



## PHYSICAL DEVELOPMENT AND QUALITY OF LIFE IN STUDENTS

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### ABSTRACT

Physical health refers to the well-being of the physical body and is defined as the optimal functioning of its constituent parts (cells, tissues, organs and systems) and harmonious interaction between them, contributing to normal structural-functional characteristics and adaptability of the organism, good physical performance and physical development. The purpose of the research is to establish whether there is a relationship between the physical development of students and their quality of life. The object of the study are 118 first-year students from the College of Medicine at Trakia University (91 women and 27 men). The research methodology includes the application of the WHO test (5) - quality of life index, anthropometric measurements including: height, weight, waist and hips as well as the ratio between them (WHR-index), BMI (body mass index). The interdisciplinary approach used, which is based on the relationship between mental (quality of life test) and physical well-being, did not find significant differences in the mental well-being test, but such were found by applying the Mann-Whitney test, and the data indicated, that a difference was found in relation to BMI ( $p \leq 0.05$ ).

**Key words:** students, physical development, quality of life, health

### INTRODUCTION

The term "physical development" in the scientific literature refers to the set of morphological, functional and mental indicators that indicate the rate and pattern of growth of the organism, as well as its ability to adapt to changing environmental conditions (1). The biological process of physical development is a reflection of ontogenesis or the change in the morphofunctional signals of the human organism during life (2). It is an indicator of physical well-being, which is one aspect of health. The World Health Organization defines health as: "A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (3).

As a result, health is a multifaceted concept that we constantly encounter, not an abstract one. The positive aspects of health are also emphasized in the definition. It is a result and at the same time a factor for the quality of life, not just the absence of illness (4).

As an important aspect of health, quality of life is a combination of elements including social interactions, mental well-being, degree of independence, physical health, environmental characteristics.

Often the concept of "quality of life" is identified with concepts such as "well-being", "social indicators" and "lifestyle", but these concepts do not overlap, it is necessary to distinguish them. Scientists in this field have adopted the term "level of well-being" as the shortest way to convey the idea of quality of life (5). According to Tsanova (6), the idea of quality of life consists of several complex components, such as physical and psychological well-being, degrees of freedom, social connections, and how these elements interact with the environment.

According to the World Health Organization, a determinant of the quality of life is also the way in which the quality of life is perceived through the goals, expectations, standards, concerns defined by the given person.

The purpose of the present study is to establish the existence of a relationship between physical development and the quality of life of students. The goal thus set is associated with solving the following tasks:

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1. Establishing the level of physical development of students by means of anthropometric measurements.
2. Application of the WHO test (5) to determine the quality of life of the studied contingent of persons.

**METHODOLOGY**

Students from the first year of the Medical College at the University of Trakia, Stara Zagora, studying in the specialties: medical laboratory assistant, rehabilitator, medical optician, medical beautician and assistant pharmacist - a total of 118 - 91 women and 27 men - participated in the study.

For each participant in the study, the anthropometric data were taken: height (height) in centimeters, body weight (in kilograms); waist circumference (in centimeters) and hip circumference (in centimeters). To obtain the

data, a standard tailor's tape measure and a balance (weighing scale) were used. The body mass index (BMI) and the WHR index were calculated using the formulas:

$$BMI = \frac{Weight (kg)}{Height (m)^2}$$

$$WHR = \frac{Weist\ circumference (sm)}{Hip\ circumference (sm)}$$

BMI contains data on the level of fat storage and associated health risks.

