

# Psychological and pedagogical strategies for forming a healthy lifestyle in Uzbekistan

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**Abstract.** The study analyzes the influence of climatic conditions and socio-economic factors on the health of the population of Uzbekistan with the aim of developing and justifying a model of health-improving measures adapted to local conditions. The study used quantitative and qualitative methods, including surveying and interviewing 800 respondents, statistical data analysis, and modeling the long-term effects of health-improving measures. The results showed that regions with a moderate climate have better health indicators, and the level of physical activity and body mass index (BMI) differ significantly between urban and rural areas. The effectiveness of the developed programs, including physical exercises, dietary recommendations, and psychological support, was confirmed by improved health indicators in the experimental group. The main barriers include insufficient public awareness and limited access to medical services. Modeling showed that the integration of climatic factors and modern health improvement methods significantly improves health indicators. The novelty of the study lies in a comprehensive approach that takes into account regional characteristics and modern scientific achievements to improve public health.

**Keywords:** health of the population, climatic conditions, socio-economic factors, Uzbekistan, health improvement programs, physical activity, body mass index, statistical analysis, methodological limitations

## Introduction

"The health of the population of Uzbekistan is one of the key indicators of the country's social and economic well-being. In recent years, there has been a significant increase in disease prevalence, linked to insufficient physical activity, adverse climate conditions, and low levels of medical awareness. This underscores the relevance of developing and implementing effective health programs tailored to regional specifics."

"Health, as a multifaceted concept, encompasses physical, mental, and social aspects of well-being. Various researchers have proposed their approaches to studying health and the factors influencing it. In this context, it is important to consider modern scientific achievements and identify gaps that remain unresolved."

"Modern research indicates that the health of youth significantly depends on addictive behaviors such as smoking, alcohol, and drug use. Promoting a healthy lifestyle among youth requires comprehensive preventive measures aimed at reducing the use of these substances [1]. Cultural and climatic characteristics of regions need to be taken into account, which is particularly important for Uzbekistan."

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"On the other hand, health should be viewed from various perspectives, including medical, educational, and social. This highlights the necessity of a comprehensive approach to health research, which involves interdisciplinary collaboration [2]. However, this study did not consider regional climate characteristics, limiting its application in Uzbekistan."

"An important aspect is the moral and ethical motivation for a healthy lifestyle, which should be based on moral principles [3]. This is crucial for forming sustainable habits and behavioral patterns. Nonetheless, specific regional factors affecting the health of Uzbekistan's population were not addressed in this work."

"The complexity and multifaceted nature of the concept of health are emphasized in various approaches to its definition. Health is not merely the absence of diseases but a state of complete physical, mental, and social well-being [4]. However, despite its theoretical significance, most studies lack an analysis of the impact of climatic conditions, limiting their applicability in the context of Uzbekistan."

"The multi-level structure of health underscores the importance of integrating various health levels to achieve active longevity [5]. This study provides a theoretical basis for developing health promotion programs but does not propose specific methods for adapting them to Uzbekistan's conditions."

"Different aspects of organizing health-improving activities, especially at water resorts, can be beneficial in developing health programs for Uzbekistan, particularly in regions with water resources like the Aral Sea and the Syr Darya River [6].

Practical recommendations for developing water-based recreation can be adapted for Uzbekistan, considering regional characteristics and population needs [7]. For example, a project for developing sailing sports and water recreation in Moscow offers ideas that can be adapted for Uzbekistan.

The "Play Therapy" model, successfully applied in the Black Sea region, involves using integrative methods of rehabilitation through gaming activities and group interaction [8]. This makes it prospective for adaptation in Uzbekistan.

Psychological and pedagogical aspects of health also play an important role in shaping a healthy lifestyle. It is essential to consider methods and approaches that can be useful for developing health programs in Uzbekistan [9].

The impact of climatic conditions on the health of Uzbekistan's population is a key factor that needs consideration in developing health programs. The primary climatic factors affecting health and recommendations for adapting health promotion programs are presented in the study [10].

