

## Prognostication of health-related life quality of ukrainian residents due to physical activity level

IULIIA PAVLOVA<sup>1</sup>, BOGDAN VYNOGRADSKYI<sup>2</sup>, IGOR RIPAK<sup>3</sup>, DMYTRO ZIKRACH<sup>4</sup>, ZBIGNIEW BOREK<sup>5</sup>

<sup>1,2,3</sup>Lviv State University of Physical Culture, Lviv, UKRAINE

<sup>4</sup>Lviv National University of Veterinary Medicine and Biotechnologies, Lviv. UKRAINE

<sup>5</sup>Crakow University of Economics, Crakow, POLAND

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### Abstract.

The problem of life quality improving is actually nowadays. The role of lifestyle components for the youth's life quality formation is studied insufficiently. The research aim was to indicate the role of physical activity in providing of life quality. Low physical activity level correlated with poor indices of life quality. The inactive forms of recreation decreased life quality according scales General Health, Physical Functioning, Vitality and Mental Health. The absence of active recreation reduced life quality on 33.4 % according General Health scale and on 32.1 % by Vitality scale. The predicted value of life quality for young people that did not participate in sport trainings did not exceed 74 point.

**Keywords:** life quality, physical activity, young people.

### Introduction.

Life quality is a complex concept that has been improved constantly in different science areas [2, 3, 15, 20]. According to R. Veenhoven definition life quality is a structure with closely linked elements – environmental factors, personal skills of the individual, the usefulness of life and its internal review [22]. Cella D.F. selects in life quality several parts that can be divided into functional, social, physical and emotional domains [1]. According to A. Novak life quality is an integral characteristic of physical, psychological, emotional and social functioning, and is based on the subjective perception [11].

In the area of Physical Education and Sports life quality concept is closely associated with the definition of health as the state of perfect physical, mental and social well-being [13, 14, 15, 17, 21]. Health-related quality of life (HRQL) displace the research focus on subjective analysis of physical and mental health. It allows evaluating the respondent's ability to perform everyday tasks and communicate with other society members.

The health is determined mainly by lifestyle and particularly by its regulated components. Nearly 40% of the factors that determine life quality are identified and characterized by researchers. The mechanisms that cause such positive and negative effects, in particular, the impact of lifestyle on life quality is not completely understood and poorly investigated.

The physical activity level is closely associated with the most common chronic diseases (heart disease, high blood pressure, metabolic syndrome, depression, etc.). It was shown the positive effect of physical activity on improvement of adults' life quality [24]. Thus, the participation in physical training is associated with decreasing of Poor Physical and Mental Days [2].

Childhood and adolescence are the critical life periods. It is a time of formation and establishment of some behaviors models. Thus, physical activity has a positive effect on the health of children and youth can be a specific behavioral pattern with long-term health benefits.

The life quality of almost healthy Ukrainian children and young people that have not any acute or chronic diseases is poor investigated [15]. Also, the role of lifestyle components especially the physical activity for the youth's life quality formation is studied insufficiently.

Identification of factors that determine the health of the young generation is crucial for every society. Formed behavior stereotypes of adults are difficult to change but in the case of youth, such patterns can be transformed. Skills acquired during childhood or adolescence period could become the basis of active and healthy lifestyle or lead to various addictions and destructive behavior. The evaluation of health-related life quality and determination the risk groups among youth are important for the formation and realization of effective preventive programs.

The identification of the role of physical activity level in life quality providing was the aim of the investigation.

## Material & methods.

1,981 of 10th graders (age  $15.8 \pm 0.3$  years) took part in the investigation. 478 female and 420 male from urban areas, 609 female and 474 males from rural territory were surveyed.

The visiting of sports sections, the family practice of active recreation, the duration of active and recreation on weekdays and weekends, the activity during breaks in school or physical culture lessons was investigated for analysis of respondent's motor activity. The general physical activity level was calculated according to PAQ-A survey [10]. 1–2.33 points was indicated as low physical activity level, 2.34–3.66 points – moderate indices, 3.67–5 points – high level.

Health-related quality of life was determined with MOS-SF 36 questionnaire [4, 23]. The welfare level was identified by 8 scales – Physical Functioning (PF), Physical Role Functioning (RP), Bodily Pain (BP), General Health Perceptions (GH), Vitality (VT), Emotional Role Functioning (RE), Social Role Functioning (SF) and Mental Health (MH).

