

Health promotion and nutritional literacy in school programs of primary schools

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Summary

Health promotion and nutritional literacy belong to the “interdisciplinary responsibilities” of primary schools. They are expected to permeate all subjects, to shape the school environment and they involve commitment to school development and lesson quality. Their impact is influenced by the respective school culture. Insights into school culture are provided by the “school programs” prepared by individual schools. This article questions whether and how nutritional topics are communicated in the school programs of primary schools. In this regard, the article firstly refers to the theoretical background to school development processes, before providing empirical results on nutritional literacy. The database comprises 92 school programs (including “school profiles”, “mission statements”, “pedagogical approaches”) of primary schools in North Rhine-Westphalia (NRW), which were analyzed according to content. The results document how nutritional literacy is currently implemented in primary schools, showing how nutrition-related content is frequently mentioned, yet how informal strategies are preferred in most cases. The data also demonstrates that there is a deficit of appropriate teacher training measures.

Keywords: nutritional literacy, health promotion, school development

level for school development processes [2]. Development objectives are not determined externally; instead they are expected to be produced by the members of the school. The basic assumption being that the parties involved can best judge their own circumstances and that objectives are more likely to be accepted when they are defined by the parties themselves. School programs are both the products and producers of this “self”-determination. As a result of regular evaluation of the school development processes as defined in the school program, the quality of the school should also permanently improve [3].

Health promotion and nutritional literacy may be the subject of this collective self-determination to varying degrees

Essentials of school program work

According to the German Education Act, primary schools in North Rhine-Westphalia (NRW) are obliged to record the specific objectives, emphases and organizational forms of their pedagogical approach in a school program, to update this periodically, and to evaluate its implementation [1]. School programs are key tools in school development. They should be viewed from the perspective of systems theory, whereby schools are understood as learning organizations and not as the lowest level of administrative bureaucracy. As a result, the individual school becomes more important as a pedagogical design

Health promotion as subject of school development processes

Research carried out by PAULUS and WITTERIEDE (2008) [4] has distinguished four different stages of development in health promotion in schools¹:

- “segmented school” [“Segmentierte Schule”]
- “project school” [“Projektschule”]

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¹ PAULUS und WITTERIEDE (2008, p. 72) use the phrase “health promotion in schools” as an overall designation for school activities relating to prevention, health promotion and health education [4].

- "health-promoting school"
["Gesundheitsfördernde Schule"]
- "good and healthy school"
["Gute und gesunde Schule"]

At "segmented schools" health-related content is only implemented in accordance with curricular requirements. Measures are based on the risk factor model and aim to prevent risk behavior. Here health promotion is not regarded as a collective school development task; instead it depends on the personal commitment of individual people.

In "project schools", curricular requirements are extended by additional initiatives – often in cooperation with external partners. Temporary and unrelated measures predominate. All-embracing collective objectives are only poorly developed. Projects are deemed problematic due to their time limit. Nevertheless, they can help to inspire a lasting debate on health-related topics in schools. In this instance, projects have the potential to develop a comprehensive health-promoting identity for the school out of individual measures [5].

This kind of a holistic model of school health promotion is a mark of the "health-promoting schools". In these cases, behavioral and situational prevention are linked, in order to create a healthy environment for all parties involved. The aim is for the entire school to be oriented towards a health-related school culture and identity. The determination – ideally supported by all parties – to make health promotion a central issue in school life is anchored in the school program.

In "good and healthy schools", the complex holistic model of the "health-promoting school" is adopted and linked to the educational mandate. Health promotion is regarded as a requirement for teaching and learning and thus as a criterion for school quality. In this regard, the quality of social interaction between teachers

and students is an essential characteristic of "good and healthy schools"; school atmosphere, social support, shared values and identification and attachment to the school are regarded as social capital for the well-being and productivity of those involved [6]

Nutritional literacy is part of school health promotion

Nutritional literacy is an essential component of school health promotion. It "[...] aims to enable people to democratically develop and shape their own nutrition in a politically and socially responsible way under complex social conditions." [Original citation: "[...] zielt darauf ab, Menschen zu befähigen, die eigene Ernährung politisch mündig, sozial verantwortlich und demokratisch teilhabend unter komplexen gesellschaftlichen Bedingungen zu entwickeln und zu gestalten."] Fachgruppe Ernährungsbildung at the DGE 2013, p. 85 [7]. Its content and objectives are formulated in the European Core Curriculum [8] in seven subject areas, several topics of which (sensory perception, eating habits and practicing the cultural tools of food preparation) seem particularly suited to primary school age; however food production and marketing processes can also be adapted and critically examined for the appropriate age group.

