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ST. KLIMENT OHRIDSKI
FACULTY OF EDUCATIONAL STUDIES AND THE ARTS

ABSTRACT

ATTITUDES TOWARDS THE NUTRITION AND SUPPLEMENTATION OF CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

for awarding the educational and scientific degree „Doctor“

professional direction: 1.2. Pedagogy /Special pedagogy/

AUTHOR: BIANKA IVANOVA STANKOVA

SUPERVISOR: PROF. EMILIA HINKOVA EVGENIEVA, PhD

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INTRODUCTION

The relevance of the problem of nutrition, diet and supplementation of children with various special educational needs is determined by the overall health policy. Globally, there is growing awareness that childhood is the ideal period for intervention – it is a time of vulnerability but also of opportunity. An unhealthy diet can provoke the appearance of a number of diseases and deterioration of the quality of life. Factors such as malnutrition, poor quality food and obesity directly affect the physical and cognitive development of children and their social activity. Therefore, it is particularly important to initiate changes regarding the education of eating habits from early childhood and attitudes towards food and physical activity.

In Bulgaria, children's nutrition, the culture of nutrition and the quality of the food consumed are the subject of research, detailed analysis and the application of a system of measures to influence the identified deficiencies. In 2023, the National Health Strategy 2030 was adopted, in which one of the main focuses was placed on the high levels of risk factors endangering health such as obesity and unbalanced nutrition. The intentions are to implement health promotion activities, including regarding the healthy nutrition of children.

The adopted health strategy and the targeted implementation measures are proof that the topic set in the dissertation development has a contemporary sound. It is particularly relevant in relation to the feeding of children with special educational needs. Healthy eating is a guarantee of a higher quality of life. Whole food contributes to the optimal development of the child's organism, of all organs, systems and functions.

In connection with this, and in accordance with the set Reform 6 Modern health education in the Bulgarian school from the National plan for recovery and sustainability, specialists are faced with the challenge of forming healthy behavior in relation to children's nutrition, as well as promoting a healthy lifestyle through forming a culture of healthy eating.

This reform acquires particular significance in the context of nutrition and eating habits of children with special educational needs, as one of the behavioral factors of health. The topics of healthy lifestyle and eating habits are within the scope of attention of pedagogical specialists. There is also a school policy for the formation of proper nutrition skills. Here we can raise the question of whether these efforts are also sufficient in relation to children with special educational needs – regarding the knowledge of their nutritional needs, the specifics of accepting different foods and the ways of forming a culture of nutrition among them. And at the moment, there are no methodological guidelines regarding the requirements for feeding children with various disorders: neurological disabilities, Down syndrome, autism spectrum,

attention deficit hyperactivity disorder, etc. A systematic review and analysis on this topic is also lacking.

The current dissertation development presents a detailed scientific review on the following issues:

- ✓ Children with special educational needs and specifics related to their nutrition.
- ✓ Global, European and national documents, initiatives and good practices regarding nutrition.
- ✓ Formation of food culture – through the prism of educational content.

On the basis of the scientific presentation of the problem, we carried out a scientific study of the attitudes towards nutrition and supplementation of specialists supporting the education of children with special educational needs and students mainly from pedagogical specialties.

The analysis of the obtained results is the basis of the development of a conceptual scheme, which aims to support the process of forming a culture of nutrition in children and adolescents. It contains, on the one hand, proposals for more effective interaction between the institutions related to children's health and education, and on the other – opportunities to optimize and enrich the educational content on the topic of nutrition, with the aim of fostering interest in healthy eating in children and applying the principles of a healthy lifestyle in practice.

The dissertation shows that asking questions about healthy eating and supplementation is of particular importance in recent years. To solve them, coordinated efforts of experts from the Ministry of Education and Culture, specialists supporting the education of children with special educational needs (resource teachers, speech therapists, psychologists, therapists), teachers, social workers, parents, students are necessary.

FIRST CHAPTER
THEORETICAL OVERVIEW OF THE STUDYED LITERATURE ON THE SUBJECT

More and more often, questions are asked about the specific features of feeding some categories of children with disorders, which still do not have a clear answer. “There is no systematic research and analysis of their results. Neither from the organizations that offer them, nor from the institutions that are directly related to the upbringing and education of children with developmental problems. This gives rise to myths and helps to develop and expand mistrust of institutions” (Stankova, Evgenieva, 2020: 494).

1.1. Children with special educational needs

We will outline in more detail the specifics of only part of the children with special educational needs, in which nutrition and diet are of particular importance, namely: children with autism spectrum disorders (ASD); children with attention deficit hyperactivity disorder (ADHD); children with specific learning disabilities (dyslexia); children with dyspraxia; children with Down syndrome.

1.1.1. Children with autism spectrum disorder

In the ICD-10, class F84, the following definition is indicated: “a group of disorders characterized by qualitative disturbances in social relationships and in the way of communication, as well as by a limited, stereotyped, repetitive complex of interests and activities. These qualitative abnormalities are a generalized feature of an individual's functioning in all situations'” (WHO, 2004: 438).

DSM-IV foregrounds the three essential disorders that define autism – social interaction (with greater severity), behavior, and communication – important because of their universal applicability.

In the 11th revision of the ICD, the definition of autism is: “Autism spectrum disorder is characterized by persistent deficits in the ability to initiate and maintain reciprocal social interaction and social communication, and by a range of restricted, repetitive and non-verbal patterns of behavior and interests. Deficits are severe enough to cause impairment in personal, family, social, educational, occupational, or other important areas of functioning and are usually a pervasive feature of an individual's functioning observed in all circumstances, although they

may vary according to social, educational or other context. Individuals across the spectrum exhibit a full range of intellectual functions and language abilities" (Valyavicharska, 2021: 47).

Nutrition in children with autism spectrum disorder

There are suggestions that there is a link between some specific food ingredients and autism, and that a certain diet can improve the functioning of cognitive functions, attention and behavior in general. It is also claimed that biochemical processes in nutrition are linked to a number of neurological and psychiatric disorders, and by following a special nutritional regime, some gastrointestinal and mental complications can be minimized.

Melillo (2019) notes that eating patterns in individuals with autism spectrum disorder are a hallmark of childhood neurological disorders. It refers to a universally applicable source of the problem in the imbalance in brain development, described as Functional Detachment Syndrome (FDS), which imbalance according to the degree and location of the affected area, produces symptoms qualitatively different in intensity and severity, and therefore variability in the final outcome. diagnosis of individuals. (Melillo, 2019: 23).

Meta-analyses regarding the nutrition of children with autism spectrum disorders documented lower intakes of protein, calcium, phosphorus, selenium, vitamin D, thiamin, riboflavin, vitamin B12 and unsaturated fats such as omega 3 (Esteban-Figuerola et al., 2019). It has been established that individuals with the same disorder have hypertriglyceridemia more often than the general population (Grayaa et al., 2018), (Dziobek et al., 2007), (Kim et al., 2010).

There is almost no child with an autism spectrum disorder who does not have gastrointestinal problems – almost imperceptible or clearly manifested. Specific for them is the oral processing of food, there are also problems of an enzymatic nature. This requires the consumption of organic foods, i.e. without GMOs, hormones and pesticides and the limitation of those that contain colors, flavors, preservatives and E's. Most likely, the brain perceives some of the foods as dangerous. Eating habits in early childhood are transferred throughout life. They can also include other manifestations uncharacteristic of typical development, such as the desire to swallow non-food, biting off various objects and materials (chalk, glue, etc.).

Eating ritual is essential. We refer to it the place of the meal, the time of serving the food, the dishes in which the food is placed, even the presence of specific people during the meal is important. The manifestations of ritual contact with food are typical – licking the food, chewing, experiencing new sensory sensations. Specific manifestations can include: refusal of foods of one or two consistencies; preference of one taste (often sweet or salty) and of the same

color; nausea when trying new foods; accepting the smell of some foods as disgusting (Stankova, 2023-b: 76).

The study of the feeding environment (kindergarten, school, home), the time of food intake, the qualities of "safe foods" and the sensations they bring should also be noted in order to move to single or co-introduction of new foods with similar qualities, with the idea of achieving desensitization. We must note that this is an activity that sometimes requires a lot of time and is not always successful from the first attempt.

1.1.2. Children with attention deficit hyperactivity disorder

In 1994, ADHD-IV identified three subtypes: predominantly inattentive ADHD, predominantly hyperactive-impulsive ADHD, and combined ADHD. This terminology is retained in DSN-5 (2013) and in DSN-5-TR (2022).

In ICD-10, in class V Mental and behavioral disorders, rubric F 90, the following definition of hyperkinetic disorders is placed: a group of disorders characterized by early onset (usually in the first five years of life), lack of persistence in activities that require cognitive involvement, a tendency to transfer from one activity to another without fully performing any of them, combined with disorganized, poorly regulated, excessive activity (ICD-10, 2003: 441).

In ICD-11, the syndrome is summarized under code 6A05 as Attention Deficit Hyperactivity Disorder and does not include (listed as secondary complications in ICD-10) dissocial and disruptive behavior and low self-esteem.

Nutrition in children with attention deficit hyperactivity disorder

There are publications in which the way of eating is cited as the cause of hyperactivity in children. Shapkova (2023) points out that many of the foods that children consume on a daily basis actually negatively affect their body's biochemistry.

In the last quarter of the 20th century, there were opinions that hyperactivity and inattention in some children could be a consequence of taking nutritional supplements (supplements). Research has been cited that rejects the role of dietary supplements as a primary cause of ADHD and states that restricted diets may help a small subset of children with the syndrome, primarily those with specific food allergies at an earlier age (Mash&Wolfe, 2010).

Some research suggests that children with ADHD have lower levels of essential fatty acids than other children. It has not been proven what the role of these fatty acids is and whether they are related to the disorder. In these cases, specialists (pediatricians, nutritionists, etc.) recommend exclusion diets (avoiding certain foods), although these diets may only be effective for a minority of children.

Meta-analyses (2013) reported in the American Journal of Psychiatry looked at the efficacy of dietary interventions (with limited elimination of artificial colors and supplementation of free fatty acids) and psychological therapies (cognitive training, neurofeedback, and behavioral interventions) for ADHD. The addition of free fatty acids and the exclusion of artificial food colorings appear to have a beneficial effect on ADHD symptoms.

A link is being sought between the risk of exposure to low levels of lead found in soil and some paints and the onset of hyperactive symptoms.

The American Academy of Pediatrics (2019), based on current research conducted in recent years, does not recommend dietary changes for children with ADHD. Research does not support the popular belief that ADHD is caused by eating too much refined sugar, however it can worsen ADHD symptoms in certain individuals.

1.1.3. Children with specific learning disabilities (dyslexia)

In ICD-10, in class V Mental and behavioral disorders, there is a separate rubric F81 Specific disorders in the development of school skills. These are disorders in which the normal ways of acquiring skills are damaged already in the early stages of development (ICD-10, 2003: 434).

DSM-IV (1994) uses the term "learning disorders" to refer to reading, writing, math, and learning disorders.

Specific learning disorders according to DSM V are: reading disorders, arithmetic disorders, written expression disorders, and learning disorders. It is correctly noted that specific reading disorders are defined in various international sources as dyslexia, and specific mathematical disorders, respectively, as dyscalculia.

And *in ICD-11* (heading 6A03), specific learning disorder is defined as significant and persistent difficulties in acquiring academic skills related to reading, writing or mathematics. It is noted that these difficulties are not a consequence of sensory, intellectual, motor or neurological disorders. Nor are they the result of lack of language proficiency or inappropriate psychosocial conditions (https://icd.who.int/browse11/l-m/en).

Nutrition in children with dyslexia

Scientists have suggested that children with dyslexia and other learning disabilities may be deficient in zinc, one of the most important minerals in the body (Grant, Howard and Davies, 1988). Research has been cited to prove that a minimal iron deficiency can have a detrimental effect on a child's immune system and affect their overall physical condition.

Taking iron supplements shows improvement in cognitive functioning in teenage girls. According to Roydeva, (2022) to the therapy of dyslexia it is necessary to include supplements such as: bee pollen (which contains minerals and vitamins), royal jelly (with vitamin B complex), vitamins C, F1, F5 and F12, calcium, magnesium and selenium. It should not be forgotten that essential fatty acids, iron and zinc can be used in the form of supplements, but their intake must necessarily be consulted with a doctor. It can be concluded that the implementation of a well-balanced diet would be beneficial in children with dyslexia.

1.1.4. Children with dyspraxia

In the *10th revision of the ICD*, in class V Mental and behavioral disorders, rubric F82, Specific disorders in the development of motor function are presented. The definition is as follows: A disorder in which the hallmark is a serious disturbance in the development of motor coordination that cannot be explained solely by general mental retardation or by some specific congenital or acquired neurological disorder.

In ICD-11, code 6A04 indicates a disorder in the development of motor coordination. Symptoms include: the significant delay in the formation of fine and general motor skills; motor skills are below typical for the age; early onset and functional limitations (https://icd.who.int/browse11/l-m/en).

In *DSM-5* (2013), developmental coordination disorder is classified as a motor disorder, in the category of neurodevelopmental disorders.

Dyspraxia feeding

A search for publications relating to the feeding of children and adolescents with dyspraxia reveals that these are almost non-existent.

Melillo's brain balance program also includes a nutritional regimen that aims to improve food sensitivities and the underdeveloped digestive system that are typical of brain imbalance. Melillo creates a special nutritional regime for optimal brain nourishment of severed children. He notes that it is not an end in itself and is part of a complex program including motor, sensory, neuroacademic exercises (Melillo, 2019: 31).

One of the diets that can be recommended for children with dyspraxia is the anti-inflammatory diet. The basis of this way of eating is the consumption of fish (rich in healthy omega-3 fatty acids and phytonutrients), fresh fruits and vegetables, rich in antioxidants and plant-based foods (nuts, legumes) – a rich source of fiber, proteins, folic acids and minerals.

1.1.5. Children with Down syndrome

Congenital anomalies, deformities and chromosomal aberrations are described in *ICD-10* in class Q00-Q99. Chromosomal aberrations, not elsewhere classified, are referred to under heading Q90-Q99. Down syndrome is represented as follows: Q90 – Down syndrome (Syndroma Down) with specific subtypes.

Nutrition in Down syndrome

Most of the children with Down syndrome are prone to obesity compared to the general population. Diabetes and gastrointestinal diseases, gastrointestinal defects are observed. Some children have defects in the structure and function of the stomach and intestines (including the esophagus, trachea and anus). This leads to digestive problems such as: heartburn, twisting and rolling of the intestines, intestinal obstruction, meconium syndrome, hernias, food intolerances, etc. Constipation occurs in almost half of individuals with Down syndrome, which is a risk factor for behavioral problems.

Food therapy includes both the quality selection of foods and a specific diet. This does not mean that children with Down syndrome must be put on a special diet. Supplementation with specific amino acids, minerals, and vitamins may be recommended.

