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Assessment of the Health Status of Children Studying in Secondary Schools with Different Catering Arrangements

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Abstract In childhood, the foundations of a healthy lifestyle are laid. One of the main factors affecting the health of children is proper nutrition. During school education, the student's body experiences increased mental and physical stress. In the school regime, changing the intervals between meals leads to a violation of appetite, which causes a disorder of the digestive system and contributes to the development of chronic diseases of the gastrointestinal tract. As most of their time children spend at school, they should receive proper nutrition there. For the harmonious development of the body of students and the preservation of its high efficiency during the day, it is necessary to observe the diet.

Keywords Students, Secondary school, Catering, Morbidity, Alimentary-dependent diseases

1. Introduction

Ensuring a prosperous and protected childhood is one of the main national priorities; health in childhood involves healthy interests and habits; it is during this period that the foundations of a healthy lifestyle are laid, as a system of norms and rules [No. UP-6099]. One of the main factors influencing children's health is nutrition, which ensures the proper functioning of the body; nutrition is of particular importance during school education, as the student's body experiences increased mental and physical stress, when a large amount of energy and nutrients is consumed [Kominar O.E., Tarbeev N.N., 2020].

It is known that in school mode, changing the intervals between meals leads to appetite disturbance, which causes digestive disorders and contributes to the development of chronic diseases of the gastrointestinal tract [Zulkarnaeva A.T., 2013]. Eating behaviour should be formed from early childhood. Nutritional disorder in the form of deficiency or excess, macro- or micronutrients directly is the true cause of various diseases of the digestive organs [Kamilova R.T., Abdusamatova B.E., Kamilov J.A., 2018]. In this regard, nutrition in childhood should be balanced, where during the day the child should receive the necessary minimum of food and minerals [Moshchev A.N., 2009].

Taking into account that children spend most of their time at school, they should also receive nutritious food at school, which ensures the preservation of students' health, which is an integral part of a health-saving school environment; for the harmonious development of the body of school children and maintaining its high performance during the day, it is necessary to observe the dietary regime [Shved O.I., 2019].

According to the recommendations of experts in hygiene of nutrition, the optimal diet for children of school age is 4-5 meals a day; the most appropriate distribution of food during the day is considered: first breakfast - 25% of the daily ration, lunch - 35-40%, afternoon snack 10-15%, dinner - 25% [Kartelishev A.V., 2007]. According to a number of authors, a hot breakfast is mandatory; the energy expended by the child's body should be constantly compensated by food, otherwise the body is forced to replenish the energy expended by its internal resources [Gordeeva I.V., 2016]. As a result of violation of energy compensation with food, body weight decreases, growth is suspended, immunity is reduced, gradually comes exhaustion [Guseva I.M., 2015].

Objective: to assess the health status of children depending on the organization of school meals.

2. Materials and Methods

The object of the study was the pupils of Tashkent comprehensive schools aged from 7 to 14 years. All surveyed pupils were divided into 2 groups: Group 1 (principal), children who ate in buffet counters where cooked meals were sold; and Group 2 (control), pupils or students who ate in canteens where hot meals were arranged. A total of 335 pupils and their parents participated in the

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questionnaire survey.

Four types of questionnaires were developed to identify the quality of nutrition of students in general education schools and factors of nutritional disorders, which were considered and approved by the Scientific Council of the Research Institute of Sanitation, Hygiene and Occupational Diseases of the Ministry of Health of the Republic of Uzbekistan (Minutes №4 of 27.04.2018). A questionnaire survey was conducted in order to study alimentary-dependent diseases and determine the signs that characterize the predisposition of the pupils to health disorders, to identify the formation of healthy eating habits and determine the subjective attitude of parents to the organization and quality of food in secondary schools. Studies were conducted under a grant project of the Research Institute of Sanitation, Hygiene and Occupational Diseases (registration number - PZ-20170918168).

The obtained data were statistically processed. Two groups were compared in the work. The results were processed using Excel, Statistica, version 6.0. Significance of differences was assessed by Student's t-test. Valid values were considered to be those obtained with a probability of possible error in the estimation of the results, starting from the value $p<0.05$.

3. Results of the Study and Their Discussion

Analysis of the questionnaire survey results showed that among the surveyed students in Group 1, 77±2.58% of parents had higher education, while among the peers in Group 2, 33±2.47% of parents had higher education (P<0.001). In group 1 students, 20±2.45% of parents had secondary or vocational education, while in group 2 parents there were 51.2±2.63% (P<0.001). Secondary education had 3,0±1,04% of group 1 parents and 15,8±1,91% (P<0,001) of group 2 parents (Table 1). Thus, in the GS with different catering arrangements, the level of parental education has a significant difference, with the schools with hot meals arrangement having significantly higher level of parental education.

During the study, according to the results of questionnaire on investigation of alimentary-dependent morbidity and results of screening to determine the characteristics characterizing the predisposition of the child to disorders, it was found that 56.5±3.99% of parents of the 1 group and 50.3±3.71% of parents of the 2 group assess the condition of their child as "good" (P - no significant differences were revealed). The frequency of diseases in the child during the past 12 months was assessed as "good" by 63.6±3.87% of the parents of Group 1 and 62.9±3.59% (P - no significant differences were revealed) of the parents of Group 2. These data indicate that parents correctly assess the health status of their child.