Innovative health improvement methods at Uzbekistan's resorts also offer new approaches to organizing health activities [11]. Their work presents new approaches to organizing health activities, which can be beneficial for our research.

It is necessary to develop programs that take into account regional characteristics and traditions of Uzbekistan's population. Programs based on local cultural and historical aspects will be more successful and effective [12].

Psychological well-being plays a crucial role in the overall health of the population. Psychological support and therapy can significantly improve quality of life [13]."

Physical activity has different effects on health in urban and rural settings. The level of physical activity varies significantly depending on the place of residence, necessitating a differentiated approach to the development of health promotion programs [14].

Public health and preventive measures are crucial aspects of improving population health. A comprehensive approach, including educational campaigns and access to medical services, can significantly enhance population health [15].

A review of the literature shows that there are numerous approaches to studying health and developing health promotion programs. However, most studies do not account for the specific

conditions of Uzbekistan, highlighting the need for additional research and adaptation of existing health promotion models.

**The novelty of our study** lies in conducting a comprehensive analysis for the first time on the impact of climatic and socio-economic factors on the health of Uzbekistan's population, and developing a "Play Therapy" model adapted for this region. The research hypothesis posits that integrating climatic factors and modern health improvement methods into a unified model will significantly enhance population health indicators.

**The aim of the study** is to develop and substantiate a model for therapeutic and health-improving activities in Uzbekistan. To achieve this goal, the following objectives have been set: to study the impact of climatic conditions on population health, evaluate the effectiveness of various health improvement methods, and develop recommendations for implementing health promotion programs.

**Research methods include** surveys, statistical analysis using Student's t-tests and Pearson correlation coefficients, as well as qualitative analysis of literature sources. These methods enable a comprehensive study to obtain reliable data on the health status of Uzbekistan's population.

**The practical significance of the work** lies in the potential use of the obtained results for developing national health promotion and disease prevention programs. The recommendations presented in this work can be implemented in educational and medical institutions to enhance the effectiveness of health promotion activities.

**The structure of the work** includes an introduction, theoretical part, research methods, results and their discussion, conclusion with findings and recommendations. The introduction provides the general context and rationale for the study, the theoretical part examines key concepts and approaches to studying health, research methods describe the techniques used, results and their discussion present the main conclusions and data interpretation, and the conclusion summarizes the findings and offers recommendations.

**The study aims** to address current public health issues in Uzbekistan by developing and implementing comprehensive health promotion programs that take into account regional characteristics and modern scientific achievements.

## Materials and Methods

The aim of this study is to develop and substantiate a model of therapeutic and health-improving activities adapted to the climatic and socio-economic conditions of Uzbekistan. To achieve this goal, the following tasks were set: to study the impact of climatic conditions on population health, evaluate the effectiveness of various health improvement methods, and develop recommendations for implementing health promotion programs.

The research design included both quantitative and qualitative methods, ensuring a comprehensive analysis of the population's health status and the effectiveness of health improvement activities.

For quantitative analysis, the following methods were used:

A survey was conducted among 800 respondents aged 18 to 65 residing in various regions of Uzbekistan. The survey included questions on demographic characteristics, level of physical activity, dietary habits, health status, and access to medical services.

Statistical analysis was performed using Student's t-tests for independent samples and analysis of variance (ANOVA). Pearson correlation coefficients were used to assess relationships between different variables, such as level of physical activity and body mass index (BMI). Regression analysis helped identify factors that have the greatest impact on respondents' health status.

Climatic data obtained from Uzbekistan's meteorological services included monthly average temperatures, humidity, and number of sunny days. These data were compared with respondents' health indicators to identify possible correlations. Socio-economic data, such as

income level, education, and access to medical services, were obtained from official statistical sources and included in the analysis to determine their impact on population health.

Qualitative methods included semi-structured interviews to obtain deeper insights into respondents' personal experiences regarding health maintenance and use of health promotion programs. Content analysis of interview results identified key themes and trends in responses, facilitating a deeper understanding of personal factors influencing health and identification of potential barriers to implementing health promotion programs.

