



Research article

Parental perspectives on Children's lifestyles: A Path for school health promotion

Nicole Amorim^{a,*}, Brito Irma^b, Fátima Guerra^c, Rute Lopes^b, Miguel Ricou^d^a ICBAS - School of Medicine and Biomedical Sciences, University of Porto & UICISA:e, Portugal^b Nursing School of Coimbra & UICISA:e, Portugal^c Community Care Unit Coimbra Saúde, ACES Baixo Mondego, Portugal^d Faculty of Medicine, University of Porto & CINTESIS, Portugal

ARTICLE INFO

Keywords:

Healthy lifestyle

School health

Family health

Community nursing

Participatory health research

ABSTRACT

The National School Health Program in Portugal advocates for healthy lifestyles. However, school health teams mostly focus their activities on educating children, whereas it is the families who are primarily responsible for managing children's lifestyles. Although the programme proposes interactive health education activities, such as meetings with the children's families, few parents participate in these activities. The project *Gostar de Mim* was created to bridge this gap by promoting healthy family lifestyles in school settings. The project used an evaluating instrument called the 'Parents' Booklet' packed with information. This study assessed the usefulness of the booklet in providing health information and planning family engagement. Based on the PRECEDE-PROCEED framework (PRECEDE: Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation; PROCEED: Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development), this article focuses on the social and epidemiological assessment phases. We examined the health surveillance status of children aged 6–10 years (epidemiological phase) and description of health behaviours in different lifestyle dimensions (behavioural and environmental phase). The Parents' Booklet was used to identify parents' perspectives on their children's lifestyles. Data analysis of 568 Parents' Booklet (23 schools) use cases showed that the lifestyle priorities, in order, were 'sleep and rest' (95.6 %), 'energy balance' (100 %), 'oral/body healthcare' (95.6 %), 'alcohol, tobacco/other drugs' (73.9 %), 'consumerism' (91.3 %), 'leisure-time occupation' (91.3 %), and 'literacy and satisfaction at school' (86.9 %). Clearly, the Parents' Booklet was useful, as it made it possible to obtain information that allowed for participatory school health diagnosis and can guide community nursing actions that need to be developed in schools. Crucially, this tool can be useful for parents, enabling them to be more aware of their children's lifestyle via self-monitoring as well as increasing their participation in health education.

1. Introduction

Improving the health status of populations, especially the most vulnerable, requires citizen empowerment strategies developed throughout their lifecycle, overcoming the social and commercial determinants of chronic diseases, and creating healthier

* Corresponding author.

E-mail address: direcao@medicinaintegrativa.pt (N. Amorim).

<https://doi.org/10.1016/j.heliyon.2024.e30095>

Received 1 September 2023; Received in revised form 13 April 2024; Accepted 19 April 2024

Available online 29 April 2024

2405-8440/© 2024 Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

communities [1]. The World Health Organization has defined a healthy lifestyle as a way of life that prevents the onset of disease and early death by encompassing physical, mental, and social well-being [2]. The Portuguese National Program for Child and Youth Health [3] and Portuguese National School Health Program [4] (PNSHP) outline several guidelines to promote the proper development of children based on the healthy lifestyles of their families.

School-based health promotion, established by the PNSHP, can help improve the determinants of children’s health. Children with a good start in life learn better, live more productive lives, and actively contribute to society. This programme uses several health education strategies [4]. However, school health teams’ activities focus mainly on children’s education, despite knowing that it is their families who manage the children’s lifestyle habits. When the focus is on families, the adoption of a healthy lifestyle affects not only these subjects’ but also their families’ way of life, especially that of the children. Indeed, evidence shows that from an early age, children’s lifestyles are influenced by their family and sociocultural contexts, thereby directly impacting their development, health, and well-being [5]. Health education in schools is traditionally aimed at children with low levels of family involvement. According to DeWalt and Hink [6] and Lee et al. [7], parents’ health literacy increases the health of school-age children. Thus, families need to be included in the health promotion activities aimed at school-age children. According to the International Collaboration for Participatory Health Research [8], participatory approaches to health research are increasingly drawing the attention of funders, decision makers, researchers, and civil society worldwide. As a paradigm (not a method), participatory health research maximises the participation of those whose lives or work are the subject of the research at all stages of the research process.

The project *Gostar de Mim* (or ‘Love Myself’ in English), developed by Brito [9], arose from the need to involve families in the health promotion process and simultaneously standardise educational interventions in school settings covered by a Community Care Unit (CCU). *Gostar de Mim* is a community-based participatory health research project [8,9] for the co-creation of a school health intervention as part of the Peer-education Engagement and Evaluation Research (PEER) project, registered at the Health Sciences Research Unit: Nursing (UICISA:e). This process has been ongoing since 2016, enabling the creation of a procedure manual and the ‘Parents’ Booklet’ [9]. Both constitute instruments that allow the self-monitoring of children’s lifestyles. In this context, *Gostar de Mim* was designed to involve families directly in the initial and final diagnoses (self-monitoring scale), and indirectly in the process of monitoring activities focused on children and evaluating results. It also documents nursing activities to help implement the PNSHP in school settings; thus, it is a record of the needs of children and their schools, and results of the intervention with the families.

During the process, if children or families with high health vulnerability (unhealthy lifestyles or biometric indicators, according to the PNSHP) are detected, the parents are contacted by the school’s health team. When positive consent is received, families are referred for specialised assessment and presented with prevention activities or social support. This procedure is included in school health nursing tasks and practices. In the future, the Parents’ Booklet is intended to be a tool for the participatory diagnosis of the health situation of school children and a resource to interact with them.

This work aims to describe the initial implementation process of the *Gostar de Mim* project, and presents the results of a situational analysis of school health within rural and urban regions in Portugal using the Parent Booklet that was co-created with the families. It also aims to assess the usefulness of the booklet in monitoring children’s lifestyles, encouraging parents’ involvement, and promoting healthy lifestyles among children aged 6–10 years in 23 selected primary schools where research was conducted.