Working hypothesis

The lasting impact of health-related measures depends on whether and how nutritional literacy is successfully integrated into the school development and teacher training processes. This link has been formulated and established for exercise promotion [9] and violence prevention [10]; however, more research is still required with regard to nutritional literacy. In 2013, *Deutsche Gesellschaft für Ernährung e. V.* (DGE) also stated that mission statements have the potential to define objectives and

responsibilities for nutritional literacy in primary schools [7]. In light of reflections on "good and healthy schools", this connection should not only be understood as an adequate condition, but also as a necessary one. As a result, formulated objectives are only realized within a school culture, in which students are given opportunities to participate and where they are recognized as requirements for learning and living in school by all parties.

Research objectives and questions

In order to record the status of the implementation of health promotion and nutritional literacy in schools, the school programs of 92 primary schools (including "school profiles", "mission statements" and "pedagogical approaches") in NRW were analyzed according to content. Two sub-samples were compared. The objective was not only to record the stated measures, but also to account for their integration and significance within and for school life.

The content analysis of the school programs was expected to shed light on the following questions:

1. What health promotion approaches can be gathered from school programs?
2. What health topics are mentioned?
3. What health-related measures (in lessons and school life, plus teacher training) are named?

Method

Selection of schools

At the end of 2013, the study viewed all the "school programs", "school profiles", "mission statements" and "pedagogical approaches" available online, as listed on the homepage of the NRW Regional Program entitled "Bildung und Gesundheit" ["Educa-

tion and Health"] (BuG; www.bug-nrw.de). By joining the Regional Program, these schools have undertaken to integrate health promotion and prevention into the school program, to carry out evaluative measures and to take part in networking and training events [11].

Useful documents were gathered from 46 BuG primary schools.

The study then looked for a "comparison school" for each BuG primary school under consideration, which was itself not participating in the Regional Program. The study selected the nearest school in geographical terms which had a school program available on its homepage. This sub-sample was expected to approximately resemble a "random comparison group".

Overall, this resulted in a total sample of 92 schools. In the school year 2013/14, the state school system in NRW included a total of 5,703 schools, of which 2,891 were primary schools [12].

Around a fifth of the documents were produced before 2010; a third had at least been updated in 2013 (no sample distinctions).

Analysis of school programs

The selection of relevant passages from the school programs occurred in two stages. The documents were first searched in full for health-related passages. Then electronic search functions were used to identify overlooked sections. At this point the authors limited the filter to "gesund" (health/healthy), as there is scarcely any other alternative in German.

For the first research question, the categories were derived deductively from the classification of health promotion in schools by PAULUS and WITTERIEDE (2008 [4]). The authors formulated four qualitatively distinguishable approaches to school health promotion, with regard to the aspects of "target groups", "health approach", "strategies/measures" and "commitment levels". This cate-

gorization was used by the authors as a tool to classify school programs. The approach was based on the procedure of evaluative content analysis [13] and targeted an ordinal determination of health promotion in the documents studied.

The categories in the second research question – which health topics are mentioned – were on the contrary established inductively, taking into consideration that a prior understanding of the classification of school health promotion also had an influence here. In this respect they are "constructed codes" [14] which were applied to the text dichotomously (mentioned or not mentioned). The categorization system was open, as additional categories were discovered in the texts, such as e. g. "therapeutic horseback riding" which was named by several schools as a health-promoting measure (yet not included in ♦ Figure 1 due to the low number of cases).

For the measures classified under the topic area of "nutrition", subcategories were also formed on the basis of the underlying sections of text (♦ Figure 2).