1.2. Nutrition and eating habits

1.2.1. World and European documents, initiatives and good practices regarding nutrition

In 2007, the EU Strategy on nutrition, overweight and obesity-related health problems was adopted. Some of the related EU initiatives are: EU Action Plan on Childhood Obesity; Health and nutrition claims; Encouraging the consumption of fruits and vegetables; Council Conclusions on Nutrition and Physical Activity (2014); EU Platform for Health Policy and more.

In its report, WHO (2019) described the rapid increase in childhood obesity as "one of the most serious public health challenges of the 21st century (WHO, 2019). At the beginning of the 20th century (2004), the Health Assembly of the WHO adopted a global strategy for diet, physical activity and health.

In 2023, WHO updated its guidelines on total fat, saturated and trans fat and carbohydrates based on the latest scientific evidence. They are at the heart of the concept of healthy diets. In 2024, new guidelines on fiscal policies to promote healthy eating are being approved.

1.2.2. National regulations, studies and analyzes regarding nutrition and supplements

In 2005, the Council of Ministers of Bulgaria adopted the *National Action Plan "Food and Nutrition 2005-2010"*. The strategic goal is "improving the health of the population in Bulgaria by improving nutrition to reduce the risk of diseases related to food and nutrition". In 2008, a national level study "Healthy children in healthy families" was carried out. In the period 2005-2010, national studies were conducted and on this basis, monitoring of nutrition and nutritional status of children aged 1 to 5 years, of overweight and obesity in students aged 7-8 years, of school meals was launched. National recommendations for healthy eating for children aged 3-6 years (2008) and for children aged 7 to 19 years (2008) have been developed.

By decision of the Council of Ministers in 2013, the *National Program for the Prevention of Chronic Non-Communicable Diseases 2014-2020* was adopted. The commitment of the Ministry of Education and Culture is the development of educational programs for healthy eating for students and their implementation within extracurricular and extracurricular activities. As a task for building capacity and skills for consulting and supporting specialists, it has been recommended to higher schools: "creation of specially targeted university education in food, nutrition and dietetics – approval of freely selectable modules on healthy nutrition for students, etc.".

In 2014, another *National study of risk factors for the health* of the population was conducted. A priority in the prepared cooperation agreement between the WHO and Bulgaria (2016-2017) are the problems of nutrition and dietetics in our country.

In 2018, an *Ordinance was adopted amending and supplementing Ordinance No. 9* of 2011 on the specific requirements for the safety and quality of food offered in childcare facilities, school canteens and retail outlets on the territory of schools and childcare facilities, as well as to food offered at organized events for children and students.

In 2020, the next National study of post-population health risk factors in the Republic of Bulgaria - 2020 is being conducted. The following documents are accepted as priority: National Health Strategy (2014-2020) and its updated version, National Program for the Prevention of chronic non-communicable diseases (2014-2020) and the adopted new one for the period 2021-2025.

1.3. Formation of food culture

Without a doubt, building a food culture from early childhood is one of the working and effective methods of health prevention.

1.3.1. National legislation on healthy nutrition for children and students

In *Ordinance No. 13 (2016)* of the Ministry of Education and Culture, the state educational standard for civic, health, environmental and intercultural education is defined, which defines the "essence and goals of health education"; "the ways and forms of implementation of health education"; "the framework requirements for health education learning outcomes" and "institutional policies to support health education" (Regulation 13, art. 1. (1), 2023). In kindergartens, health education is carried out both in the training in the main educational areas and in the additional forms of pedagogical interaction from the first to the fourth group. In school, health education is carried out in the process of general education of students.

Ordinance No. 5 of the Ministry of Education and Culture (2018) defines the state educational standard for general education. A healthy lifestyle, a part of which is nutrition, is included as a priority in the content of study subjects 12. Environment and 13. Man and nature (initial stage of education). Separate annexes to the regulation contain requirements for the learning outcomes of each subject forming the general educational preparation of students.

In the *Inclusive Education Ordinance (2016)*. In Art. 23 "Health Care" is listed as a type of general support. The content regarding the formation of attitudes towards healthy eating is reduced to paragraph (2): "For children and students in kindergartens and schools, programs related to health education, healthy eating, first aid and others are organized" (Ordinance on Inclusive Education, 2016).

1.3.2. Formation of food culture through the educational content

Learning content for the learning subjects in the initial stage of education related to nutrition

The subjects from the compulsory general education of elementary school students providing knowledge, skills and competences about food and nutrition are: Native Studies in 1st and 2nd grade and Man and Nature in 3rd and 4th grade.

In conclusion: Regardless of the various activities in class and extracurricular activities, students do not have an established eating culture. They fall under the influence of aggressive advertisements of "delicious" junk foods, full of fat, salt or sugars, which are harmful to their health and risky in terms of obesity, type 2 diabetes and a number of other non-communicable diseases. They have not formed sustainable attitudes towards the correct selection of foods useful for their health. This applies even more to children with special educational needs.

SECOND CHAPTER
RESEARCH PROGRAM

2.1. Object and subject of research

The object of the research is the attitudes of students and specialists regarding the nutrition and supplementation of children with special educational needs.

The subject of the study is the process of forming skills for healthy eating and nurturing a culture of eating in children with special educational needs.

2.2. Aim, tasks and hypothesis of the study

The purpose of this dissertation is to explore the opinions and attitudes of students and professionals regarding the nutrition and supplementation of children with special educational needs.

Sub-goal 1. To analyze the attitudes of students regarding the idea of healthy eating and their opinions regarding the place of topics related to healthy eating and supplements in the curricula and in individual disciplines in higher education. On this basis, conclusions should be drawn regarding their training as future specialists.

Sub-goal 2. To investigate the familiarity of the specialists supporting the education of students with special educational needs with the idea of healthy eating and the acceptance of supplements and their attitudes and opinions regarding the place of topics related to healthy eating and supplements in the curricula and in individual curricula subjects in which they support children with special educational needs at school.

Sub-goal 3. To compare the attitudes of students with those of specialists regarding the formation of a culture of nutrition through conventional methods and means and with the help of informal sources of information.

Sub-goal 4. To develop a conceptual scheme for the formation of a culture of nutrition in children with special educational needs.

Tasks:

- ✓ To carry out a theoretical review and analysis of the Bulgarian and foreign scientific literature on the subject of the study.
- ✓ To analyze international and national documents related to the healthy nutrition of children and students.

- ✓ To analyze the educational content on the topic of Nutrition, included in the curricula of educational subjects in the initial stage of education.
- ✓ To create and implement a survey to study the attitudes of students and specialists regarding the nutrition and supplementation of children with special educational needs.
- ✓ To study the attitudes of students from pedagogical specialties regarding nutrition and supplementation of children with special educational needs.
- ✓ To study the opinion and attitudes of specialists supporting the education of children with special needs regarding nutrition and supplementation.
- ✓ To develop a conceptual scheme supporting the formation of a culture of nutrition in children with special educational needs.
- ✓ To process and analyze the empirical data from the study.
- ✓ To formulate conclusions and recommendations for the work of specialists and for the preparation of students regarding the possibility of forming a culture of nutrition in children with special educational needs.

In relation to the purpose and tasks of the study, we have formulated the following hypothesis(es):

Hypothesis 1: If the components that in the process of child development create positive eating habits are systematized, we could propose a conceptual scheme through which to expand and supplement the understanding of the existing educational content so that teachers can improve the formed eating culture.

Hypothesis 2: We assume that students are not sufficiently prepared and do not have sufficient information about nutrition and supplementation of children with special educational needs and the formation of a culture of nutrition in these children.

Hypothesis 3: We assume that specialists have positive attitudes towards the inclusion of topics related to healthy nutrition and supplementation of children with special educational needs and tend to use them to form a culture of nutrition.

2.3. Study contingent

179 students from pedagogical specialties and 173 specialists supporting the education of children with special educational needs participated in the present study. The total number of respondents was 352.

The specialists included in the research are mainly resource teachers from the RCPPPO from Sofia, Varna, Targovishte and Shumen. Answers were also given by elementary teachers, speech therapists, psychologists, therapists/rehabilitators, etc.

Criteria for selecting students: gender; age; ACS; specialty and course of study.

Criteria for selection of specialists: gender; age; level of education; teaching experience; specialty.

2.4. A research battery

For the purposes of this study, the following methods were selected:

A method of theoretical analysis. Through this method, it is possible to carry out a thorough and targeted theoretical overview, through which to construct the theoretical framework of the study.

Survey. For the purposes of this study, we constructed two surveys. They are designed to investigate the attitudes of the two groups of respondents (students and professionals working with children with special educational needs) towards nutrition and supplementation of children with special educational needs.

*Student Survey***:** Data from the student survey was collected during the second semester of the 2023/2024 academic year and extracted into an excel file from Google Forms. The survey contains a total of 24 questions.

*Expert survey***:** Expert survey data was extracted into an excel file from Google Forms. The survey contains a total of 20 questions.

Statistical and graphical methods for processing research results

The qualitative analysis in this dissertation helped us to enrich the scientific assumptions about the object and subject of the study. The quantitative analysis of the obtained results allowed us to identify the attitudes of students and professionals and helped to transform our observations into an attempt to understand this problem. To visualize the received empirical data, a graphic and tabular presentation of the results has been prepared through diagrams, figures and tables.

To process the empirical data of the study, we applied **the Chi-square Test of Independence method.** Python version 3.8 was used. with the Pandas, SciPy and Matplotlib libraries.

2.5. Organization of the study

The research was carried out in three main stages: preparatory (finding) stage, main (executive) stage and final (concluding) stage.

Preparatory (finding) stage. At the beginning of the research work, we formulated the subject, purpose and tasks of the research. We studied scientific publications in the specialized literature, got acquainted with the content of international and national directives, conventions, plans regarding factors for a healthy lifestyle, trends related to healthy nutrition and supplementation of children and adolescents with typical development. We studied in detail the specifics of these groups of children with special educational needs, where nutrition, diet and supplementation are of particular importance.

After determining the direction of the research, we came to the discussion of a working hypothesis and tools for the implementation of the research and determined the content of the questionnaire surveys, through which to determine the attitudes of the respondents.

Basic (executive) stage. The actual research, data collection and primary processing of the received empirical data took place in the period January - May 2024. At the same time, the data entry and processing of the questionnaire surveys of students and specialists according to the set criteria of the research took place. Based on the results obtained from the statistical processing of the empirical data, a quantitative and qualitative analysis of the data was carried out.

Final (final) stage. This stage includes the period June - July 2024. After the description, quantitative and qualitative analysis of the research results, conclusions, recommendations and conclusion were formulated.

CHAPTER THREE
ANALYSIS OF THE OBTAINED DATA

3.1. Demographic data

The gender distribution of the two groups of respondents is presented in Figure 1 – for students and in Figure 2 – for specialists.

Of the 197 students who completed the online survey, 167 were women and 12 were men.

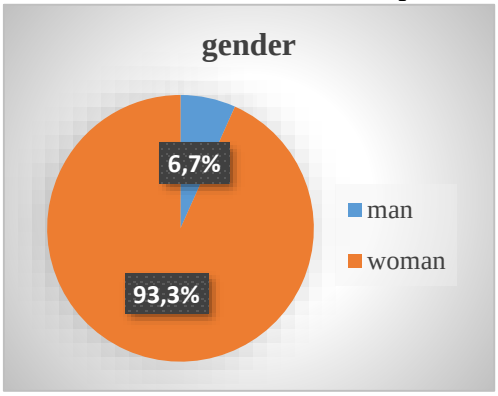


Figure 1 *Gender of students*

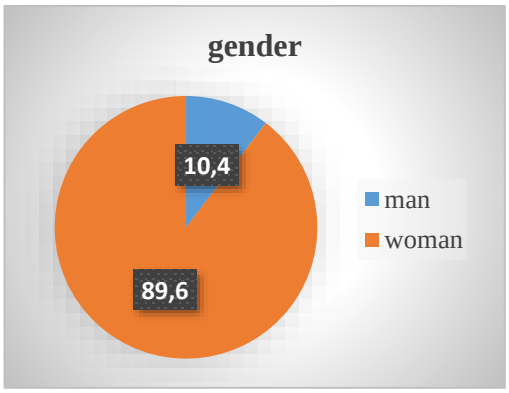


Figure 2 *Gender of specialists*

The situation with the specialists is as follows: a total of 173 completed the survey, of which 155 are women and 18 are men.

The following is the presentation of the respondents by age – Figure 3 and Figure 4

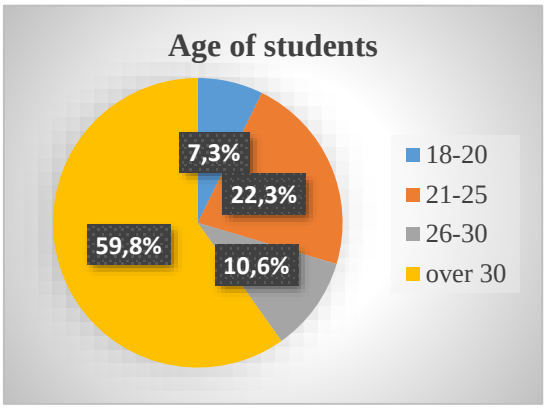


Figure 3 *Age of students*

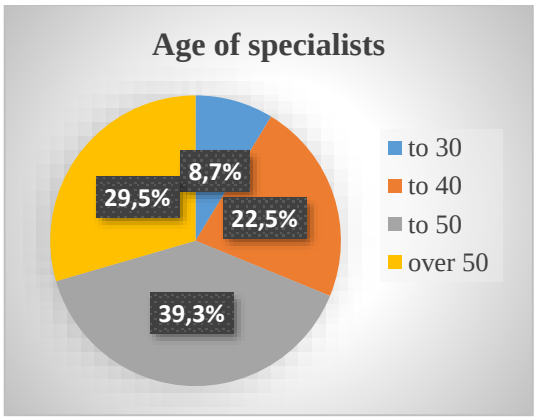


Figure 4 *Age of specialists*

The smallest number (13) are students aged 18-20. The students aged between 26-30 years are in next place – 19 students, followed by the students aged 21-25 years, respectively 40 students. The majority of students are over 30 years of age – there are 107 students studying at the Bachelor's and Master's Colleges.

Out of all 173 respondents, the percentage of specialists aged 41-50 is the highest (68 specialists – 39.3%), followed by those over 50 with 29.5%, respectively, these are 51 of the respondents and those in the interval 31-40 years old – 22.5% (39 specialists). With the lowest percentage (8.7%) are those working under the age of 30 – only 15 specialists.