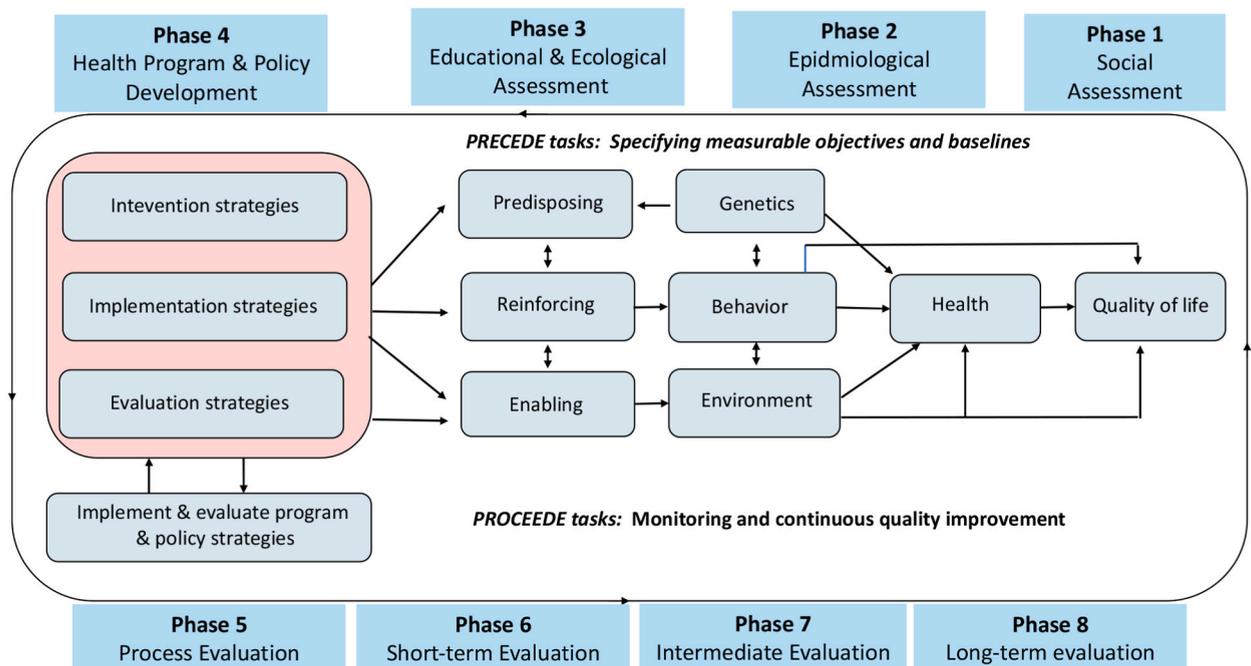


Fig. 1. Based on the representation of the PRECEDE-PROCEED model with its planning, implementation, and evaluation phases [10].

2. Materials and methods

Gostar de Mim involves five steps: 1) At the beginning of the school year, the school health team (specialised nurses) registers pupil lists, by school, on the data platform of the Portuguese National Health System (NHS). Then, in school meetings, the team explains the project to teachers and parents, and delivers the Parents' Booklet to parents through teachers. It is then returned after being filled out by the parents. 2) The data collected from the booklet is entered into the NHS platform. The Parents' Booklet is then returned to the parents so that families can benefit from it for child and family health promotion, and even monitor and register their children's lifestyle for the final evaluation. 3) Afterwards, the parents are invited to a meeting to reflect on the usefulness of the Parents' Booklet. 4) During the year, health promotion interventions are carried out for the children using educational games and sending home some parent-child activities for family. 5) Some online meetings are also conducted with the families (monthly dynamised by specialists according to the themes proposed by the PNSHP). At the end of the school year, parents are invited to fill out the Parents' Booklet again, reassessing the changes in the children's lifestyle. The booklet was developed in 2016 with the school health team and a group of parents as an assessment tool useful for PNSHP implementation. It also contains information to increase parents' health literacy.

This project was developed within the participatory health research approach [1] and applies the PRECEDE-PROCEED framework. PRECEDE stands for Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation, and PROCEED stands for Policy, Regulatory and Organizational Constructs in Educational and Environmental Development [10,11]. This framework presupposes the following: the first stage (PRECEDE, health situation diagnosis) guides the design of collaborative actions for health promotion, and the second stage (PROCEED) corresponds to the implementation and evaluation of the planned health promotion activities [10]. According to the PRECEDE-PROCEED model [10] illustrated in Fig. 1, this consists of eight phases: Social Assessment (phase 1), Epidemiological Assessment (phase 2), Educational and Ecological Assessment (phase 3), Health Program and Policy Development (phase 4), Process Evaluation (phase 5), Short-term Evaluation (phase 6), Intermediate Evaluation (phase 7), and Long-term Evaluation (phase 8). This article focused on Phases 1 and 2 only, as school health activities were interrupted due to the COVID-19 pandemic. The first phase, Social Assessment, focuses on the population's quality of life related to health and other factors. The second phase, Epidemiological Assessment, begins with a review of the incidence, prevalence, and distribution of health conditions, and subsequently, the population's health related to behaviour and the environment (rural or urban).

2.1. Participants

The study participants were the parents of children from 23 primary schools in central Portugal (urban and rural) who accepted the invitation to self-monitor the lifestyle of their children using the Parents' Booklet. Of the 649 invited parents, only 568 participated in the project. No exclusion criteria were applied, and the booklet was filled in by the mother, father, or legal guardian (the decision was up to the family). No social or educational information was collected to improve adherence. The schools were grouped into urban (8 schools) and rural zones (15 schools). The sample was collected in 2019 by the school's health team (six community nurses from the Health Care Center with the task of implementing the PNSHP). This survey included all schools in the area covered by the Health Care Centre. Therefore, no sampling criteria were established and all families of children attending school were included. According to PNSHP, all families are entitled to benefit from school health activities. As participation in the study was voluntary, some families did not participate, reducing our sample to 568 participants.

