

Long and prosperous life paradigm

Authors' Contribution:

A - Study Design
B - Data Collection
C - Statistical Analysis
D - Manuscript Preparation
E - Funds Collection

Ivan Uher^{ABDE}, Milena Švedová^{DE}

Department of physical education and sport, University P. J.Šafarika, Košice
Slovakia

Abstract. *If aging were simply a matter of wearing out, we would expect all centenarians to be in poor health, trapped in bodies with many deteriorated working parts. Actually, standards of health are high among numerous centenarians. Those who study centenarians been taken aback by their strong attachment to freedom and independence. Even though biological aging in humans fall into two categories (Programmed or adaptive and Non- programmed or non-adaptive theories) in our Meta – analysis we predominantly focused our attention on Non-programmed theories of aging. We selected some factors that play significant role in secondary aging, namely self-discipline, to have meaning and purpose in life, maintaining a steady weight through life, eating more quality than quantity of food, be physically active, have social ties be practical rather than idealistic also assertive but at the same time flexible to new challenges in life. Also have more wisdom than intelligence. Above mentioned indicators are greatly influenced by way we think. We believe that by apply positive psychology's principles to our existence we can enhance biological, psychological and social homeostasis consequently enhances overall health and longevity.*

Keywords: *Independent leaving, centenarians, quality of life, homeostasis, positive psychology*

INTRODUCTION

Most of us have never met anyone who is 100 years old. Historically, living to 100 was an achievement so scarce that it was almost whimsical. Today in most industrial countries, one person in about 5 000 passes the century mark, and the ratio is rising faster than any other growth statistic in the population. Most babies born in the past few years in most developed countries will live to be 100 if current trends continue [1,2]. The older people alive today do not tend to be merely random survivors, but individuals who embody enviable attitudes and values. Good-sized still get around on their own, and many continue to work, at least by keeping house and caring for themselves. In some studies [3,4] was found that 30-40% of people today were independent between the ages of 92 and 100. Another studies [5,6] showed that 40% of super centenarians (those more than 110 years old) needed little assistance or were independent. These studies "do not accord with the prediction that the fourth age is in a vegetative state". The question arise, how we should look on aging? Which factors are crucial to maintain successful aging? Even though the programmed vs. non-programmed aging controversy has existed in some form for 150 years. Both categories also recognize that deteriorative processes cause deterioration of any organized system but that living organisms have extensive capability for maintenance and repair of damage in certain circumstances. We

focus our attention more on non-programmed theory of aging. We focus our attention on positive psychology that is primarily concerned with using psychological theory, research and intervention techniques to understand the positive, adaptive, creative and emotionally fulfilling aspects of human behavior. Which when apply in daily life can to great extend help to maintain homeostatic balance therefore quality of overall human existence.

Factors that influence aging process

When we look at exercise, there is an apparent absence of pursuing organized exercise despite the fact that exercise is known to retard aging [7]. To understand this phenomenon, we have to look deeper into offer of physical activities and how much activity is actually needed to make a meaningful contribution to longevity [8]. There is well know fact that the least active people had the highest death rate that the fittest one. What is surprising is that the most striking improvement came with modest levels of physical activity [4]. Some experts assert that someone who walk thirty minutes a day, six days a week, enjoy a mortality rate almost as low as someone who ran thirty to forty miles per week [9]. Another way to say is that doing anything physically is much better than remaining inactive. Professionals postulate that exercise for fitness is not the same as exercise for health. Heavy exercise gives only an illusion of adding to life span. Base on some studies, we can conclude that strong hand grip and good muscle tone of many centenarians indicate that they are active people [9].

Maintaining a steady weight throughout life seems to be more important than whether one is over or underweight [28]. Famous Harvard graduates study revealed that gaining or losing even a moderate amount of weight over a long period raised one's risk of mortality. The fact that either gaining or losing weight shortens one's life span makes some scholars to speculate that poor self- esteem is possible culprit [10]. Further, the subjects who maintained a steady weight are likely to be psychologically steady as well- this is their saving virtue, not their weight per se.

The diet affects longevity to some extend. There is no insistence on the use of vitamins and minerals, no recommendations on health food regimens, fiber supplements, or vegetarianism. Centenarians eat a wide variety of diets - this has been confirmed in all the studies, but the fact that they maintain a constant weight implies that they tend to eat moderately. It seems that many of our present dietary beliefs may need to be less rigid. What we now know is that healthy diet must have two components. It has to be psychologically satisfying and, it has to provide a balanced supply of nutrients several times a day. From reviewing some studies we can conclude, that majority of centenarians are light eaters [29,30]. Lately diet restriction theory got momentum, their proponents' postulates that food restriction diet would lead to almost certain improvement in health, particularly in the areas of cancer and cardiovascular disease. Even though no one yet discover why calorie restriction extends life span in animals. It seems unlikely that many people will ever undertake severe calorie restriction as a longevity program, given its rigors. Some author, allege that longevity can result from taking little or no food one day a week (in the form of fruit juice, warm water with honey, etc.). The principle at work is simple, the digestive system is allowed to take a rest, to recover its balance and flush out accumulated impurities. Modern physiology has not accepted these principles, yet many proponents of spiritual traditions are proud of long-lived people who adhere to them. From our perspective, the success of frugal eating is neither a punishment nor a discipline but a respite from daily activity.

