. In Europe, there is a wide variation within and across countries as well as age groups, regarding the way food is made available at schools [61]. In Portugal, the school food supply for the fifth to ninth grades is at the responsibility of the school’s principal and should follow the guidelines issued by the Portuguese Ministry of Education [62, 63]. Participants considered that schools have substantially improved the nutrition profile of regulated school meals, through the application of nutrition guidelines for school meals’ composition. In light of the information collected from the SHCs, previous research findings on school lunch programmes indicated that students who participate in these lunches experienced significant improvements in their diet and eating behaviour, namely by improving the consumption of fruits and vegetables [64–66]. According to the SHCs, healthy school lunches and eating at school canteens must be promoted, and the unhealthy food available in vending machines and school cafeterias should be removed. The high availability of such foods also conveys the message that these foods are acceptable and may encourage students to choose them to the detriment of the school meal programme [67, 68].
Taking into account all these findings, it is recommended that Portuguese schools examine their food-related policies and consider strategies to decrease access to foods and beverages that are low in nutrients and high in fats and sugars. Even considering that many schools rely on the revenue from vending machines, as also reported by our participants, it is possible that when access to competitive foods is restricted, the students’ participation in school meal programmes will increase, compensating for the loss of revenue from snack sales [9]. Additionally, price reduction strategies to increase the purchase of healthier foods, while simultaneously increasing prices on preferred high energy dense foods, can be an effective way to encourage the selection of those targeted foods [69–71]. Moreover, vending machines and school cafeterias could also be used to advantage in selling healthy food products [61]. Curiously, in the context of the school food supply, the intervention of school food service professionals was marginally reported by the participants. Nevertheless, previous studies indicate that the successful promotion of healthy eating also depends on the importance it is given to it by food service staff [72, 73].

### School surroundings

According to the participants, school food supply competes with food outlets outside the school. As reported in various US studies, these food outlets are systematically concentrated within a short walking distance from schools [74, 75], exposing schoolchildren to an unhealthy food environment in their school surroundings and contributing to obesity [75, 76]. In this research, 69% of the public schools of the municipality of Matosinhos had three or more food outlets within a 300 m street buffer, thus within easy reach. This is why the SHCs argued that schools should promote the development of food choice skills, enabling students to make healthy decisions and to defend themselves by refusing foods that are more palatable but more energy dense. As a result, the promotion of healthy eating habits must entail the establishment of a clear link between food intake and young people’s health needs and provide them with a realistic sense of efficacy and responsibility associated with a more positive eating identity: their appearance [19]. Gains of health oriented dietary changes are mostly related to the far future, uncertain and hardly perceivable [77]. This would suggest that the message addressed to adolescents should focus on shorter term effects of a healthy diet, namely on positive appearance effects, as this would help them build their self-confidence and peer acceptance [19].

### School structure and policy

Participating SHCs identified structural and political difficulties to implement healthy eating programmes in a school setting. Not all teachers are comfortable with the commitment that healthy eating promotion programmes require, considering that they must accumulate this additional project with other activities implemented at school and supported by the school board. In fact, in this study, the school environment level was more prevalent than the outside school environment level, reflecting the influence of the school’s structure and policy on healthy eating promotion. It emphasizes that SHCs and their peers have difficulties in embracing this kind of project in an environment that is already under significant pressure [46]. Lack of time and/or lack of funding still remain as barriers to the participation of teachers in health promotion programmes, as has also been reported in recent studies [30–32, 53, 78–80]. As suggested by St Leger [46], to gain the commitment of the school principal, SHCs can also argue that the concept of HPS, particularly healthy eating, will enable schools to address other issues, such as violence, family breakdown or environment. SHCs should furthermore draw the attention of their peers to the fact that they can potentially improve students’ academic performance [45], by recognizing the link between student health indicators and positive outcomes [81–84]. The teachers’ recognition of improvements in students’ learning has been identified as one of the major reasons leading teachers to change their practices [50].

As this study had a qualitative focus, the findings are not generalizable to the entirety of the
Portuguese schools. Another limitation in this study is that SHCs reported their participation in healthy eating programmes as they perceived them and thus there may be some degree of self-reported bias from those interested in the programme. Furthermore, the perspectives of the multiple stakeholders involved were not compared.

**Conclusion**

To sum up, this study has shown that there are many interlinked factors influencing young people’s eating behaviour, reinforcing the idea that ensuring that students choose a healthy lifestyle is not the responsibility of schools alone [85]. Young students receive many competing messages from family, peers, teachers, health professionals and the media, emphasizing the need for consistent and repeated messages delivered by the school community and family in promoting effective healthy eating habits [58, 86]. Schools should put the HPS principles into practice, by using its full organizational potential, and not only the school health promotion team, to operate in a number of areas that go beyond the classroom, namely by enhancing the school environment and establishing closer links with the community [46]. However, our SHCs evoked the schools’ structural and political barriers with regard to collaboration from fellow teachers and conversely relegated the intervention of school food services on healthy eating promotion. Moreover, the SHCs positively highlighted the existing cooperation between school and the health care services. Nevertheless, care should be taken as setting up these links with health professionals to support their actions or to contribute with specific medical knowledge, may lead to a biomedical rather than a global approach [45]. Additionally, participants reported the parents’ low level of involvement in healthy eating promotion at school. As a result, it could be argued that more effort should be devoted to the HPS approach, to avoid the reported panorama within many of the schools under study, which often involves a set of healthy diet promotion activities disconnected from overall nutritional and physical exercise policies or disregarding joint efforts involving the school community at large.

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