The next stage of our study was to investigate the visits to a doctor during the last year; we found that in group 2 pupils 43,1±3,68% went to the doctor more often than in group 1 parents 33,1±3,79% (P - no significant differences were found). Group 2 students were 1.4 times more likely to be registered at the dispensary than group 1 students (2.7 vs. 1.9%; P - no significant difference detected).

In the study of morbidity, parents of pupils noted: 12.9±0.47% of group 1 pupils and 16.5±0.41% of group 2 pupils had infectious diseases (P - no significant difference was found), excessive body weight, obesity had 1.3±0.16% of group 1 children and 3.9±0.21% (P<0.01) of group 2 children Avitaminosis, hypovitaminosis occurred in 1.3±0.16% of group 1 pupils and 5.5±0.25% (P<0.001) of group 2 pupils; skin and subcutaneous fat diseases occurred 1.6 times more frequently among group 2 pupils than among group 1 pupils (13.3 vs 8.0%; P - no significant difference was found).

The surveys asked about symptoms indicative of digestive diseases. Symptoms and signs of alimentary-dependent diseases characteristic of pupils in general education schools are presented in Table 2.

As a result of the questionnaire, a comparative analysis of chronic diseases among students of two groups was conducted. Among 20.8±3.27% of Group 1 students and 26.5±3.28% (P - no significant difference was found) of Group 2 students, two chronic diseases per student were identified. An alarming finding was that pupils had three or more chronic illnesses, and it was found that the number of such illnesses was greater among pupils in the canteen schools than among pupils in the cafeteria schools (21.4±3.30 vs.18.7±2.89; P - no significant difference found).

Table 1. Education of parents of children included in the study

Education	Father				P	Mother				P
	1 group		2 group			1 group		2 group		
	M	±m	M	±m		M	±m	M	±m	
Higher education	86,7	2.70	38,3	3,62	0,001	62,6	4,68	27,7	3,32	0,001
Secondary vocational or professional	11,4	2,53	47,2	3,72	0,001	32,7	4,54	55,2	3,69	0,001
Secondary	1,9	1,09	14,5	2,62	0,001	4,7	2,05	17,1	2,79	0,001

Table 2. Symptoms and signs of alimentary-dependent diseases among secondary school students

Symptoms	Group 1		Group 2		P
	M	**±m**	**M**	**±m**	
Have decayed teeth	44,8	4,00	48,1	**3,71**	-
Any toothache	45,5	4,01	43,1	3,68	-
Is there white or yellow plaque on the tongue	28,6	3,64	11,0	2,32	0,001
Are there dental impressions on the tongue	2,6	1,28	11,0	2,32	0,01
Has there been bad breath	51,3	4,02	46,4	3,70	-
Taste (bitter, sour) in the mouth	31,8	3,75	23,2	3,13	-
Nausea or nausea	45,5	4,01	27,1	3,30	0,001
Do you have any belching	43,5	3,99	22,1	3,08	0,001
Is there heartburn	8,4	2,23	17,7	2,83	0,05
Has your abdomen been unreasonably painful for no reason	37,0	3,89	37,3	3,59	-
Have you had abdominal pain before eating?	22,7	3,37	17,7	2,83	-
Have you had abdominal pain after eating?	24,7	3,47	23,2	3,13	-
Have you had pain in the right side of the stomach?	9,1	2,31	7,7	1,98	-
Has anyone been chronically ill with stomach disease	3,9	1,56	6,1	1,77	-
If there is chronic liver disease	1,3	0,91	3,3	1,32	-
Chronic bowel disease	8,4	2,23	4,9	1,60	-
Are you constipated?	35,1	3,84	30,3	3,41	-
Diarrhoea or diarrhoea	31,7	3,74	24,3	3,18	-
Stool has a distinctive smell (acidic, foul-smelling, putrid)	13,6	2,76	13,8	2,56	-
Has there been any discolouration in the stool (red, black, white, green, yellow)?	5,2	1,78	8,3	2,05	-
Has there been stool blood in the faeces?	1,3	0,91	1,1	0,77	-
Has there been mucus, pus in the faeces?	3,9	1,56	1,1	0,77	-
Any reactions to foods (rash, itching, scaling, red spots, swelling, lacrimation, nasal discharge, sneezing, coughing, difficulty breathing, etc.)	12,9	2,70	17,7	2,83	-

4. Conclusions

1. It has been established that the education level of parents of pupils with a hot meal arrangement is significantly higher than that of parents of children at a comprehensive school where ready-made meals are sold. Consequently, the parents' educational level influences the choice of a comprehensive school for their child, taking into account the organisation of catering.
2. Alimentary-dependent diseases were more frequent in Group 2 than in Group 1: infectious diseases - 1.2 times (16.5 vs. 12.9%), overweight and obesity - 3 times (3.9 vs. 1.3%), avitaminosis, hypervitaminosis - 4.2 times (5.5 vs. 1.3%), skin and subcutaneous tissue diseases - 1.6 times (13.3 vs. 8.0%).
3. The organisation of nutrition is a risk factor for the development of chronic diseases, so continuous monitoring of children's nutrition with the involvement of health workers, teachers and parents is necessary in general education schools.

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