

The Importance of Socio-Psychological Factors and Lifestyle in Shaping Health and Life Expectancy among Longlivers from Precarpathian Region (West Ukraine)

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Abstract

Introduction: In the last years in most countries of the world there is a tendency to increase the life expectancy of the population, which leads to an increase in the number of elderly people seeking to maximize the period of normal physical, social and psychological activity.

Purpose: To assess socio-psychological factors and lifestyle in longlivers from Precarpathian region (West Ukraine).

Methods: The questionnaire was interviewed individually with each longliver using a "pencil-paper" technique.

Results: During 2008 - 2010 yy, 487 persons (aged 90+) women and men from Ivano-Frankivsk region, West Ukraine were voluntarily included in the study. There was compare the influence of different factors on each of the 49 study traits among longlivers and control group.

Among the 487 longlivers only 5 (1%) men smoked lifelong, the rest of the people were health lifestyle. Traditionally, it has been more than 295 (60.6%) persons who have never used alcohol.

Long-livers experienced active physical activity from a young age, being outdoors, on the fresh air probably avoiding stressful situations. Particular importance in the formation of life expectancy are the following factors: adherence to natural biorhythms (or = 486,70 (p < 0,001), $\chi^2 = 651,57$); physical activity (or = 6.51 (p < 0.001), $\chi^2 = 197.49$); limited nutrition (or = 23.01 (p < 0.001), $\chi^2 = 288.73$); no occupational harm (or = 6.25 (p < 0.001), $\chi^2 = 116.29$).

Conclusion: Future research should further evaluate whether the mentioned characteristics are associated with longevity beyond the average life expectancy.

Keywords: Longlivers; Socio-Psychological Factors; Lifestyle; Precarpathian Region; West Ukraine

Introduction

In the last years in most countries of the world there is a tendency to increase the life expectancy of the population, which leads to an increase in the number of elderly people seeking to maximize the period of normal physical, social and psychological activity [1-3]. Although longlivers species are found in different countries, population-geographical features of their distribution have been established [1,4,5].

Studies with longlivers provide fundamental insights to lifestyle of humans [3]. In the last century, researchers have noticed that youth and longevity are affected by special places on the planet. They are called blue zones [6]. In such areas, people live a record long. But scientists still cannot explain the phenomenon of these zones. Among all the longlivers, most were registered in the mountainous terrain and blue zones [7].

Genetic factors obviously contribute to exceptional longevity and healthy aging, but identification of major genes remains a challenge. Studies of associated genes and gene-related genomes (GWAS) for longevity have so far been of limited success [5,8,9]. Tindale LC., *et al.* from Canada in their research report that the influence of genetic factors occupies one of the prominent places in life expectancy in long-lived [10].

There is a similar mystical oasis in Ukraine in the Carpathians or Carpathian Mountains. Ivano-Frankivsk region belongs to Eastern Carpathians [11]. For the longest time, people in Ukraine have traditionally lived in Kyiv (the capital of the country) and in the western regions of our country. The western region differs from other regions of Ukraine with better ecology (except Kyiv) and less prevalence of alcoholism. Gerontologists say there are about 100,000 longlivers in Ukraine. They live mainly in western part of Ukraine. They are believers - and this is a great psychological discharge and help. There are many vegetables, milk and berries in their diet, which also has a positive effect on health. Equally important is the good character - people who are sincere and kind usually become long-lived. Plus activity - physical and mental [12].

Aim of the Study

The aim of our study was to assess socio-psychological factors and lifestyle in longlivers from Precarpathian region (West Ukraine).

Materials and Methods

During 2008 - 2010 years, 487 persons (aged 90+) women and men from Ivano-Frankivsk region, West Ukraine were voluntarily included in the study. For this work, 165 males and 322 females over the age of 90 yrs were studied (1,03% were over 100 years old). All longlivers were treated on the basis of the Central City Clinical Hospital and of the Regional Clinical Cardiology Clinic in Ivano-Frankivsk and followed-up. We considered the following data for each patient: age at moment of questionnaire, height and medical history.

Clinical, socio-demographic, reproductive, psychological and lifestyle characteristics were assessed using standard procedures and questionnaires. The questionnaire was interviewed individually with each longliver using a "pencil-paper" technique. The inclusion criteria - persons who were 90 years of age or older at the time of the survey, who were born and have lived all the time in this territory. The exclusion criteria - the patients with mental illness and cancer.