2.2. Data collection

We proceeded to characterize the territory and set of schools (social diagnosis), health surveillance status of children aged 6–10 years (epidemiological diagnosis), and description of health behaviours in the different lifestyle dimensions (behavioural and environmental diagnosis).

The assessment instrument Parents' Booklet was the resource used for data collection to define the behavioural and environmental diagnosis (Appendix I). It is a self-completion questionnaire to assess a) lifestyle and b) adherence to safety measures and accident prevention for children. The instrument also allows parents to analyse the results and can (or cannot) be shared in the reflection sessions with the families that are part of the Gostar de Mim project. Children's lifestyles are assessed with 45 questions grouped into 11 dimensions: 'sleep and rest', 'energy balance', 'normal development', 'oral and body healthcare', 'alcohol, tobacco and drugs', 'consumerism', 'interaction with friends at school', 'leisure time occupation', 'no injuries (accidents and diseases)', 'affections and emotions', and 'literacy and satisfaction at school'. Note that questions related to 'alcohol, tobacco, and drugs' refer to children being exposed to such use (or abuse) at home. This instrument presents three answers for each question: '0', '1', and '2'. The higher the sum, the closer the children are to a healthy lifestyle. Scores of '0' and '1' should lead parents to reflect on the causes and consequences of their children's unhealthy behaviours. The validation process for the Parents' Booklet is underway and will be submitted in another article.

At the beginning of the school year, a meeting was held with the teachers and parents' association to explain the project, and reflect on its relevance and usefulness. The school health team taught parents how to use the Parents' Booklet. Besides this, the booklet was accompanied by a letter explaining the project and included instructions on how to use the Parents' Booklet. The instrument was delivered through the official communication circuit: 1) The school health team delivered the Parents' Booklet to the teachers in a number approximate to the number of students per class. 2) The teachers sent it to the parents' home in an envelope with the instrument and instructions for completion through the children. 3) Parents who did not want to participate did not fill out the instrument. 4) Parents who did want to participate filled out the instrument, reflecting on its usefulness in managing their children's

of health problems.

3.1.1. Children's lifestyle

Regarding the behavioural and environmental diagnosis, the use of the Parent's Booklet allowed the data collection of the lifestyles (LS) of children aged 6–10 years. The 11 dimensions of the instrument showed global results in relation to the items in which the behaviours were considered healthier (position 2) or less healthy (position 0). In total, 23 primary schools completed the instrument, totalling 568 families. The global average of lifestyles reported by parents was 75.7 (± 7.8) points (for a maximum of 90 points). No significant difference in the overall mean value of the LS of children was observed between urban (U) or rural (R) territories ($U = 75.3 \pm 7.6$; $R = 76.0 \pm 8.0$; $t = 0.996$; $p = 0.502$).

Table 1 summarizes the analysis results for lifestyles reported by parents and schools. The analysis was organised by school and territory because the school health team needs to know the prevalence of lifestyle behaviours among children by group so that it may undertake appropriate community interventions. The schools that had less than 60 % of '2' scores of healthy behaviours. Those with a prevalence of risky behaviours exceeding 5 % were selected as priority cases for immediate intervention; these are coloured grey. As previously mentioned, the data were submitted to the NHS platform, allowing protected access only to health teams.

On 'sleep and rest', parents reported that 40.1 % of their children sleep between 10 and 13 h a day, 59.6 % have no difficulty falling asleep, and 78.0 % have no nocturnal enuresis. Regarding 'energy balance', most parents reported that their children ate breakfast daily (82.7 %). Daily consumption of five pieces/portions (fruits or vegetables) was reported by 70.6 % of the parents; however, 6.0 % reported that their children ate hypercaloric food (sweet, salty, fried) every day. A few children seemed to have a habit of drinking liquids only when they felt thirsty (14.4 %) and performed physical exercise less than thrice a week (18.8 %). Although 64.8 % of the children were of appropriate weight, 11.7 % did not engage in physical activity.

Regarding the 'normal development' of children, parents reported that their children know their full name, age, address, and date of birth (80.0 %), have a fluent and well-articulated vocabulary (73.3 %), confuse some sounds (10.9 %), and wear glasses (13.6 %). A very small percentage of parents suspected that their children had visual (2.2 %) and/or hearing impairment (1.0 %), with only 0.8 % wearing hearing aids. Most parents stated that their children always or almost always showed psychomotor coordination in different life contexts (77.3 %) as well as always or almost always dressed without help (73.8 %). Regarding 'oral and body health', parents reported that their children brushed their teeth two or more times a day (58.6 %), or only once a day (24.8 %). Approximately 42.1 % of the children had never had tooth decay, and only 7.2 % had untreated cavities. Most children (80.2 %) always or almost always washed themselves, their hands, and their faces unaided. Regarding 'alcohol, tobacco, and other drugs', slightly more than half of the parents reported that their children were not exposed to tobacco smoke (59.4 %), with a minority (2.86 %) being exposed at home and/or in a car. Likewise, 58.9 % of the children were not exposed to the consumption of alcoholic beverages (they see drinking) at home. Most parents (72.0 %) said that their children were not exposed to the use of other illicit drugs, with only 0.2 % reporting this. Most (73.3 %) were not exposed to excessive medical drug use (see taking medication), but 4.0 % were. Regarding 'consumerism', 46.0 % of parents reported that their children have many toys, although they do not play with all of them. Approximately 34.1 % and 19.3 % of parents reported that their child occasionally throws tantrums to buy toys, games, and sweets, and that they have a lot of clothes and do not wear them all, respectively.