Table 6

Distribution of respondents by specialty

position	specialists	students	major
Resource teacher/special pedagogue	119	83	Special pedagogy
Speech therapist	25	20	Speech therapy
Psychologist/pedagogical advisor	14	1	Psychology
Primary teacher/preschool pedagogue	6	31	Preschool and primary pedagogy
Therapist/ Rehabilitator	7	44	Social pedagogy
Director of RCPPPO	1		
Total:	**173**	**179**	**Total:**

According to the degree of completed education, the distribution of the specialists who answered the questions from the survey is as follows: OCS "bachelor" – 36 specialists; OCS "master" – 130 specialists and with OCS "doctor" – 7 specialists.

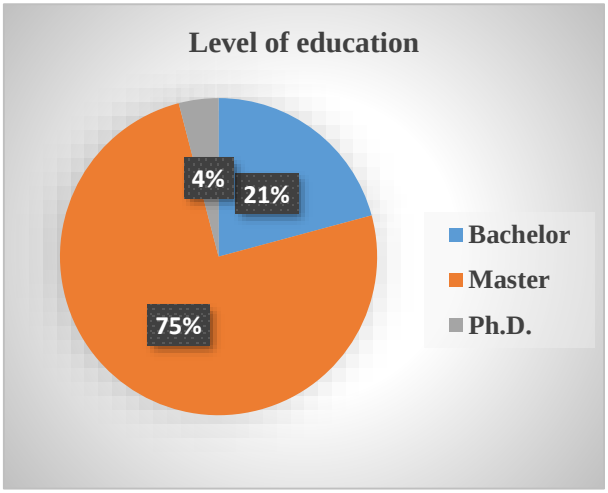


Figure 7 *Level of education* `

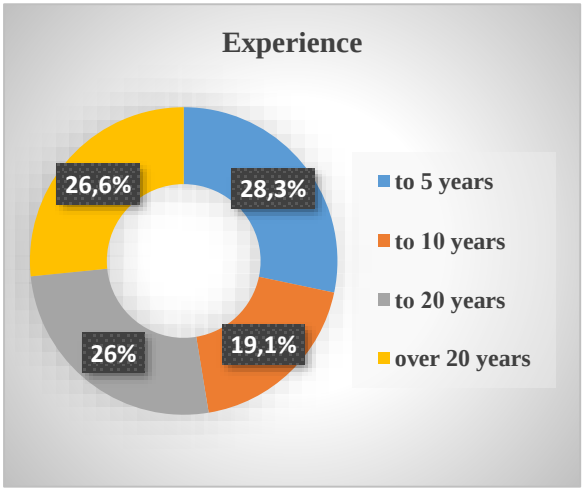


Figure 8 *Experience*

The majority of the specialists have a completed master's degree – 130 of all respondents. ¼ have a bachelor's degree. Among those who completed the survey, there are also 7 specialists who have obtained the ONS "doctor". The largest number of participants with teaching experience of more than 5 years – 49 respondents. Specialists with over 20 years of experience and those with up to 20 years of experience follow closely behind, 46 and 45 respondents, respectively. The fewest are specialists with up to 10 years of teaching experience – 33.

Of the 173 specialists surveyed, only 3 do not have any additional qualifications, and one did not answer the question. More than half of the respondents have acquired a bachelor's degree - 109, and 78 of them have completed an additional specialty at the Master's College. Almost ¼ have acquired SCC or SPC.

Table 7

Groups of children with SEN – number and in %

autism spectrum disorders	ADHD	Down syndrome	Dyslexia	Dyspraxia
162	**112**	**56**	**78**	**51**
93,6%	**64,7%**	**32,4%**	**45,1%**	**25,5%**

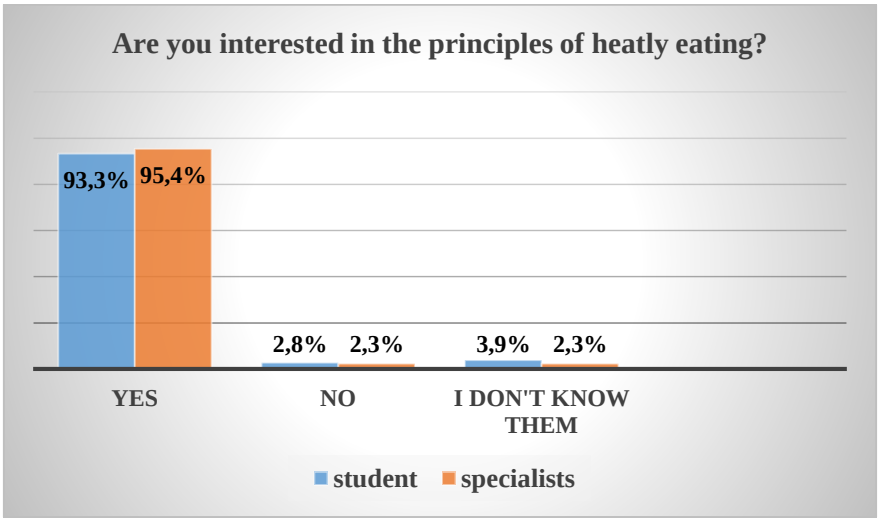
Almost all specialists (162) work with children with autism spectrum disorders. Next are the specialists who work with ADHD cases – 112 or 64.7% of all who answered the survey. Almost half of the respondents have children with dyslexia in their groups. There are the fewest cases of Down syndrome and dyspraxia that the specialists work with, respectively 56 and 51 of them.

3.2. Quantitative and qualitative analysis of the results

3.2.1. Familiarity with healthy eating and supplements

The first question is "*Are you interested in the principles of healthy eating?*"

Graph 3 shows that a large percentage of students and professionals are interested in the principles of healthy eating. For both groups of respondents, this is more than 90% of those who answered.



Graph 3 *Interest in the principles of healthy eating*

The second question of section 3 concerns the respondents' understanding of healthy eating. The responses of the respondents are visualized in Table 8:

Table 8

Understanding healthy eating

answered	students		specialist	
Balanced consumption, providing the body with the necessary amounts of nutrients.	162	90,5%	160	92,5%
To follow strict diets.	-	-	-	-
Avoid semi-finished products, pasta and fried foods.	17	9,5%	13	7,5%
Total:	**179**	**100%**	**173**	**100%**

There are no respondents who associate healthy eating with following strict diets. Almost all students and specialists give as an answer the balanced consumption of foods that provide the body with the necessary nutrients. 9.5% of students and 7.5% of professionals believe that healthy eating and pasta and fried foods are somewhat compatible.

On Graph 4, we present data related to the knowledge of healthy eating by students and specialists. About 4% of students and 3% of professionals either do not know completely or rather cannot define what a healthy way of eating is. The distribution of the remaining answers in both groups indicate that only half of them know and know well the healthy way of eating. Among students, only 15.6% know him well, and 40.2% know him well.

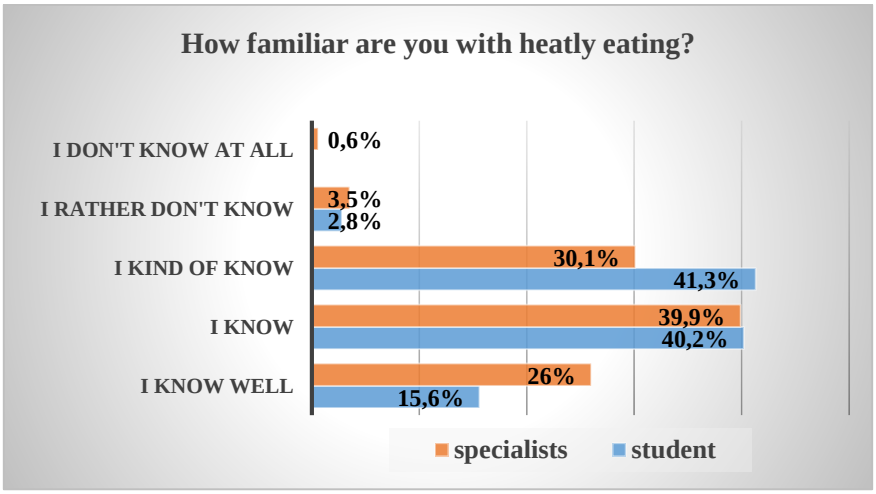


Chart 4 *Knowledge of healthy eating habits*

Among specialists, the percentage ratio is slightly different: 2/3 are familiar with healthy eating, respectively 26% know it well and 39.9% know it. Not a small percentage of respondents gave the answer "somewhat familiar" – 41.3% of students and 30.1% of specialists.

We included two more questions in the student survey.

One question is "*What is a healthy lifestyle?*" For students, the concept of a "healthy lifestyle" mainly includes four components with the greatest weight: rational nutrition, rejection of harmful habits, physical education and sports activities, and an optimal movement regime.

Table 9

A healthy lifestyle is:

answers	number	%
Giving up bad habits	**139**	**77,7%**
Personal hygiene	97	54,2%
Optimum engine mode	**110**	**61,5%**
Rational nutrition	**140**	**78,2%**
Tempering	37	20,7%
Positive emotions	98	54,7%
Physical education and sports	**122**	**68,2%**
Presence of safe behavior	47	26,3%

Most students (140 out of all 179) indicated rational nutrition as an answer to the question. A little over 3/4 of the students indicate that giving up harmful habits is also important for a healthy lifestyle.

The other question is whether, according to them, rational nutrition is part of a healthy lifestyle.

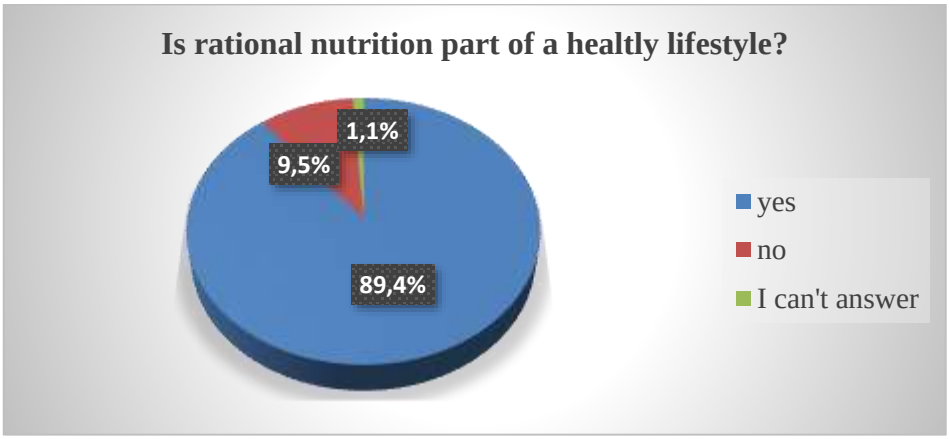


Figure 9 *Rational nutrition and healthy lifestyle*

160 students answer positively, and when it is one of the possible answers, 140 students indicate it. One group of students 39 (21.8%) in the first question and 19 in the second (10.6%) do not think that rational nutrition is part of a healthy lifestyle.

The next common question in both surveys concerns the relationship between unhealthy eating habits and diseases caused by them.

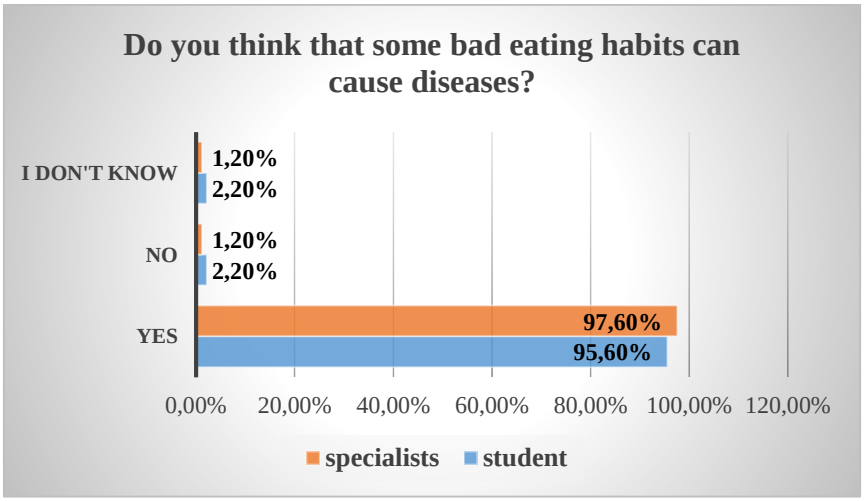
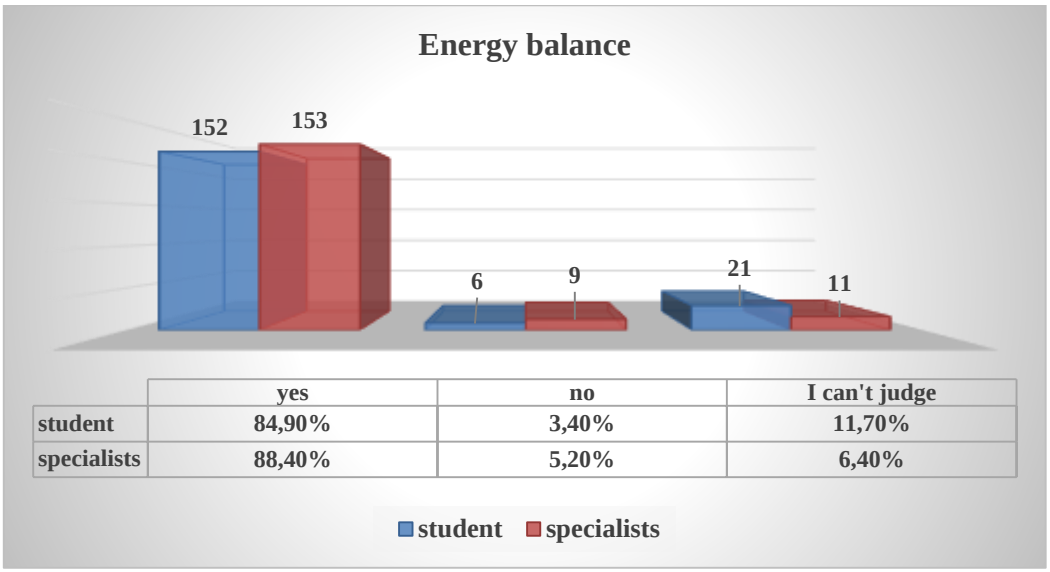


Chart 6 *Relationship between harmful eating habits and diseases*

The first statement is: Do you agree that rational nutrition is "*a balance between the energy received from food and the energy expended by a person in his life activity, in other words – energy balance*". The results are as follows:

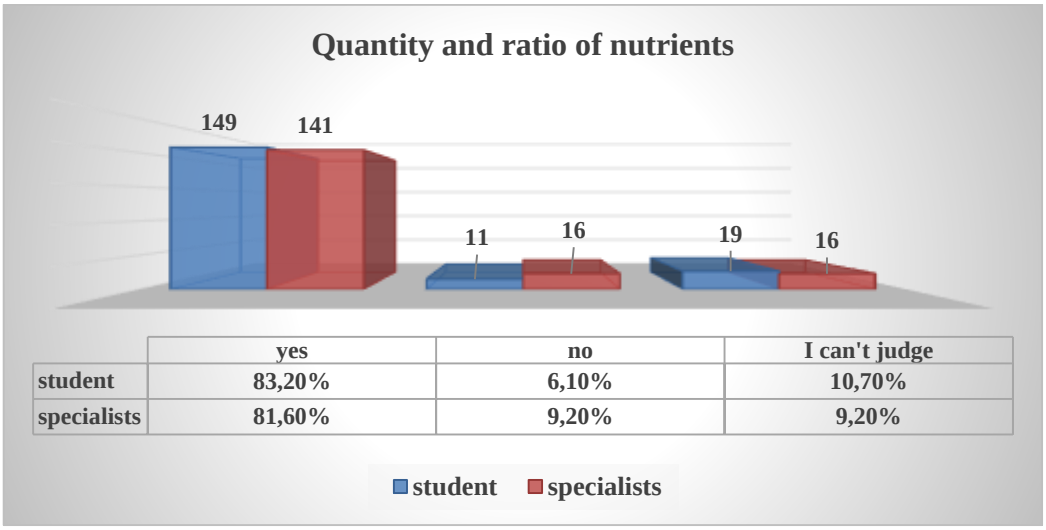


	yes	no	I can't judge
student	84,90%	3,40%	11,70%
specialists	88,40%	5,20%	6,40%

Graph 7 *Energy balance*

Almost all respondents agree that rational nutrition is a balance of energy – received with food and spent in life activities. It is noteworthy that for 27 students (15.1%) and for 20 specialists (11.6%) this is not the case.