The control group consisted of 295 people between 36 and 60 years of age (49.5 ± 3.8 years), including 102 (34,6%) men and 193 (65,4%) women living in these territories, according to genealogical data in pedigrees without longlivers.

Our research was conducted in compliance with the main provisions of the GCP (1996), the Council of Europe Convention on Human Rights and Biomedicine of 04.04.1997, the Helsinki Declaration, Orders of the Ministry of Health of Ukraine.

Informed consent was signed by each longliver with collection of genealogical data and anamnesis of life. All informed consent was verified by the ethics committee of the Ivano-Frankivsk National Medical University (Ukraine).

When analyzing the results, there was compare the influence of different factors on each of the 49 study traits in the two study groups: the longlivers - the comparison group of control. Because the presence or absence of significance of such a trait is a qualitative indicator, the mathematical odds ratio method (Odds Ratio (OR)) was used. It allowed to determine the probability of influence of each of the 49 factors on the formation of longevity.

Results

According to the Statistical Office on January 2010 population [11] was 1,380,700 persons, including 727,529 women (52,7%) in Ivano-Frankivsk region (West Ukraine). The number of longlivers in Ivano-Frankivsk region in 2010 was 4328 persons. We studied 487 longlivers (11.3%). Establishing the role of socio-psychological factors in the formation of longevity was among 487 longlivers from Ivano-Frankivsk region compared with the control group. As can be seen from table 1, lack of education and a low level of material income were the most important factors in achieving longevity.

No	Factor	OR	95% CI	χ^2 (N-5,99)	p
Social indicators					
1.	Living in one’s own home	3,74	2,72 - 5,13	84,37	< 0,001
3.	Married and had children	2,11	1,46 - 3,05	16,35	< 0,001
4.	Were living in orphanages or relatives	2,26	1,60 - 3,20	106,92	< 0,001
5.	Lack of education	19,29	10,29 - 36,16	146,33	< 0,001
6.	The low level of financial income	9,64	6,62 - 14,05	200,37	< 0,001
Psychological indicators					
7.	Life stresses were common	0,06	0,04 - 0,11	286,45	< 0,001
8.	Life stresses were rare	35,14	19,18 - 64,37	286,45	< 0,001
9.	Participation in hostilities	15,67	4,88 - 50,30	351,93	< 0,001
10.	Accommodation in occupied territories	36,06	19,68 - 66,06	351,93	< 0,001
11.	A sound sleep	2,85	2,10 - 3,86	46,87	< 0,001
12.	Having a favorite activity	3,93	2,87 - 5,36	79,03	< 0,001

Table 1: Assessment of the importance of social and psychological indicators in the formation of longevity.

Direct communication with the longlivers showed that not every one of them could receive secondary education in the territory of Galicia. At the same time, it promoted active physical activity from a young age, being outdoors, on the fresh air probably avoiding stressful situations. The last is confirmed by the analysis of the chances of psychological factors regarding the impact of negative stress, which are highly likely to reduce life expectancy (Table 1).

The low cost of living made it impossible to eat high-calorie foods. This was compensated by the plant-specific food of the region, which contained the necessary vitamins, unsaturated fatty acids, and vegetable proteins. All this provided the necessary energy costs of the body. Living in one’s own home was one of the important factor in shaping longevity among social factors. In the words of the longlivers residents, the feeling of the owner of his home, the plot of land gave rise to involvement in his native land, responsibility for his family.

Therefore, a significant probability of a longer life expectancy for married people who had children ($p < 0.001$).

Many of the longlivers were non-parental by parents and were living in orphanages or relatives. The answer of that is the historical events, that took place in the Carpathian region in the 30 - 50 years of XX century, led to the lost of a large number of relatives, including parents. This could be one of the reasons why children could not get a full education. And this led to the acquisition of working professions, active physical work.

By the results of the analysis of psychological indicators, the probable way of reaching longevity was determined by people who lived in the occupied territories. Compared to the previous indicator, there was less chance for 2.30 times of reaching the age of 90 years in combatants ($p < 0.001$).

The longlivers commuted associated a long life with a sound sleep and having a favorite activity. The last included the production of Carpathian souvenirs, fishing, embroidery picking mushrooms or berries in the highlands. The impressive character traits of the longlivers were kindnesses, optimism, deep faith in God. We can assume that favorite activities distract people from stressful situations, reduce psychological burden. The results confirm the data of clinicians on the recommendations of adequate physical activity for the prevention of many multifactorial diseases of the cardiovascular, respiratory, nervous systems and another.

