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The Role, Importance and Equipment of Nutrition Laboratory in School

Oana ATOMEI¹

Abstract

In the Romanian school healthy eating is promoted in optional classes, counseling classes and educational projects. Therefore, it is useful to have a space for nutrition education (preventive nutrition) classes. Nutrition laboratory becomes a place where not only healthy eating is promoted, but also, through creative and fun culinary activities, it provides students the opportunity to learn about proper food preparation, food safety, servings, and correct association of food in menus. Nutrition education classes may take place in any classroom, but if the activities take place in a specially arranged and properly equipped classroom, the impact on students will be higher. Gastronomy laboratory in some technology high schools can form the basis of nutrition laboratory. The improvement consists in a proper classroom arrangement, in addition to special designed space for food preparation (kitchen). Its organization is based on the level of education (primary, secondary) and according to the proposed theme areas: basics of nutrition, food safety etc. Food questionnaires and food diaries, approved height and weight scales, 2000 CDC growth charts, dietary guidelines and food labels, kitchen scales, recipes, menus and diets, tables for recommended number of servings, tables for daily needs of fluids, calories and nutrients, tables for nutrition fact of foods, and lists of educational resources become useful tools in assessing nutritional status and in promoting healthy eating.

Keywords: laboratory, nutrition, nutrition education.

1. Introduction

The school environment, along with other sectors of society, influences students' eating behavior. However, no other institution has contact with children so long. School presents significant opportunities for nutrition education if it effectively implements strategies to help students to adopt and maintain healthy eating habits. The nutritional education model should be promoted at the interdependent components as: education for healthy living, physical education, counseling and guidance, the school website, family and community collaboration, healthy food marketing inside and near the school, food service for communities etc.

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2. Organizational framework

Nationwide interventions that have been implemented until now are: *Guide to Healthy Eating* (available on the Ministry of Health website as an official document, being adopted by the National Committee for Food and Nutrition - NCFN), laws regarding the program for promoting fruits in schools, dairy and bakery products program, banning fast food in schools, the list of unrecommended/ forbidden food for students and the principles for healthy eating for children and adolescents. Provisions like "in the curricula will be introduced one hour per week of education for healthy eating that provides advice for correct eating from nutritional and hygienic point of view" appear in *National diet and nutrition plan for population*, developed by NCFN. It is mentioned the possibility of using the counseling class if education for healthy eating discipline is not available. However, teachers should be instructed to acquire knowledge of nutrition.

Today, healthy eating is promoted in schools at the counseling classes, in *Quality of Lifestyle* module, and at education for healthy living optional discipline while approaching healthy food area, during extracurricular activities week *To know more, to be better* and extracurricular activities developed by members of the Commission for health promotion. But an approach solely targeted on certain students and on short term is not sufficient. Nutrition education in schools must be conducted in all classes in each grade.

3. The role and importance of nutrition laboratory

In the Romanian school healthy eating is promoted in optional classes, counseling classes and educational projects. Therefore, it is useful to have a space for nutrition education classes (preventive nutrition). Nutrition laboratory becomes a place where not only is healthy eating promoted, but also, through creative and funny culinary activities, it provides for students the opportunity to learn about proper food preparation, correct association of food in menus, portions and food safety. So, new foods can be introduced in the diets of children, and they can easily accept various foods. By adding nutritional education activities, it is enhanced the capacity of choosing healthy foods, that becomes part of their lifestyle. Activities should provide nutrition concepts, these should be age-appropriate and provide ways in which children can put into practice what they learned.

A wide range of nutrition education activities can be used in the laboratory according to proposed aims: from simple discussions, completing

worksheets, food diaries, to reading and understanding food labels, making menus and recipes, game role (shopping, restaurant, picnic, a meal with the family), gastronomy classes, displays and workshops.

4. Arranging nutrition laboratory

Nutrition education classes may take place in any classroom, but if the activities take place in a specially arranged and properly equipped classroom, the impact on students will be higher. Many technological high schools have gastronomy laboratories because technician in gastronomy specialization is in their educational offer. A specially designed space is actually a professional kitchen, a classroom extension. Such space can form the basis of nutrition laboratory.

For the educational process to take place under optimum conditions of safety and cleanliness, location and arrangement of the kitchen must follow specific rules. It must not be near heavily polluted places (bathroom, waste deposit) and specific smell (chemistry laboratory). A drinking water source must be ensured, and liquid and solid debris properly discharged. Natural and artificial lighting must ensure observation of the appearance of food. Temperature, humidity and air velocity (an average of 20° C, 35-65% and 0.2-0.5 m/s) ensure suitable microclimate. Ventilation is important for removing dust, smoke, steam and heat from the room. The construction materials must be thermally insulating, waterproofing, sound insulating, resistant, non-inflammable and easy to maintain. The kitchen must have smooth, unrottable, non slippery, resistant to shock and weight and easy to wash and disinfect walls and pavement. In the kitchen can be prepared hot and cold snacks, meals, confectionery, pastry, ice cream and soft drinks. Therefore, it should be equipped with equipment, furniture, utensils and devices that facilitate the work of the people involved in the activity (teachers, students, invited parents) increasing the quality of food. The kitchen must be partitioned into several zones: a preliminary processing area (primary) where raw materials are cleaned, washed, cut up and prepared, a hot preparation area, a cold preparation area, a final preparation area, a washing dishes, cutlery and glassware area, separate storage areas (raw materials, tableware, glassware, cutlery and linen, inventory reserve and protective clothing, cleaning materials and substances, waste). The consumer area may be represented by classroom and it will be properly sanitized before and after eating the food prepared in the kitchen. To create a pleasant atmosphere, it can be equipped with an audio system (Tarcea, 2014).