The possibility to perform everyday activity was evaluated within Physical Functioning scale. Physical Role Functioning or Emotional Role Functioning indicates the role of physical or emotional state in everyday activity. The impact of painful feelings on respondent's daily activities and work capacity was determined by Bodily Pain scale. The level of living tone and subjective characteristics of respondents' health was indicated by Vitality and General Health Perception respectively. The determination of social contacts by physical and mental state was evaluated within Social Activity scale. The mood and mental conditions were assessed according to Mental Health scale. The maximum possible score for every scale was 100 points, minimal – 0 points. The higher was the score the better life quality was.

Correlation analysis was made by Spearman.

The linear regression analysis was used for the determination of physical activity role in life quality providing. Estimated life quality parameters were obtained from regression equations (coefficient  $b_0$  – the point of intersection of regression dependence curve with argument axis). Statistical data processing was performed with SPSS Statistics 22 software.

## Results.

The life quality of 10th grade students was in the upper range according each scale. However, the data for this age group was significantly lower than in other countries (Fig. 1). For the population of China and Canada the Physical Functioning data was in the range of 94–97 points, Physical Role Functioning – 88–98 points. Life quality of young people from China was significantly better than for Ukrainian residents. The results were higher than 95 points almost by all scales.

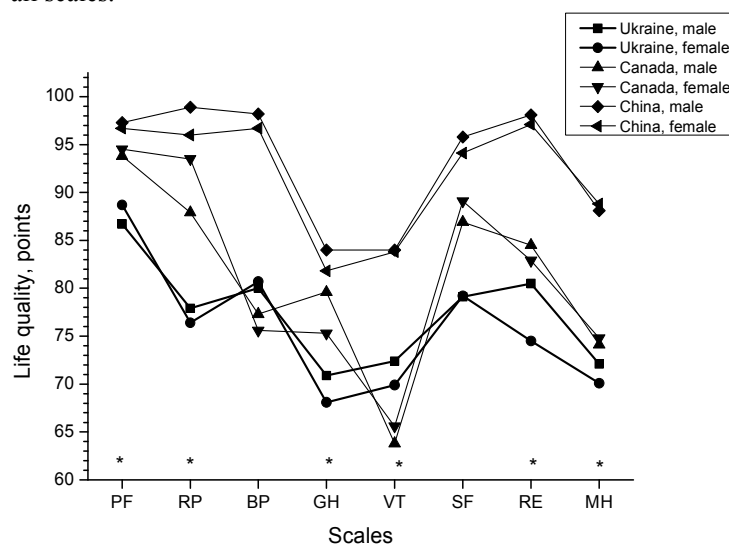


Fig. 1. Life quality of youth.

A – practically healthy young people from Ukraine (1,087 female, 894 male, age 15 – 16 years; own data), Canada (264 female, 243 male, age – 16 – 19 years [7]) and China (age 18– 29 years [19]).

Note. “\*” – the significant difference between life quality of Ukrainian males and females according marked scales.

The statistically significant differences between the life quality of male and female were identified for scales Physical Functioning, Physical Role Functioning, General Health, Vitality and Emotional Role Functioning. The lowest rates of females' life quality were observed for General Health (68.1 points), Vitality (69.9 points), and Mental Health (70.1 points).

The diseases of respiratory and digestive systems have the prevailing position in the structure of general morbidity among Ukrainian children and youth. Considering this data, the scientific interest had the comparison

of life quality of students without any acute or chronic illnesses and persons that suffer on the most specific for these age group diseases (Table 1). The third selected data group was life quality of youth who suffer from various forms of deafness. This pathology can lead to significant deterioration of mental and emotional development, physical and social disability. Thus, it was assumed that life quality would have one of the lowest values.

Respondents with low physical activity level had the lower quality of life (Fig. 2). Statistically significant differences ( $p < 0.01$ ) were observed for all scales except Social Functioning. The value of life quality exceeded 84 points for persons with the high level of physical activity (scales Physical Functioning, Bodily Pain, and Emotional Role Functioning).