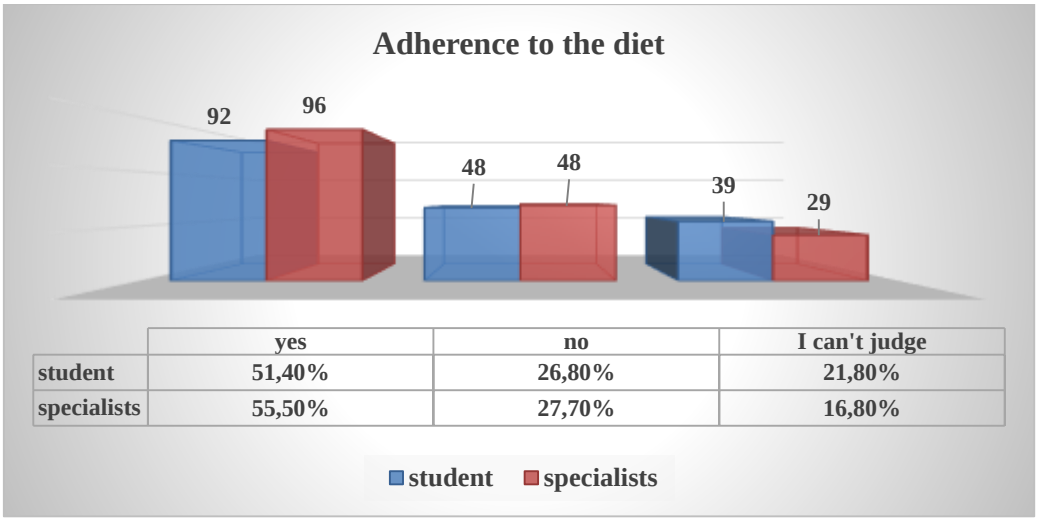
The second statement is: Do you agree that rational nutrition is "*satisfying the needs of the body with a certain amount and ratio of nutrients*". The following results were obtained: The trend of responses as in the first statement is maintained. Over 80% of both groups of respondents are of the opinion that rational nutrition is satisfying the body's needs with a certain amount and ratio of nutrients. There are more undecideds here – 19 students and 16 specialists.



	yes	no	I can't judge
student	83,20%	6,10%	10,70%
specialists	81,60%	9,20%	9,20%

Chart 8 *Quantity and ratio of nutrients*

The third statement is: Do you agree that rational nutrition is "*following a diet (a certain amount of food is taken at a certain time, at each meal)*".



	yes	no	I can't judge
student	51,40%	26,80%	21,80%
specialists	55,50%	27,70%	16,80%

Chart 9 *Adherence to the diet*

The three answer options are distributed almost evenly. However, a yes answer prevails, i.e. half of the respondents accept that rational nutrition can also be defined as following a diet (a certain amount of food is taken at a certain time, at each meal). The other half of students and professionals do not accept or cannot judge whether this is the case.

If we compare the respondents' answers to the three statements, *we can conclude* that there is almost no difference in the attitudes of students and specialists regarding what they think is rational nutrition. They categorically point to the first two statements as likely.

To the students, in this connection, we asked two more questions specifying their attitudes towards healthy eating.

The first of them is: "*Do you think that healthy eating gives the body the nutrients it needs?*". The majority of students (148) are of the opinion that the necessary nutrients enter the body through a healthy diet. 17% of them do not accept that the body can obtain the necessary nutrients through a healthy diet.

The next question is: *Is it necessary to follow a special food and drink regime (diet)?*

The share of the statement that it is not necessary to follow a diet is the smallest (19 students). There are almost equal answers that it is necessary (74 students) and partly necessary (86 students) to follow a diet. Here we can conclude that students perceive taking supplements and following specific diets as a way to keep their bodies in good health.

We have formulated several questions that are relevant to diets and supplements.

The first in this series of questions is: "*Do you know any of these diets?*"

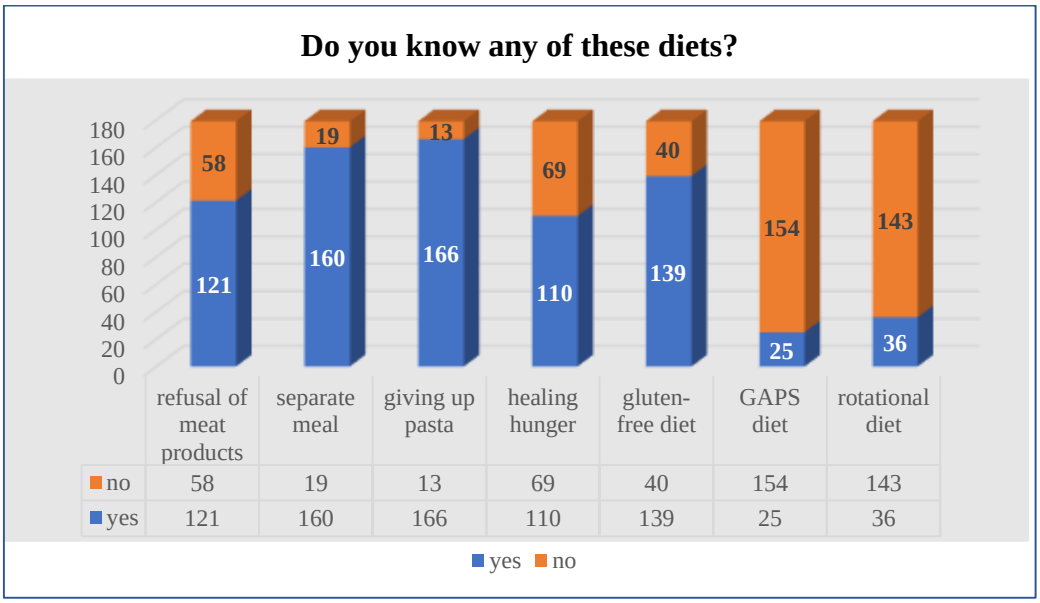


Chart 10 *Do you know these diets? (students)*

The majority of students know the refusal of pasta and the method of separate feeding, respectively, 166 students in the first diet and 160 students – in the separate feeding. Next, the gluten-free diet, the refusal of meat products and the healing hunger are ranked in the answers of the students. The most unfamiliar to students are two diets – the GAPS diet and the rotational diet. The least of them knew the GAPS diet, only 25 out of all 179 students.

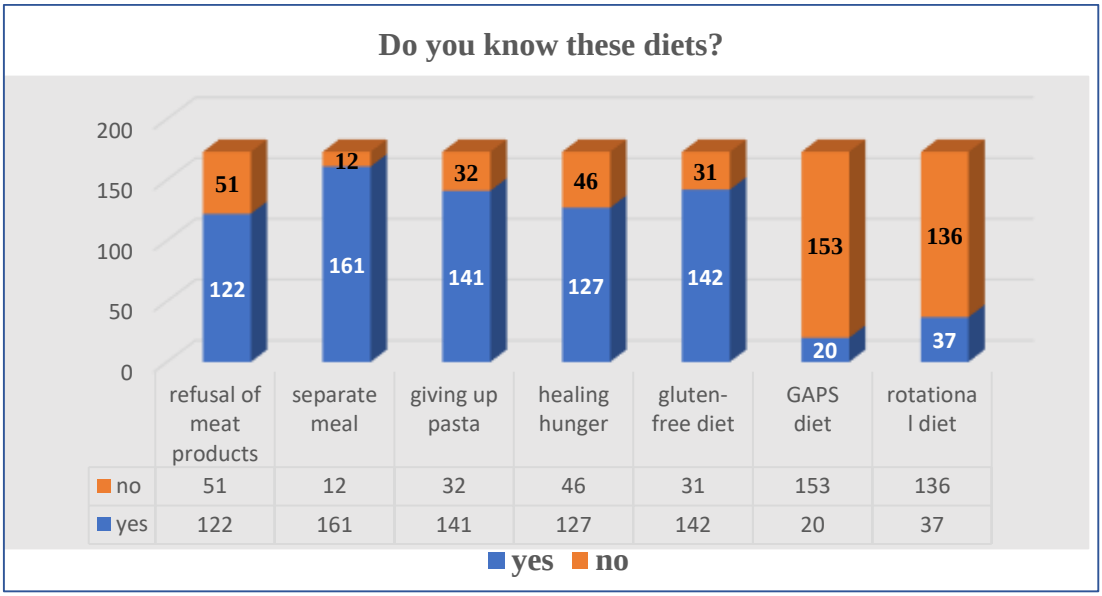


Chart 11 *Do you know these diets? (specialists)*

With almost the same result, as the most familiar among the specialists, separate feeding (with 161 responses), gluten-free diet (with 142 responses) and the rejection of pasta products (with 141 responses) are indicated. In the next place with close response values are two diets – curative hunger (with 127 responses) and rejection of meat products (with 122 responses). The rotation diet (with 37 respondents) and the GAPS diet were indicated as the most unfamiliar to specialists – only 20 specialists indicated that they knew it.

To the question "*Do you think that taking nutritional supplements improves the functional state of the body?*" the results are:

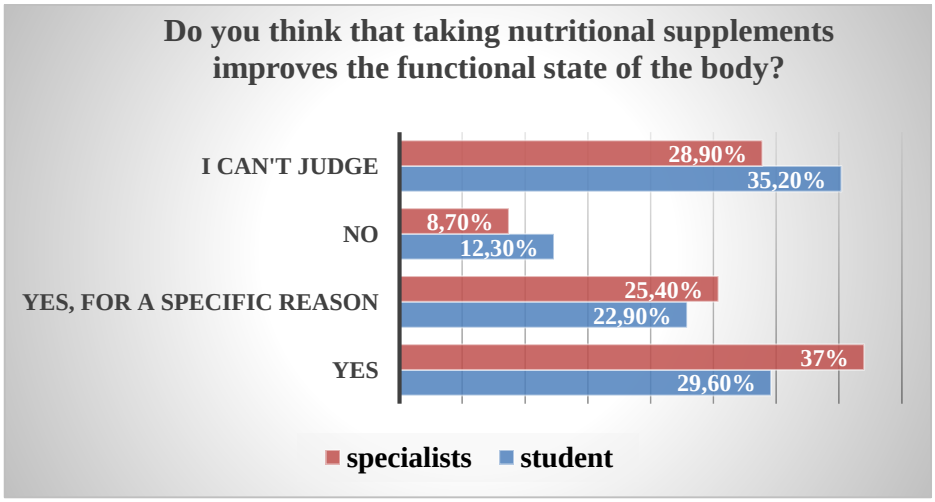


Chart 12 *Improving the condition of the body through supplements*

The data show that more than 60% (108) of the specialists are of the opinion that supplements are useful for improving the functional state of the body. Only 15 respondents are of the opposite opinion, and 50 are undecided and cannot judge.

Among students, there is a difference in the usefulness of dietary supplements. A little over 50% (94) of the students agree with the statement that supplements can improve the functioning of the body, including for a specific reason. Only 22 students disagree with this statement, and 63 cannot decide.

The next question related to supplements is: "*Are you aware of the negative health effects of some dietary supplements?*".

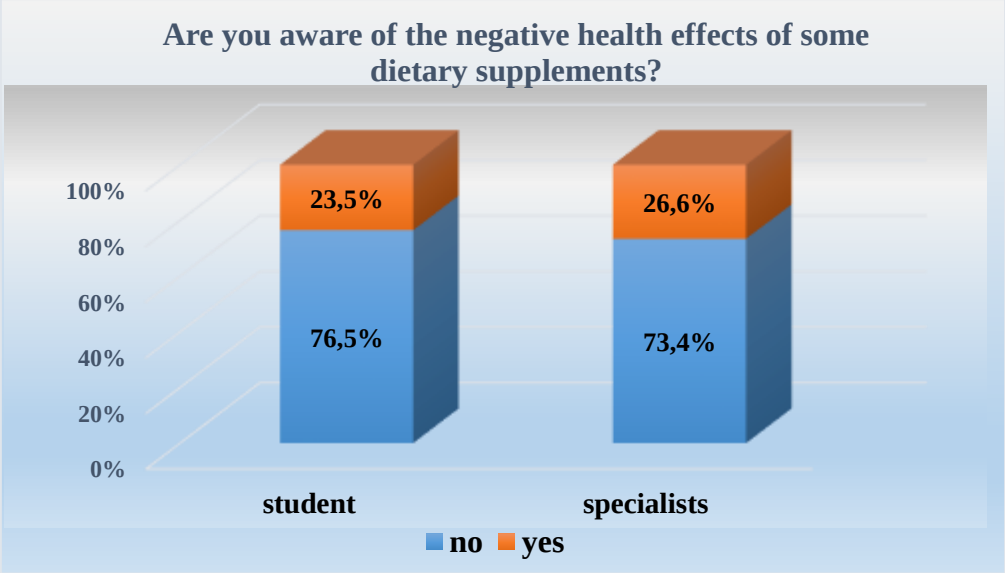


Chart 13 *Awareness of the negative effects of some supplements*

23.5% (42) of students and 26.6% (46) of professionals reported that they were aware of the negative effects of some dietary supplements. Accordingly, 76.5% (137) of students and 73.4% (127) of specialists answered negatively. Over 2/3 of respondents are not aware of the negative health consequences of taking certain supplements.