Regarding 'interaction with friends and at school', most parents (77.5 %) reported that their child chooses and plays with friends without discriminating against them, whereas 0.7 % isolate themselves. Most of them (74.2 %) understood and accepted the rules when playing; however, 4.9 % were hyperactive and had concentration disorders. On children's 'leisure time occupation', almost half of the parents (49.3 %) reported that their child is enrolled in extracurricular activities about twice a week, whereas 16.1 % do not undertake any activities outside the school curriculum. More than half of the children (66.1 %) socialised with other family members and/or friends twice a week. However, 39.9 % stayed in front of the screen for approximately 1–2 h a day and 4.7 % for more than 2 h a day.

Regarding the item 'injuries, accidents and illnesses in the last school year', most parents stated that their child always uses seatbelts/car seats (80.9 %), while 2.5 % do not always do so. Approximately 74.5 % of parents reported that their children had accidents/injuries at school or on the way to school fewer than three times. A similar percentage reported no accidents at home or on the road (80.7 %), and accidents/injuries at home and/or during leisure activities (74.2 %) in the previous year. Regarding bullying situations (victims/offenders) in the past year, most parents reported that their child was not involved (71.0 %), whereas 12.1 % reported that their children were involved occasionally.

A little more than half of the parents (56.5 %) reported that, in the last year, their child had two health surveillance visits (doctors and dentists). On 'affections and emotions', 78.8 % of the parents reported that their children always or almost always like to receive or give affection (78.0 %), know how to express their needs or emotions (74.5 %), and have self-control (66.3 %). As for 'literacy and satisfaction at school', 63.1 % of the parents reported that their child always or almost always likes to read, and is also told stories. In total, 51.5 % reported that their children often do not return from school sad or unmotivated, whereas 29.9 % reported that this is only occasionally the case. Approximately 66.4 % reported that children are always or almost always involved in school activities (at school and at home), 72.3 % never or almost never refused to attend school, and only 9.9 % refused occasionally.

Notably, the dimensions with the lowest values in most schools were 'sleep and rest', 'energy balance', 'oral and body health', 'alcohol, tobacco and other drugs', 'consumerism', 'leisure time occupation', and 'literacy and satisfaction at school'. The dimensions with the highest scores were 'normal development', 'interaction with friends and at school', 'no injuries and diseases', and 'affections and emotions'. The schools in this situation were S1, S3, S12, S15, and S28, which belonged to rural areas (33 % of rural schools), and S10, which belonged to an urban area. Regarding risk behaviours, the energy balance dimension showed almost all risk behaviour items above 5 %.

Table 2
Correlation coefficient of children’s lifestyle scores gathered from the ‘Parents Booklet’.

N = 568		Sleep and rest	Energy balance	Normal development	Oral and body health	Alcohol, tobacco, and other drugs	Consumerism	Interaction with friends and school	Leisure time occupation	No injuries	Affection and emotions	Literacy and satisfaction with school
Sleep and rest	ρ	1										
	s											
Energy balance	ρ	0.329**	1									
	s	0.000										
Normal development	ρ	0.401**	0.483**	1								
	s	0.000	0.000									
Oral and body health	ρ	0.328**	0.381**	0.461**	1							
	s	0.000	0.000	0.000								
Alcohol, tobacco, and other drugs	ρ	0.262**	0.400**	0.471**	0.356**	1						
	s	0.000	0.000	0.000	0.000							
Consumerism	ρ	0.228**	0.330**	0.346**	0.361**	0.409**	1					
	s	0.000	0.000	0.000	0.000	0.000						
Interaction with friends and school	ρ	0.233**	0.294**	0.411**	0.319**	0.319**	0.398**	1				
	s	0.000	0.000	0.000	0.000	0.000	0.000					
Leisure time occupation	ρ	0.169**	0.320**	0.287**	0.268**	0.242**	0.160**	0.395**	1			
	s	0.000	0.000	0.000	0.000	0.000	0.000	0.000				
No injuries	ρ	0.194**	0.290**	0.351**	0.325**	0.298**	0.339**	0.596**	0.442**	1		
	s	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
Affection and emotions	ρ	0.240**	0.301**	0.455**	0.343**	0.322**	0.390**	0.668**	0.416**	0.601**	1	
	s	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		
Literacy and satisfaction with school	ρ	0.250**	0.297**	0.364**	0.274**	0.430**	0.319**	0.610**	0.380**	0.557**	0.561**	1
	s	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

Legend: ρ—correlation coefficient; s—significance, if ** the correlation is significant.

Importantly, 60 % schools presented a need for intervention (values below 60 % on healthy behaviours). The most prevalent dimensions were 'energy balance' in 100 % of schools, 'sleep and rest' in 95.6 % schools, 'normal development' in 43.5 % schools, 'oral and body health' in 95.6 % schools, 'alcohol, tobacco and drugs' in 73.9 % schools, 'consumerism' in 91.3 % schools, 'interaction with friends at school' in 52.2 % schools, 'leisure time occupation' in 91.3 % schools, 'non-injuries (accidents and illnesses)' in 65.2 % schools, 'affections and emotions' in 65.2 % schools, and 'literacy and satisfaction at school' in 86.9 % schools.

3.1.2. Correlations among children's lifestyle

Table 2 lists the correlations among the Lifestyle (LS) dimensions. Positive associations are observed in all dimensions. They are more pronounced ($\rho > 0.45$) between 'energy balance' and 'normal development', 'oral and body health' and 'alcohol, tobacco and other drugs', and 'non-injuries', 'affections and emotions', and 'literacy and satisfaction with school'.

3.1.3. Children's safety measures and accident prevention

The Parents' Booklet instrument also made it possible to collect data for the Environmental Diagnosis about parents' adherence to safety measures and accident prevention with their children. Parents' answers revealed that the average sum of the 24 questions (with answers from 1 to 5) was 3.4 (± 0.5) among schools in urban areas and 3.5 (± 0.6) in rural areas, with no statistically significant difference ($t = -1539$; $gl = 578$; $p = 0.124$). 4 (26.7 %) schools in rural settings (S4, S6, S17, S28) and 4 (50 %) in urban settings (S5, S7, S10, S20) had averages below the global average (3.4 ± 0.6 points).