Table 1

Life quality of Ukrainian young people with different health status

Life quality scales	Practically healthy youth (N = 1,981, own results)	Youth with chronic or acute diseases		
		Chronic gastroduodenitis (N = 32, age – 15,3 year) [12]	Bronchial asthma (N = 88, age – 14,8 year) [16]	Sensorineural hearing loss (N = 35, age – 11–17 year) [18]
PF	87.7	77.2	86.9	45.3–70.7
RP	77.4	81.3	73.4	56.2–78.4
BP	80.3	55.1	82.7	53.6–65.6
GH	69.4	53.4	59.5	58.5–80.5
VT	70.8	59.1	67.6	32.7–46.8
SF	79.2	68.2	83.1	34.2–51.4
RE	77.7	67.6	74.2	37.4–54.2
MH	71.0	64.2	73.4	37.6–59.1

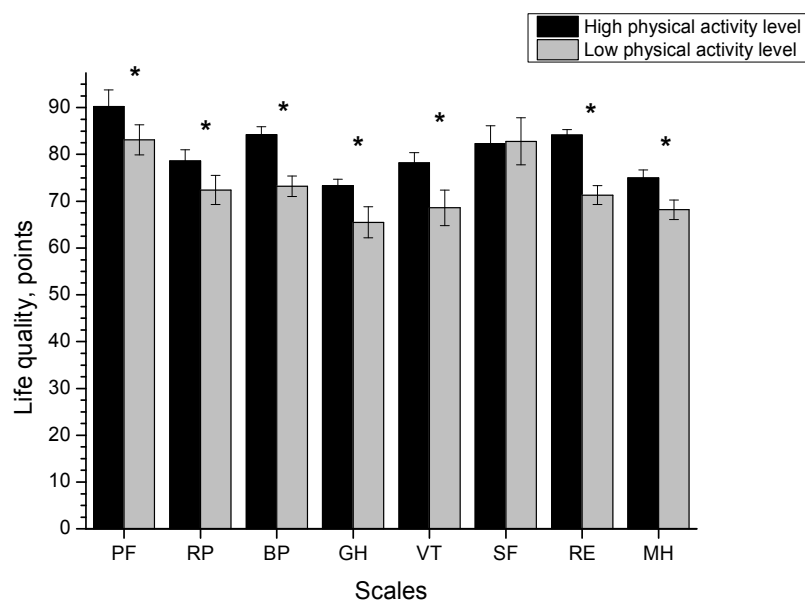


Fig. 2. The life quality of students\*\* with different physical activity level.

Note. “\*” – the significant difference between different groups was observed ( $p < 0.01$ ); “\*\*” – in the survey took part students with high (N = 201) and low (N = 298) level of physical activity.

The inactive forms of recreation had the negative impact on life quality of 10th graders (Fig. 3). Medium-sized negative correlations were observed between the duration of TV watching, computer games playing and Mental Health ( $r = -0.46 - -0.54$ ). Negative correlation coefficients were identified between parameters “Using home video console” and General Health ( $r = -0.51$ ), Physical Functioning ( $r = -0.45$ ), Vitality ( $r = -0.41$ ), Mental Health ( $r = -0.61$ ). Prolonged using of games console was tightly associated with decreasing of life quality. The poor life quality was observed according scales Physical Functioning ( $r = -0.45$ ), Physical Role Functioning ( $r = -0.76$ ), Bodily Pain ( $r = -0.53$ ), General Health ( $r = -0.51$ ), Vitality ( $r = -0.41$ ) and Mental Health ( $r = -0.61$ ).

Physical activity and fitness are important health indicators; in particular, they determine the morbidity and mortality from cardiovascular diseases. Therefore, the minimum life quality results under the influence of maximal negative factors were calculated (table 2). Estimated values of life quality were obtained from regression equations.

