

NUTRITION KNOWLEDGE AND ATTITUDES OF 12–13 YEAR OLDS TOWARDS HEALTHY NUTRITION IN SLOVENIA

Verena KOCH, Mateja KAVČIČ

Abstract: *In the report we present the views of pupils on healthy nutrition, and knowledge of pupils about healthy diet. In the research 242 students participated. To get the answers about the knowledge and views of pupils we administered a questionnaire which was composed of two parts. In the first part the pupils had to express a positive or negative position related to a healthy diet. In the second part they were given written statements to which they had to decide whether they were correct or incorrect. We wanted to determine whether the knowledge of primary school children varies according to the gender and age, or class. The majority of pupils have positive attitudes to healthy diet; they are aware that what they eat has effects on their health now and in the future. The results also show, that there are differences in nutritional knowledge between sexes, where girls have slightly better knowledge, and more positive result are among pupils who attend higher classes.*

Keywords: *nutritional knowledge, attitudes, pre-adolescents, Slovenia*

Introduction

Good health is an important indicator of the quality of life and refers to broader human environment, in which healthy nutrition takes an important place. The indexes of healthy nutrition according to the guidelines of WHO, are closely related to lower general and specific mortality rate due to heart and coronary diseases and cancer. These two diseases are also top reasons for mortality (WHO, 1990; Ferro Luzzi, Gibney, Sjoström, 2001).

The statistics in Slovenia shows that 66.4% of all death cases were due to coronary heart diseases and cancer. The fourth place (6.6%) is taken by diseases of gastro-intestinal organs. Some of them are related to unhealthy nutrition and bad eating habits.

Education about healthy lifestyle and healthy nutrition is an important factor which influences the formation of healthy lifestyle and healthy eating habits of an individual. An early inclusion of healthy nutrition teaching programmes into compulsory elementary school curricula and into other levels of formal and informal education can improve knowledge and behaviour of children connected with eating habits.

Nutrition knowledge alone does not influence behaviour, but does provide individuals with the ability to know how to select a healthy diet. The nutritional knowledge and skills need to be taught during childhood when firm eating practises are being established (Birch, 1987; Shepherd, Dennison, 1996). Therefore, school is the major area for providing young people with nutrition knowledge and skills.

In the Republic of Slovenia, like in other countries, nutrition has gained a significant place in strategies of nutrition policy at all levels of education. This issue has been implemented in the official policy of Slovenia in 2004 (Resolution on the National Programme, 2005). It stems from the need to maintain people's health and to decrease the so called modern civilisation diseases which cause premature death of the population. For this reason education is an important element for achieving this goal.

The resolution on the national nutrition policy and sport activities for healthier living in 2005-2010 was accepted in 2005 and emphasizes strategies for increasing professional education and training in healthy nutrition and healthy life-styles.

The majority of the population gain knowledge about nutrition during the period of compulsory education. For this reason the teachers need to encourage students to take regular and healthy meals, and point out the consequences of unhealthy nutrition and its impacts on human health.

In Slovenian educational programs nutrition topics are integrated into other subjects, with the exception of secondary school programs for food technology and catering, medical school and home economics programmes. Nutrition, as a special didactic program is »hidden« is home-economics curricula in the fifth and sixth grade of elementary school where it is a compulsory subject. Nutrition can be taken as an elective subject in the last three years of elementary school, however it is optional (Koch, Kostanjevec, 2005).

Nutrition in the pre-school curricula

At this level we can talk about a »disguised« curriculum. Children are engaged in all sorts of communication and interaction activities, through reward and failure they learn about the rules how to manage time and space. It is through these activities that a disguised curriculum can be brought in. Such a curriculum is not precisely defined but lends itself to bringing in elements of education which can be more effective compared to a targeted curriculum .

Nutrition in the curriculum of elementary schools (nine-year programme)

Compulsory elementary school education lasts for 9 years and begins when children reach the age of six and ends when they successfully complete the educational programme, or after nine years of schooling.

In the first cycle (grades 1–3) all, or most of the subjects are taught by general class teachers. Half of the lessons in the first grade of the elementary school are assisted by the pre-school teacher. During the second cycle (grades 4–6) specialist teachers

become more and more involved in the teaching process. In the third cycle (grades 7–9) lessons are taught solely by specialist teachers.

The compulsory elementary school curriculum is based on several national curricular documents which were prepared and adopted by the National Curricular Council and the Council of Experts for general education of the Republic of Slovenia (1998-2006) and were launched by Ministerial decrees, and issued in accordance with the Elementary school Act. The Act specifies which school subjects are compulsory.