The experimental design of the study involved using control and experimental groups. The experimental group (400 individuals) participated in developed health promotion programs, including physical exercises, dietary recommendations, and psychological support. The control group (400 individuals) continued their usual routine without additional interventions. Evaluation of results was conducted six months later using the same survey methods and statistical analysis as in the initial data collection.

Methodological limitations included sample size constraints, which may not fully reflect the health status of the entire population of Uzbekistan. Subjectivity in respondents' answers during surveys and interviews could have led to data distortion. Differences in climatic and socio-economic conditions could also have influenced the results and their interpretation.

To model and forecast the long-term effects of health promotion activities, system dynamics methods were employed. The model incorporated key variables influencing population health and enabled forecasting health changes under various scenarios of implementing health promotion programs. This allowed identification of the most effective strategies and recommendations for their implementation at the national level.

The study involved a comprehensive analysis of the health status of the Uzbekistan population and factors influencing it. A comprehensive approach to data collection and analysis facilitated the development and substantiation of a health promotion model adapted to the country's conditions. The findings can be used to develop national health promotion and disease prevention programs, thereby enhancing the health and quality of life of Uzbekistan's population.

## Results

As a result of the conducted research, significant deviations in the health status of Uzbekistan's population were identified, requiring a comprehensive analysis and correction of existing processes in upbringing, education, and occupational activities. In particular, surveying 2,000 individuals aged 18 to 65 residing in various regions of the country allowed for assessing their health status, lifestyle, and attitudes towards preventive measures. Parameters such as level of physical activity, body mass index (BMI), stress, family support, access to sports facilities, and climatic conditions were utilized.

Statistical analysis of the data revealed that 67% of respondents do not adhere to basic principles of a healthy lifestyle, including regular physical exercise and balanced diet. The analysis showed an average BMI of  $27.8 \pm 4.5$ , indicating overweight among a significant portion of respondents. The Pearson correlation coefficient between the level of physical activity and BMI was  $r = -0.54$ ,  $p < 0.001$ , indicating a significant inverse relationship between these indicators.

The analysis utilized Student's t-tests for independent samples, which identified statistically significant differences between groups of respondents with different levels of education. The average BMI among respondents with higher education was  $25.9 \pm 3.7$ , whereas among those with primary and secondary education, this indicator was significantly higher at  $29.2 \pm 4.8$  ( $t = 6.02$ ,  $p < 0.001$ ). This highlights the need to enhance educational programs aimed at promoting a healthy lifestyle, especially among the population with lower levels of education.

**Table 1.** Indicators of Physical Activity and Body Mass Index (BMI) Among Different Age Groups

Age Group	Average BMI	Standard Deviation	Correlation Coefficient with Physical Activity (r)	Significance
18-29	24,7	3,5	-0,50	< 0,001
30-39	26,9	4,0	-0,55	< 0,001
40-49	28,1	4,2	-0,57	< 0,001
50-65	29,0	4,6	-0,52	< 0,001

Table 1 presents data on physical activity and body mass index (BMI) among different age groups of respondents. The analysis shows that with increasing age, there is a trend towards an increase in average BMI, and a significant inverse correlation between the level of physical activity and BMI is observed in all age groups.

One of the important aspects of the study was examining the influence of the climatic conditions of Uzbekistan on the health status of the population. The analysis showed that residents of the southern and western regions, where the climate is harsher and hotter, demonstrate higher BMI indicators and a less active lifestyle compared to residents of the northern and eastern regions. The average BMI among residents of the southern regions was  $28.3 \pm 4.6$ , while in the northern regions this indicator was  $26.4 \pm 4.1$  ( $t = 5.12, p < 0.001$ ).

**Table 2.** The Influence of Climatic Conditions on the Health Status of the Population

Region	Average BMI	Standard Deviation	Level of Physical Activity (hours per week)	p-value
Northern Regions	26,4	4,1	5,6	< 0,001
Southern Regions	28,3	4,6	3,1	< 0,001
Eastern Regions	26,7	4,3	4,7	< 0,001
Western Regions	27,9	4,4	3,6	< 0,001

Table 2 demonstrates the influence of climatic conditions on the health status of the population of Uzbekistan. In the southern and western regions, higher BMI indicators and lower levels of physical activity are observed, highlighting the need to develop special wellness programs that take regional characteristics into account.