From the enquiry shown in Appendix II (question 25), the issues least mentioned by parents in the open questionnaire were changing the detergent from its original packaging, having safety latches on balconies/windows, having protection on stairs, and having protection on electrical plugs. When parents were asked (in open questioning) what other safety measures they adopted, the most relevant answers were: constant or increased supervision, especially in busy places; knowing the children their own children play with and where they are; parental control of net access devices; not forcing someone to kiss you if you do not want to; no furniture on balconies; the use of latches on the rear doors of cars; and protection on furniture corners. Regarding protective measures, most parents reported protective counselling and training measures to understand the difference between what is play and what can hurt; dangers at home, on the road, and whenever you go to new places; how to react when the child is lost from the parents or in case of an emergency; wearing an SOS bracelet in the summer; not talking to strangers; not to use the internet or play on the street alone; not to answer the doorbell or open the door if alone at home; and not to leave school with someone you do not know.

4. Discussion

The first and second phases of the PRECEDE-PROCEED model [10] were used to perform school health diagnosis by examining parents' self-monitored assessment of their children's health. This study provides better knowledge about the coverage area of this population and what interventions are needed to improve children's healthy lifestyles. This diagnosis was shared with the school's health team and administration, and the families that participated in the meetings.

Using the Parents' Booklet completed by parents, we identified the intervention needs with respect to specific children's lifestyle dimensions: sleep and rest; energy balance; oral and body health; mental health and socio-emotional skills; safety and accident prevention; and the low health literacy of parents and children in these areas. The instrument was useful for assessing information on children, planning the involvement of families in the project, and communicating with them to promote children's healthy lifestyles. The Parents' Booklet instrument also proved to be useful in providing data about school health and simultaneously involving families in the assessment of their children's lifestyles. The collected data allowed for the participatory situation diagnosis. All schools that participated in this study were located on the outskirts of the city. Only 34.8 % of these schools were located in urban areas, whereas 65.2 % were located in rural areas.

Crucially, parents' answers to questions about health behaviours on different lifestyle dimensions yielded important data characterising the health status of primary school-going children and helped determine the focus of interventions for health promotion. Interestingly, no statistically significant differences were observed between the results for urban and rural areas. Meanwhile, most of the 23 schools involved presented a need for intervention (prevalence more than 85 %) in the parameters 'energy balance', 'sleep and rest', 'oral and body health', 'consumerism', 'occupation of leisure time', and 'literacy and satisfaction at school'.

According to the Portuguese National Health Institute [4], children between the ages of 6 and 13 years should sleep between 9 and 11 h per day. Meanwhile, only 40 % of the children sampled in this study sleep for more than 9 h per day. Turco et al. considered sleep to be an important modulator of the neuroendocrine function of glucose metabolism in children, thereby influencing the increase in and prevalence of obesity, and impairing attention and concentration [15]. Miller et al. corroborated this idea by concluding that sleep duration and patterns may contribute to the risk of obesity [16]. Vega-Rodriguez et al. studied 260 children aged 6–12 years, and concluded that children with normal weight had better sleep habits than those who were overweight or obese [17]. These findings also indicate that one in three school-aged children suffer from obesity, highlighting the importance of developing strategies for its prevention. A systematic review revealed a significant relationship between sleep duration and unhealthy eating habits in children. Short sleep duration was associated with higher consumption of soft drinks and processed snacks, and lower consumption of vegetables and fruits [18].

In 2020, the World Health Organization recommended that children and adolescents should engage in 60 min of moderate-to-vigorous physical activity at least 3 days per week and aerobic activity daily [19]. Meanwhile, in our study, only 17.1 % of the children were engaged in physical activity for at least 1 h per day (LS9), 44.6 % had screentime of 1 h or more per day (LS32), and 49.3 % undertook extracurricular activities only twice a week (LS30). A study of 177,091 children aged 8–17 years from public and private

schools linked insufficient sleep to increased screen time consumption. Moreover, eating habits, screen time, and aerobic fitness were significantly associated with insufficient sleep duration [20]. A systematic review by Hale and Guan revealed a significant association between screen time, and reduced sleep duration and increased sleep problems. These data help us reflect on the role of the family in children's lifestyle [21]. A literature review revealed that addressing the influence of parents on the diet and lifestyle of their children was an important factor in the emergence of childhood obesity, as essential bonds are created in childhood and are important for the individual's development [22]. This study also shows that children who spend more time in front of screens are the ones who are less adherent to extracurricular activities, have less time for physical exercise with more altered values in 'sleep and rest', and are more unmotivated (LS43) at school.

Regarding the 'environmental diagnosis' collected in the same instrument, adherence to child protection measures needs to increase because only 80.9 % of parents reported using seatbelts in car transportation. In Portugal, according to the Association for the Promotion of Child Safety, 42 children aged from 5 to 9 years and 170 children/youngsters aged from 10 to 19 years of age died in accidents. Trauma and unintentional injuries (i.e. accidents) are the second leading causes of death between 5 and 14 years of age [23]. Therefore, additional education and legal enforcement are required.

The Parents' Booklet instrument seems to be an important tool for schools to provide information on the health status of children and plan interventions to involve families. Schools with lower adherence to healthy lifestyles among their pupils should augment actions to engage with their families. Furthermore, using this instrument, we could better understand and explore the predisposing, facilitating, and reinforcing factors that best explain the behavioural and environmental diagnoses found. School health teams can use the results from a social-ecological approach to plan effective strategies for promoting healthy lifestyles among families and schools. Notably, positive correlations were observed between different dimensions: children who sleep less, use more screens, exercise less, eat worse, and take less care during transportation are from the same families and schools. This can be relevant for prioritising families/schools as the focus of interventions and for efficient interventions.