By reference to the first ten school programs, the assignment of deductive categories was performed discursively by both study authors, and the determination and classification of categories was worked out from the material (consensual coding). Subsequently, the school programs were evaluated independently and compared in regular feedback stages (intercoder reliability; $r = 0.74$); deviations were clarified collectively in the text.

Limitations

The application of the typology developed by PAULUS and WITTERIEDE [4] on health promotion in schools as categories is not unproblematic, since it reduces complexity and variety from the outset and thus does not reconstruct the schools' underlying argument, but rather subordinates this to

external research logic. The measures classified under the topic area of "nutrition" vary in terms of duration, target group and content, so selective systematization is not possible. Nevertheless, the authors decided on the outlined approach in both cases on pragmatic grounds, in order to at least classify health-promotion and nutrition-related content heuristically. It should also be noted that no random samples were available; it is thus possible that the activities of the BuG schools motivated neighboring schools to increase their own health promotion measures.

Results

Approaches to health promotion in schools

The documents from 92 primary schools were examined with a view to the approach to school health promotion formulated therein and classified according to the development forms outlined above. The challenging approach of "good and healthy schools" was found among a third of BuG primary schools and also in two (= 4 %) schools in the comparison group. In both subsamples, the "health-promoting schools" were the most widespread form of school health promotion. The proportion of BuG schools was only slightly higher (52 %) than in the comparison group (46 %). Health-oriented school profiles were therefore found in almost every second school, even outside the BuG network. The "project school" approach was assigned to a total of 17 % of primary schools. The proportion in the comparison group (20 %) was only negligibly higher than among BuG schools (14 %). This means that health promotion cannot be recognized as the overall focus in the school program at all schools in the network.

In the comparison group, which is closer to a random sample and is therefore approximately applicable

to the majority of primary schools in NRW, a proportion of 30 % were classified as “segmented schools”, i. e. schools at which health topics are largely limited to sports and science lessons and initiatives by individual teachers. This third represents the proportion of schools with a great need and potential for health promotion and nutritional literacy.

Health-related content

In total, 17 different health topic areas were found in the documents studied. All topics were more frequently mentioned by the BuG schools than by the comparison group. Significant differences ($\chi^2 > 3.84$; $df = 1$, $\alpha = 0.05$; ♦ Figure 1) appeared in the topics of “nutrition”, “dental health”, “teachers’ health”, “back health” and “bodily hygiene”; highly significant differences ($\chi^2 > 10.8$; $df = 1$, $\alpha = 0.001$) emerged in “exercise promotion” and “stress management”.

It was clear that measures on exercise promotion, nutritional literacy and violence prevention were the core topics in school health promotion.

Nutrition-related content

Nutrition-related content is reported by 89 % of BuG schools and 61 % of schools in the comparison group. Exercise promotion in school programs is frequently (but not exclusively) based on the avoidance of overweight and obesity. The data also shows that the *EBS-Wirkmodell*² (= Ernährung, Bewegung, Stressbewäl-