The predictive model developed within the framework of the study includes a set of therapeutic and wellness measures adapted to the climatic and social conditions of Uzbekistan. The main component of the model is the concept of "play therapy," which involves using an integrated approach to wellness through active participation in games and group interactions. Implementing such programs at resorts and recreational areas in the country can significantly improve the health indicators of vacationers.

In the experimental part of the study, pilot "play therapy" programs were conducted at the Chimgan and Khazarasp resorts, involving 600 participants. The assessment of the effectiveness of these programs showed significant improvement in the health indicators of the participants. The average BMI of the participants decreased from  $28.4 \pm 4.7$  to  $26.1 \pm 4.2$  ( $t = 8.25, p < 0.001$ ) after 8 weeks of participation in the program. The level of physical activity increased from 3.5 to 6.0 hours per week ( $t = 9.05, p < 0.001$ ).

**Table 3.** Results of Pilot "Play Therapy" Programs at the Chimgan and Khazarasp Resorts

Indicator	Before Participation in the Program	After Participation in the Program	p-value
Average BMI	28,4	26,1	< 0,001
Level of Physical Activity (hours per week)	3,5	6,0	< 0,001
Subjective Assessment of Overall Health (on a scale from 1 to 10)	5,4	8,0	< 0,001

Table 3 illustrates significant changes in the health indicators of participants in the pilot programs. The reduction in average BMI and the increase in the level of physical activity indicate the high effectiveness of the proposed approach. The subjective assessment of overall health also significantly improved, confirming the positive perception of the activities by the participants.

Additionally, the study analyzed the socio-economic factors affecting the population's health. It was found that low income levels and limited access to medical services significantly worsen health indicators. The average BMI of respondents with low income levels was  $29.6 \pm 4.8$ , whereas for respondents with high income levels, this indicator was  $26.0 \pm 3.7$  ( $t = 6.85$ ,  $p < 0,001$ ).

**Table 4.** The Influence of Socio-Economic Factors on the Health Status of the Population

Income Level	Average BMI	Standard Deviation	Level of Physical Activity (hours per week)	p-value
Low	29,6	4,8	2,7	< 0,001
Medium	27,3	4,1	4,2	< 0,001
High	26,0	3,7	6,2	< 0,001

Table 4 demonstrates differences in health indicators depending on income levels. Low income levels are associated with higher BMI indicators and lower levels of physical activity, highlighting the need to develop social support programs and improve access to medical services for low-income populations.

The study also examined the psychological aspect of forming a healthy lifestyle. The analysis showed that high levels of stress and lack of motivation are significant barriers to maintaining health. The average stress level of the respondents was  $6.8 \pm 1.7$  on a scale from 1 to 10, with the level of physical activity being inversely proportional to the stress level ( $r = -0.48$ ,  $p < 0.001$ ).

**Table 5.** The Influence of Stress on the Level of Physical Activity

Stress Level	Level of Physical Activity (hours per week)	p-value
Low	6,6	< 0,001
Medium	4,3	< 0,001
High	3,0	< 0,001

Table 5 illustrates the influence of stress on the level of physical activity. A high level of stress leads to a significant decrease in physical activity, which negatively affects health. This

highlights the importance of including psychological support and motivational programs in wellness activities.

The study also showed that support from family and close friends plays an important role in forming a healthy lifestyle. Respondents who received regular support from their families demonstrated lower BMI indicators and higher levels of physical activity. The average BMI of respondents with high family support was  $26.2 \pm 3.8$ , whereas for respondents with low family support, this indicator was  $28.5 \pm 4.4$  ( $t = 5.47, p < 0.001$ ).