Further, the notion of aging elite supports the idea that biology can be influenced by outside factors. Coming from a disadvantaged background does not automatically disqualify someone from better life. As far person achieves a stable income, good health, and a satisfying marriage, he is adding to his chances of longer life. Longevity has been a conscious primary

goal for only a small number of people through out history. However, the insights of those few are important to consider [5]. In addition, attempt to articulate a specific “longevity personality” is too render down for centenarians, the amiable, quiet, wise grandmother is only one type of many. Living to be 100 as well happens to selfish, sarcastic, and unsociable people as well.

The key to mastery of life

We should take into consideration that perception of reality is not the problem of the senses, but the interpretation of the sensual experiences. Thus those experiences we filter through our intelligence and wisdom that are in any means not the same. Listen to our body’s wisdom, which express itself through signals of comfort and discomfort. Live in the present, for it is only moment we have, look for the fullness in every moment. Accept what comes to as totally and completely so that you can appreciate it, learn from it, and then let it go. Take time to be silent, to quiet the internal dialogue. We should pay attention to our inner life so that we can be guided be intuition rather than externally imposed interpretation of what is or is not good for us. Abjure own need for external approval. Our goal is to discover infinite worth in ourselves.

"Good interpersonal relationships act as a buffer against stress" [11]. Knowing you have people who support you keeps you healthy, mentally and physically. Chronic stress weakens the immune system and ages cells faster, ultimately shortening life span by 4 to 8 years, according to some experts [12]. However, older person need friends that they can talk to without being judged or criticized. People who consider themselves self-disciplined, organized achievers live longer and have up to an 89% lower risk of developing Alzheimer’s than the less conscientious [13,14]. When we’re good at focusing our attention, we use more brain power [15]. About 17% of Americans are flourishers, says experts, they have a positive outlook on life, a sense of purpose and community, and are healthier than "languishers" about 10% of adults who don’t feel good about themselves. Most of us fall somewhere in between. Therefore, we should strive to flourish, to find meaning in our lives," saying some experts [16,17]. "In Sardinia and Okinawa, where people live the longest, hard work is important, but not more so than spending time with family, nurturing spirituality, and doing for others. Further, to maintain a healthy lifestyle, it’s important to associate with people who have similar goals, some studies claim [18]. If our closest friends gain weight, our chance of doing the same could increase by 57%, according to some studies [19,17]. One study found that people with more than 12 years of formal education (even if it’s only 1 year of college) live 18 months longer than those with fewer years of schooling. The more education we have, the less likely we are to smoke. In fact, only about 10% of adults with an undergraduate degree smoke, compared with 35% of those with a high school education or less, according to the [20].

It's pretty obvious even to nonscientists that how you get there depends partly on the genes you are born with and partly on lifestyle what and how much you eat, where you live and what types of stress and trauma we experience. How much depends on each factor, though, was unknown until some researchers start to look at the only set of people who share genes but not lifestyle. Namely identical twins that were separated at birth and reared apart. If genes were most important, we would expect the twins to die at about the same age. In fact, they don't, and the average difference convinced the scientists that only about 20% to 30% of how long we live is genetically determined. The dominant factor is lifestyle [21].

In Okinawa study was found that local people practice a dietary philosophy known as “hara hachi bu” literally, eight parts out of 10 full. In translation, they eat only to the point at which they are about 80% sated. That makes for a daily intake of no more than 1,800 calories, compared to the more than 2,500 that the average American man scarfs down. As scientists have learned from lab animals, the simple act of calorie restriction can have significant effects

on longevity.

Different study of Seventh-Day Adventists in Utah supports this finding. Those unusually clean-living Americans are genetically diverse, but they avoid alcohol, caffeine and tobacco and they tend to live an average of eight years longer than their countrymen. All of this is good news which indicates, that we can't change our genes, but we can change what we eat and how much we exercise. The lesson from that is pretty clear in terms of what the average person should be doing. We strongly believe that with some changes in health-related behavior, each of us can earn the right to have at least 25 years beyond the age of 60 years of healthy life at good function. However the disappointing news is that it requires work and willpower [22].