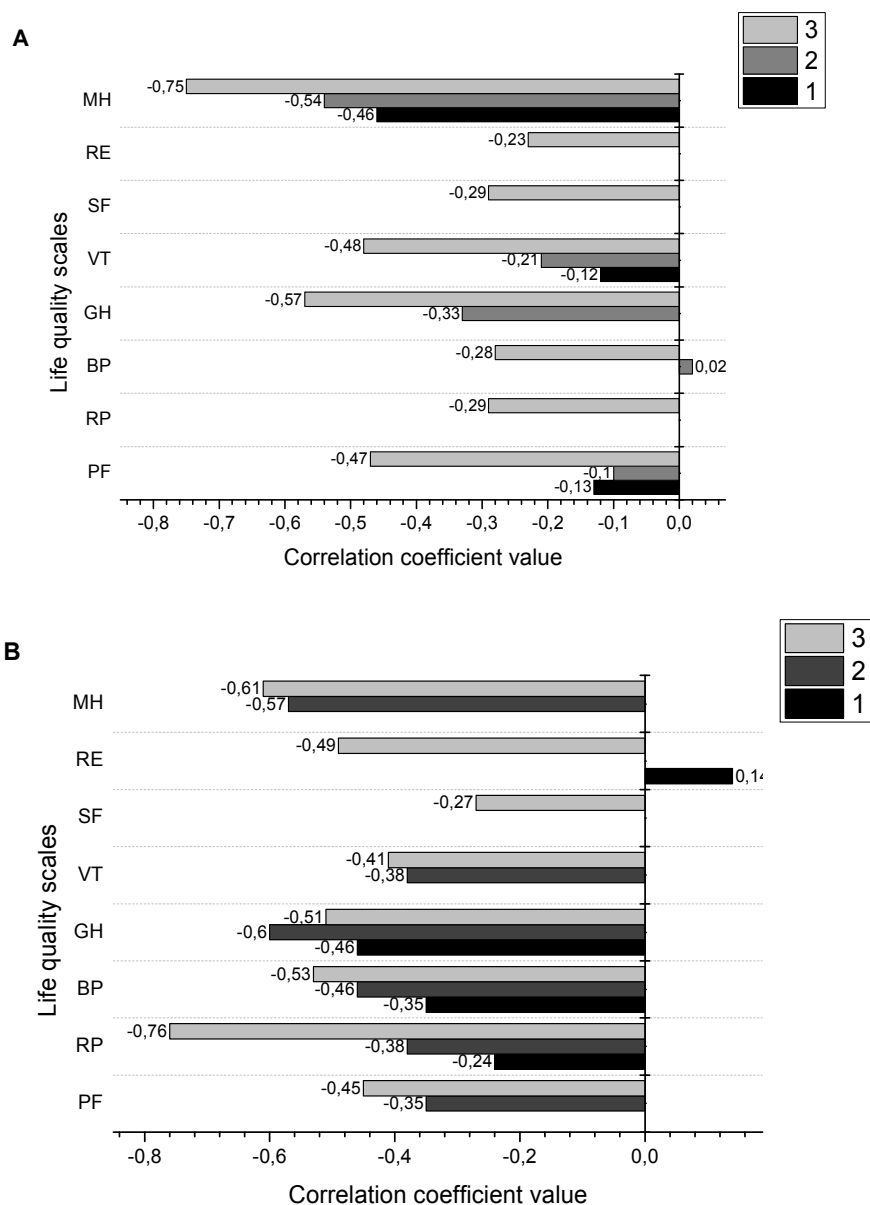


Fig. 3. The correlation between duration of passive recreation and quality of life\*.  
 A – Passive recreation on weekdays; B – passive recreation on weekend.  
 1 – TV-watching; 2 – computer game playing; 3 – using home video console.  
 Note. “\*” – on the graphs are presented only significant ( $p < 0.01$ ) correlation coefficient.

Table 2

The negative factor	Estimated value of life quality							
	Scale, scores							
	PF	RP	BP	GH	VT	SF	RE	MH
Student was not involved to physical trainings in sport sections	85.7	74.0	ND	66.7	68.0	ND	72.2	68.9
Student was not engaged in outdoor games	79.4	71.1	72.7	60.0	57.8	70.7	60.7	60.1
Parents of student did not exercises	ND	ND	74.2	66.6	67.9	ND	ND	ND
Continuous passive recreation in weekday	ND	ND	84.3	70.6	72.7	84.4	80.4	74.1
Continuous passive recreation at the weekend	89.7	79.2	84.9	ND	73.0	84.5	ND	73.8
The minimal activity on Physical Culture lessons	74.0	66.8	73.1	56.9	59.7	67.1	63.1	57.5
Low level of physical activity	83.2	73.1	78.8	57.0	56.5	69.6	64.6	64.9
Poor overall physical fitness	30.0	18.1	19.7	27.9	27.7	28.6	14.8	22.6

Note. ND – regression model was statistically insignificant.

Unsatisfactory physical state (respondent constantly have pain feelings, was unable to climb the stairs one floor up, run, lift any heavy things, take a bath, perform routine work, or had some difficulties with physical training, etc.) had a maximal negative effect on life quality. The indexes by all scales did not exceed 30 points. This data was the same for persons with severe disabilities.