Most of the students get their supplement information mostly from the internet (popular and professional supplement sites). The answer options in order of frequency are: scientific articles in the medical literature, doctors, fitness instructors, and friends. Druggists and personal experience are the least likely to be answered. *Not a single student indicated a study discipline from his major in which he acquired knowledge about nutritional supplements*.

The results for the specialists are as follows: the answers "scientific medical literature, scientific articles, textbooks in Bulgarian and foreign languages" predominate significantly. The answer "from the Internet" is significantly less indicated. Response options include: nutritional supplement brochures/leaflets, health programs on television, medical professionals/doctors, training on the topic, personal experience.

The following results were obtained for the question "*Do you have information about diseases or health problems that you associate with taking dietary supplements?*":

The majority of respondents (85.5% of students and 79.8% of professionals) have no information about diseases or health problems related to taking supplements. Only a small part of them have such information.

Students and professionals knowledgeable about the nutritional supplement-health problem link indicate diabetes, gastrointestinal problems, and high blood pressure as some of the most common risk complications of taking supplements.

3.2.2. Willingness to include healthy eating and supplement topics

The first question is: "*Are there any subjects or topics related to healthy eating and supplements in your training as a student?*".

131 students (over 70%) and 139 professionals (over 80%) did not have during their training disciplines or topics that dealt with issues of healthy eating and supplements. Only 26.8% of students and 19.7% of specialists state that their training includes such disciplines or includes topics with similar content.

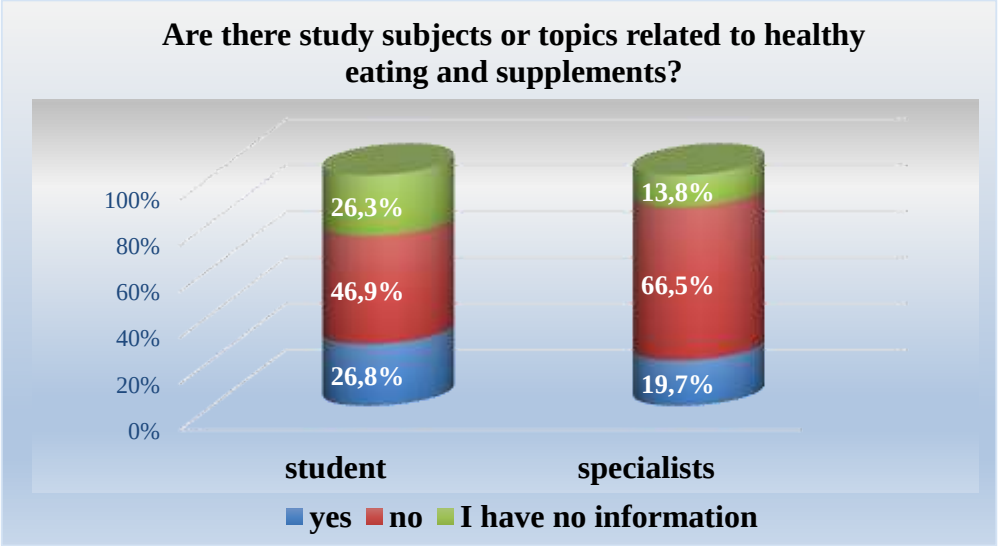


Chart 15 *Study subjects or topics related to healthy eating and supplements*

When asked, "*Which subjects in your curriculum do you think you might get more detailed information about nutrition and supplements in*?" many students indicated that they could not tell. The most frequently mentioned are: Health Education, Social Ecology, Biology, Man and Nature, Anatomy and Physiology. Disciplines such as Physics, Psychology, Chemistry, Special pedagogy, Psychodiagnostics of children with SEN, Autism, ADHD, Sports, etc. are mentioned individually. Several responses are reported such as: "in each discipline" and "a separate discipline is required".

The following answers were received to the question "*In your opinion and in your experience, how useful is introducing students to topics related to healthy eating at school?*"

The percentage of the statement that introducing students to topics related to healthy eating is "very useful" is the highest – this is 2/3 of the students and nearly 70% of the specialists. The percentage of respondents answered "useful", respectively 26.8% of students and 24.9% of specialists. The number of respondents from both groups (14 students and 10 professionals) who indicated the answer "somewhat useful" and "can't judge" is relatively small. There are no participants who think this is not useful.

Table 10

Attitudes towards healthy eating topics

answered	students		specialist	
Very useful	117	65,4%	120	69,4%
Helpful	48	26,8	43	24,9%
Somewhat useful	11	6,1%	7	4%
Not helpful	-	-	-	-
Can't judge	3	1,7%	3	1,7%
Total:	**179**	**100%**	**173**	**100%**

We can conclude that almost all respondents accept that it is useful for children to learn about healthy eating topics at school and they are aware of the importance of these issues for children's health.

The following results were obtained for the question "*Exploration of nutrition-related topics has the potential to shape attitudes towards food and supplements in students*":

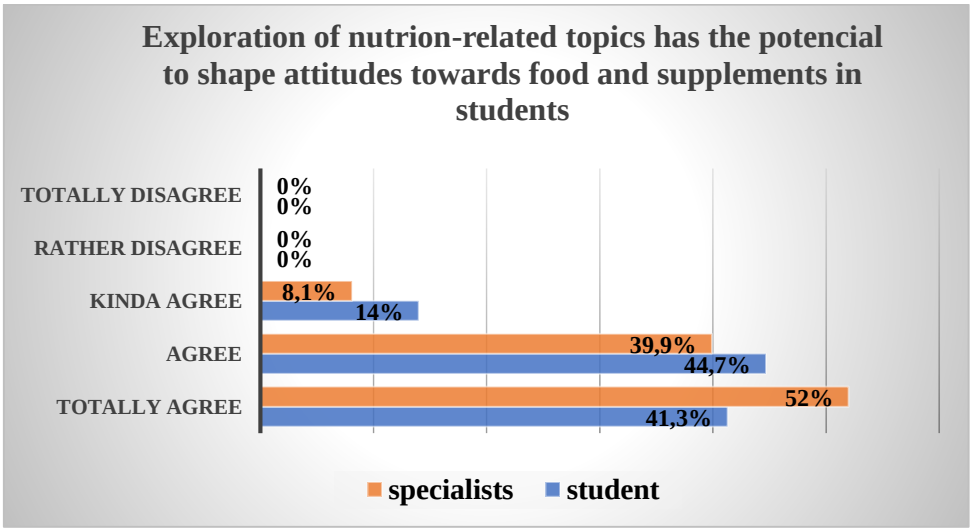


Chart 17 *Formation of attitude towards food and supplements*

Almost equally, students strongly agree (41.3%) and agree (44.7) on the question asked, somewhat agree 14% and there are no students who disagree. A little over half of the

specialists completely agree (52%), almost 40% agree and only 8% give the answer that they somewhat agree with the thesis.

The next question is, according to them, "*How often is it good to teach and discuss topics related to healthy eating for children in school?*". The results are presented in Table 11.

Table 11

Teaching and commenting on healthy eating topics

answered	students		specialist	
Very often	52	29%	54	31,2%
Often	97	54,2	92	53,2%
Occasionally	30	16,8%	26	15%
Rare	-	-	1	0,6%
Never	-	-	-	-
Total:	**179**	**100%**	**173**	**100%**

Half of the students and specialists are of the opinion that it is necessary to often teach and comment on topics related to children's healthy eating at school. About 1/3 of the respondents believe that it should be very often, and the least are those who indicate the answer "from time to time", respectively 16.8% of students and 15% of specialists, of whom one is indicated the answer "rarely".

We sought the opinion of the respondents, according to them, "*How often is it good to include questions in the development of lessons related to healthy eating for children?*".

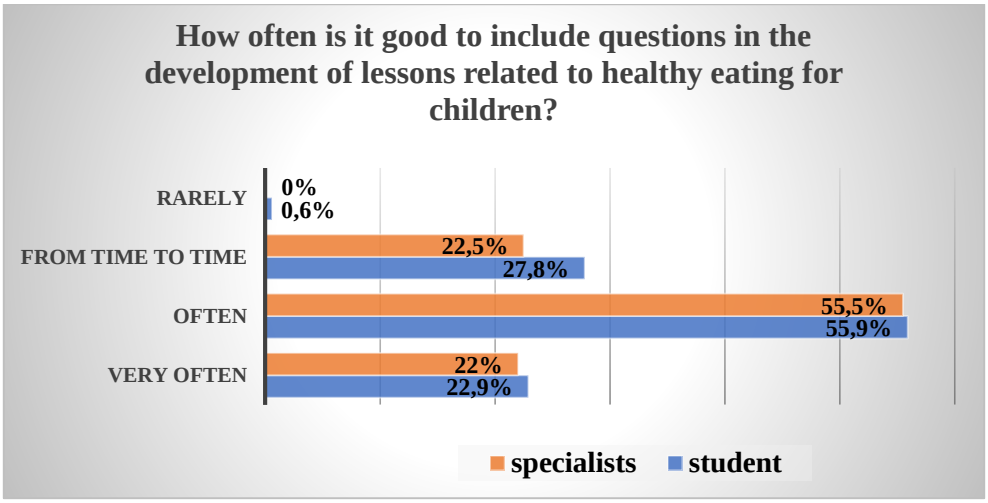


Figure 19 *Questions about healthy eating in the development of lessons*

Half of the participants are of the opinion that it is good to often include questions related to healthy eating when preparing lessons – 55.9% of students and 55.5% of specialists. Almost equally are those who say it should be "very often" (22.9% of students and 22% of professionals) and "occasionally" (27.8% of students and 22.5% by the specialists).

The question "*In which subjects do you think it is good to include such information?*" yielded the following results: A significant part of the *students* indicates Biology and health education, Native studies, Man and nature as study subjects in which information related to healthy nutrition should be included – a third student indicated these study subjects. About 10% of students think that such questions can be discussed in class time, they also have no idea and cannot name a specific subject. Physical education and sports and Chemistry and environmental protection are indicated with significantly fewer votes. With several votes each, study subjects such as: Psychology, Mathematics, BEL, Technology and entrepreneurship appear. A small number of students believe that such information can be included in all study subjects, others suggest having a separate study subject for healthy eating. For example, as an answer it was written: "They can be included in all subjects, as non-intrusive information, even as a math problem.", as well as: "Unfortunately, it is quite common to see a child – a student who is overweight. I think it's good to have a separate subject for healthy eating!" and "It's better to have a separate subject to pay enough attention to healthy eating. This is just as important as physical education, and the percentage of children suffering from diabetes and obesity is growing every year." In the responses of the specialists, the subjects Biology and Health Education, Man and Nature and Class Time are the most mentioned. Subjects such as Chemistry and Environmental Protection and Technology and Entrepreneurship are significantly less indicated. Only a few specialists indicated that information about healthy eating could be included in all subjects.

To the question "*In your opinion, where can you include an issue related to children's healthy nutrition in practical work with children and students?*", the following results were obtained:

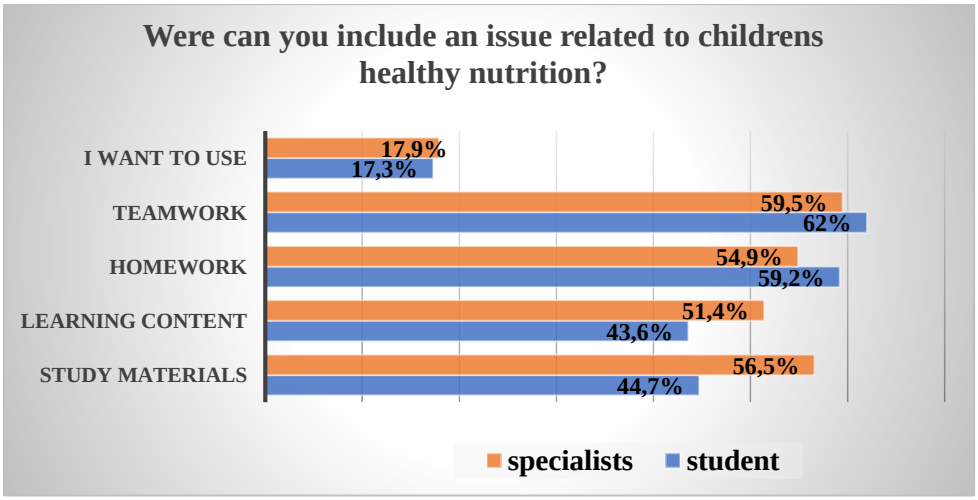


Figure 20 *Inclusion of a question about healthy eating*

The most preferred answer is “in class, when students work in a team” – 62% of students and 59.5% of specialists indicated it. Close to the first answer of the students is “creating tasks for homework” (59.2%) – as a practical application of knowledge and skills about healthy eating and an opportunity to interact with other family members when preparing food. The next two responses “preparation of learning materials” and “preparation of the learning content that I will teach” are equal, 44.7% and 43.6% respectively. The least number of answers were given by students who said “I have not used such questions, but I would like to include them” – 17.3%.

With a slight difference in percentages, the specialists indicated three answers: “preparation of teaching materials” with 56.5%, “creating tasks for homework” with 54.9% and “preparation of the learning content that I will teach” with 51. 4%. Here, too, the option “I have not used such questions, but I would like to include them” is indicated as the least likely answer – 17.9%. As an answer, there is also the option “I do not wish to use topics related to children's healthy eating in my teaching”. It was mentioned by one student and one specialist.

The last common question to both groups of respondents is: “*Through which informal sources, in your opinion, students can be informed about topics related to healthy eating?*”.

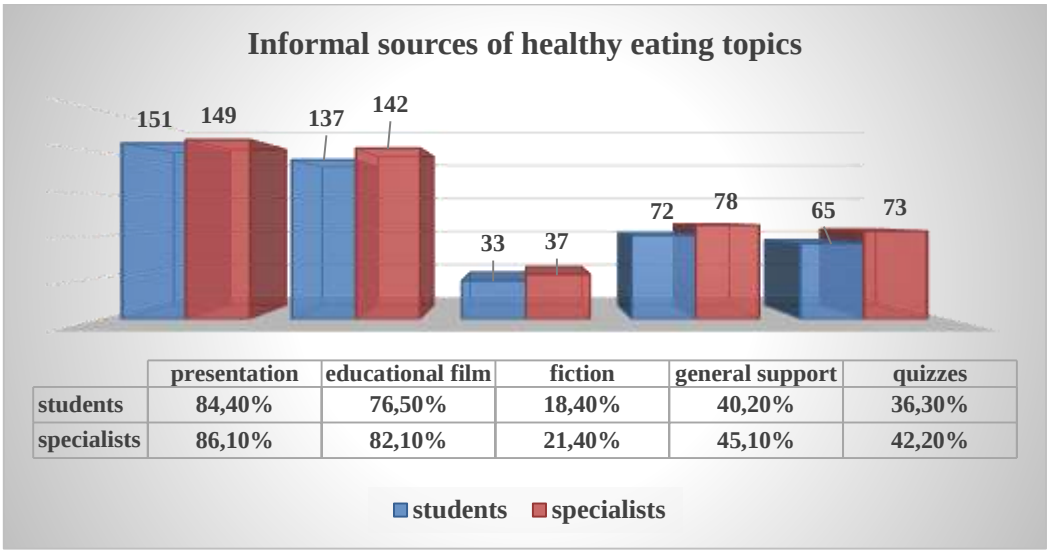


Figure 21 *Informal sources of healthy eating topics*

A large part of the respondents believes that through presentations and educational films, children can receive reliable information about healthy eating – over 80% in both groups of respondents. Next (with about 40%) respondents ranked general support activities and quizzes. The least (about 20%) indicated fiction as an answer.