The longlivers noted that during their lifetime they did not contact with adverse factors such as occupational hazards or pollutants of the atmosphere, water and soil by electromagnetic radiation, radiation, in the home - hygienic and household chemicals and other. Using the odds method, it was proved that the absence of a comprehensive impact of these indicators provided active longevity ($p < 0.001$).

Among the indicators of lifestyle, a separate block can be identified such important factors: physical work. (Table 2).

No	Indicators	OR	95% CI	χ^2 (N-5,99)	p
1.	Physical work as a permanent occupation	6,50	4,62 - 9,15	130,05	< 0,001
2.	Physical activity	6,51	4,51 - 9,39	197,49	< 0,001
3.	The lack of occupational hazards	6,25	4,39 - 8,90	116,29	< 0,001
4.	Lack of exposure to harmful substances during life	5,04	3,16 - 8,04	53,39	< 0,001
5.	Observing the daylight regime	486,70	241,44 - 981,11	651,57	< 0,001
6.	Limited or insufficient nutrition	23,01	15,09 - 35,10	288,73	< 0,001
7.	Not eating spicy foods	15,24	10,34 - 22,45	243,48	< 0,001
8.	Constant use of vegetables and fruits	3,29	2,37 - 4,56	53,23	< 0,001
9.	Good appetite	2,38	1,76 - 3,22	36,40	< 0,001
10.	Eating with pleasure	2,06	1,53 - 2,78	28,07	< 0,001
11.	No use of alcohol	7,82	5,64 - 10,84	278,03	< 0,001

Table 2: Distribution of importance of lifestyle indicators in the formation of longevity.

According to the odds ratio, they are equally important in shaping health and longevity. When we were studying the phenomenon of longevity, we pointed out that moderate physical activity through whole life is inherent in most longevity. The observance of natural biorhythms, in particular light day, contributed most to the increase in life expectancy. The upper bound of the odds ratio reaches 981.11 with an average of 486.70 ($p < 0.001$). None of the studied factors showed a similar positive effect on longevity formation (Table 2).

An integral part of all researches of the effects of external factors on longevity in longlivers is the study of nutrition. Despite the ethnic and geographical differences of the surveyed longlivers the same was: the low calorie and moderation in the food without overeating. The results obtained confirmed this observation. This way, in the second place, the might of impact on life expectancy is occupied by restrictions or even malnutrition, which correlates with the corresponding diet of nutritious foods, the dominance of vegetables and fruits of local region.

In addition to the nature of nutrition, a positive appetite and pleasure with eating ($p < 0.001$) showed a positive effect on food absorption and nutrient metabolism.

Major contribution to the destruction of human health is not only the impact of environmental pollutants on production, but also bad habits - smoking, alcohol, addiction to toxic and narcotic substances. In terms of odds ratio, no alcohol consumption ranked fourth in

importance among the 11 others that characterize the life expectancy of longlivers, “no alcohol” style of life was very important for them. Among the 487 longlivers only 5 (1%) men smoked lifelong, the rest of the people were health lifestyle. Traditionally, it has been more than 295 (60.6%) persons who have never used alcohol.

It can be considered as a factor of family alcohol requires additional stress of the adaptive mechanisms of the person, contributes to the development of hypertension, heart failure, oncopathology. The results of our surveys showed that all longlivers from west part of Ukraine body weights were lower than those in the comparison group, which gave them a chance to reach the age of 90 years [$\chi^2 = 172.28$; OR = 19.79 (1.99 - 49.03)] ($p < 0.001$).

For longer livers was also characterized by smaller height, as opposed to control [$\chi^2 = 58.17$; OR = 7.87 (4.26 - 14.56)]. This indicator may be dependent on age-related changes in the bone system (osteoporosis, reduction of organic matter).

A large reserve of health and efficiency was confirmed by the results of the poll of the longlivers Carpathian region (Table 3).

