Longevity Compliance Scale

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Research

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Abstract

Objectives Nine common characteristics of Blue Zone regions (Power 9) are having a natural movement pattern, having an ikigai (a reason for being), being able to cope with stress, being able to stop eating before being full, eating a predominantly plant-based diet, drinking wine regularly, having a sense of belonging, strong family ties and strong social bonds. In the present study, we investigated the relationship of Power 9 characteristics with age and gender using the 'Longevity Compliance Scale' that we have recently developed. **Methods** Data were collected by administering the online 'Longevity Compliance Scale' (nine questions of 5-point Likert scale type) to 490 participants. SPSS was used for calculations. **Results** Cronbach's alpha value was found to be 0.763 (76.3%). Kaiser–Meyer–Olkin coefficient was 83%, and the factor analysis test provided high reliability (0.830 > 0.750). The total score was higher in female and elderly participants (Hedges' g: 0.046643, 95% CIs: 1.152-4.517, p:0.01). **Conclusion** We found that longevity compliance developed predominantly in female and elderly participants. These results may vary across regions and cultures; thus, they cannot be generalized. However, it is crucial to demonstrate the effect of the nine common dominant points, which have been found after extensive studies conducted for many years. These nine points could be critical factors associated with longevity. It might provide us with tips to prolong our lives and help us stay healthy. Knowledge and experience accumulated as a result of aging, especially in women, may, instinctively or consciously, enhance compliance with the codes for longevity.

Introduction:

Eos begs with Zeus, the father of gods, to make his lover Tithonus immortal. But Eos forgets to ask for eternal youth for his lover (1). As Tithonus grows older, he loses his strength one by one but is immortal. He lives in pain and torment forever. Human life expectancy is getting longer as our knowledge and experience about treating and preventing diseases increase. This brings with it many diseases due to aging and a decrease in the quality of life accompanying. We look at old age with the hope of getting a healthy age, not the years of pain and torment like Tithonus in this mythological phenomenon. We have experienced a kind of paradigm shift over the years, and a period of reign years that were missed in our life, as the Cicero described in his book of "*Cato the Elder on Old Age*".

A study of National Geography with a team of researchers for many years showed the common nine characteristics (Power 9) of people living in long-living areas called the Blue Zone (2). Blue Zone points are Sardinia (Italy), Okinawa (Japan), Loma Linda (California), Ikaria (Greece), and Nicoya (Costa Rica). The vast majority of people in these regions can reach the age of 100 and actively continue their lives until the years of 80-90. Power 9 features are:

1-Having a natural movement pattern: Walking, doing gardening, or doing housework during the day is one of the main features of the blue zone lifestyle.

2-Finding your ikigai: When we research this word of Japanese origin, "iki" means life, "gai" means impact, cause, benefit, and "ikigai" has a deep meaning as "reason for living." According to the Japanese, each individual has a different ikigai. To find this, the individual will go on a long and deep inner journey and see the light at the end of this meaningful journey, namely Ikigai, and will eventually reach a power that can define his own "ikigai." After finding it, we embrace life more strongly, and we can maximize our energy and be protected from chronic diseases (3).

3- Coping with stress: Blue Zone people lead a less stressful life. BlueZone centenarians continue stress-reducing rituals in their daily lives. Adventists pray, Ikarians relieve stress by napping, and Sardinia have "happy hour" (2).

4-Stomach 80% Rule: These people stop eating when their stomachs are 80% full and make their smallest meals in the early evening. So eat less, live longer (4).

5-Plant-based diet: Vegetables, fruits, whole wheat are the main nutrients, while meat constitutes only a small part of the meals. High micronutrient and fiber ratios make herbal nutrition a part of being healthy (5,6).

6-Drinking light and regular wine: Light but on a daily base, wine consumption is also frequent. Polyphenols in wine are resveratrol, anthocyanins, catechins, and tannins, and their positive effects on health have been shown in many studies (7).