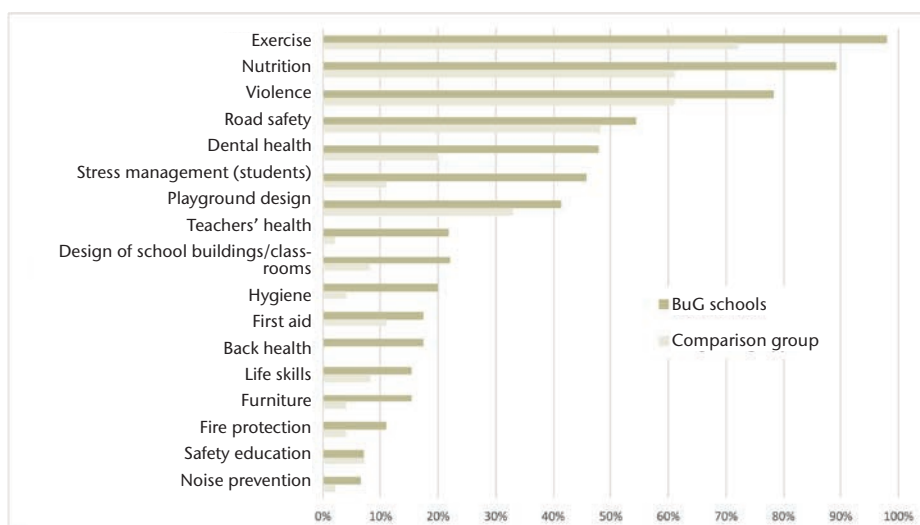


Figure 1: Health-related content contained in school programs. Data for 92 primary schools in North Rhine-Westphalia BuG = “Bildung und Gesundheit” [“Education and Health”]

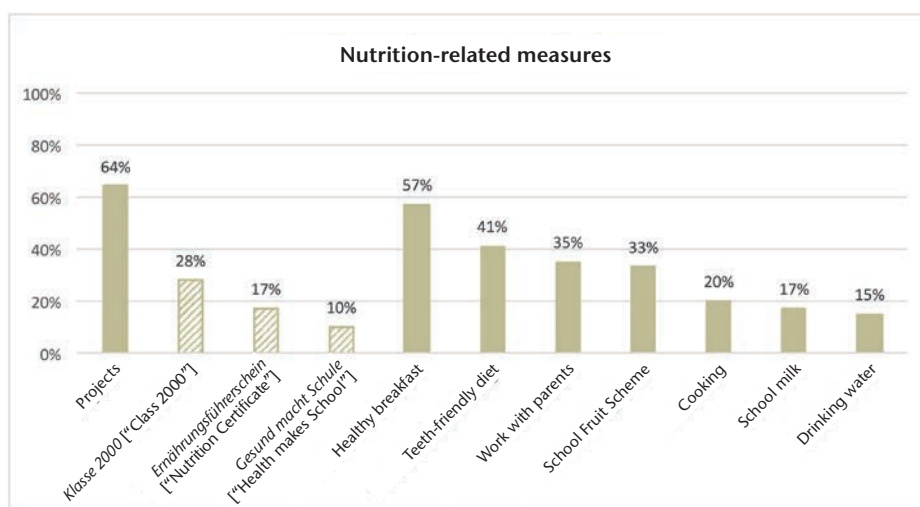


Figure 2: Nutrition elements mentioned in school programs Percentage figures refer to the 69 primary schools which feature nutrition-related content in the school program. Different shading = the three most frequently-mentioned individual projects

² The EBS-Wirkmodell (Ernährung, Bewegung, Stressbewältigung – Nutrition, Exercise, Stress Management) was developed by the Bundeszentrale für Gesundheitliche Aufklärung (BZgA) as part of the “Gut drauf!” campaign and is a holistic approach to improving the health of children and young people, in which the topics of nutrition, exercise and stress management are merged (URL: www.gutdrauf.net/index.php?id=ebs-konzept).

tigung – Nutrition, Exercise, Stress Management) is only fully implemented at a quarter of schools (BuG: 41 %; comparison group: 11 %) and in this case it is primarily stress management that is neglected. The topic of “nutrition” is often ad-

dressed in primary schools from the perspective of dental health. At almost every second BuG school (48 %) and at 20 % of schools in the comparison group, lesson content on low-sugar and “teeth-friendly” diets is mentioned under the topic

of “dental health”, in addition to the required dental examinations. Content on “healthy nutrition” is also addressed in the life skills programs, such as *Klasse 2000* [“Class 2000”] and *Gesund macht Schule* [“Health makes School”]. As the term “life skill” suggests, these programs regard knowledge about the human body (e. g. digestive processes), physical sensations, as well as critical analysis of food, drinks and sweets as skills, which should encourage children to adopt a responsible and healthy lifestyle.