The Parents' Booklet demonstrated its usefulness and can be a much-needed point of access for information for these families. It has made it possible to obtain information that allows for health diagnoses from participatory schools, thereby guiding community nursing actions that need to be developed. Additionally, this tool can be useful for parents, allowing greater awareness of self-monitoring of children's lifestyles and increasing participation in health promotion.

Among this study's limitations, we considered the lack of information about the family's socioeconomic status as a restrictive factor. Knowing this would help in a better understanding of contextual factors. Additionally, the fact that the Parents' Booklet is a self-report instrument does not ensure that parents answered the questions truthfully (social desirability). Further, the results cannot be compared because it is a community-based study. In particular, the low prevalence of unhealthy lifestyle habits in rural areas requires further research. Note that the COVID-19 pandemic interrupted the course of the investigation because of the need to allocate health professionals to fight against the pandemic.

5. Conclusions

This study describes the initial implementation process of the Gostar de Mim project, and presents the results of a situational analysis of school health within rural and urban regions in Portugal using the Parent Booklet that was co-created with the families. It allows us to assess the usefulness of the Parents' Booklet for monitoring children's lifestyles, especially for the school health teams that implement the PNSHP. The instrument also promotes the involvement of parents in assessing healthy lifestyles among children aged 6–10 years, as demonstrated by the high adherence in the selected 23 primary schools where the research was carried out.

This study demonstrated that the Gostar de Mim project is aligned with the axis of health promotion proposed by the PNSHP. Its purpose is to guide the practices of the school health teams, and identify the schools, families, and dimensions to be prioritised for intervention. Social and epidemiological assessments allowed us to determine the areas covered by this population and some of their needs. Through the Parents' Booklet instrument, we obtained data on the lifestyle of children which showed a correlation between the different dimensions of healthy lifestyles. In particular, risk behaviours are associated with each other: children who sleep less, use more screens, exercise less, eat worse, and have less care in transportation. These data are useful for providing information about the school's health situation and involving families in the evaluation of their children's lifestyles. The collected data provide the school health team with sufficient information to diagnose the situation in primary schools and personalise the planning of health promotion interventions. Importantly, the application of this instrument helped in overcoming the traditional lack of family participation in health promotion in school settings. The instrument will be revised in the weakest items, and meetings will be scheduled so that the programme can move forward to phase 3 (predisposing, facilitating, and reinforcing factors) (Fig. 1) to make the Gostar de Mim project more consistent and contribute more to improved family health outcomes.

Clearly, the Parents' Booklet, as a self-reported instrument, contributed to improving the work of the school health team through the standardisation and documentation of nursing interventions to implement PNSHP. For parents, this may increase their awareness of their children's lifestyles and counteract their low adherence to face-to-face activities performed at school within the scope of school health. In the future, the Parents' Booklet can serve as a tool for participatory research related to the health status of school children, a useful resource for interacting with their families, and a tool to evaluate the project's impact. This study corresponds to the first phase of the PRECEDE stage. In the future, we hope to complete the remaining phases and validate the entire programme.

Ethics statement

This study was approved by the Ethics Committees of the Administração Regional do Centro (No. 56–2022) and Health Sciences

Research Unit: Nursing (No. 869-04-2022). This study has obtained a written informed consent from the parents.

Funding

This research received no external funding.

Data availability statement

The data collected in this study were registered in the computer system of the Portuguese National Health Service. Therefore, it is confidential and cannot be used for any other purposes.

CRediT authorship contribution statement

Nicole Amorim: Writing – review & editing, Writing – original draft, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Brito Irma:** Writing – review & editing, Writing – original draft, Supervision, Software, Project administration, Methodology, Investigation, Formal analysis, Data curation. **Fátima Guerra:** Methodology, Investigation. **Rute Lopes:** Writing – original draft, Formal analysis. **Miguel Ricou:** Writing – review & editing, Writing – original draft, Validation, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

The authors are thankful for those supporting this project: Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto; Escola Superior de Enfermagem de Coimbra and UICISA:e; Community Care Unit Coimbra Saúde and all the health professionals of the school team, teachers, and parents that participated in the project.

Appendix I

HOW HEALTHY IS YOUR CHILD'S LIFESTYLE?			
These statements refer to behaviors of children your child's age. Consider your child's usual behavior and indicate the number of answer choices that best apply to your child's situation. Always consider what is most common and not rare situations. Add up the points. The closer to 90 points the better the child's lifestyle. Reflect on the behaviors where you scored "0" and try to identify the reasons for this. Can they be changed? What would be needed to do so? Have a family reflection.			
Sleep and rest	LF1	Sleep:	2 - 10–13 h per night; 1 - 7–9 h per night; 0–6 or less hours per night
	LF2	He has difficulty falling asleep:	2 - Never or hardly ever; 1 - Only when you go to school; 0 - Occasionally
	LF3	Has nocturnal enuresis "wets the bed":	2 - Never or hardly ever; 1 - Only when you go to school; 0 - Occasionally
Energy balance	LF4	Eats breakfast:	2 - Every day; 1 - Only when you go to school; 0 - Less than 3 times a week
	LF5	Eats 5 a day (fruit/vegetables):	2 - Every day; 1 - Only when you go to school; 0 - Less than 3 times a week
	LF6	Eats high-calorie foods (sweets/salty/fried foods):	2 - Less than 3 times a week; 1 - Only when you go to school; 0 - Every day
	LF7	Drinks fluids between meals (water, infusions, natural juices):	2 - Every day, at least 1L; 1 - About 2 glasses a day; 0 - Only when you are thirsty
	LF8	Engages in physical activity:	2 - Every day; 1 - Only at school; 0 - Less than 3 times a week
	LF9	Plays sports that require physical activity:	2 - Vigorous; 1 - Moderate; 0 - Does not practice
Normal development	LF10	Is at BMI level (weight___; height___):	2 - Normal; 1 - Underweight or overweight; 0 - Underweight or obese
	LF11	Language:	2 - Knows full name, age, address, and date of birth; 1 - Is often wrong; 0 - Doesn't know
	LF12	Has a vocabulary:	2 - Fluent and well articulated; 1 - Confuses some sounds; 0 - Unintelligible or stuttering
	LF13	Sight:	2 - No change; 1 - Has glasses; 0 - Suspected visual deficit
	LF14	Hearing:	2 - No change; 1 - Has braces; 0 - Suspected hearing impairment
	LF15	Has psychomotor stability in different life contexts:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally

(continued on next page)

(continued)

HOW HEALTHY IS YOUR CHILD'S LIFESTYLE?			
These statements refer to behaviors of children your child's age. Consider your child's usual behavior and indicate the number of answer choices that best apply to your child's situation. Always consider what is most common and not rare situations. Add up the points. The closer to 90 points the better the child's lifestyle. Reflect on the behaviors where you scored "0" and try to identify the reasons for this. Can they be changed? What would be needed to do so? Have a family reflection.			
Sleep and rest	LF1	Sleep:	2 - 10–13 h per night; 1 - 7–9 h per night; 0-6 or less hours per night
	LF2	He has difficulty falling asleep:	2 - Never or hardly ever; 1 - Only when you go to school; 0 - Occasionally
	LF3	Has nocturnal enuresis "wets the bed":	2 - Never or hardly ever; 1 - Only when you go to school; 0 - Occasionally
Oral and body health	LF16	Dresses without help:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF17	Brushes teeth:	2 - Two or more times a day; 1 - Once a day; 0 - Do not brush your teeth daily
	LF18	Dental caries:	2 - Never had; 1 - Had it, but it is treated; 0 - Has in ___ teeth
Alcohol, tobacco and drugs	LF19	Performs hygiene, washes hands and face without help:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF20	Is exposed to tobacco smoke (sees smoking):	2 - Never or hardly ever; 1 - Only in some contexts, but not at home/ in the car; 0 - At home and/or in the car
	LF21	Is exposed to the consumption of alcoholic beverages (sees drinking):	2 - Never or hardly ever; 1 - Only in some contexts, but not at home/ in the car; 0 - At home
	LF22	Is exposed to the use of other drugs (sees using):	2 - Never or hardly ever; 1 - Only in some contexts, but not at home/ in the car; 0 - At home
Consumerism	LF23	Is exposed to excessive use of medication (sees taking):	2 - Never or hardly ever; 1 - Only in some contexts, but not at home/ in the car; 0 - At home
	LF24	The toys he/she has are:	2 - Enough to entertain themselves; 1 - Too many and will not play with all; 0 - Very expensive and will not play with all
	LF25	The clothes he/she has are:	2 - Enough for everyday life; 1 - Too many and won't use them all; 0 - Too expensive and won't use them all
Interaction with friends at school	LF26	He/she throws tantrums to buy toys, games, treats, or other things:	2 - Never or hardly ever; 1 - Occasionally; 0 - Often
	LF27	Picks and plays with friends:	2 - No discrimination; 1 - Very selective; 0 - Isolates him/herself
	LF28	When he/she plays:	2 - Understands and accepts the rules; 1 - Understands but does not accept the rules; 0 - Doesn't play
Leisure time occupation	LF29	At school he/she is hyperactive and has difficulty concentrating:	2 - Never or hardly ever; 1 - Occasionally; 0 - Often
	LF30	Is enrolled in extracurricular activities (youth group, scouts, music):	2 - About twice a week; 1 - About once a week; 0 - No activities
	LF31	He/she socializes with other family members and/or friends:	2 - About twice a week; 1 - About once a week; 0 - Occasionally
Non-injuries (accidents and illnesses)	LF32	Is in front of a screen (TV, electronic game, tablet, cell phone, ...):	2 - Less than 1 h per day; 1 - 1–2 h a day; 0 - More than 2 h a day
	LF33	In car transportation uses seat belt/safety seat:	2 - Sempre; 1 - Nem sempre; 0 - Nunca
	LF34	In the last school year had accidents/injuries at school or on the way to school:	2 - Never; 1 - Less than three times; 0 - More than three times
	LF35	In the last school year had accidents/injuries at home or leisure activities:	2 - Never; 1 - Menos de três vezes; 0 - Mais de três vezes
	LF36	In the last year been involved in home or road accidents:	2 - Nunca; 1 - Less than two times; 0 - Two or more times
	LF37	In the last year he/she has had a health check-up (doctor and dentist):	2 - Twice; 1 - Once; 0 - Never
Affections and emotions	LF38	In the last year he/she has been involved in bullying situations (victim/aggressor):	2 - Never or hardly ever; 1 - Occasionally; 0 - Often
	LF39	Likes to receive and give affection:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF40	Knows how to express his/her needs and emotions:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF41	Has self-control:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
Literacy and satisfaction at school	LF42	Enjoys reading and/or being told stories:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF43	In the last school year, came home sad or unmotivated from school:	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF44	Engages in school activities (at school and at home):	2 - Always or almost always; 1 - Only in some contexts; 0 - Occasionally
	LF45	Refused to go to school:	2 - Never or Never or almost never; 1 - Occasionally; 0 - Often

TOTAL POINTS:

Developed by Brito I. & Guerra F. and Suttentes of Participatory Health Research in 2016

Translated version

Appendix II

ASSESSMENT ON ACCIDENT PREVENTION

This questionnaire measures how often you act in a certain way with your child. Please read each sentence of the questionnaire and answer how often you do this with your child, at home or on the street, considering 1 = Never; 2 = Sometimes; 3 = Sometimes; 4 = Multiple times; 5 = Always; N=Not applicable

	1	2	3	4	5
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
Answer the following question:					
25					
Use an (X) to indicate your answer					
26					
27					
Developed by Brito I. & Guerra F. and students of Participatory Health Research (2016)					
Translated version					