7-A sense of belonging: Being part of a faith-based community is thought to extend life at least four years (8). Personality development has an essential place in Erikson's life and theory. According to Erikson, one of the pioneers of ego psychology, there are eight stages of development: (1) Trust or insecurity 2) Autonomy or shame and indecision 3) Venture or guilt 4) Skill or inferiority 5) Ego identity or role complex 6) Close relationships or abstraction 7) Productivity or infertility 8) Belonging or despair (9). Considering the increasingly long life of people in the West, his wife added the "age" stage as the ninth stage after he died.

8-Strong family ties: Maintaining close and strong family ties is a common feature of long-living areas. Many studies show positive health outcomes of family ties (10).

9-Social Interaction: Having close friends and secure social connections have positive effects on health. Physio-social factors such as participation in social activities have been shown to reduce mortality at older ages significantly (11).

In this cross-sectional study, we tried to analyze the 'Longevity Compliance Scale' (LCS) and scale scores that we created based on the standard features, namely Power 9, of Blue Zone Points, and the scale scores between age groups and gender (Table I.).

Method

Data were collected by administering the online 'Longevity Compliance Scale' (nine questions of 5-point Likert scale type) to 490 participants who were 18 and over the years old. In calculating the sample size of this study for LCS evaluation, each variable's power was determined by taking at least 80% and type 1 error 5%. Kolmogorov-Smirnov ($n > 50$) and Skewness-Kurtosis tests were examined to see if the measurements in the study were normally distributed. Parametric tests were applied since the measurements were normally distributed. Descriptive statistics for continuous variables in our study; mean, standard deviation, minimum, maximum; for categorical variables, they are expressed as numbers and percentages. Within the scope of Validity-Reliability, "factor analysis" was applied to determine LCS sub-dimensions. Cronbach's Alpha coefficients were obtained within the range of the reliability analysis of LCS questions. The calculation was made by taking into consideration the total scores of LCS questions. Independent T-test and One-Way Variance Analysis (ANOVA) were performed to compare LCS scores according to demographic data. Following the variance analysis, Duncan test was used to identify different groups. Chi-square test was used to determine the relationship between categorical variables (Age group and Gender and scale question items). The statistical significance level (α) was taken as 5% in calculations and SPSS (IBM SPSS for Windows, Ver.24) statistical software was used for calculations.

Results:

We shared the scale on social media, and the study with 490 participants, including 250 (51%) men and 240 (49%) women, were conducted between 03.10.2019 and 10.11.2019. According to the results of the Kolmogorov-Smirnov ($n > 50$) test, LCS total score does not appear to be normally distributed ($p < 0.05$). However, since the Skewness and Kurtosis values of these measurements show normal distribution (range of ≤ 1.5), it is appropriate to use Parametric tests in comparisons. Cronbach's Alpha value of "LCS Total Score" was found to be 0.776 (76.3%) and so the reliability of these questions (items) is high. The entire questionnaire was subjected to factor analysis. The reliability of the factor analysis was tested with the Kaiser-Meyer-Olkin (KMO) test. The KMO coefficient is 83%. The factor analysis test based on the KMO test results provides high reliability ($0.830 > 0.750$). Bartlett test is also significant ($p < 0.05$). According to this, it can be said that there is a high correlation between the variables.

In the study, the factors with significant initial eigenvalue statistics were determined. There are two factors with eigenvalues greater than 1. The first factor explains 37.77% of the total variance. The first and second factors together explain 51.44% of the whole difference. As a result of factor analysis, the scale questions were grouped by dividing the items into two sub-dimensions. As a result of the factor analysis, the scale questions were grouped significantly in 2 factors. As a result of the factor analysis, the scale questions were grouped significantly in 2 factors. Each factor shows a different sub-level / dimension. According to this, factor 1 included questions 1-9 (except question 6). In Factor 2, only the 6th question took place. Therefore, since there is only one question (question-6) in the second factor, all questions are treated as a single factor.

No statistically significant relationship was observed between "gender" and items of 1,2,6,7 ($p > 0.05$). A statistically significant relationship was observed between "gender" and items of 3,4,5,8 and 9 ($p < 0.05$).

A statistically significant relationship was observed between “gender” and “all scale questions” ($p < 0.05$) (Table II.). The difference between all age groups was found significant ($p < 0.05$). Compared to the previous age group, there is a significant increase in the LCS total score (Table III).