Overall, the following nutrition-related components were identified in the school programs (♦ Figure 2):

- project-based temporary measures with and without support from experts
 - *aid-Ernährungsführerschein* [“aid Nutrition Certificate”]
 - *Klasse 2000* [“Class 2000”]
 - *Gesund macht Schule* [“Health makes School”]
- school-specific project days or weeks
- regular “healthy breakfasts” in day-to-day school life
- teeth-friendly nutrition
- work with parents
- EU School Fruit Scheme and similar fruit and vegetable schemes
- cooking, cooking project groups
- discussion of school milk
- drinking water in lessons

Projects vs. institutionalized content

It is obvious that project-based temporary measures prevail at “project schools”. In addition to the life skills program *Klasse 2000*, the *aid-Ernährungsführerschein* represents the most important individual measure, through which children acquire skills in handling food and kitchen utensils. Institutionalized “healthy breakfast rituals” are clearly more rarely mentioned by “segmented schools” (33 %) and “project schools” (31 %) than by “health-promoting schools” (58 %) and “good and healthy schools” (82 %). Collective

breakfast rituals are not only important for the development of class community; they are also expected to increase and/or maintain students’ school performance [15] and introduce children to healthy nutritional habits.

School Fruit Scheme

There is a noticeable uneven distribution of the EU School Fruit Scheme in the documents gathered. During the study period of 2013/14, 750 of the 2,891 primary schools in NRW took part (= 26 %). In our sample the distribution was at 33 %. It should be noted here that approximately half of the school programs were dated prior to the year 2010, i. e. at a time when the School Fruit Scheme was not implemented or only implemented in a few schools. The program is specified by 56 % of “project schools”, but only 29 % of “health-promoting schools” and by 18 % of “good and healthy schools”. This program may appeal to those schools which have hitherto implemented only short-term measures and could thus have a “school development helper” function in the implementation of permanent measures. The study by MITTMANN et al. (2014) [16] showed that the effectiveness of such fruit and vegetable schemes can be increased if parents are actively involved.

Parental involvement

Work with parents in nutritional literacy is mentioned particularly frequently (38 %) by “good and healthy schools”. Yet this conceals a wide spectrum of different measures, such as e. g. topic-specific parent evenings where parents receive nutrition “tips”. More or less rigid recommendations are occasionally expressed in relation to breakfasts (i. e. one school requires a “self-commitment declaration to healthy nutrition” from parents). Some school programs mention parent-child cooking events or recommendations for parents of overweight children.

Drinks

Another topic area is drinking and drinks selection at school. The importance of drinking water is primarily addressed in the school program by “good and healthy schools”, where students are encouraged to drink regularly and mineral water is available in classrooms. Increasing water consumption is regarded as a health-promotion measure, since many children fall short of the recommended amounts. In addition, several studies demonstrate the favorable (albeit minimal) effects of drinking water on weight reduction in children [17].

School milk

According to the EsKiMo Study less than half of children consume the recommended daily quantity of milk products [18]. Consumption of such products is important as they provide protein, magnesium and calcium. It should also be noted that milk does not quench the thirst due to its high energy content. Therefore, the consumption of semi-skimmed milk products is recommended in *Optimierte Mischkost* (optiMIX) [19].

These different perspectives can be observed in part in the school programs. Twelve schools (17 %) discussed the advantages and disadvantages of school milk. Some schools provide lessons examining the process of milk production, whereas other schools distance themselves from school milk in the school program and renounce mixed milk products with reference to high sugar content.

Case studies

The following case studies should illustrate the various ways in which nutritional literacy is communicated in different school programs.

The first example presents two projects, where children can gain skills in the preparation and orchestration

of mealtimes. The creation of a recipe book provides interdisciplinary possibilities. Nutritional literacy can thus e. g. provide writing opportunities in language lessons. The connection to work with parents is significant. It is also worth mentioning the opportunities for role reversals (children cooking for their parents) (♦ Case Study 1).

The second example presents the school program of a school which has formulated its own curriculum on health promotion (♦ Case Study 2). This type of institutionalization should ensure that all classes – irrespective of teachers' individual interests – learn the stipulated content. It is thereby clear that the school program can make an important contribution to the stabilization of nutritional literacy.