Scholl is the basic institution of formal education where students acquire knowledge about nutrition through compulsory, as well as elective subjects and science subjects. Thus, topics on nutrition are included in all triads. In the first triad nutrition is incorporated into the Environment subject (1st, 2nd and 3rd grade), in the second triad in Science and Technology subject (4th and 5th grade) and Home economics (5th and 6th grade). In the third triad nutrition topics appear in the following subjects: home economics, science, biology, chemistry, and electives (modern methods of food preparation and nutrition). The main compulsory subject with most topics on food and nutrition is home economics in the 6th grade of nine-year elementary school programme. According to the home economics syllabus, students are supposed to have acquired certain degree of knowledge about food and nutrition after the 6th grade.

Two elective subjects with topics on nutrition are offered in the nine-year elementary school: Modern methods of food preparation and Nutritional methods. These two provide more in-depth knowledge on the topics which are useful for later vocational training or in everyday life. These subjects are optional and can be taken in the third triad (i.e. 7th, 8th or 9th year). The subject Modern methods of food preparation includes topics on the significance of correct nutrition for maintaining health, e.g. safe, protective, and healthy nutrition and cooking. The syllabus includes topics on nutrients and health, quality of food and healthy meals, and nutritional habits. The subject Nutritional methods focuses on the aspects of nutrition as a means for protecting and maintaining health, e.g. the importance of healthy eating habits, healthy food in various stages of life, and nutrition in special circumstances. The syllabus includes topics on: over-nutrition, traditional and other nutritional habits, nutrition in different age groups and in special circumstances. In addition to this students acquire relevant knowledge also through Science subject in the 6th grade and Biology in the 9th grade.

School meals as part of a curriculum

By law, every elementary school in Slovenia has to organise at least one meal at school (Art. 57, Elementary School Act, Official Gazette, No 12 -29 II. 1996:884). Thus school meals also represent a form of nutrition education, which is in fact a disguised curriculum.

The teaching goals are operationalised so that pupils can:

- understand the meaning of school meals and learn about the nutritional rhythm
- understand the importance of good eating habits and their significance for health

- learn basic hygiene needed in catering
- learn good manners during eating
- evaluate school meals and compose menus
- assess suitability of school meals according to their sensory value.

(Simčič, 1999)

Studies have demonstrated that adolescents are not worried about the consequences of what they eat today on their health in the future. However they do know what they should be eating to have a healthy diet but their eating behaviour does is not reflected in their knowledge (Story, Resnick, 1986; Gracey, Stanley, Burke et al 1996).

Methods

SUBJECTS

Subjects were recruited from schools in Slovenia. There were approximately equal numbers of males and females.

Table 1. Children aged 12-13 y by gender

gender	number	%
male	118	48.8
female	124	51.2

QUESTIONNAIRE

A questionnaire, which was previously designed and used successfully with 11 to 12 year olds, was employed (Frobisher, Maxwell, 2001). The subjects were asked to complete the questionnaire on their own. The first part of the questionnaire examined the subject's attitudes to various aspects of nutrition and healthy eating. The subjects were asked to state their level of agreement or disagreement with statements using a 5-point Likert scale. The second part of the questionnaire tested the subjects' knowledge on nutrition and healthy eating. The statements provided tested either the subjects' theoretical or practical knowledge. The subjects responded to statements by selecting a 'true', 'false' or 'don't know' response. Points were awarded for a correct response and deducted for an incorrect one.

STATISTICAL ANALYSIS

Using the data from the questionnaire, cross tabulations and frequencies were calculated for the whole group. Independent t-tests were carried out on the knowledge scores from part two of the questionnaire to test for any significant differences between pupils by gender and age. The level of significance used was 0.05.

HYPOTHESES

- Elementary school children have positive attitudes towards healthy nutrition.
- Healthy nutrition attitudes differ by age and gender.
- Children are aware that diets have impact on their health.

- Children’s knowledge about nutrition is fair (medium) on the average, however, differs by gender or the age of children.

Results:

CHILDREN’S ATTITUDES TOWARDS HEALTHY NUTRITION

In analysing the data we used the Likert scale which is used in pedagogical research. There were five categories of answers to which we assigned numerical values (number of points). For positive statements (which describe desired attitudes) we assigned the category »Agree« 5 points, and 4, 3, 2 and points to the remaining categories. For negative statements (which describe undesired attitudes) the »Agree« category was assigned 1 point value and the remaining statements 2, 3, 4 and 5 points.

