	Федеральное государственное бюджетное образовательное учреждение высшего образования «Волгоградский государственный медицинский университет» Министерства здравоохранения Российской Федерации Образовательная программа специальности 31.05.01 Лечебное дело (специалитет)	УЧЕБНО-МЕТОДИЧЕСКИЙ КОМПЛЕКС ДИСЦИПЛИНЫ «ГИГИЕНА»

ТЕМА:
«ASSESSMENT OF A NUTRITIONAL STATUS, DESCRIPTION OF HEALTH RISKS, HYGIENIC RECOMMENDATIONS FOR CORRECTING ACTUAL NUTRITION (part 1,2,3)»

Methodical recommendations to the lesson
for students in the specialty 31.05.01 "General Medicine"

г. Волгоград, 2020 г.

ASSESSMENT OF A NUTRITIONAL STATUS. DESCRIPTION OF HEALTH RISKS. HYGIENIC RECOMMENDATIONS FOR CORRECTING ACTUAL NUTRITION

The motivational description of the theme

The health condition of a population is associated with its feeding habits, and is assessed by the nutritional status and structure of nutrition-related diseases. A nutritional status refers to a set of indicators that reflect how the actual intake meets the real needs of the body. Inadequate energy intake and imbalanced diet alters body weight, functional status of the body, its reactivity and adaptability and therefore can be a detrimental factor in many pathological conditions. The assessment of the nutritional status enables the physician to substantiate their practical steps aimed to correct the patient's diet.

The objective: to learn how to assess the nutritional status and the actual diet of an individual (for example, a medical student), to formulate hygienic recommendations for diet correction.

Students' independent classroom activities

1. Diagnostics of nutritional status.
2. Hygienic evaluation of the food ration of a medical student.

Give a conclusion and provide recommendations.

3. Case problem.
4. Presentation and discussion of topics individually assigned by the teacher.

Self-study tasks:

1. Definition of the indicators of a nutritional status.
2. The indicators used to assess a nutritional status

Plan of students' independent activities

1. Diagnostics of nutritional status (fill the table).

1.1. According to the structural parameters:

- Body weight, % of ideal body weight;
-Weight to height ratio (kg / m ²);
- Triceps skin-fold thickness (mm);

1.2. According to the symptoms of vitamin deficiency:

- Skin dryness and flaking (vitamin A);
- Follicular hyperkeratosis / keratinization of hair follicles, rough skin, "goose bumps" on the flexor surfaces of the legs, hips, buttocks / (vitamins A, C);
- Angular stomatitis / papules, maceration and epithelial desquamation, small cracks in both corners of the mouth / (vitamin B2, B6, PP);
- Cheilosis / epithalaxia in the closing of the lips, mucous inner surface of the lips is shiny, bright red, with transverse cracks on the lips / (vitamin B2, B6, PP);
- Friability, bleeding gums (vitamin C, PP);
- Spontaneous petechiae / Punctulate hemorrhages in the skin / (vitamin C, P);

- Hypertrophy of lingual papillas (vitamin B1, B2, B6, PP);
- Dryness of the conjunctiva (vitamin A, B2);
- Increased sebaceous excretions, seborrhea / increased secretion of the sebaceous glands, glossy skin, small, easy to scrape off the scales mainly in the nasolabial, postaural folds, nose alae / (vitamins B1, B2, B6, PP).

1.3. According to the function:
- Time of dark adaptation (a function of the visual analyzer, vitamin A).

2. Hygienic evaluation of the food ration of a medical student (fill table).
3. A comprehensive assessment of the diet of a medical student (based on the calculations carried out in class when themes 2.4. and 2.5. were studied), filling in the table.
4. Give a conclusion about the "types of nutritional status" and provide recommendations.

Reference information

Term descriptions

HYGIENIC DIAGNOSTICS OF NUTRITIONAL STATUS

The nutritional status of a person as well as the evaluation of their actual nutrition (energy intake, chemical composition of foodstuffs) underlie the hygienic control over the adequacy of nutrition.

Classification of nutritional status

I. Ordinary
II. Optimum
III. Excessive
    1. Excessive nutrition
    2. Obesity
IV. Insufficient
    1. Inadequate
    2. Premorbid
    3. Morbid

ORDINARY NUTRITIONAL STATUS is referred to as the absence of any structural or functional disorders related to nutrition as well as the presence of adaptive resources adequate for normal living conditions. This nutritional status is inherent in many healthy people who eat a balanced diet.