**Table 6.** The Influence of Family Support on Health Status

Level of Family Support	Average BMI	Standard Deviation	Level of Physical Activity (hours per week)	p-value
High	26,2	3,8	6,0	< 0,001
Medium	27,4	4,2	4,5	< 0,001
Low	28,5	4,4	3,2	< 0,001

Table 6 demonstrates the influence of family support on health status. A high level of support is associated with lower BMI and higher levels of physical activity, highlighting the importance of social support in forming a healthy lifestyle.

The study also showed that the availability of sports and wellness facilities plays a significant role in maintaining the physical activity of the population. The average BMI of respondents with access to sports facilities was  $25.9 \pm 3.9$ , whereas for respondents without such access, this indicator was  $28.7 \pm 4.6$  ( $t = 6.91, p < 0.001$ ).

**Table 7.** The Influence of Accessibility to Sports Facilities on Health Status

Accessibility to Sports Facilities	Average BMI	Standard Deviation	Level of Physical Activity (hours per week)	p-value
Got access	25,9	3,9	6,3	< 0,001
No access	28,7	4,6	3,1	< 0,001

Table 7 demonstrates the influence of accessibility to sports facilities on health status. Access to sports and wellness facilities contributes to a decrease in BMI and an increase in the level of physical activity, highlighting the need for investments in sports infrastructure.

Additional data were collected on the levels of fruit and vegetable consumption among respondents. The average level of consumption was 2.8 servings per day ( $\pm 1.3$ ). Respondents who consumed more than 5 servings per day had significantly lower BMI ( $26.0 \pm 3.9$ ) compared to those who consumed less than 2 servings per day ( $28.5 \pm 4.3$ ) ( $t = 4.98, p < 0.001$ ).

**Table 8.** The Influence of Fruit and Vegetable Consumption on Health Status

Fruit and Vegetable Consumption (servings per day)	Average BMI	Standard Deviation	Level of Physical Activity (hours per week)	p-value
< 2 servings	28,5	4,3	3,5	< 0,001

<b>2-4 servings</b>	27,0	4,0	4,7	< 0,001
<b>&gt; 5 servings</b>	26,0	3,9	6,1	< 0,001

Table 8 demonstrates the influence of fruit and vegetable consumption on health status. Higher consumption of these products is associated with lower BMI indicators and higher levels of physical activity.

The impact of time spent outdoors on the health of respondents was also analyzed. The average time spent outdoors was 2.4 hours per day ( $\pm 1.1$ ). Respondents who spent more than 3 hours per day outdoors had significantly lower BMI ( $26.1 \pm 3.7$ ) compared to those who spent less than 1 hour per day ( $28.2 \pm 4.2$ ) ( $t = 5.22, p < 0.001$ ).

**Table 9.** The Influence of Time Spent Outdoors on Health Status

<b>Time Spent Outdoors (hours per day)</b>	<b>Average BMI</b>	<b>Standard Deviation</b>	<b>Level of Physical Activity (hours per week)</b>	<b>p-value</b>
<b>&lt; 1 hour</b>	28,2	4,2	3,4	< 0,001
<b>1-3 hours</b>	27,1	4,0	4,6	< 0,001
<b>&gt; 3 hours</b>	26,1	3,7	6,2	< 0,001

Table 9 demonstrates the influence of time spent outdoors on health status. Longer time spent outdoors is associated with lower BMI indicators and higher levels of physical activity.

The results also showed that the educational level of respondents has a significant impact on their health. Respondents with higher education showed lower BMI indicators ( $26.2 \pm 3.8$ ) and higher levels of physical activity (5.8 hours per week) compared to respondents with secondary education (BMI  $27.9 \pm 4.3$ , physical activity 4.2 hours per week) ( $t = 5.75, p < 0.001$ ).

**Table 10.** The Influence of Education Level on Health Status

<b>Education level</b>	<b>Average BMI</b>	<b>Standard Deviation</b>	<b>Level of Physical Activity (hours per week)</b>	<b>p-value</b>
<b>Higher</b>	26,2	3,8	5,8	< 0,001
<b>Average</b>	27,9	4,3	4,2	< 0,001
<b>Elementary</b>	28,5	4,5	3,0	< 0,001

Table 10 demonstrates the influence of education level on health status. Higher education is associated with lower BMI and higher levels of physical activity, emphasizing the importance of educational programs aimed at promoting a healthy lifestyle.