As other response options, only two students indicated “game” and “STEM lessons”. In contrast, specialists supplement informal sources with: “training with children and parents”;

“holiday food workshops”; “a meeting with a nutritionist who would introduce the children to some interesting cases from his practice”; “chemical experiments with nutrients”, “workshop”, “practical activities from everyday life” and “personal example”.

The last question asked to the specialists is: “*In your opinion, there should be a nutritionist/dietetic specialist in the EPLR*”. 45.7% of specialists (79) are of the opinion that a specialist in nutrition and dietetics is needed in the EPLR, 18.5% (32) do not agree that such a specialist should be a member of the EPLR and 35.8% (62) do not can judge. The division of opinion shows that this proposal is not universally accepted.

3.3. Method of statistical analysis

3.3.1. Correlations between indicators of gender, age, level of education, pedagogical experience and specialization of specialists

A Chi-square test of independence was used to test whether there was a significant relationship between each pair (question – factor).

3.3.1.1. Statistics for each expert survey question

The dissertation presents detailed statistical data on each survey question. In the abstract, we will present the significant relationships established between the answers to the questions and the factors (gender, age, education, teaching experience, position):

Significant Links:

1. **Question 3: "How familiar are you with healthy eating?"**
   - **Age: p = 0.028** → There is a significant relationship between age and responses.
2. **Question 5 in the part "Do you agree that rational nutrition is: Satisfying the body's needs with a certain amount and ratio of nutrients?":**
   - **Age**: p = 0.041 → There is a significant relationship between age and responses.
   - **Education**: p = 0.004 → There is a significant relationship between education and responses.
   - **Position**: p = 0.004 → There is a significant relationship between position and responses.
3. **Question6: Do you know any of these diets? (GAPS diet)?”**
   - **Education**: p = 0.0002 → There is a significant relationship between education and responses.
   - **Position**: p = 0.0002 → There is a significant relationship between position and responses.

4. **Question10: „ Do you have information about diseases or health problems that you associate with taking dietary supplements?“**
    - **Education**: p = 0.031 → There is a significant relationship between education and responses.
    - **Position**: p = 0.031 → There is a significant relationship between position and responses.
5. **Question 12: „Are there subjects or topics related to healthy eating and supplements in your training as a student?“**
    - **Age**: p = 0.0001 → There is a significant relationship between age and responses.
6. **Question 17: „In which subjects do you think it is good to include such information?“**
    - **Education**: p = 0.0002 → There is a significant relationship between education and responses.
    - **Position**: p = 0.0002 → There is a significant relationship between position and responses.

We can draw the following conclusion:

Significant relationships were observed mainly with respect to age, education, and occupation, with these factors having a significant influence on responses to certain questions. The relationship between education and occupation is particularly strong with issues related to diets and healthy eating.

3.3.1.2. Dependencies and trends in pairs of expert survey questions

For the purposes of the study and to track trends in the survey of professionals, it was important for us to establish whether and how there was a relationship between the answers to some of the questions.

1. Comparison between the answers to the **first and third** questions: If the specialists are interested in the principles of healthy eating, how familiar are they with the healthy way of eating.

The results of the Chi-square test show the following:

- **Chi-square value**: 17.94
- **p- value**: 0.0217

The p-value of 0.0217 is less than the usual significance threshold of 0.05. This means that there is **a statistically significant relationship** between the answers to the first and third

questions. In other words, the way professionals answer the question of whether they are interested in the principles of healthy eating is related to how familiar they are with healthy eating. **This is proof that the interest in healthy eating is related to the level of awareness of specialists on the subject.**

2. Comparison between the answers to **the third question** and the different parts of **the fifth question**: If the specialists are familiar with the healthy way of eating, to what extent do they agree that a rational diet is:...

The results of the Chi-square test show the following:

Question 5.1: Balance between the energy received from food and the energy expended by a person during his life activity, in other words – energy balance?

p-value: 0.0098 → **There is a significant** relationship between the answers to these two questions.

Question 5.2: Satisfying the needs of the body with a certain amount and ratio of nutrients?

p-value: 0.0004 → **There is a significant relationship** between the answers to these two questions.

Question 5.3: Adherence to a diet (a certain amount of food is taken at a certain time, at each meal)?

p-value: 0.0367 → **There is a significant relationship** between the answers to these two questions.

The conclusion is that: **for all three parts of question 5** there **is a statistically significant relationship with the answers to question 3**. This means that the level of familiarity with healthy eating (question 3) is related to the degree of agreement with the different aspects of rational eating (question 5). **Specialists who are more familiar with healthy eating are more likely to agree with the statements about rational eating**.

3. Comparison between the answers to **the fourth question** and the different parts of the **fifth question**: If experts believe that some harmful eating habits can cause diseases, to what extent do they agree that a rational diet is…:

The results of the Chi-square test show the following:

Question 5.1: Balance between the energy received from food and the energy expended by a person during his life activity, in other words - energy balance?

p-value: 0.0053 → **There is a significant relationship** between the answers to these two questions.

Question 5.2: Satisfying the needs of the body with a certain amount and ratio of nutrients?

p-value: 0.3416 → **There is no significant relationship** between the answers to these two questions.

Question 5.3: Adherence to a diet (a certain amount of food is taken at a certain time, at each meal)?

p-value: 0.6753 → **There is no significant relationship** between the answers to these two questions.

The following is established:

There is no significant relationship between the answers to the fourth question and the other two parts of the fifth question (question 5.2 and 5.3).

There is a significant relationship between the answers to the fourth question and the first part of the fifth question (question 5.1). This means that specialists who believe that unhealthy eating habits can cause disease are more likely to agree with the statement that rational nutrition is a balance between energy intake and energy expenditure.

4. Comparison between the answers to **the fifth question** and the **seventh question**: If the experts agree that rational nutrition is:..., then do they think that taking nutritional supplements (supplements) improves the functional state of the body.

The results of the Chi-square test show the following:

Question 5.1: Balance between the energy received from food and the energy expended by a person during his life activity, in other words - energy balance?

p-value: 0.2136 → **There is no significant relationship** between the answers to these two questions.

Question 5.2: Satisfying the needs of the body with a certain amount and ratio of nutrients?

p-value: 0.1022 → **There is no significant relationship** between the answers to these two questions (but close to significance).

Question 5.3: Adherence to a diet (a certain amount of food is taken at a certain time, at each meal)?

p-value: 0.3419 → **There is no significant relationship** between the answers to these two questions.

In summary: **There are no statistically significant relationships** between the answers to the fifth and seventh questions, although the relationship between the answers to questions 5.2 and 7 is close to significance.

Comparison between the answers to **the fourth question and the seventh question**: If experts believe that some harmful eating habits can cause diseases, do they think that taking nutritional supplements (supplements) improves the functional state of the body.

The results of the Chi-square test show the following:

- **Chi-square value**: 7.27
- **p- value**: 0.2965

The p-value of 0.2965 is greater than the usual significance threshold of 0.05. This means that there is no statistically significant relationship between the answers to these two questions. In other words, **experts' beliefs about whether unhealthy eating habits can cause disease were not significantly related to their views about the usefulness of nutritional supplements to improve the body's functional status.**

5. Comparison in terms of **gender and age** between the answers to the **seventh question and the eighth question**: If the experts think that taking nutritional supplements (supplements) improves the functional state of the body, are they aware of the negative effects of some nutritional supplements.

The Chi-square test results for gender and age show the following:

- **Gender**: p-value = 0.1261 → No significant relationship.
- **Age:** p-value = 0.1850 → No significant relationship.

The conclusion is that **there is no statistically significant relationship between professionals' views on the benefit of food supplements and their knowledge of the negative health effects of food supplements in terms of gender and age**.

3.3.2. Correlations between indicators gender, age, ACS, specialty and course of study of the students

Statistical test. A Chi-square test of independence was used to test whether there was a significant relationship between a question-factor pair as well as between a pair of questions. The results of chi-square tests show the following:

The detailed data are present in the dissertation development. We will present only the survey questions for which there is a significant relationship in the responses.

1. **Question 1: "Are you interested in the principles of healthy eating?"**
   - **Gender:** no significant relationship (p-value = 0.626)
   - **Age:** no significant relationship (p-value = 0.623)
   - **Course of study:** no significant relationship (p-value = 0.215)
   - **ACS:** no significant relationship (p-value = 0.663)

- **Specialty:** there is a significant relationship (p-value = 0.010)

Conclusion: *Major has a significant relationship with the answers to this question*. It was found that the most interested are the students from the Special Pedagogy OCS "Bachelor" and from the Master's program Speech Therapy.

2. **Question 9: Do you think that a healthy diet provides the body with the necessary nutrients?**
   - **Gender: there is a significant relationship** (p-value = 0.048)
   - **Age:** no significant relationship (p-value = 0.867)
   - **Course of study: no significant relationship** (p-value = 0.218)
   - **ACS:** no significant relationship (p-value = 0.552)
   - **Specialty: there is a significant relationship** (p-value = 0.0004)

Conclusion: The significant associations show that for the question of healthy eating and required nutrients, *gender and specialty* are important factors.

3. Comparison between the answers of **the third question** to the different parts of the **seventh question**: If students are familiar with healthy eating, do they agree that rational eating is...:

The results of the analysis show the following: there are no statistically significant relationships between familiarity with healthy eating and agreement with different aspects of rational eating according to the results of chi-square tests.

With such a comparison, a statistically significant relationship is observed in the responses of the specialists.

4. Comparison between the answers of **the fifth question to the different parts of the seventh question:** If students think that some harmful eating habits can cause diseases, do they agree that a rational diet is...:

The results of the analysis show the following:

Question 7.1. Balance between the energy received from food and the energy expended by a person during his life activity (energy balance):

- Chi-Square Value: 29.166
- p-value: 7.23e-06
- **There is a statistically significant relationship (p-value < 0.05)**

Question 7.2. Adherence to the diet (a certain amount of food is taken at a certain time, at each meal):

- Chi-Square Value: 1.364
- p-value: 0.850

- No statistically significant relationship (p-value > 0.05)

Question 7.3. Satisfying the needs of the body with a certain amount and ratio of nutrients:

- Chi-Square Value: 6.527
- p-value: 0.163
- No statistically significant relationship (p-value > 0.05)

It is established that:

There is no significant relationship between the answers to the fourth question and the other two parts of the fifth question (question 7.2 and 7.3).

There is a significant relationship between the answers to the fifth question and the first part of the seventh question (question 7.1). This means that students who believe that unhealthy eating habits can cause disease are more likely to agree with the statement that rational nutrition is a balance between energy intake and energy expenditure. *The same trend emerged in the responses of the specialists.*

5. Comparison in terms of **gender and age** between the answers **to the eleventh question and the twelfth question**: If the students think that taking nutritional supplements (supplements) improves the functional state of the body, are they aware of the negative effects of some nutritional supplements.

The results of the analysis show the following:

Gender:

- Chi-Square Value: 15.619
- p-value: 0.001
- **There is a statistically significant relationship** (p-value < 0.05)

:

- Chi-Square Value: 15.619
- p-value: 0.001
- **There is a statistically significant relationship** (p-value < 0.05)

The conclusion **is that there is a statistically significant relationship between students' views on the benefit of nutritional supplements and their knowledge of the negative health effects of nutritional supplements in terms of gender and age.** A significant relationship is found in women over 30 years of age.

A similar trend by gender and age is not noticeable in the responses of the specialists.

3.3.3. Correlations between student and expert responses

In order to determine whether there is a statistical difference between the responses of the students and the professionals who completed the surveys, we used the **Chi-square test** of independence. These are questions from section 4 of both surveys.

1. *Are there subjects or topics related to healthy eating and supplements in your preparation as students?*

Results of the statistical analysis are:

- **Chi2 Value:** 1.10
- **p-Value:** 0.777 (much greater than 0.05)
- **Degrees of freedom (dof): 3**
- **Significant difference:** No (due to high p-value)

The results of the Chi-square test show that **there is no statistically significant difference** between the responses of students and professionals.

2. *In your opinion and in your experience, how useful is introducing students to topics related to healthy eating at school?*

Table 12

Answers to question 18 (students) and question 13 (professionals)

Question 18 (Students)	**Question 13 (Specialists)**
Very useful: 65.36%	**Very useful:** 69.36%
Useful: 26.82%	**Useful:** 24.86%
Somewhat Helpful: 6.15%	**Somewhat Helpful:** 4.05%
Can't judge: 1.68%	**Can't judge:** 1.73%

These results show that **the distribution of responses is quite similar between students and professionals**, which is consistent with the previous analysis, which showed no statistically significant difference.

Statistical analysis results for Question 18 (students) and Question 13 (specialists):

- **Chi2 Value:** 5.37
- **p-Value:** 0.068 (slightly greater than 0.05)
- **Degrees of freedom** (dof): 2
- **Significant difference**: No (due to p-value greater than 0.05)

The results of the Chi-square test show that there is *no statistically significant difference* between the responses of students and professionals.

3. Addressing nutrition-related topics has the potential to shape attitudes toward food and supplements in students

It can be seen that the majority of the respondents in both groups are "Strongly Agree" or "Agree", with little difference in percentages.

Table 13

Answers to question 19 (students) and question 14 (professionals)

Question 19 (Students)	**Question 14 (Professionals)**
Strongly agree: 41.34%	**Strongly agree:** 52.02%
Agree: 44.69%	**Agree:** 39.88%
Somewhat agree: 13.97%	**Somewhat agree:** 8.09%

Statistical analysis results for Question 19 (students) and Question 14 (specialists):

- **Chi2 Value:** 5.37
- **p-Value:** 0.068 (slightly greater than 0.05)
- **Degrees of freedom (dof):** 2
- **Significant difference:** No (due to p-value greater than 0.05)

The results of the Chi-square test show that there is *no statistically significant difference* between the responses of students and professionals.