OPTIMUM NUTRITIONAL STATUS also implies the absence of any structural or functional disorders related to nutrition as well as the presence of adaptive resources sufficient not only for normal living conditions but also for living and

performing activities in extreme conditions. It is developed by means of a special diet and in those who are in such professions as pilots, spacemen, rescuers.

EXCESSIVE NUTRITIONAL STATUS is characterized by structural and functional disorders and low adaptive resources. This nutritional status is developed by individuals who are on diets with excessive energy and nutrient intake.

INSUFFICIENT NUTRITIONAL STATUS involves structural and functional disorders, low adaptive resources. It develops due to qualitative and quantitative inadequacy of food intake.

INADEQUATE NUTRITIONAL STATUS is characterized by minor structural disorders when the symptoms of dietary deficiency cannot be observed. Special diagnostics, however, can reveal a decline in adaptive resources and functional capability of the body.

PREMORBID NUTRITIONAL STATUS gives rise to micro symptoms of dietary deficiency, induces malfunctioning of the basic physiological systems, a decrease in the general resistance and adaptive resources of the body even in normal conditions. However, a disease cannot be revealed at this stage.

MORBID NUTRITIONAL STATUS is associated not only with structural and functional disorders, but also with the clearly marked syndrome of nutritional deficiency.

DIFFERENTIAL DIAGNOSTICS OF THE NUTRITIONAL STATUS

The differential diagnostics of the nutritional status is carried out on the basis of somatometric, clinical, functional, biochemical, immunologic and demographic indicators.

1. Structural indicators:

- somatometric indicators are as follows: body height, body weight, chest circumference, shoulder circumference, shin circumference, skin fold thickness, weight to height ratio, etc.
- clinical indicators are as follows: the state of the skin and its appendages, the state of the tongue, visible mucous membranes, conjunctiva, parotid and mandibular glands, lymph nodes and some other organs available for palpation or physical examination.

2.Functional indicators

- evaluation of work capacity and productivity of a person (physical fitness, the state of the cardiovascular and respiratory systems).
- functional state of certain organs and systems (the functions of the visual analyzer, central nervous system, etc.).

3. Indicators of adaptive resources

- indicators of metabolic processes (protein, fat, carbohydrate and lipid metabolism, vitamin intake, etc.)
- immune status of the human body (bactericidal power and automicroflora of the skin, lysozyme of saliva, phagocytic activity of leucocytes, etc.).

4. **Demographic indicators**

- are used in considering the nutritional status of groups of people (mortality, birth rate, average life span, morbidity, etc.).

Appendix

I. BODY WEIGHT. Body weight is the most widespread indicator of the body structure. One can distinguish a permissible peak of body weight, normal body weight, standard body weight and ideal weight of the body.

Optimum weight of the body – (based on Insurance Company Statistics Society, USA), or ideal body weight (based on the Institute of Nutrition of the Russian Academy of Medical Science, Russia) is the weight of the individual which ensures the longest life expectancy.

Body weight of a person is assessed according to the weight tables which establish the desirable weight for men and women. It´s percentage is calculated in relation to the standard weight.

If a person maintains a desirable weight (e.g. within 10% of the standard weight), this weight is considered normal. A person´s weight may be reduced by 10% to 20%_of the standard body weight. In this case this weight is considered slightly reduced. A_20% to 30% reduce of the body weight means a moderately reduced body weight. If a person´s weight is reduced by 30% and even more, such a body weight is considered badly reduced.

If a person´s body weight is increased by 10% to 20%, it is referred to as excess weight. A 20% increased body weight means obesity of an individual.

2. KETLE´S INDEX

Body weight of an individual depends mainly on some other anthropometric indicators, especially on the human´s height. Adults´ height remains constant and does not change due to under- or overnutrition. Therefore, adults´ weigh to height ratio is usually referred to as an index. Ketle´s index, one of the most common dietary assessment techniques, is recommended for use by the WHO to assess nutrient adequacy and inadequacy of an individual.

Ketle´s index = Body weight (kg) / Height (m)²

According to the Metropolitan Height and Weight Tables, normative Ketle´s index is within 20-25 kg/m². In people with the 1st degree of obesity, who run the risk of dislipidemia, hypertension, diabetes and other diseases, Ketle´s index may increase up to 25-30 kg/m².

