

## OPINION

by **prof. ELENA GROZEVA ZHELEVA, PhD in Pedagogy**  
**MEDICAL UNIVERSITY "PROF. Dr. Paraskev Stoyanov" - Varna**

**Branch - Sliven**

e-mail – [ejeleva@abv.bg](mailto:ejeleva@abv.bg), [e\\_zheleva@abv.bg](mailto:e_zheleva@abv.bg)  
[elena.zheleva@mu-varna.bg](mailto:elena.zheleva@mu-varna.bg)

Appointed as a member of the scientific jury according to:  
Order No. R-109-318/24.07.2025 of the Rector of MU – Varna

**Subject:** Dissertation work for awarding of educational and scientific degree “Doctor” in the Scientific specialty: “Health Care Management”, Professional field: 7.4 Public Health, field of Higher Education: 7. Healthcare and Sport

**Author of dissertation:** Anushka Strahilova Uzunova, a doctoral candidate in Health Care Faculty at Medical University “Prof. Dr. Paraskev Stoyanov” – Varna, Sliven Affiliate

**Title:** “The impact of the COVID-19 pandemic on nutrition and physical activity of those involved in the educational process – educators and students at the Medical College – Stara Zagora”

**Scientific supervisor:** Assoc. Prof. Svetlana Peneva Angelova, DrPH

### **General overview of the procedure**

For awarding the educational and scientific degree “Doctor” in the field of Higher Education: 7. Healthcare and Sports; Professional field: 7.4. Public Health; Doctoral program: “Health Care Management”

The recension has been submitted in full compliance with the Law on Academic Staff Development in the Republic of Bulgaria, Regulations on the Terms and conditions for acquiring scientific degrees and holding academic positions at Medical University “Prof. Dr. Paraskev Stoyanov” – Varna.

### **Professional biography and development of the doctoral candidate**

In 1999, Anushka Strahilova Uzunova obtained the degree of "Rehabilitator" at the Medical College of Trakia University – Stara Zagora. In 2007, she graduated with a Bachelor's Degree in Health Care Management from the Faculty of Medicine of the Trakia University – Stara Zagora, followed by a Master's Degree in Health Care Management from the Faculty of Health Care Management at Medical University – Sofia.

Anushka Uzunova is an independent doctoral student at the Department of Health Care at the Sliven Branch of the Medical University of Varna.

Since 2012, she has been working as a Senior Lecturer at the Medical College of Trakia University – Stara Zagora. Since then, she has been continuously working with students studying towards the degree of "Rehabilitator". In 2020 she has been appointed Head of the specialty "Medical Cosmetologist".

She is an established specialist with highly professional competencies in the field of management and health care. She is communicative, with proven abilities to work in a team.

The dissertation of Anushka Strahilova Uzunova is dedicated to a significant problem – the impact of the COVID-19 pandemic on the nutrition and physical activity among those involved in the educational process – both educators and students at Medical College – Stara Zagora.

The work is a result of her long-term, purposeful work as a health care specialist and researcher.

The author's main thesis is that issues and negative impact of the online form of study and work affect both the physical and psycho-emotional health of students and teachers. Upon this observation, an experimental and universal set of exercises, combined with a balanced dietary regime has been developed and applied.

Key priorities were identified as a starting point to find possible solutions, after which an original dietary model for the case of reduced physical activity was created, in accordance with Ordinance No. 1 of 22. 01. 2018 for the physiological nutrition norms for the population.

The results of the experiment showed that the applied intervention led to significant improvements in body composition, respiratory functionality, perceived exertion and bone density in the experimental group, which differed from the control group. The data confirm the effectiveness of the applied methodology in the experimental group, while also showing the unfavorable effects in the absence of targeted physical activity.

The developed author's "Model for Nutrition and Physical Activity in an Online Learning Environment" offers a dietary approach for cases of reduced physical activity.

The dissertation consists of 143 pages, of which the body contributes to a total of 117 pages, with a bibliography of 175 sources – 26 in Cyrillic, 138 in Latin and 11 websites. The work contains an introduction, four chapters, a conclusion, suggestions, contributions, bibliography, and is illustrated with: 51 figures, 33 tables, 1 model and 3 appendices.

The discussion and evaluation of the study is to analyze the impact of the COVID-19 pandemic on the nutrition and physical activity of those involved in the educational process – both educators and students at Medical College – Stara Zagora.

### **I. Relevance of the topic**

The relevance of the topic of the dissertation lies in the fact that the impact of the COVID-19 pandemic on the nutrition and physical activity of those involved in the educational process requires an in-depth study of the health consequences. Linking the topic to nutrition and physical activity corresponds to one of the main goals of public health – prevention and promotion of a healthy lifestyle.