- Degree of fat accumulation according to BMI**  
**< 18.5 - below normal**  
**18.5 - 24.99 - norm**  
**25 - 29.99 - above normal**  
**> 30 – obesity**

*Table 1. WHR-based health risk rating*

Man	Woman	Degree
0.95 or lower value	0.80 or lower value	Low risk
From 0.96 to 1.0	From 0,81 to 0,85	Medium risk
1,0+	0,85+	High risk

WHR is a measure that indicates a person's tendency toward abdominal (android) obesity. The development of atherosclerosis with ischemic heart disease, arterial hypertension with stroke, hyperlipoproteinemia (types 2 and 4), non-insulin-dependent diabetes, gout, and asymptomatic hyperuricemia are at higher risk when obesity is present at a younger age, according to current research. Finding the ratio of waist circumference (measured across the navel) to hip circumference (measured in centimeters) is how WHR is diagnosed. Values of the waist-hip index up to 1.0 for men and 0.80 for women are considered normal. All measurements were carried out on the territory of the Medical College of Thrace University, at the beginning of the first semester of the first year of the students' studies (7).

The self-report test of perceived "quality of life" was administered to all participants. It contains

five questions that cover the last two weeks of the students' daily life. They are as follows:

- 1) **I felt cheerful and in a good mood;**
- 2) **I felt calm and rested;**
- 3) **I felt alive and energetic;**
- 4) **I felt refreshed and rested upon waking;**
- 5) **my daily life was filled with interesting things.**

Answers are based on the self-report of the surveyed students, and a six-point Likert scale of choice from 0 to 5 is provided.

The interpretation of the data is according to the proposed methodology of the World Health Organization. The Kruskal-Wallis test was applied.

**RESULTS AND ANALYSIS**

**Table 2** presents the results of the survey conducted to determine the well-being index.

Table 2. Quality of life test results

Questions	Specialties	Number	Arithmetic Rank
<b>QUESTION 1:</b> <b>I felt cheerful and in a good mood</b>	Medical beautician	23	53.22
	Medical laboratory assistant	27	50.96
	Medical optician	10	69.60
	Assistant Pharmacist	24	71.88
	Rehabilitator	34	58.82
<b>QUESTION 2:</b> <b>I felt calm and rested</b>	Medical beautician	23	55.15
	Medical laboratory assistant	27	49.02
	Medical optician	10	65.30
	Assistant Pharmacist	24	71.15
	Rehabilitator	34	60.84
<b>QUESTION 3:</b> <b>I felt alive and energetic</b>	Medical beautician	23	55.76
	Medical laboratory assistant	27	44.63
	Medical optician	10	70.30
	Assistant Pharmacist	24	66.56
	Rehabilitator	34	65.68
<b>QUESTION 4:</b> <b>I felt refreshed and rested upon waking</b>	Medical beautician	23	53.26
	Medical laboratory assistant	27	53.00
	Medical optician	10	75.55
	Assistant Pharmacist	24	68.54
	Rehabilitator	34	57.78
<b>QUESTION 5:</b> <b>I felt cheerful and in a good mood</b>	Medical beautician	23	54.02
	Medical laboratory assistant	27	52.76
	Medical optician	10	69.05
	Assistant Pharmacist	24	69.04
	Rehabilitator	34	59.01

The results of the quality of life test (WHO 5) are interpreted separately for each question and by specialty (Table 2).

On the first question, "I felt cheerful and in a good mood", the results show that the highest arithmetic average rank is the subjects with the specialty "Pharmacist Assistant" (Mean Rank = 71.88), followed by the subjects with the specialty "Medical Optician" (Mean Rank = 69.60), "Rehabilitator" (Mean Rank = 58.82); "Medical beautician" (Mean Rank = 53.22) and "Medical laboratory technician" (Mean Rank = 50.96).

On the second question, "I felt calm and rested", again with the highest average arithmetic rank are the examined persons with the specialty "Assistant Pharmacist" (Mean Rank = 71.15), followed by the specialty "Medical Technician" (Mean Rank = 65.30), "Rehabilitator" (Mean Rank = 60.84); "Medical beautician" (Mean Rank = 55.15) and "Medical laboratory technician" (Mean Rank = 49.02).

On the third question, "I felt lively and energetic", the leaders in the arithmetic mean rank are the examined persons from the

specialty "Medical Optician" (Mean Rank = 70.30), followed by the specialty "Pharmacist's Assistant" (Mean Rank = 66.56), "Rehabilitator" (Mean Rank = 65.68); "Medical beautician" (Mean Rank = 55.76) and "Medical laboratory technician" (Mean Rank = 44.63).