In people with the 2nd degree of obesity, Ketle´s index may vary from 30 to 40 kg/m². In patients with the 3d degree of obesity, Ketle´s index is usually 40 to 50 kg/m². In people with the 4th degree of obesity, it is more than 50 kg/m².

3. SKIN FOLD THICKNESS

By measuring skin fold thickness at certain locations body fat can be estimated. It is usually established with the help of an anthropometric sliding caliper. Skin fold thickness can be measured at various locations:

a) measurements taken at the back under the shoulder blade, at an angle of 45º to the spine (this measurement corresponds to the natural direction of the skin fold);
b) measurements taken at the stomach, inguinal region, parallel to the paraduodenal fold;
c) measurements taken at the back of the upper arm, at the back of the triceps.
Measurement of the skin fold thickness at the back of the triceps is more frequently used in class because of its ease and practicality. Measurements are taken at the back of the upper arm. The hand should be close to the body. The skin fold should be clutched by two fingers lengthwise, then, its thickness is measured with an anthropometric sliding caliper.

4. PERIOD OF DARK ADAPTATION TECHNIQUE

The test is made with the help of a black card with an area of 20x20 cm. At the corners of the box there must be blue, yellow, red and green small squares, 3´3 cm in size.
A student should take the box and stop-watch and get into a dark room. He should put the box at the level of his eyes, at a distance of 40-50 cm and start the stop-watch. As soon as he could see yellow and blue small squares in the box, the stop-watch is switched off. This is the period of dark adaptation. Normally, it is 30 to 60 sec.
An increased period of dark adaptation indicates vitamin A deficiency in the human body (i.e. hypovitaminosis), which usually results in hemerolopy (i.e. day blindness).

Table 1

Scheme for evaluating a nutritional status

Indicators	Nutritional Status					
	Ordinary	Optimal	Excessive	Insufficient		
				Inadequate	Pre-morbid	Morbid
1	2	3	4	5	6	7
Body weight (kg) % from ideal	90-110	100	>110	89-80	79-70	<70
Ketle´s index (kg/m²)	20-25	20-23	>25	19.9-18	17.9-16	<16
Skin fold thickness (mm) Men Female	7.7-10.2 14-24	8.5 18.0	>11.0 >25	7.7-6.8 14-10.0	6.8-6.0 10-8.0	<6.0 < 8.0
a) dryness & skin flaking	- +	--	--	+-	+	++
b) follicular hyperkeratinizati	--	--	-+	+-	+	++

on						
c) angular stomatitis	--	--	-+	-+	+	++
d) cheilosis	--	--	-+	-+	+	++
e) gum bleeding & gum friability	--	--	--	+	++	+++
f) spontaneous petechiae	--	--	-+	-	+	++
g) hypertrophy of lingual papilla	--	--	--	-+	+	+++
h) dryness of conjunctiva	--	--	--	-+	+	++
i) increased sebaceous excretion	--	--	++	--	--	--
Period of dark adaptation (sec.)	40-60	40	40-60	60-90	90-120	>120

Table 2

Ideal body weight

MALE				FEMALE			
Height, cm	Weight, kg	Height, cm	Weight, kg	Height, cm	Weight, kg	Height, cm	Weight, kg
145	51.9	166	64.0	140	44.9	161	56.9
146	52.4	167	64.4	141	45.4	162	57.6
147	52.9	168	65.2	142	45.9	163	58.3
148	53.5	169	65.9	143	46.4	164	58.9
149	54.0	170	66.6	144	47.0	165	59.5
150	54.5	171	67.3	145	47.5	166	50.1
151	55.0	172	68.0	146	48.0	167	60.7
152	66.6	173	63.7	147	48.6	168	61.4
153	56.1	174	69.4	148	49.2	169	62.4
154	56.6	175	70.1	149	49.8	170	63.2
155	57.2	176	70.8	150	50.4	171	64.3
156	57.9	177	71.6	151	51.0		
157	58.6	178	72.4	152	51.5		
158	59.3	179	73.3	153	52.0		
159	59.9	180	74.2	154	52.5		
160	60.5	181	75.0	155	53.1		
161	61.1	182	75.3	156	53.7		
162	61.7	183	76.5	157	54.3		
163	62.3	184	77.3	158	54.9		
164	62.9	185	78.1	159	55.5		

165	63.5	186	78.9	160	56.2		