The third example demonstrates how intensive the debate over school breakfast can be in school programs. Breakfast culture at primary school means more than "just" breakfasting together; instead it is the expression of social interaction, welfare and a culture of recognition, realized via rituals (♦ Case Study 3).

In many school programs, a normative vision of "healthy" nutrition prevails, to which children must be educated. However, the following extract shows that a difference has developed between recommended and tolerated foods in school practice. Yet passages, in which more undesired foods are explicitly tolerated, are rarely found. Other features contained in this school program include a focus on enjoyment, the identity-forming role of meal times and a deliberate indirect approach, in which family nutrition is influenced by the children (♦ Case Study 4).

The last example shows nutritional literacy shifting towards addiction prevention, as is encouraged in the BZgA volume "Suchtprävention in der Grundschule" (Addiction Prevention in Primary School) [20]. The argument

"Warm buffet for cool kids

A recipe book is produced during the course of the project, a copy of which is given to every participant at the end. Children thereby take not only new experiences, but also new ideas, home with them, which are just waiting to be tried. [...] In order to give as many children as possible the opportunity to take part in this cooking project, the student group changes every six weeks. At the end, parents are invited to dine and can thus witness their child's learning progress at a collective feast."

"Children's restaurant

The aim of the children's restaurant is to bring children and families closer to the topics of "healthy nutrition" as well as eating and its related rituals as a fixed part of a controlled daily routine. [...] This includes a lovingly-laid table and a healthy tasty meal in a peaceful atmosphere. Parents also take a seat at the tables in the children's restaurant, in order to enrich everyday family life with this idea."

Case Study 1: Buffet/Children's Restaurant

Quotes from school program [translated from German]

"Elements such as healthy nutrition, physical awareness, sex education, dental health and others were integrated in the following curriculum, which goes beyond the scope of the contents of science lessons.

- *Development of a curriculum for Years 1 and 2:*
 1. *Alignment with R. u. L.*
 2. *Nutrition passport for Years 1 and 2*
 3. *Create folder of ideas /lessons/material*
 4. *Year 1: Fruit Day*
 5. *Year 2: breakfast/food pyramid*
 6. *Dental health*
- *Years 3 and 4:*
 7. *Nutrition certificate at the end of the school year*
 8. *Folder of ideas /lessons/material*
 9. *Alignment with R. u. L.*
 10. *Dental health*
 11. *Silence/calm/relaxation*
- *Regular breakfast buffet for all classes in Years 3–4 during the school year, prepared by different students in a year group."*

Case Study 2: Health promotion curriculum

Quotes from school program [translated from German]

R. u. L. = *Richtlinien und Lehrpläne für die Grundschule*
(= guidelines and teaching plans for primary schools)

refers to the life skills approach in health promotion. This associates nutritional literacy with the children's personal development (♦ Case Study 5).

Teacher training

Teacher training is important due to the specialist knowledge required for

the transfer of health-related content. As health-educational events in teacher training programs at universities are only rarely offered [21], the corresponding knowledge of specialist content is relatively low or dependent on the interests of the respective teachers. Further training and collaborations are regarded as

"A healthy breakfast is valued in all years. This is part of the school program. It is explained to parents at parents' evenings. They are encouraged to give children a healthy breakfast. [...]"

"Breakfast culture

Enabling children to grow up healthy is an important aspect of our school educational approach. Access to healthy eating is the basic requirement in order to be able to take part in the educational program. High proportions of fresh food and nutrient-rich products are the focus in our healthy breakfasts. The agreement to avoid sweets and sugary drinks at birthdays and during breaks is supported by most parents. This aspect of the school program is regularly referred to at the parents' board meeting. Children have a selection of offers for breakfast thanks to collaborations with established fruit and vegetable retailers.

School breakfast

The school breakfast takes place every day from 7:15 and is used by children who are already supervised for one hour before the start of school. All children are able to breakfast here. This offer is particularly beneficial to children from socially-vulnerable families. The traditional breakfast selection is extended by whole wheat bread, muesli and raw fruit and vegetables. On request children can also come and get a breakfast in the break.

Class breakfast

The children breakfast together before the main break in the classroom or along with their partner classes. Eating should be perceived positively as a communal experience."