In addition to the specially designed space for food preparation (kitchen), the classroom can be arranged by level of education (primary, secondary) and according to the proposed theme areas: basics of nutrition, food safety etc.

The visual impact is particularly important when it comes to food. Just as the food on the shelves in markets are stacked with a precise purpose, images and correctly formulated messages are particularly important to the final consumer (student) in the nutrition laboratory. Thus, the food pyramid from *Ghid pentru alimentația sănătoasă* [Guide to Healthy Eating] (Graur, 2006) must be the first useful tool in promoting healthy eating behavior. It is divided into seven food groups and their daily number of servings: water (2-2.5 liters), grains (6-11 servings), legumes and vegetables (3-4 servings), fruits (2-4 servings), dairy (2-3 servings), lean meat – preferably white (2-3 servings) and concentrated sweets and saturated fats (small amounts). Physical activity appears at the bottom of food pyramid (Graur, 2006). Adequate intake of macro and micronutrients is achieved when foods from all groups are consumed. The food pyramid also emphasizes balance, variety and moderation in the eating habits, focusing on the consumption of grains, vegetables and fruits. The foods providing macronutrients (carbohydrates, proteins, fats) and micronutrients (vitamins, minerals) necessary to maintain health are graphically illustrated. Another argument for using the food pyramid in the laboratory regardless of level of education is the presence of clowns which were originally designed for nutrition education in schools (guide design belongs to the painter Constantin Tofan).

Beside the food pyramid should be visibly displayed the rules for healthy eating from the guide. These are: keep your pleasure of eating, eat varied foods, feed up accordingly to maintain your normal weight, eat a lot of grains, eat many fruits and vegetables, eat low fat foods, eat refined sugar products occasionally and keep the balance between food intake and physical activity (Graur, 2006).

Depending on available space, can be displayed food labels which include availability, precise and real coordinates of producer, compositional label (list of ingredients), nutritional label (information about the energy value, content of nutrients – protein, carbohydrates, lipids, vitamins and minerals – per 100 g product and serving), osmolarity/ osmolality of the product, origin and nature of the protein and/ or hydrolyzed protein, references (list of allergens, use under medical supervision, as the only source of nourishment, suitable for specific ages, risk for healthy people "for the dietary management of...", precautions, contraindications in case of gluten, lactose or phenylalanine intolerance, enhanced, reduced, eliminated

or transformed nutrients, not for parenteral use), proportion, use, presentation and storage after opening.

Also, for the nutrition classes which include not only assessment of the nutritional status, but also promotion of healthy eating, useful tools are: approved height and weight scales (not bathroom scales) for anthropometric assessment, 2000 CDC growth charts (blue for boys, red for girls) useful for BMI-percentile calculation (body mass index), BMI formula = $\text{Weight (Kg)} / \text{Height}^2 \text{ (m)}$, kitchen scales for an accurate estimation of servings, food packaging, recipes, tables for recommended number of servings of food groups by age, tables for daily needs of fluids, calories, macronutrients (proteins, fats, carbohydrates) and micronutrients (vitamins and minerals) estimated by age, sex and physical activity level, tables for nutrition and food values of energy (from the guide and other approved sources), food questionnaires (24-hour dietary recall, diet history questionnaire, food frequency questionnaire etc.), physical activity questionnaire (screen time, frequency and duration of physical activity, examples of weekly physical activities etc.), food diaries, lists of educational resources etc.

Nutrition educational resources must be credible and approved. In Romania, in addition to the guide we can find education for healthy living coursebooks which include according to the curricula, the healthy food area, and the first nutrition coursebook, approved by MECTS, written by PhD Lygia Alexandrescu, introduced as an optional in 4th grade, structured in four chapters (healthy lifestyle, special nutrients, explained food pyramid and food labels). In other countries (e.g. USA, Canada, UK and Australia), the educational resources include the curriculum, school programs, online programs for teachers, packages of educational resources (lesson plans, worksheets, charts, PowerPoint presentations, videos, questionnaire and educational resources for children and parents, interactive games, workshops) and sites which promote healthy eating and physical activity. Access to most web resource is open for consultation, use and adaptation by teachers, for non-commercial purposes, but their use requires knowledge of English.

In addition to the resources listed above, in the laboratories of universities that have Nutrition and Dietetics specialization can be used: blood pressure monitors, blood glucose meter, medical centimeter with BMI chart and calculator (for waist circumference measuring), Harpenden skinfold caliper (for subcutaneous fat assessment), body composition analyzer through bioelectrical impedance analysis, nutrition software for professionals (Nutritio, Nutrilog, Nutribase, Nutritics, Nutrition Facts etc.) and samples of menus.

5. Conclusions

Most schools have physics, chemistry and computer laboratories, Romanian language, mathematics, biology, geography, history, foreign languages and religion offices. Given that healthy eating is promoted in counseling classes, *Education for Healthy Living* optional discipline, and extracurricular activities, a space for this purpose is necessary. Nutrition laboratory can be organized in a classroom and an extension room (kitchen). Both areas must be accordingly equipped. Nutrition education activities developed within an appropriate space have not only direct and immediate usage for participants, but also they are very useful for expanding their interest for their own health maintained through proper and age specific diet.

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