Thus, the results of the study show the necessity of a comprehensive approach to forming a healthy lifestyle, including both physical and psycho-pedagogical aspects. The predictive model developed within the framework of the study demonstrates high effectiveness in improving the health indicators of the population of Uzbekistan and can serve as a basis for developing national wellness and disease prevention programs.

Comparative analysis by different regions also revealed that the incidence of cardiovascular diseases is higher in the western and southern regions than in the northern and eastern regions. The average incidence rate of cardiovascular diseases in the western and southern regions was 34.2% ( $\pm 3.7\%$ ), whereas in the northern and eastern regions, this indicator was 27.5% ( $\pm 3.2\%$ ) ( $t = 4.85, p < 0.001$ ).



**Table 11.** Regional Differences in the Incidence of Cardiovascular Diseases

Region	Incidence Rate (%)	Standard Deviation	p-value
Northern Regions	27,5	3,2	< 0,001
Southern Regions	34,2	3,7	< 0,001
Eastern Regions	27,8	3,3	< 0,001
Western Regions	34,1	3,8	< 0,001

Table 11 shows regional differences in the incidence of cardiovascular diseases. Higher rates in the western and southern regions emphasize the need for targeted prevention programs.

The study also assessed the frequency of tobacco use among respondents. It was found that 23% of respondents regularly smoke tobacco products. The average BMI among smoking respondents was  $27.8 \pm 4.3$ , whereas among non-smoking respondents, it was  $27.1 \pm 4.0$  ( $t = 2.35, p < 0.05$ ).

**Table 12.** The Influence of Smoking on Health Status

Smoking Status	Average BMI	Standard Deviation	Level of Physical Activity	Значение p
Smokers	27,8	4,3	4,0	< 0,05
Non-smokers	27,1	4,0	4,8	< 0,05

Table 12 demonstrates the influence of smoking on health status. Smoking respondents show higher BMI and lower levels of physical activity compared to non-smokers.

Additionally, a study was conducted on the influence of sleep duration on the health of respondents. The average sleep duration among the surveyed was 6.9 hours per day ( $\pm 1.2$ ). Respondents who slept less than 6 hours per day had a higher BMI ( $28.3 \pm 4.2$ ) compared to those who slept 7-8 hours ( $26.5 \pm 3.9$ ) ( $t = 4.67, p < 0.001$ ).

**Table 13.** The Influence of Sleep Duration on Health Status

Duration of Sleep (hours per day)	Average BMI	Standard Deviation	Level of Physical Activity (hours per week)	p-value
< 6 hours	28,3	4,2	3,7	< 0,001
7-8 hours	26,5	3,9	5,2	< 0,001
> 8 hours	27,1	4,1	4,8	< 0,001

Table 13 demonstrates the influence of sleep duration on health status. Optimal sleep duration (7-8 hours) is associated with lower BMI and higher levels of physical activity.

Thus, the results of the study show the necessity of a comprehensive approach to forming a healthy lifestyle, including both physical and psycho-pedagogical aspects. The predictive model developed within the framework of the study demonstrates high effectiveness in improving the health indicators of the population of Uzbekistan and can serve as a basis for developing national wellness and disease prevention programs.

## Discussion

The results of the conducted study confirm the significant influence of climatic conditions and socio-economic factors on the health of the population of Uzbekistan. The obtained data demonstrate that regions with more favorable climatic conditions, such as moderate temperature and high humidity, have better health indicators. In particular, in regions with an average monthly temperature of about 20°C and humidity above 60%, the incidence of cardiovascular diseases was 25% lower compared to regions with harsher climates. These results correspond to studies conducted in other countries with similar climatic conditions. For example, studies conducted in Italy and Spain also showed the positive impact of a moderate climate on the overall health status of the population, where the incidence of cardiovascular diseases was 30% lower in regions with a mild climate [16]. In Russia, similar studies in the Krasnodar region showed a 20% decrease in morbidity compared to the northern regions [21].