4. *How often, in your opinion, is it good to teach and comment on topics related to healthy eating for children at school??*

Table 14

Answers to question 20 (students) and question 15 (professionals)

Question 20 (Students)	**Question 15 (Specialists)**
Frequent: 54.19%	**Frequent:** 53.18%
Very common: 29.05%	**Very common:** 31.21%
Occasionally: 16.76%	**Occasionally:** 15.03%
Rare: 0%	**Rare:** 0.58%

It can be seen that the distribution of responses is quite similar between students and professionals, with small differences in percentages.

Statistical analysis results for Question 20 (students) and Question 15 (specialists):

- **Chi2 Value:** 1.35
- **p-Value:** 0.716 (greater than 0.05)
- **Degrees of freedom (dof):** 3
- **Significant difference:** No (due to p-value greater than 0.05)

The results of the Chi-square test show that there is **no statistically significant difference** between the responses of students and professionals.

5. *In your opinion, how often is it good to include questions in the development of lessons related to children's healthy eating?*

Table 15

Answers to question 21 (students) and question 16 (professionals)

Question 21 (Students)	**Question 16 (Professionals)**
Frequent: 55.87%	**Frequent:** 55.49%
Very common: 22.91%	**Very common:** 22.54%
Occasionally: 20.67%	**Occasionally:** 21.97%
Rare: 0.56%	**Rare:** 0%

The distribution of responses between the two groups is very similar, suggesting that the opinions of students and professionals are close.

Statistical analysis results for Question 21 (students) and Question 16 (specialists):

- **Chi2 Value:** 1.15
- **p-Value:** 0.766 (greater than 0.05)
- **Degrees of freedom (dof):** 3
- **Significant difference:** No (due to p-value greater than 0.05)

The results of the Chi-square test showed that there was **no statistically significant difference** between the responses of students and professionals regarding the frequency of including questions related to healthy eating in the development of lessons.

6. *In which subjects do you think it is good to include such information?*

Table 16

Answers to question 22 (students) and question 17 (professionals)

Question 22 (Students)	**Question 17 (Specialists)**
Biology and Health Education: **11.17%**	Biology and Health Education: **9.83%**
Man and Nature: **3.35%**	Man and Nature: **3.47%**
Class Time: **2.79%**	Class Time: **1.73%**

Biology and Health Education:

- Students: 36.31%
- Specialists: 56.07%

Man and Nature:

- Students: 18.44%
- Specialists: 11.56%

Class time:

- Students: 5.03%
- Specialists: 8.09%

Based on the obtained results, we can draw the following conclusions:

- ✓ Both groups place the highest priority on “Biology and Health Education” as an appropriate subject to include information on healthy eating.
- ✓ A higher percentage of students indicate “Man and Nature” as a suitable subject compared to specialists.
- ✓ Specialists are more specific in their responses, resulting in fewer responses in the Other category.

7. In your opinion, where can you include an issue related to children's healthy nutrition in the practical work with children and students?

The most frequently mentioned options are:

Preparation of study materials:

- Students: 44.69%
- Specialists: 56.65%

Preparation of the learning content:

- Students: 15.64%
- Specialists: 15.03%

Create homework assignments:

- **Students: 16.76%**
- **Specialists: 6.36%**

In class, when students work in teams:

- Students: 13.41%
- Specialists: 9.83%

Others:

- Students: 9.50%
- Specialists: 12.14%

From the empirical data we can draw the following **conclusions**:

- ✓ Both groups place the highest priority on “Preparation of learning materials” as a methodical approach for including issues related to healthy eating in practical work.
- ✓ Students are more likely to use homework assignments than professionals.
- ✓ Specialists have a slightly higher percentage of responses in the “Other” category, suggesting diversity in their approaches.

To do statistical analysis for this type of data, we use a **Chi-square test of independence**, similar to the previous questions.

The results of *the statistical analysis* for Question 23 (students) and Question 18 (professionals) are as follows:

- **Chi2 Value:** 12.22
- **p-Value:** 0.016 (less than 0.05)
- **Degrees of freedom (dof):** 4
- **Significant difference:** Yes (due to p-value less than 0.05)

The results of the Chi-square test show that **there is a statistically significant difference** between the responses of students and professionals regarding the methodological skills they can include in questions related to healthy eating in practical work with children and students. This means that the distribution of responses in the two groups is different and this difference is not random.

8. *Through what informal sources, in your opinion, can students be informed about topics related to healthy eating?*

Answer categories:

Presentations:

- Students: 84.36%
- Specialists: 86.13%

Educational films:

- **Students:** 15.08%
- **Specialists:** 10.40%

Quizzes:

- **Students:** 0.00%
- **Specialists:** 1.16%

General support activities:

- **Students:** 0.00%
- **Specialists:** 2.31%

Fiction:

- **Students**: 0.56%
- **Specialists**: 0.00%

Conclusions:

✓ Both groups of respondents give the highest priority to “Presentations” as an informal source for informing students about healthy eating.

- ✓ Students are more likely to use educational films compared to professionals.
- ✓ Specialists indicated a small percentage for quizzes and general support activities, which was absent from the students' responses.

Statistical analysis results for Question 24 (students) and Question 19 (specialists):

- **Chi2 Value:** 8.71
- **p-Value:** 0.069 (greater than 0.05)
- **Degrees of freedom (dof):** 4
- **Significant difference:** No (due to p-value greater than 0.05)

The results of the Chi-square test show that **there is no statistically significant difference** between the responses of students and professionals regarding informal sources of informing students about healthy eating. The distribution of responses in the two groups was similar and the differences between them could be due to chance.

Conceptual scheme supporting the formation of a culture of nutrition in children with special educational needs

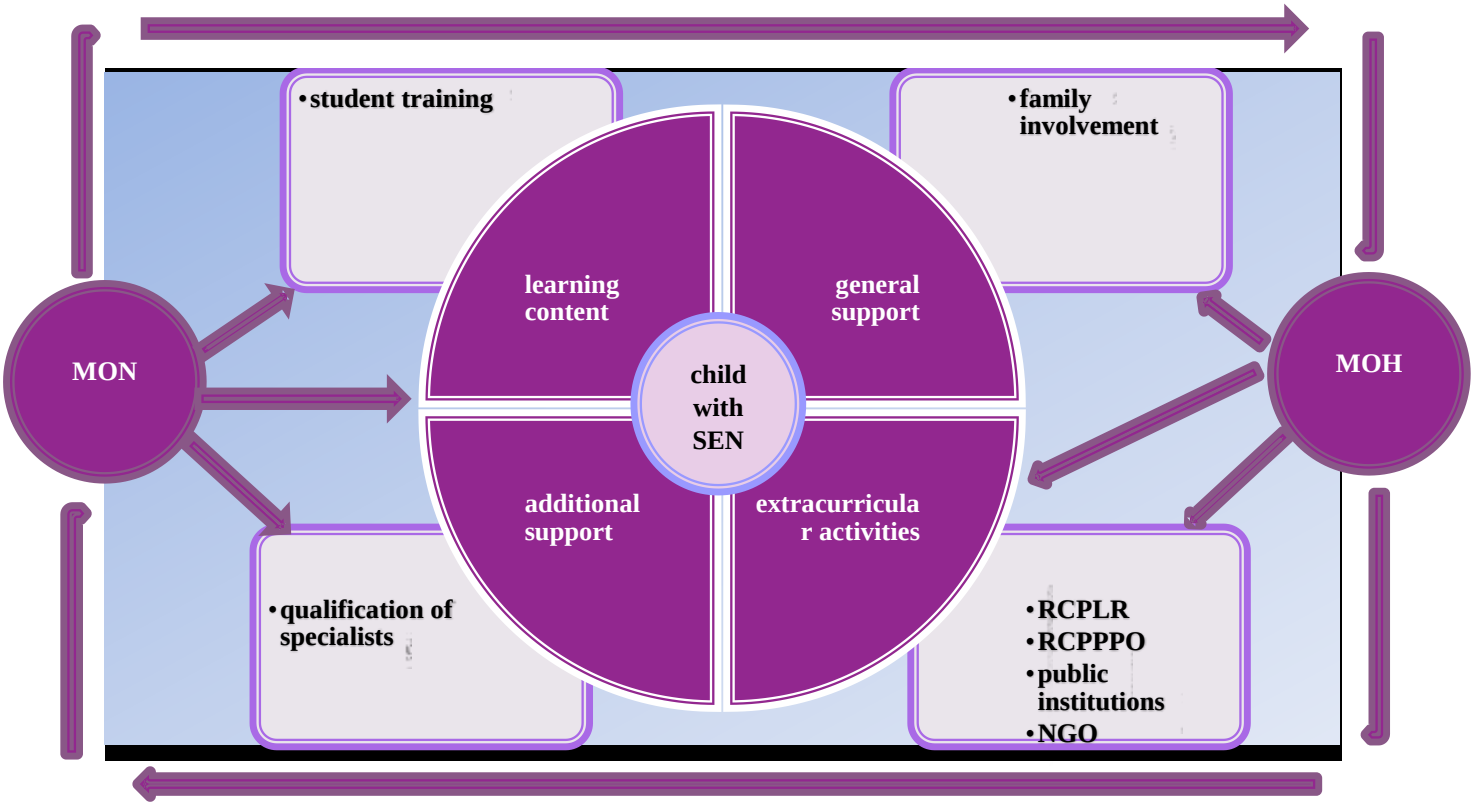
We will present a *conceptual scheme* that is the result of a serious study of existing documents, conventions, legal regulations, educational content related to the nutrition and supplementation of children with special educational needs. When developing this scheme, we also considered the analysis from the statistical and qualitative processing of the empirical data from the surveys of students of pedagogical specialties and specialists supporting the education of children with special educational needs.

The grounds for the creation of the conceptual scheme refer to: the topicality of the topic and research in the field of healthy nutrition, the need for the serious attitude and coordinated efforts of specialists from at least two main ministries (the Ministry of Education and Science and the Ministry of Health), innovations in the educational a process related to diversifying the forms and tools for the formation of a culture of nutrition for children and adolescents, a holistic curriculum and updating the content of the subjects of the educational subjects related to nutrition.

The main goal of the scheme is to coordinate the efforts of experts and specialists to raise awareness regarding healthy and balanced nutrition through conventional education, through forms of general and additional support, through the application of good practices and interaction with the families of children with special educational needs. needs.

Thus, the proposed conceptual scheme provides an opportunity to discuss adequate and effective measures by all parties interested in this topic. This is necessary due to the following "stumbling blocks" for systematic work in relation to healthy eating:

- ✓ insufficient cooperation and coordination in the actions of the Ministry of Health and the Ministry of Health;
- ✓ insufficient preparation of students and specialists on the subject;
- ✓ diverse and unsystematized information, aggressive advertising;
- ✓ insufficient relationship between family – school – public institutions;
- ✓ difficult to change attitudes.



Scheme 2 Conceptual scheme for the formation of a culture of nutrition

At the center of this scheme is the child with special educational needs. The target groups for which the scheme was developed are experts from the Ministry of Education and Culture and the Ministry of Health, specialists supporting the education of children with special educational needs (resource teachers, speech therapists, psychologists, therapists), teachers, social workers, parents, students.

The advantage of the conceptual scheme is found in the possibility*:*

At the ministry level

- ✓ Development of projects on the problems of feeding children and adolescents with special educational needs.

- ✓ Stimulation of specialists for inclusion in programs such as: “Motivated teachers”, “Lifelong learning”, etc.
- ✓ Encouraging the development of educational content adequate to modern trends in nutrition.
- ✓ Discussion and development of teaching aids and methodological guidelines on the subject.

At the university level

- ✓ Inclusion in the curricula of the pedagogical specialties of study disciplines on the issues of nutrition, supplementation and dietetics of the students.
- ✓ Practical training of students for the development of topics related to healthy nutrition and the formation of a culture of nutrition in children.
- ✓ Expanding the possibilities to include programs for retraining and DPC in matters of healthy nutrition.
- ✓ Organization of round tables, conferences and seminars on the issues of healthy nutrition, supplementation and diets.

At the school level

- ✓ Enrichment and attractive presentation of educational content on the topic of nutrition, with the possibility of greater practical orientation
- ✓ Maximum use of the forms of general support for personal development - offering circles for preparing healthy food, meeting with professional chefs and dieticians, organizing quizzes, etc.
- ✓ Through additional support for personal development - consultations with various specialists regarding nutrition in specific disorders of child development: autism spectrum disorder, ADHD, dyslexia, dyspraxia, Down syndrome, etc., integration of the efforts of various specialists when working with a child with special educational needs of school, RCPPPO, etc.
- ✓ Organization of extracurricular activities related to nutrition – visits to places to eat, discussion of a healthy menu, growing fruits and vegetables, etc.
- ✓ Involvement of parents in the school's initiatives, introducing them to modern approaches to healthy and balanced nutrition, giving advice on a healthy lifestyle.

CONCLUSIONS AND RECOMMENDATIONS

As a result of the theoretical overview, the conducted research and the analysis of the obtained results, the following **conclusions** can be formulated:

1. The nutritional regime, the well-balanced diet for children with special educational needs (autism spectrum, ADHD, dyslexia, dyspraxia, Down syndrome) should not be an end in itself, but should be implemented against the background of individual work with a psychologist, speech therapist, resource teacher to implement different interventions corresponding to their individual condition.
2. Healthy eating is a topic that is present in the curricula of specific subjects at school. The advocated content corresponds to modern understandings of healthy eating. Regardless of the various activities in class and extracurricular activities, students do not have an established eating culture. They have not formed sustainable attitudes towards the correct selection of foods useful for their health. This applies even more to children with special educational needs.
3. The survey showed that more than 90% of specialists supporting the education of children with special educational needs and students of pedagogical specialties are interested in the principles of healthy nutrition. Therefore, they would be more motivated and willing to form a culture of nutrition in the children they work with. It was statistically proven that the factor “age” has a significant relationship with the answers to this question.
4. When answering the question “Are you interested in the principles of healthy eating?” it was statistically proven that the major had a significant relationship with the students' answers. The most interested are the students from the Special Pedagogy OCS “Bachelor” and the students from the Master's program Speech Therapy.
5. The way professionals answer the question of whether they are interested in the principles of healthy eating is related to how familiar they are with healthy eating. This is proof that the interest in healthy eating is related to the level of awareness of specialists on the subject.
6. Almost all students (90.5%) and specialists (92.5%) define healthy eating as “the balanced consumption of foods that provide the body with the necessary

nutrients". Specialists who are more familiar with healthy eating are more likely to agree with the statements about rational eating.