Table 2: Attitudes of children towards healthy nutrition

	Arithmetic mean (M)	Standard deviation	Variance
I like cooking.	2.20	0.95	0.91
I have never been on a slimming diet.	2.74	1.48	2.18
I like the taste of healthy food.	2.13	1.03	1.07
I am too young to think about healthy nutrition and about a balanced diet.	3.58	1.24	1.53
I understand what a healthy diet is and I know what I should eat.	1.86	0.80	0.65
Perhaps the food I consume now will have impacts on my health in the future.	2.17	0.96	0.92
I know what energy values different food products have (calories).	2.89	0.99	0.98
Our school meals are not healthy.	3.28	1.19	1.41
I believe that my diet is balanced.	2.45	0.89	0.79
We eat healthy food at home.	2.20	0.92	0.85
My friends are not eating healthy.	3.11	0.92	0.85
I don’t know which food to take to eat healthy.	3.48	1.13	1.27
My friends are afraid of getting fat.	2.60	1.06	1.13
Healthy nutrition is a loss of time.	4.13	1.15	1.32
For most of food products I know how much fat they contain.	2.82	1.06	1.12
I eat what my friends eat.	3.61	1.11	1.24
I know how to prepare a healthy meal.	2.22	0.83	0.68
I always read and understand declarations on food products.	2.78	1.07	1.14
I don’t like the taste of healthy food.	3.77	0.998	0.996

The data in tables show average answers of all children.

Children have positive attitudes towards their own nutrition; they understand

and know which food is good for them. The majority agree that healthy food tastes good which is a positive indicator, in particular when new food is being introduced to children.

In our survey we made two opposing statements: I like the taste of healthy food and I don't like the taste of healthy food. For both statements we got very positive responses: the agreement with the former statement was (M=2.13), and for the latter (M=3.77).

Children also agreed with the statement that they eat healthy food at school (M=3.28) and at home (2,20) which is encouraging since children's nutritional habits are formed at this stage and will probably remain permanent. This attitude has been additionally reinforced by answers to the statement that the food they eat now will have impacts on their health in the future. Also, children did not agree with the statement that consuming healthy and balanced diets is not important because they are too young for that (M=3.58). Children are also aware that reading declarations on food products is important.

Nutrition knowledge of elementary school children

Part of the questionnaire contained a test with 17 items, i.e. statements, to which they had to decide whether the statement was correct or incorrect. They could also opt for a third option (undecided) if they did not know the answer.

The test items contained questions referring to the role of nutrients for human body, knowledge about nutrients and nutritional values for particular food items, and general principles and recommendations for healthy nutrition.

The results were arranged by the grading criteria: fail (1), pass (2), fair (3), very good (4), and excellent (5). The maximum number of points was 17. Other points were distributed according to the following criteria:

- 0 – 8 points = 1 (fail)
- 9 – 10 points = 2 (pass)
- 11 – 13 points = 3 (fair)
- 14 – 15 points = 4 (very good)
- 16 – 17 points = 5 (excellent)

Table 3: Grading scale with the results

Grading scale	Grade	No of students	Distribution of grades achieved %
from 0 to 8	1 (fail)	110	45.4
from 9 to 10	2 (pass)	66	27.3
from 11 to 13	3 (fair)	59	24.4
from 14 to 15	4 (very good)	7	2.9
from 16 to 17	5 (excellent)	0	0
		N=242	100%

THE AVERAGE NUMBER OF POINTS ACHIEVED WITH THE GRADES FROM THE KNOWLEDGE TEST

On the average children achieved 8.87 points, which is a negative grade, i.e. 1.87 (arithmetic mean). The results show that the knowledge of children is poor; 110 children (i.e. 45.4 %) failed at the written test, followed by 66 children (27,3 %) who achieved a pass grade, 59 children achieved fair grade, and only 7 (2,9 %) were very good. None of the 242 children collected maximum points and none got an excellent grade. However, there were three children who collected no points. All the three encircled the third option, i.e. remained undecided and therefore we could not treat their answers as relevant.

Children know the general principles of healthy nutrition only to a certain extent. Problems arise when they deal with a question which requires higher level of knowledge and when they need to apply previously acquired knowledge. We were expecting that their knowledge about general principles of healthy nutrition would be at the fair (medium) level. Of course, it would be necessary to find out the reasons for such poor knowledge acquired by formal education, to analyse what teaching methods are used at schools, and to take the syllabus of home economics subject and related topics taught under other subjects under scrutiny. Also, children motivation should be carefully analysed.