### **II. Methodological justification**

The precisely and clearly formulated purpose, tasks, subject, and hypotheses of the dissertation research allow doctoral student Anushka Uzunova to make objective and necessary conclusions related to the main problems identified for the development of the "Model for Nutrition and Physical Activity in an Online Learning Environment".

The analysis of the results forms the basis for ensuring effective organization of research and experimentation aimed at optimizing learning and reducing or preventing the negative effects of the physical and mental health of those using the online environment for study or work, which undoubtedly increases the significance of the analyses obtained not only from a theoretical, but also from a practical point of view.

The methodology is adequate for the purpose or the research and its set tasks. The description of the methods used is presented in detailed and in-depth manner, which additionally justifies the validity of the end results. The research includes documentary (collection of information from specialized literature – official and normative documents; photographs that describe the studied problems), sociological (two anonymous survey questionnaires for students and lecturers) and statistical methods (descriptive statistics, hypothesis testing, correlation analysis, etc.).



The survey data has been collected and incorporated into MC Excel tables. The statistical analysis has been carried out using IBM Statistick v.20 for Windows. The results obtained have been evaluated as statistically dependent when the  $p\text{-value} < 0.05$ , in which case the null hypothesis was rejected.

The statistical methods used are as follows: **Descriptive methods and estimation methods** – Descriptive statistics for quantitative variables – mean, minimum and maximum value and standard deviation; Frequency analysis of qualitative variables (nominal and rank), which includes absolute and relative frequencies (in percentages), cumulative relative frequencies (in percentages). **Methods for testing hypotheses** – Kolmogorov-Smirnov and Shapiro-Wilk test to verify the normality of the distribution of the given sample; Chi-square for consistency, Chi-square test for independence and exact Fischer's test for mutual influence between qualitative variables; Student's T-test for comparison of averages between quantitative variables between different measurements; Correlation analysis to establish the relationship between the studied quantitative and qualitative variables; **Laboratory method Experiment** – referring to the development and implementation of a diet-movement regime and healthy practices for a certain period of time.

The survey was conducted among a general population of 191 respondents (82% of the initially planned 233 respondents), 32 of which lecturers and 159 students majoring in "Rehabilitator", "Medical Laboratory Assistant", "Medical Cosmetologist", "Assistant Pharmacist".

All respondents have voluntarily agreed to participate in the survey with the permission of the Rector of Trakia University and the Director of the Medical College of Stara Zagora.

### **III. Evaluation of results**

The importance of the problem under study is substantiated from the very introduction of the dissertation – the impact of the COVID-19 pandemic on the nutrition and physical activity of the students involved in the educational process – both educators and students at Medical College – Stara Zagora. The relevance of the research is related to the effective organization and management of the problem under study, which determines the interest in the formulated topic of the dissertation.

Doctoral candidate Anushka Strahilova Uzunova reveals the objective and subjective conditions that determine the need to study the problem.

The first chapter "Literature Review" serves as an overview of the beginning of the pandemic, as well as the current situation – Distance Learning (Advantages and disadvantages); Physical activity (Physical inactivity and physical education); Social isolation and mental health; Physiological importance of hydration (Water loss during high physical activity); The role of nutrition; Types of nutrients (Proteins, lipids, carbohydrates, vitamins, macronutrients, trace elements, antioxidants, enzymes) and conclusions from the literature review.

Analysis proves that the applied intervention leads to significant improvements in body composition, respiratory functionality, subjective load sensation and bone density in the experimental group, which results differ from the results of the control group.

The second chapter "Purpose, Tasks, Methodology and Organization of the Study" analyzes the purpose, tasks, hypotheses, subject, technical units of observation, and logical units of the conducted study.

The setting of the study, the sources and methods of collecting primary sociological information, the methods for processing and analyzing the information are precisely outlined. The statistical analysis was carried out using IBM Statistick v.20 for Windows. The results obtained were evaluated as statistically dependent when the  $p\text{-value} < 0.05$ , at which point the null hypothesis was rejected.

This allowed the author to optimally organize the methodology of research of the dissertation. In the ascertaining research, documentary and sociological methods were used to collect empirical data, which was processed using statistical methods.



In the third chapter – "Results of own research", PhD student Anushka Uzunova analyzes the results of the survey conducted on a total of 191 respondents, studying or working at the Medical College of Stara Zagora, of which a higher relative share is represented by the students (83.25%, n=159) compared to the relative share of respondents from the group of lecturers (16.75%, n=32). This difference is statistically significant at a significance level of  $p<0.05$ .