A comparative analysis of data on physical activity and body mass index (BMI) revealed significant differences between urban and rural areas. In rural areas of Uzbekistan, the level of physical activity was 40% higher, which contributed to lower BMI indicators and better overall health. In particular, the average BMI in rural areas was 23.5, while in urban areas, this figure reached 27.2. These results are consistent with studies conducted in India, where the rural population generally leads a more active lifestyle compared to the urban population, and the average BMI in rural areas is 15% lower [17]. In Russia, according to studies conducted in Siberia and the central part of the country, there are also significant differences in physical activity levels between urban and rural residents, affecting their overall health status. For example, the average BMI in rural areas of Siberia is 18% lower than in cities [22].

The effectiveness of the developed wellness programs, including physical exercises, dietary recommendations, and psychological support, was confirmed by the improvement in health indicators in the experimental group. Six months after the start of the program, the average cholesterol level in the experimental group decreased by 15%, while no changes were observed in the control group. These results are similar to the conclusions of studies conducted in the United States, where comprehensive wellness programs have proven effective in improving the health of the population, including reducing cholesterol levels by 18% [18]. Thus, our data confirm the importance of integrating various aspects of health into wellness programs.

A qualitative analysis of data obtained from interviewing respondents showed that one of the main barriers to the implementation of wellness programs in Uzbekistan is the lack of public awareness about the benefits of a healthy lifestyle and limited access to medical services. For example, 45% of respondents noted that they lack access to necessary information about healthy eating and physical exercises. These findings are consistent with studies conducted in Nigeria, where access to medical information and services is often limited, and 50% of respondents lack knowledge about a healthy lifestyle [19]. To overcome these barriers, educational campaigns and improved access to medical services are recommended.

Modeling and forecasting the long-term effects of wellness activities showed that integrating climatic factors and modern wellness methods into a single model can significantly improve the health indicators of the population. The model showed that with the implementation of comprehensive wellness programs, the incidence of chronic diseases can decrease by 20% within the first five years. These results correspond to conclusions made in studies conducted in Australia, where climatic conditions and socio-economic factors were taken into account in the development of wellness programs, leading to a 22% reduction in chronic disease rates [20]. This underscores the importance of considering regional characteristics when developing and implementing wellness programs.

Methodological limitations, such as the limited sample size and the subjectivity of respondents' answers, may have influenced the study results. However, correlation coefficients, such as  $r=0.65$  for the relationship between physical activity and BMI, and  $p<0.05$  for differences in health status between the experimental and control groups, confirm the statistical

significance of the obtained data. Future studies should include larger samples and additional methods to minimize potential data biases.

The results of this study confirm the need for the development and implementation of comprehensive wellness programs that take into account the climatic and socio-economic conditions of Uzbekistan. A comparative analysis with previously published data shows that the proposed methods and approaches can be effective in improving the health of the population. The recommendations presented in this study can serve as a basis for developing national wellness and disease prevention programs, which will improve the health and quality of life of the population of Uzbekistan.

## Conclusion

The comprehensive analysis conducted in this study underscores the significant impact of climatic and socio-economic factors on the health of Uzbekistan's population. By integrating various health-promoting strategies, including physical exercise, dietary recommendations, and psychological support, the study demonstrates a substantial improvement in health indicators among participants. The data reveals that regions with moderate climates exhibit better overall health, suggesting the need for region-specific health interventions. Additionally, the findings highlight the importance of educational campaigns to raise public awareness about healthy lifestyles and the necessity of improving access to medical services, particularly in areas with harsh climatic conditions.

Furthermore, the study's predictive modeling indicates that the integration of climatic considerations with modern wellness methods can lead to a considerable reduction in chronic disease prevalence. This approach is essential for tailoring health programs to the unique regional characteristics of Uzbekistan. The results advocate for a multidisciplinary and comprehensive strategy in health promotion, addressing both physical and psychological aspects to foster sustainable health improvements. The research provides a robust foundation for the development of national health programs, emphasizing the adaptation to local cultural, climatic, and socio-economic conditions to enhance the overall well-being of the population.

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