Table 4: Nutrition knowledge of elementary school children by gender

Gender	Average number of points achieved	Average grade achieved during the test
	(arithmetic mean)	(arithmetic mean)
Boys	8.81	1.82
Girls	8.75	1.87

NUTRITION KNOWLEDGE OF ELEMENTARY SCHOOL CHILDREN BY GENDER

We analysed the data according to the age of students as well: our hypothesis was that the knowledge of older children would be better, particularly because older children have already been taught more complex topics within the home economics course and in addition they have had other subjects and thus had more possibilities to be able to relate the knowledge about healthy nutrition acquired from other subjects.

Grades achieved in the test by twelve-year olds

Table 5: Grading scale and grades achieved by 12 – year olds

Grading scale	Grade	No. of children	Distribution of grades achieved % %
from 0 to 8	1 (fail)	69	51.9
from 9 to 10	2 (pass)	31	23.3
from 11 to 13	3 (fair)	31	23.3
from 14 to 15	4 (very good)	2	1.5
from 16 to 17	5 (excellent)	0	0
		N=133	100%

The table above shows the grades achieved by 12-year-old children at the knowledge test. As can be seen from the table almost 48 % achieved a positive grade, and 51.9 % failed the test.

Grades achieved in the test by thirteen-year olds:

Table 6: Grading scale and grades achieved by 13-year olds

Grading scale	Grade	No of children	Distribution of grades achieved % %
from 0 to 8	1 (fail)	41	37.6
from 9 to 10	2 (pass)	35	32.1
from 11 to 13	3 (fair)	28	25.7
from 14 to 15	4 (very good)	5	4.6
from 16 to 17	5 (excellent)	0	0
		N=109	100%

It needs to be noted that 13-year olds attend the 7th or 8th class of elementary schools.

Table 7: Average number of points collected and average grade achievement in the knowledge test by student age

Age	Average number of points achieved (arithmetic mean)	Grade achievement in the knowledge test (arithmetic mean)
12	8.48	1.76
13	9.29	2.07

The table above shows that the number of points collected and consequently the grade improves with the age of children. This may be due to the fact that 13-year olds have passed the course in home economics and have attended some other elective courses.

The study shows that children are unable to apply theoretical knowledge acquired at school to everyday life situations. For example, they know some basic nutrients but do not know what nutrients are contained in certain food products and in what amounts. This means that children know some general principles of healthy nutrition but are unable to apply higher levels of understanding, or practically apply the knowledge in problem solving.

We should need to look for the reasons for poor nutrition knowledge in the methods used in formal education, and to find out whether children do receive all the necessary knowledge required by the syllabus.

An important factor for nutrition knowledge acquisition is learner's interest. Some children are more interested in certain topics than others and this normally results in better knowledge. For example, girls have better nutrition knowledge which may be due to the fact that girls at this age put more emphasis on the body image than boys.

Also, nutrition knowledge improves with the age, because learners have already gone through the process of formal education and have already been taught about food and nutrition during home economics courses and other subjects.

Conclusions

Good eating practises, healthy attitudes and a good knowledge basis to nutrition and health need to be established in childhood and adolescence. Data from this study suggests that healthy attitudes need to be established more within the subjects. This study supports the idea that nutrition needs to have a secure place in the curriculum at school. Pre-adolescents need to be educated in nutrition and healthy eating so they will be able to select, produce and consume a healthy diet now and in the future to help slow down the increasing levels of many diseases.

NUTRIČNÍ ZNALOSTI A POSTOJE DVANÁCTILETÉ A TŘINÁCTILETÉ ŠKOLNÍ MLÁDEŽE KE ZDRAVÉ VÝŽIVĚ VE SLOVINSKU

Abstrakt: Ve zprávě prezentujeme názory žáků na zdravou výživu a jejich znalosti o ní. Výzkumu se zúčastnilo 242 žáků. Pro získání informací o postojích a názorech žáků jsme použili dotazník, který byl složen ze dvou částí. V první části měli žáci vyjádřit svůj kladný nebo záporný postoj související se zdravou stravou. V druhé části jsou uvedena jejich písemná vyjádření, ve kterých museli vyznačit, jestli byly jejich postoje správné nebo nesprávné. Chtěli jsme zjistit úroveň znalostí, postojů a vztahů k výživě na základních školách, zda jsou v tomto smyslu mezi dětmi rozdíly v závislosti na pohlaví, věku nebo konkrétní třídě. Většina žáků, kteří mají pozitivní vztahy a názory na zdravou výživu, je si vědoma, že to, co jedí, má vliv na jejich zdraví nyní i v budoucnu. Výsledky také ukazují, že existují rozdíly v nutričních znalostech mezi pohlavími, kde děvčata mají o něco lepší znalosti a další pozitivní výsledky jsou mezi žáky vyšších ročníků.

Klíčová slova: nutriční znalosti, postoje, dospívající mládež, Slovinsko