References

- [1] I. Brito, O que é a pesquisa-ação participativa em Saúde, in: *Pesquisa-Ação Participativa na Co-Criação de Instituições de Ensino Superior Promotoras de Saúde*, 2018, pp. 23–60. Palimage: Coimbra , PT.
- [2] World Health Organization, Regional Office for Europe. *Healthy Living : what Is a Healthy Lifestyle?*; EUR/ICP/LVNG 01 07 02, WHO Regional Office for Europe, Copenhagen, 1999. <https://apps.who.int/iris/handle/10665/108180>. (Accessed 9 June 2023).
- [3] Direção Geral de Saúde. Programa Nacional de Saúde Infantil e Juvenil; 010/2013; Portugal. <https://www.dgs.pt/documentos-e-publicacoes/programa-tipo-de-atuacao-em-saude-infantil-e-juvenil-png.aspx> (accessed 2023-June-15).
- [4] Direção Geral de Saúde, Programa Nacional de Saúde Escolar, 2015. <https://observatorio-lisboa.eapn.pt/ficheiro/Programa-Nacional-de-Sa%C3%BAde-Escolar-2015.pdf>. (Accessed 1 December 2022).
- [5] K. Tenjin, M. Sekine, M. Yamada, T. Tatsuse, Relationship between parental lifestyle and dietary habits of children: a cross-sectional study, *J. Epidemiol.* 30 (6) (2020) 253–259.
- [6] D.A. DeWalt, A. Hink, Health literacy and child health outcomes: a systematic review of the literature, *Pediatrics* 124 (Supplement 3) (2009) S265–S274.
- [7] H.Y. Lee, A.Q. Zhou, R.M. Lee, A.L. Dillon, Parents' functional health literacy is associated with children's health outcomes: implications for health practice, policy, and research, *Child. Youth Serv. Rev.* 110 (2020) 104801.
- [8] I.C. Icpshr, For participatory research-home. What is Participatory Health Research (PHR)?. http://www.icphr.org/uploads/2/0/3/9/20399575/what_is_the_icphr_-_short_description_-_version_2014_10_20.pdf. (Accessed 2 December 2022).
- [9] I. da S. Brito, Famílias Com Jovens: Riscos e Desafios in Paineis Intervenções Centradas Na Comunidade, in: *Suplemento da Revista de Enfermagem Referência. Atas do 1o congresso Internacional de saúde familiar e comunitária. Referência*, 2015, pp. 142–155.
- [10] J.E. Fielding, *Health Program Planning, Implementation, and Evaluation: Creating Behavioral, Environmental, and Policy Change*, JHU Press, 2022.
- [11] C.M. Scott, *Health promotion planning: an educational and ecological approach: LW green*, in: M.W. Kreuter (Ed.), *Mountain View, CA: Mayfield Publishing Company*, 1999, p. 384, 621 Pp. *Can. J. Public Health Rev. Can. Santé Publique* 2001, 92 (5).
- [12] R. Kline, *Principles and Practice of Structural Equation Modeling*, third ed., The Guilford Press, New York, 2015.
- [13] UCC Coimbra Saúde. <https://bicsp.min-saude.pt/pt/biufs/2/20020/2060951/Pages/default.aspx> (accessed 2023-June-14).
- [14] Unidade de Saúde Familiar Progresso e Saúde. Plano de ação da Unidade de Saúde Familiar. <https://bicsp.min-saude.pt/pt/biufs/2/20020/2060672/O%20QUE%20OFERECEMOS/Plano%20de%20a%C3%A7%C3%A3o%202019-2021.pdf> (accessed 2023-June-15).
- [15] G.F. Turco, R. Reimão, S. Rossini, A. Antonio, A.A. Barros Filho, Distúrbios Do Sono e Qualidade de Vida Em Crianças e Adolescentes Obesos: Revisão Bibliográfica, *Neurobiologia* 74 (2) (2011) 71–78.
- [16] A.L. Miller, J.C. Lumeng, M.K. LeBourgeois, Sleep patterns and obesity in childhood, *Curr. Opin. Endocrinol. Diabetes Obes.* 22 (1) (2015) 41.
- [17] P. Vega-Rodríguez, A. Álvarez-Aguirre, Y. Bañuelos-Barrera, B. Reyes-Rocha, H. Castañón, Estilo de Vida e Estado de Nutrição Em Crianças Na Escola, *Enfermeria Univ.* 12 (4) (2015) 182–187.

- [18] F.V. Córdova, S. Barja, P.E. Brockmann, Consequences of Short sleep duration on the dietary intake in children: a systematic review and meta-analysis, *Sleep Med. Rev.* 42 (2018) 68–84.
- [19] WHO guidelines on physical activity and sedentary behaviour. <https://www.who.int/publications-detail-redirect/9789240015128>. (Accessed 14 June 2023).
- [20] K.D. Tambalis, D.B. Panagiotakos, G. Psarra, L.S. Sidossis, Insufficient sleep duration is associated with dietary habits, screen time, and obesity in children, *J. Clin. Sleep Med.* 14 (10) (2018) 1689–1696.
- [21] L. Hale, S. Guan, Screen time and sleep among school-aged children and adolescents: a systematic literature review. *Sleep med, Rev.* 21 (2015) 50–58.
- [22] F.M.M. Linhares, K. de O. Sousa, E. de N. Martins, C.C.M. Barreto, Obesidade Infantil: Influência Dos Pais Sobre a Alimentação e Estilo de Vida Dos Filhos, *Temas Em Saúde* 16 (2) (2016) 460–481.
- [23] Associação para a Promoção da Segurança Infantil. Relatório de Avaliação 30 Anos de Segurança Infantil em Portugal 2022; Avaliação; ©APSI. https://www.apsi.org.pt/images/PDF/2022/APSI_RELATORIO_30.pdf, 2022. (Accessed 15 January 2023).