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INTEGRATED MONITORING OF HEALTHY NUTRITION, BIOCHEMICAL INDICATORS, AND QUALITY OF LIFE AMONG YOUTH

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Abstract: The health of young people plays a decisive role in determining the intellectual and socioeconomic potential of society. In recent years, exploring the complex interrelationship between nutrition quality, biochemical indicators, and life quality has become a key direction in public health. This study focuses on the integrated analysis of dietary habits, biochemical status, and quality of life among young individuals. Findings indicate that balanced nutrition, adequate intake of proteins, vitamins, minerals, and regular physical activity contribute to maintaining biochemical homeostasis, enhancing resistance to stress, and improving overall quality of life.

Keywords:healthy nutrition, youth, biochemical indicators, quality of life, integrated monitoring, psycho-physiological state.

Introduction

Modern youth face increasing challenges related to high academic load, mental pressure, irregular sleep, and unbalanced diet, which together disrupt physiological equilibrium. The excessive consumption of fast food, carbonated drinks, and processed products leads to nutritional imbalances, metabolic disorders, anemia, and chronic fatigue. Such conditions not only affect physical health but also reduce mental performance, emotional stability, and social engagement.

Healthy nutrition should be understood as a multifactorial determinant that ensures not only physical well-being but also intellectual productivity and emotional balance. The metabolism of young individuals is highly active, and therefore, the quality, diversity, and bioavailability of nutrients play a decisive role in sustaining optimal physiological function.

The formation of a healthy eating culture is not limited to medical education but extends into social and pedagogical contexts, requiring the involvement of families, educational institutions, and public health organizations. This study aims to analyze the interrelations between eating habits, biochemical indicators, and life quality among youth through an integrated monitoring approach and to develop a scientific basis for enhancing healthy nutrition culture.

According to the World Health Organization and Food and Agriculture Organization, poor dietary patterns, sedentary lifestyles, and high psychological stress are among the main determinants of declining youth health worldwide. Research across various populations has shown a high prevalence of deficiencies in vitamin D, vitamin B12, iron, zinc, and iodine among young adults. These deficiencies can lead to anemia, hormonal imbalance, impaired glucose metabolism, and cognitive decline.

Changes in biochemical parameters such as reduced hemoglobin, elevated cholesterol, and disturbed glucose tolerance are closely associated with poor dietary quality and

psychological stress. Psychosomatic studies confirm that balanced nutrition positively influences emotional stability, attention, social adaptability, and subjective life satisfaction.

In recent years, an integrated health monitoring model combining biochemical, psychological, and lifestyle indicators has become increasingly important. Such a system allows for a more comprehensive and accurate evaluation of youth health status, forming the foundation for preventive public health strategies.

Methods

The study assessed the nutritional behavior, physical activity, psychological condition, and social adaptability of young participants using structured questionnaires and in-depth interviews. Blood samples were analyzed to determine hemoglobin, glucose, total protein, cholesterol, triglycerides, and vitamins D and B12 levels.

Each indicator was evaluated in correlation with dietary patterns, study workload, sleep quality, and stress levels. Quality of life was assessed through the internationally validated "SF-36 Health Survey." The obtained data were analyzed using medical-statistical, correlation, and regression analysis methods to identify the interrelationship between nutritional status, biochemical parameters, and psycho-physiological well-being.

Results

The study revealed that a significant proportion of young participants had inadequate dietary patterns characterized by skipping breakfast, low intake of fruits and vegetables, and overreliance on processed food. Such patterns were associated with low hemoglobin levels, metabolic irregularities, and increased fatigue and irritability.

Participants with consistent and balanced dietary habits, including regular consumption of proteins, fresh vegetables, and whole grains, exhibited better metabolic profiles, higher energy levels, and more stable mood. They also demonstrated higher academic productivity and social activity. Conversely, frequent fast-food consumption and sweetened beverage intake were linked to elevated cholesterol, unstable glucose regulation, and reduced psychological resilience.

Quality of life assessments showed that youth who practiced balanced nutrition reported greater life satisfaction, higher self-esteem, stronger emotional stability, and better interpersonal relations compared to those with irregular eating habits. These findings confirm that nutrition has a multidimensional impact extending beyond physiology to include psychological and social well-being.

Discussion

The results of this study reinforce the understanding that nutrition is a fundamental determinant of holistic health in youth. Properly organized nutrition supports hormonal balance, strengthens immunity, improves cognitive function, and enhances emotional regulation. Balanced nutrient intake promotes the synthesis of serotonin and dopamine, neurotransmitters associated with motivation, concentration, and emotional resilience.

The lack of healthy eating culture among young people is influenced by a combination of social, economic, and educational factors. Students often experience time constraints, excessive

academic load, and a preference for convenience foods, leading to neglect of dietary quality. Therefore, establishing a sustainable healthy nutrition model requires integrated interventions involving educational programs, public awareness campaigns, and institutional support within universities.

The integrated monitoring approach applied in this study provides a multidimensional evaluation framework by simultaneously examining biochemical, psychological, and lifestyle factors. This approach enables early detection of nutrition-related imbalances and facilitates timely preventive measures to improve youth health and life quality. Integrating nutrition education, behavioral counseling, and periodic biochemical screening into student health programs would significantly enhance their resilience, performance, and long-term well-being.

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