7. 15% of students and 26% of specialists are well aware of healthy eating. About 40% have knowledge about healthy eating. This means that there is a need to expand and enrich the training of students and specialists regarding healthy eating. This can be done through different channels: through additional study disciplines or topics in the study programs of some study disciplines for students and through additional qualification and training courses – for specialists.
8. Students associate a healthy lifestyle primarily with rational nutrition, optimal exercise regime and refusal of harmful foods. The significant relationships indicate that for the question of healthy eating and required nutrients, gender and specialty are important factors. It is statistically proven that women are of the opinion that the necessary nutrients enter the body through a healthy diet. A significant relationship is established in the students of the Special Pedagogy OCS "Bachelor" and in the students of the Master's program in Speech Therapy.
9. Almost all respondents agree that bad eating habits can cause diseases – 95.6% of students and 97.6% of specialists. Specialists who believe that unhealthy eating habits can cause disease are more likely to agree with the statement that rational nutrition is a balance between energy intake and energy expenditure.
10. There is almost no difference in the attitudes of students and professionals regarding what they think is rational nutrition. The statements are categorically stated that rational nutrition is "a balance between the energy received from food and the energy expended by a person during his vital activity, in other words – energy balance" and "satisfying the body's needs with a certain amount and ratio of nutrients" – over 80% of respondents.

    When experts define rational nutrition as "satisfying the body with a certain amount and ratio of nutrients," age, education, and job position have a significant relationship with this answer.
11. It has been statistically proven that students' interest in the principles of healthy eating is related to the degree of familiarity with healthy eating. Most students interested in the principles of healthy eating also have varying degrees of familiarity with healthy eating, with the largest number knowing or somewhat familiar with healthy eating.

12. A greater part of the students indicate as the most familiar diets related to the refusal of pasta products and separate meals. Specialists point to split meals, the gluten-free diet and the refusal of pasta as diets they know. The most unfamiliar are two diets – the GAPS diet and the rotational diet. However, professional education and occupation were significantly associated with response to the GAPS diet.

    Even the students of Special Pedagogy and Speech Therapy during their studies do not receive enough scientific and complete information about specific diets that are part of complex therapy for children with various developmental disorders and about the specifics of healthy nutrition and supplementation of children with special educational needs.
13. Students and specialists do not have a definite opinion about whether supplements improve the functional state of the body. 2/3 of respondents are not aware of the negative health consequences of taking certain supplements. The training of current students and working professionals lacks sufficient knowledge about nutritional supplements (supplements). The conclusion that arises from the answers of the respondents is that students find the necessary information about supplements mainly from the Internet, while specialists behave professionally and acquire the necessary knowledge through scientific literature, as well as through consultations with medical specialists and participation in training seminars. Targeted systematic training is lacking and the reserves in this direction are large.
14. 79.8% of specialists and 85.5% of students have no information about diseases or health problems related to taking supplements. It is statistically proven that the education and position of the specialists have a significant relationship with the answers to this question. There is also a statistically significant relationship between students' views on the benefit of nutritional supplements and their knowledge of the negative health effects of nutritional supplements by gender and age. A significant relationship was found in women over 30 years of age.
15. Over 70% of the students and over 80% of the specialists did not have during their training disciplines or topics that dealt with issues of healthy nutrition and supplements. The conclusion is that the respondents are not sufficiently prepared and do not have the necessary information in which academic disciplines they would receive systematized knowledge about healthy nutrition and

supplementation. In the statistical processing of the experts' answers, it was found that age has a significant relationship with the answers to this question.

16. Almost all respondents agree that it is useful for children to learn about healthy eating topics at school and realize the importance of these issues for children's health.
17. Both working professionals and students are aware of the potential of topics related to nutrition and supplements to shape students' attitudes towards food (86% of students and 92% of professionals).
18. Half of the participants in the survey are of the opinion that it is good to often include questions related to healthy eating when preparing lessons - 55.9% of students and 55.5% of specialists. We can conclude that the teachers have enough practical experience in the development of lessons and the implementation of questions related to nutrition, supplementation and nutrition culture would not be difficult for them. The students, for their part, in their practical training also express readiness for this.
19. Most of the respondents are oriented on which subjects the children can learn about healthy eating and supplements. The education and position of the specialists have a significant connection with these answers.

    Unfortunately, those of them who see the potential opportunities of the other subjects are negligible. In modern times, more and more attention is being paid to the holistic nature of curricula and the possibility of applying a competency-based approach to education, as well as the formation of key competencies in students. As is well known, key competences are cross-curricular and applicable in all subjects. It is necessary for teachers to acquire skills for integrating the learning content of different learning subjects more categorically, and the examination and commenting on topics related to a healthy lifestyle should be included in more learning subjects.
20. The respondents are aware of which of the forms of work with the students are working in terms of the healthy nutrition of the children in practical terms. Their favorites are “in class when students work in a team” (with about 60% of the responses), “preparing learning materials” and “preparing the learning content I will teach” (with around 45-50% of the responses).

✓ Students are more likely to use homework assignments than professionals.

- ✓ Specialists have a slightly higher percentage of responses in the “Other” category, suggesting diversity in their approaches.

21. Both students and specialists rely on informing students about topics related to healthy eating mainly on informal sources of an interactive nature (more than 80% of respondents indicate this answer), after them they order activities with a competitive and heuristic element. The least preferred use is fiction.

- ✓ Both groups of respondents give the highest priority to “Presentations” as an informal source for informing students about healthy eating.
- ✓ Students are more likely to use educational films compared to professionals.
- ✓ Specialists indicated a small percentage for quizzes and general support activities, which was absent from the students' responses.

22. The significant relationships among specialists are observed mainly in terms of age, education and position, and these factors have a significant influence on the answers to certain questions. The relationship between education and occupation is particularly strong with issues related to diets and healthy eating.
23. The significant relationships among the students were observed mainly in terms of gender, age and ACS, and these factors had a significant influence on the answers to certain questions.

Based on the formulated conclusions from the conducted research and the results obtained, the following **recommendations** are outlined:

- ✓ To create adequate educational content with a practical orientation to build knowledge and attitudes for a healthy balanced diet and to form a culture of nutrition in children and adolescents.
- ✓ To create additional learning resources providing structured information on nutrition and supplementation for children with special educational needs.
- ✓ Through the forms of continuing qualification of educators and specialists, trainings should be organized to acquaint them with the specific requirements regarding healthy nutrition and supplementation of children with special educational needs.
- ✓ Universities preparing specialists for work with children and students to include in the curriculum disciplines or additional topics in separate disciplines related to the specifics of nutrition and supplementation of children with special educational needs, as well as the prevention of chronic non-infectious diseases.

- ✓ To carry out a closer interaction of specialists with the parents of children with special educational needs for the formation of practical skills for healthy and balanced nutrition and nurturing a culture of nutrition.

DISSERTATION CONTRIBUTIONS

Contributions in a theoretical aspect:

- ✓ The scientific developments showing the specifics of nutrition in certain categories of children with special educational needs have been studied and systematized.
- ✓ An overview and analysis of international and national documents, strategies and conventions on the factors causing chronic non-infectious diseases and the importance of nutrition and healthy lifestyle of the population was made.
- ✓ The topics of healthy nutrition and supplementation in the educational content of educational subjects in the initial stage of school education have been studied. The new concepts and competencies that students should acquire in relation to nutrition are outlined. Conclusions have been made to optimize the process of forming a culture of nutrition in children.

Contributions in a practical-applied aspect:

- ✓ A conceptual scheme for the formation of a nutrition culture is proposed, coordinating the efforts of experts and specialists to increase awareness regarding healthy and balanced nutrition through conventional education, through forms of general and additional support, through the application of good practices and interaction with families of children with special educational needs.
- ✓ Possibilities have been identified at different levels - ministry, university, school, for nurturing a culture of nutrition in children and forming an attitude towards food and supplements and skills for a healthy balanced diet.

CONCLUSION

Nowadays, more and more demands are placed on the conventional education of students, related to the goals of sustainable development. In practice, this means that teachers must fulfill new roles, have attitudes to apply innovative pedagogical tools in the teaching-learning process. To a significant extent, this applies to teachers who teach science, including topics related to healthy lifestyles and healthy eating.

In the 21st century, humanity is faced with a number of health challenges related to improper nutrition, malnutrition and the consumption of unhealthy foods. Cases of obesity, type 2 diabetes, depressive states, hyperactivity among children and adolescents are increasing worldwide. The OECD (2010, 2015) and UNESCO (2020) reports pay attention to children's education, which should have a decisive role in forming healthy lifestyle habits and instilling a culture of nutrition and physical activity among students. Studies show that at least 80% of type 2 diabetes, strokes and heart disease can be prevented through health education.

In this situation, teachers have to fulfill the role of innovators who, taking into account the holistic nature of scientific education, adopt and apply in their work innovative and effective approaches to promote and promote a healthy lifestyle, the main component of which is a healthy balanced feeding. In this complex situation, it is necessary to support teachers through training, on the one hand, to minimize their resistance to changes, and on the other hand, to accept and support innovations in education. A meta-analysis in recent years has argued that to be effective, teacher education programs must focus on "building knowledge that teachers can use directly during instruction and that can support them in making informed decisions." (Hill, Lynch, Gonzalez, & Pollard, 2020). Teachers must master and apply in their work a set of tools such as: organizing discussions, debates and case studies on healthy eating and supplementation, working in small groups, joint creation of healthy eating projects, educational games and practical activities.

At the same time, teachers must change their attitudes, which are formed by a number of factors such as available resources, methodological guidelines, school management, institutional requirements, specifics of the curricula. I.e. the commitments, attitudes of teachers are crucial to the happening of changes in education. Teachers should be empowered to invest in health, nutrition and well-being education.

In their article “The school as an ideal environment for promoting health and well-being among young people”, Pulimeno et al., (2020) concluded that “as a mainstream educational institution, the school should integrate student health promotion into its regular

practices of teaching and learning in the perspective" of "better health through better schools.". Through the various activities at school, a double effect must be achieved: on the one hand, prevention of harmful habits in terms of consumption of harmful foods, tobacco products, drugs and alcohol, and on the other hand, promotion of an attitude towards balanced nutrition, towards physical activity to achieve of physical, mental and social well-being. Our conceptual scheme assigns a significant place not only to the passive perception of knowledge about healthy eating, but also to the involvement of students in active practical activities, thus they will learn to take responsibility for their own health.

In recent years, organizations such as the United Nations and UNESCO have carried out a number of studies on the effects of implementing multi-component narrative-based strategies to improve healthy eating habits and reduce risk factors for overweight and obesity in children and adolescents (Pulimeno et al., 2018). In this regard, the WHO proposes that the topic of health literacy should be present in the curriculum of compulsory subjects from the first grade and that educational institutions become "health promoting schools". This literacy can be formed when a health-friendly environment exists in school.

WHO (2008), in the prepared School Policy Framework: Implementing the WHO Global Strategy on Diet, Physical Activity and Health, defines this type of school as institutions that "continually increase their capacity for healthy living, learning and working environments". This means putting into action measures that work, such as:

- ✓ involvement of pedagogical specialists, teachers and students, joint work with families, members of the public, non-governmental organizations, cooperation with health experts, etc. for the transformation of the school as a healthy place;
- ✓ provision of health education through projects, activities and programs for the promotion of health, food safety, balanced nutrition (WHO, 2008).

The main aim of our study was to explore the opinions and attitudes of students and professionals regarding the nutrition and supplementation of children with special educational needs. In the course of the study, the attitudes of the students regarding the idea of healthy eating and their opinions regarding the place of topics related to healthy eating and supplements in the curricula and in individual disciplines in the higher school were established. On this basis, analyzes and conclusions were made regarding their training as future specialists. It was investigated to what extent the specialists supporting the education of students with special educational needs are familiar with the idea of healthy eating and the acceptance of supplements, their attitudes and opinions regarding the place of topics related to healthy eating and supplements in the curricula and in individual subjects were determined, which support

children with special educational needs at school. A comparison was made between the attitudes of students and those of specialists regarding the formation of a culture of nutrition through conventional methods and means and with the help of informal sources of information.

In the course of the research, we proved that the students are not sufficiently prepared and do not have sufficient information about the nutrition and supplementation of children with special educational needs and the formation of a culture of nutrition in these children, which confirmed Hypothesis 2.

The results of the study found that specialists have positive attitudes towards the inclusion of topics related to healthy eating and supplementation of children with special educational needs and tend to use them to form a culture of nutrition, which confirmed Hypothesis 3.

The data obtained from the conducted research led to specific findings, on the basis of which we derived a conceptual scheme for the formation of a culture of nutrition, with which we confirmed Hypothesis 1. On this basis, we trace the path for the future projection of the idea of healthy nutrition and supplementation for children with special educational needs. This requires an even more detailed understanding and determination of the possibilities to assist specialists and parents in forming a culture of nutrition in children.

This scheme makes it possible to positively influence the quality of life of children and adolescents, to form an active attitude towards their health, towards healthy eating and physical activity in the primary grades. The ideal place for this is school.

The Bulgarian school is still not the place where health and healthy eating are sufficiently promoted, regardless of the efforts made in this direction. Joint efforts of teachers, specialists and parents are needed to change the understanding of food and the attitude towards nutrition.

Creating a modern food culture requires an innovative approach. It reflects the traditional patterns of eating and adds those that are imposed by the changes of today, related to the dynamics of life and the development of the food industry. In this process, the role of the education system and the way in which it reacts and influences the resulting changes is important. This, in turn, gives rise to the need for more detailed future studies and actions in this direction.

PUBLICATIONS ON THE TOPIC OF THE DISSERTATION

1. **Stankova, B.,** E. Evgenieva., **(2020)** Contemporary trends in the understanding of the nutrition of children with special educational needs // Collection "Education and Arts: Traditions and Perspectives" of FNIO, UI "St. Cl. Ohridski", S., 2020, ISBN 978-954-07-5061-3, pp. 490-495
2. **Stankova, B., (2023)** Normative documents for healthy nutrition and healthy lifestyle of children and students in Bulgaria // Yearbook of Shumen University "Bishop Konstantin Preslavski", Volume XXVII D, Veliko Tarnovo, Faber Publishing House, University Publishing House "Bishop Konstantin Preslavski", 2023, 871 pp., 65-72, ISSN 1314-6769 (indexed in CEEOL)
3. **Stankova, B., (2023)** Nutrition and dietary regimen in children with autism spectrum disorder // Yearbook of Shumen University "Bishop Konstantin Preslavski", Volume XXVII D, Veliko Tarnovo, Faber Publishing House, University Publishing House "Bishop Konstantin Preslavski", 2023, 871 p., 73-80, ISSN 1314-6769 (indexed in CEEOL)
4. Nikolova, S., **B. Stankova, (2024)** Influence of nutrition on the articulation and learnability of children with special educational needs who have orthodontic deformities // Collection of scientific works from a traveling seminar Rome-Perugia-Assisi (13.03.2024 - 16.03.2024) "40 years of the Faculty of Pedagogy", 2024, 315 p., 210-218, ISBN 978-619-201-760-6, Shumen University "Bishop Konstantin Preslavski", Faculty of Pedagogy, Publishing House "Faber", city Veliko Tarnovo