On the fourth question, "I felt refreshed and rested when I woke up", again with the highest values in the arithmetic mean rank are the studied students from the specialty "Medical Optician" (Mean Rank = 75.55), and behind them are "Assistant Pharmacist" (Mean Rank = 68.54), "Rehabilitator" (Mean Rank = 57.78); "Medical beautician" (Mean Rank = 53.26) and "Medical laboratory technician" (Mean Rank = 53.00).

On the fifth question "I felt cheerful and in a good mood", the examined persons in the specialty "Medical Optician" are the first in arithmetic mean rank (Mean Rank = 69.05), with a minimal difference, "Assistant Pharmacist" (Mean Rank = 69.04), followed by from the other groups "Rehabilitator" (Mean Rank = 59.01); "Medical beautician" (Mean Rank = 54.02) and "Medical laboratory technician" (Mean Rank = 52.76).

**Table 3.** Self-assessments of well-being by specialties

	question 1	question 2	question 3	question 4	question 5
<b>Chi-Square</b>	<b>7.466</b>	<b>6.555</b>	<b>9.394</b>	<b>5.966</b>	<b>4.705</b>
<b>df</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>
<b>Asymp. Sig.</b>	<b>0.113</b>	<b>0.161</b>	<b>0.052</b>	<b>0.202</b>	<b>0.319</b>

As can be seen in **Table 3**, no statistically significant differences were found regarding self-reports of well-being by specialty and the five questions.

It is of interest to us to analyze the data regarding the question of whether there is a difference in the perception of the quality of life between the students of the "Rehabilitator" specialty and the other participants in the study, which we associate with their special training and professional realization.

As presented in the table, no significant difference was found in the self-assessment of well-being from the group of students majoring in "Rehabilitator" compared to the rest of the contingent of examined persons.

The Kruskal-Wallis test was applied, through which the arithmetic mean values of the ranks of the observations (the obtained data WHR, BMI and the well-being index) were analyzed.

**Table 4.** Arithmetic mean values of the ranks of the observations

	BMI	WHR	Percentage
<b>Chi-Square</b>	10.843	11.719	10.541
<b>df</b>	4	4	4
<b>Asymp. Sig.</b>	0.028	0.020	0.032

The data presented in **Table 4** show that there is a statistically significant difference for the relative importance of WHR and BMI for each of the five observed groups (majors studied).

The presence of a statistically significant difference between WHR, BMI and the well-

being index obtained in rehabilitators and the other specialties was also investigated.

The Mann-Whitney test was applied. The data indicate that such a difference is found in relation to BMI ( $p \leq 0.05$ ). But the data do not show such a difference in the other indicators (**Table 5**).

**Table 5.** Mann-Whitney test

	BMI	WHR	Percentage
<b>Mann-Whitney U</b>	1098.000	1331.500	1415.000
<b>Wilcoxon W</b>	4668.000	4901.500	2010.000
<b>Z</b>	-1.961	-0.574	-0.078
<b>Asymp. Sig. (2-tailed)</b>	<b>0.050</b>	0.566	0.938

## CONCLUSIONS

The data from the conducted research and their analysis point to the following conclusions:

1. An interdisciplinary approach was used, which is based on the interrelationship between the mental (quality of life test) and physical well-being of students studying in the specialties: "Medical laboratory technician", "Rehabilitator", "Medical optician", "Medical cosmetologist" and "Assistant Pharmacist".
2. The initial stage of training of the studied persons implies smaller differences in the perception of the quality of life.
3. No significant differences were found in the test for determining mental well-being between

students studying in the various specialties of Medical College - Stara Zagora.

The relationship between indicators of physical development and their impact on quality of life is a problem that requires a wider range of data and established results on a larger set of criteria for assessing quality of life. In this context, we believe that effective training in the discipline of "Physical Education and Sport" can be designed and enriched with educational content with a narrower focus on the future professional realization of students from the "Rehabilitator" specialty.

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