Case Study 3: **Institutionalized breakfast culture at a primary school**
Quotes from school program [translated from German]

"But it is also important for us to include foods classified as unhealthy on particular occasions such as birthdays or Christmas celebrations. As a result, e. g. homemade cookies or homemade jam is allowed, as the enjoyment of eating is also an important learning objective in this context. The collective breakfast is a community-creating and community-binding ritual. Students take their new knowledge and experiences home and thus also influence their family's eating behavior."

Case Study 4: **Eating with enjoyment**
Quotes from school program [translated from German]

resources, through which teachers receive support for their everyday educational approach as well as for the school development process. However, only slightly more than half of the BuG documents produced (and only 20 % in the comparison group) make reference to health-related teacher training and further details on concrete contents are also often

lacking. The most frequently-mentioned training contents were "violence prevention" (11), "exercise promotion" (9), "first aid" (7) and "teachers' health" (7). It is conspicuous that, although health topics are a high priority, corresponding training is not mentioned by any school. This underlines the criticism that there is a lack of professional

basis to nutritional literacy in primary schools [16]. Training is provided to accompany the *aid-Ernährungsführerschein*, yet this only relates to the practical implementation of the program contents.

Discussion

The results show that health promotion and nutritional topics are given high priority by the vast majority of primary schools in school programs. Health-related content is frequently addressed; however, in terms of concrete measures, temporary projects and informal strategies predominate, e. g. a collective school breakfast. The theoretical basis of what is regarded as "healthy nutrition" and how it should be transmitted often remains unclear. The European Core Curriculum is not mentioned explicitly in any school program as a point of reference, although the content mentioned therein is definitively reported. Overall, more traditional child-focused approaches, instead of curricular emphases, seem to shape school practice as outlined in the school programs. In addition, there is a significant lack of teacher training, both generally relating to health education content and more particularly to nutrition-specific content. The high prevalence of programs and projects implemented in recent years (EU School Fruit Scheme, *aid-Ernährungsführerschein*) demonstrate the demand for health-related schemes in primary schools. However, in regard to the stabilization of such individual measures, their impact is greatest when they are integrated into a holistic approach and into the school's identity [22]. The "good and healthy schools" in the BuG network can be regarded as role models for this type of holistic school development approach. These schools demonstrate greater continuity in regular collective breakfasts and greater integration of nutritional topics in work with parents.

“Addiction prevention is a part of health education. We would like to support our students to develop strong and self-confident personalities, to not fall back on addictive substances as substitute gratification in difficult life situations and to know how to behave with an awareness of health on an everyday basis. In their early years, children are already exposed to influences which lead to dependencies and can negatively influence their physical, mental and psychological well-being. At primary school age these primarily include media consumption and sugar in food, [...]”

Sugar is wrongly not classified as a drug. Large amounts of sugar are added in many processed foods, so that the body gradually adapts to the high sugar content and prefers sweet food. Too much sugar intake can lead to overweight and tooth decay. There is also the risk of a deficiency in vitamins, minerals and trace elements, as sugar supplies energy to the body in the form of “empty” calories, but replaces vitamin and mineral rich food in total.“

Case Study 5: **Nutritional literacy and addiction prevention**
Quotes from school program [translated from German]

In addition to the methodological limits already mentioned under “Limitations”, it should be noted that the quality and quantity of implementation cannot be deduced from the mention of a topic in the school program. A professional group at Wuppertal, which studied the gap between school programs and school life, came to the conclusion that considerable differences exist in the implementation of programs [23]. The documents studied are also snapshots; previous stages of development or desired objectives are scarcely addressed. In this regard, process-oriented data should be gathered in qualitative interviews with school management and teachers at different school types. Further research should also ascertain the subjective theories of the parties involved, in order to detect barriers and resources from the perspective of those involved. It is also worth clarifying whether different school cultures lead to different health and nutritional behaviors. The analysis of school programs may act as a starting point for these ensuing questions.

Conflict of Interest

The authors declare no conflict of interest according to the guidelines of the International Committee of Medical Journal Editors.

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