No	Indicators	OR	95% CI	χ^2 (N-5,99)	p
1.	Seek medical attention at least once a year	3,76	2,76 - 5,13	108,84	< 0,001
2.	Blood pressure is different from normal	3,94	2,90 - 5,36	92,13	< 0,001
3.	Heart work with disorders	1,86	1,39 - 2,49	20,57	< 0,001
4.	Not common acute respiratory diseases	3,70	2,63 - 5,20	113,27	< 0,001
5.	The presence of chronic diseases	1,31	0,95 - 1,80	2,76	> 0,05
6.	Absence of a history of tuberculosis	1,33	0,82 - 1,54	2,85	> 0,05
7.	No history of surgery	2,50	1,71 - 3,66	45,29	< 0,001
8.	Lack of diabetes	2,22	1,46 - 3,38	18,89	< 0,001
9	Continuous use of medicines	0,76	0,53 - 1,09	4,27	> 0,05

Table 3: The value of health indicators in shaping life expectancy.

As you can see, most of them rarely sought for medical help, had no acute respiratory infections, surgery, did not have diabetes ($p < 0.001$). Persons with chronic diseases and tuberculosis ($p > 0.05$) were less frequently found among the longlivers.

Disorders of the cardiovascular system in the longlivers, such as increased blood pressure, changes in the musculoskeletal system were partially collinear to age-related changes, but a large group of individuals who had hypertension (AH) and osteoarthritis (OA) which need of hereditary predisposition to these pathologies.

According to the survey results, persons who participated in the Chernobyl (Ukraine) accident or lived in radiation contaminated territory, had less chance to reach longevity, which is confirmed by the odds ratio - [$\chi^2 = 1,88$; OR = 0.88 (0.49 - 1.58)] at $p > 0.05$. In contrast, more residents of the region are registered among those living in moderately polluted areas [$\chi^2 = 6,12$; OR = 1.44 (1.07-1.93)] at $p < 0.05$.

Discussion

Our research provides recent population-based among longlivers from Ivano-Frankivsk region (West Ukraine). Although, there study provides new data about lifestyle’s longlivers.

Our results show that a significant probability of a longer life expectancy for married people which coincides with the study of Pawlińska-Chmara R among status of polish centenarian women [13]. A deep faith in God helped the longlivers in various situations of life. This data is the same from what was observed by Pawlińska-Chmara R [13], where believers in God women consisted 95.6% among 361 women aged over 100 year.

In our study, most of the longlivers had no completed education. At the same time, high percentage (77%) of the Polish longlivers women had basic education- including incomplete higher and higher educations [13]. According to historical events, there were frequent military operations in the west part of Ukraine, so in many cases it was not for education. The question was how to feed the family and the children, and education was sidelined. The same data is given by Czibere I, *et al.* [14] observed of life quality, mental conditions and cognitive status of people over the age of 90 from Hungary. Their article presents the results of a study of longlivers residents and shows that mental and physical activity, a variety of hobbies, avoiding isolation, personal autonomy solitude allow people to experience quality life. We received the same data when interviewing longlivers people.

Obtained results showing that longevity is a very difficult trait including in the first place genetic and in the second place environmental factors. The same opinion is expressed by Montesanto A., *et al.* [4] from Italy.

Wahlqvist ML., *et al.* [15] note that diet is a more important predictor of survival in longlivers. The authors point out that the Mediterranean diet, along with other factors, plays a prominent role in life extension. In our study longer from Ivano-Frankivsk (west part of Ukraine) ate mainly vegetable food characteristic of the region, which contained the necessary vitamins, unsaturated fatty acids, proteins of vegetable origin. As a separate favorite dish, they distinguished dishes of white mushrooms that grow in the Carpathians.

Since the probability of reaching the age of 90 or more was in people who had a healthy lifestyle, then the observance of natural biorhythms was one of the determinants of the longlivers.

The impressive character traits of the longlivers were kindnesses, optimism, deep faith in God.

The study of the functional state of the lifestyle in shaping health of the majority of longlivers of Ivano-Frankivsk region (West Ukraine) was carried out for the first time.

Conclusion

1. The distribution of the long-lived inhabitants of the Carpathian region depends on the area of residence, environmental and socio-psychological conditions.
2. Particular importance in the formation of life expectancy are the following factors: adherence to natural biorhythms (or = 486,70 ($p < 0,001$), $\chi^2 = 651,57$); physical activity (or = 6.51 ($p < 0.001$), $\chi^2 = 197.49$); limited nutrition (or = 23.01 ($p < 0.001$), $\chi^2 = 288.73$); no occupational harm (or = 6.25 ($p < 0.001$), $\chi^2 = 116.29$).
3. Future research should further evaluate whether the mentioned characteristics are associated with longevity beyond the average life expectancy.

Key Summary Points

Taking into account the available indicators will help to develop a set of recommendations for life extension and active longevity.

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