The analysis of the data shows online learning, as well as its hybrid forms, requires increased awareness of the potential negative impact on the physique and psyche of the participants. The research proved negative consequences of social isolation, combined with hypodynamia and poor eating habits, which can be limited or overcome with appropriate health practices.

A key element in the study is that after conducting the experiment, statistically significant differences were found between the experimental and control groups in terms of key indicators - body mass, BMI, chest mobility during breathing, muscle mass, distance traveled and bone density.

The PhD student thoroughly researched and analyzed the opinion of respondents from the experimental group, who had significantly lower body mass and BMI compared to the control group ( $p<0.05$ ), which proves the positive effect of the applied intervention. In addition, chest mobility during breathing proved better in the experimental group, which indicates potential benefits for the functional respiratory capabilities of the participants.

With regard to muscle mass, the experimental group demonstrated a significant improvement in the indicator as a result of the applied intervention, proven by a visible decrease in the participants with low muscle mass and an increase in the proportion of participants with excellent muscle mass. In the control group, a deterioration of the condition was observed. The number of participants with low muscle mass was increased, while there was a sharp decrease in those with excellent muscle mass.

In terms of bone density, the experimental group showed a higher proportion of participants with normal values after the experiment (68.89% versus 33.33% in the control group), while the incidence of osteopenia and osteoporosis was higher in the control group. This may indicate the positive impact of the applied healthy regimen on bone health.

Anushka Uzunova proves that there is a statistically significant difference in favor of the experimental group ( $p=0.001$ ), and the subjective feeling of fatigue measured by the Borg scale is significantly lower in the same ( $p=0.001$ ), which suggests better adaptation to the load compared to the control group.

The analysis from the Diagnostic Card includes 90 respondents, divided into two groups – experimental and control. In both groups, the participants have the same relative share – 50.00%.

In the fourth chapter "Model for Nutrition and Physical Activity in an Online Learning Environment" the path to optimization of learning in an online environment is directed. The impact of online learning during the COVID-19 pandemic on the physical activity and nutrition of students and their trainees at the Medical College – Stara Zagora has been studied. A universal set of healthy practices has been developed and proposed to reduce and/or overcome the negative consequences affecting the physical and mental health of those using an online learning or work environment.

A set of exercises for students and teachers has been developed and applied, reducing motor deficit and its consequences. A diet is also proposed, allowing for a balance between caloric intake and expenditure.

The conducted experiment includes measurements and studies concerning hypodynamia. The changes in nutrition during the pandemic have been studied. A complex set of exercises and diet for a period of at least two months was applied. The indicators selected in the experiment were tracked, which helped finding changes in blood pressure, pulse wave speed, functional physical capacity, anthropometric and morphometric indicators, muscle strength, and osteodensitometry.

The applied intervention proved significant improvements in body composition, respiratory functionality, subjective load perception and bone density in the experimental group, which results differed from those obtained by the control group.

The size of the sample allows the doctoral candidate to draw objective conclusions related to the state of the problem under study.

The PhD student shows the effectiveness of each activity included in the "Model for Nutrition and Physical Activity in an Online Learning Environment".

In "Conclusions and Suggestions", the doctoral candidate summarizes the reflected data from the study with the help of 9 final conclusions. There are 2 proposals, regarding reducing or overcoming the negative consequences affecting the physical and mental health of those using an online learning or work environment.

The conclusions naturally stem from the analysis of the data presented, and the proposals are specific and aimed at those who use an online learning or work environment.

#### **IV. Assessment of contributions**

The doctoral candidate identifies two theoretical contributions and three practical contributions that reflect the scientific value of the work.

#### **V. Abstract and publications on the dissertation**

The abstract reflects the structure and main results. Two publications (one sole-authored, one co-authored with Uzunova as first author) are related to the dissertation topic.

#### **Conclusion:**

The comprehensive analysis of Anushka Strahilova Uzunova's dissertation shows that in terms of relevance, methodological precision, research scope, findings, and recommendations, it contains specific scientific and applied contributions, meeting the criteria of the Law on the Development of Academic Staff in the Republic of Bulgaria and the Rules of the Medical University – Varna.

Therefore, I give my **positive assessment** and confidently propose to the esteemed jury members to award Anushka Strahilova Uzunova the educational and scientific degree **“Doctor”** in the field of Higher Education: 7. Healthcare and Sports; Professional field: 7.4. Public Health; Scientific specialty: “Health Care Management”.

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Written by

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Prof. Elena Zheleva, DP