Discussion

With this study, we wanted to question how much the life adaptation of the participants developed, in which age groups adequate adaptations to living a long and healthy life, and to what extent these adaptations can be applied to life practices with the knowledge and experience that individuals have accumulated over the years. The question of how we can adapt the power nine principles that BlueZone taught us to our community is a difficult question to answer. In modern cities and public living areas that we have built with our own hands, vehicles and buildings are mostly included. As a result, people's activities, such as walking, cycling, and climbing, are severely restricted (12). We spend most of our daily life in our cars on the way to work, shopping and even to gyms. In this way, going everywhere by car causes us to increase our stress and spend less time with our loved ones. Lack of time management causes us to make practical decisions in the short term and make decisions that will impair our health in the long run. The environment we live in, due to reasons such as time constraints and the presence of stress increasing factors, the necessity to live in an obesogenic environment, dictates our habits such as eating ready-made and processed foods, or fast food-style ones (13,14). We do not have the time to cook our meals ourselves and grow our fruits and vegetables ourselves.

It is thought that there is a long-standing and increasing value gain in the presence of reflexive and transactional relationships between the places where aging occurs (15). Studies indicate that older adults who have a good connection with the home are likely to feel safe and develop a positive sense of self (16). Therefore, it is essential to understand the relationship that the elderly establish with the place, the meaning that people attach to both objects and places as they get older. Decisions taken by both the elderly and their families to be geographically close often have important implications for the nature of their interactions (17).

In our study, we found that extended life harmony developed more dominantly in women and older ages. We can say that these results may vary according to regions and cultures and therefore, cannot be generalized. Countless factors such as living spaces, religious and cultural differences of people, or lifestyles affect human health in many ways. However, showing the effects of 9 dominant common points on human life in studies in different societies may be necessary for giving us tips that will prolong the life and keep us healthy.

Conclusion

The knowledge and experiences accumulated with aging cause individuals to instinctively or consciously adapt to long life codes in the Blue Zone regions. However, in matters where religious and cultural influences prevail, this adaptation may be disrupted against long life. It is possible to increase the

awareness of individuals' adaptation to longevity in terms of health with awareness and education studies.

Declarations

Conflict of Interest: The authors have no conflicts of interest to report.

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Approval for this study was obtained from the ethics committee of Akdeniz University.

Biographical Statement

- Tahir Belice studies the Health of Elderly, a PhD program in Ege University. His recent publications include *Importance of dried fruits and vegetables in the elderly* (DOI: 10.4274/ejgg.galenos.2020.280) and *The synergistic effects of lipoic acid and vitamin B in sarcopenia* (DOI: 10.4274/ejgg.galenos.2020.261).

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Tables

Table 1: Longevity Compliance Scale Questions

1. Does your diet predominantly consist of vegetables?
2. Do you perform things like napping, walking, etc., to cope with stress?
3. Do you have strong family ties?
4. Do you have strong social bonds?
5. Do you feel that you belong to a place or a group?
6. Do you occasionally drink wine?
7. Do you stop eating before you are completely full?
8. Have you found your reason for being (ikigai)?
9. Do you have a natural movement pattern (garden work, daily walking, housework etc.)?

Table 2:Correlations of scale's total scores with Gender

	N	mean	Std. Sap.	Min.	Max.	*p.
Men	250	27,712	7,2741	12,0	41,0	,001
Women	240	29,833	6,7127	14,0	45,0	
Total	490	28,751	7,0777	12,0	45,0	

**Independent T-testisignificancy analysis*

Table 3.Correlations of scale's total scores with with Age groups

Age groups	N	mean.	Std. Sap.	Min.	Max.	*p.
20-29	101	22,901 ^e	6,0341	14,0	38,0	<0,001
30-39	102	25,706 ^d	6,1008	12,0	40,0	
40-49	98	27,735 ^c	5,6487	16,0	40,0	
50-59	103	32,951 ^b	5,3254	17,0	45,0	
60 +	86	35,360 ^a	3,4807	22,0	41,0	
Total	490	28,751	7,0777	12,0	45,0	

**ANOVA test significancy results*

A, b : Duncan post-hoc testi

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