The negative impact on life quality had the low physical activity level and passive recreation in free time (on weekdays and weekends). If students did not perform any exercises during Physical Culture lessons or physical training than life quality was nearly 60 points by most parameters (Physical Role Functioning – 66.8 points, General Health – 56.9 points, Social Functioning – 67.1 points, Mental Health – 57.5 points).

The absence of active recreation (student's parents were not engaged to sport trainings) reduced life quality on 33.4 % according to General Health scale and on 32.1 % of Vitality scale. If a student did not participate in any sports section, the predicted value of life quality according to Emotional Role Functioning was 74.0 points, General Health – 66.7 points, Vitality – 68.0 points, Emotional Role Functioning – 72.2 points, Mental Health – 68.9 points. The choice of passive recreation on weekdays or weekends (TV watching, playing computer games, using the game console) reduced life quality on 15–20 %.

### **Discussion.**

According to WHO classification Ukraine belongs to class “C” type country of the European region. It is characterized by high mortality rate among adults, steady decreasing of average life expectancy, and while in the European region, these indexes are improving permanently. The population decline in Ukraine consisted 1 million 151 thousand during 2006–2010. This tendency is typical for Belarus, Bulgaria, Greece, Estonia, Italy, Latvia, Lithuania, Moldova, Russia, Romania, Slovenia, Czech Republic, Sweden, etc., but only in Ukraine, the population decreasing has accelerated rate. Among the major causes of morbidity and mortality in Ukraine (in order from highest to lowest) are high blood pressure, high cholesterol level, smoking, alcoholism, high body mass index, low fruits and vegetable consumption, low physical activity level, drug addiction, unsafe sex. All this problem can be regulated by appropriate behavior patterns.

Significant deterioration of child's health coincides with the start of school education. Children from natural, directed on their development circumstances get in conditions that substantially limit their physical activity (school requirement to sit still, do not run, do not walk in class, follow clear rules and norms of behavior, perform hard-coordination work – writing). 30 % of Ukrainian first-graders are practically healthy, while among graduates – not more than 6 %.

Physical activity is a variable component of lifestyle and universal background for health improving and diseases prevention. Obesity, depression, suicide, premeditated injury, deviant behavior, violence and bullying in schools, alcohol consumption and drugs abuse, game addiction are the consequences of the low level of motor activity and passive recreation.

The paradigm of health has been changed significantly over the past 20 years. The psychological and social aspects of well-being are taking into account during health status assessing [1, 3, 6, 20, 23]. Thus, the researchers are focused on people feelings, their psychological and social well-being, abilities to perform daily tasks. In the case of chronic or acute diseases, life quality data will display the decreasing of daily physical activity volume, difficulty in performing daily tasks.

In the case of highly developed countries, the life quality indices lower than 75 points indicate the presence of various diseases or disabilities [5, 7, 8, 13, 19]. For children and young people, the value lower than 85 points can be considered as critical. The life quality of Ukrainian youth significantly decreased in adulthood according to scales Physical Functioning, Physical Role Functioning, Vitality and Bodily Pain. Therefore, the calculated indices for Ukrainian young people can be considered as potentially dangerous.

The life quality value according to scale Physical Functioning that detects the performance of daily activities was 86.7–88.7 points. Further deterioration of this indicator will indicate about the limitations of daily activities due to a health problem. The relationships between physical conditions and ability to perform daily duties could be understood according to scale Physical Role Functioning. Results of Ukrainian students (76.4–77.9 points) are comparable with the data obtained for respondents with acute or chronic diseases [5, 7, 8, 9, 13].

The direct positive effect of physical activity on physical and psychological components of life quality was detected – the respondents had not any troubles with running, participation in sports, work at home, easily overcome long distances and climb stairs up, very rarely feel physical pain, the anxiety and depression did not reduce the work capacity, effectiveness of daily work or communication within society.

### **Conclusions.**

The parameters of life quality of Ukrainian youth were in the upper range of values but they were lower than welfare indices of respondents from other countries. The critical were the meanings of scales that characterized physical component of life quality (Physical Functioning, Physical Role Functioning, Bodily Pain and Vitality).

The low level of physical activity decreased life quality of young people. The low physical activity level and the preference of passive recreation on weekdays and weekends can reduce life quality on 30 %.

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