Oldsters in Sardinia, another wellspring of longevity, have many similarities to their Okinawan counterparts except that the Sardinian ratio of centenarians is about equal for men and women (in most societies, 100-plus females outnumber males by 3 or 4 to 1). They maintain very active lives and powerful social networks; extended family and friends are available to share troubles and take some of the emotional burden out of life. Say researchers, which were studying the group. In addition the 100-year-olds are less depressed than average 60-year-olds [23]. That makes perfect sense to [24] who has studied American centenarians he calls them "expert survivors" and compared them to people in their 80s ("master survivors") and to relative youngsters in their 60s. Researchers found that out of 16 personality traits, the experts exhibited four coping mechanisms. First, he says, centenarians are more dominant. They want to have their way, and they are not easily pushed around. Many are characterized by "suspiciousness". They do not take information on the superficial level but will question an issue and think it through. They tend to be practical rather than idealistic. And in their approach to life, they are likely to be more relaxed. In other words, they are strong but not inflexible characters. One study determined that people whose age reaches three figures tend to have a high level of cognition, demonstrating skill in everyday problem solving and learning. Many of these subjects aren't rich, some of them have homes with mud floors. Nevertheless, they make good out of it. "Many have their own gardens, they grow their own vegetables. They're living down to earth, means they live simple life [10].

Like the Okinawans, Sardinians and, the U.S. centenarians enjoy a strong social-support system. Few Americans live in a village anymore, but having outlived family and friends of the same age, the super old find new helpers and confidants among people younger by a generation or more. It might be someone to help with groceries or car trips or simply a sympathetic voice on the other end of the line. Maintaining a connection with the world, with younger people, keeps their outlook youthful.

With so much evidence that lifestyle is the key to healthy aging, it might be tempting to ignore the role of genes altogether. That would be a mistake. Brothers of centenarians are 17 times as likely to live to 100 as are people without 100-year-olds in the family, while sisters of centenarians are 8.5 times as likely to live into their second century. Given statistics like that, says [25] on exceptional survival, "we are interested in looking for some kind of genetic component to longevity." Author approach is to look at family members, especially the children, of centenarians. "Kids of centenarians who are in their 70s and early 80s are very much following in the footsteps of their parents, with around 80% reduced risk of heart disease, stroke and diabetes [12].

Indeed, despite number of adverse studies, there's evidence that in some families, at least, genes exert pretty powerful effects on life-span. For example, one study showed no consistent patterns in diet, exercise or healthy habits that could explain their extended years. About 20% had smoked at some point in their lives, and some had eating habits that should have made them obese or unhealthy but somehow did not. At least 10% to 15% had a history of heart disease, stroke or diabetes for more than 20 years. Something in that group's genes was

protecting them from succumbing to diseases that had felled the average American decades earlier. "These people still get to 100". They seem to have a functional reserve or adaptive capacity that allows them to get disease but not necessarily suffer from it [25,26]. The key seems to be resilience. Some of that resilience may be linked to human leukocyte antigen (HLA) genes, a group clustered on chromosome 6 that affects vulnerability to such autoimmune diseases as lupus, rheumatoid arthritis and multiple sclerosis [26,27]. Some authors has found a region on chromosome 4 that centenarians and their siblings and children in the U.S. seem to have in common and that sets them apart from shorter-lived individuals. What exactly that stretch of DNA does remains to be discovered, but it may be a key not just to long life but also to the resilience found among U.S. centenarian-study participants, with their 20% smoking rate and imperfect eating habits [25]. That group may be especially genetically blessed, and researchers are eager to tap its secrets.

CONCUSION

Longevity we should perceive in broad terms, majority of factors are very subjective, having to do with how older cohorts in our respect feels about themselves. In comparison, to purely objective factors linked to long life that are not too many and are very general. Namely in physical characteristics as not being seriously over or underweight, little weight fluctuation over their lifetime, good general muscle tone, good hand grip, younger appearance to skin, engages in physical activity. In psychological characteristics, superior inborn intelligence, keen interest in current events, few illnesses, not prone to worry, tend to be their own bosses, majority did not retire early, high versatility, positive, not preoccupied with death, living with satisfaction from day to day, further, religious in their own sense, they are early risers, some abstained some drank moderately, used less medications in their lifetime than many old people in one week. The fundamental question arises whether longevity belongs only to those who are fortunate enough to be born with certain advantages ? We believe that maintaining equilibrium on biological, psychological and social level is critical for maintaining long and healthy life.

We assume that excessive physiological activation can have pathological consequences. Hence differences in neuroendocrine reactivity might influence patterns of aging. We refer not to specific disease outcomes, but rather on the possibility that neuroendocrine reactivity might be related generally to increased risk of disease and disabilities. Stress mechanisms are thought to interact with age changes in major regulatory systems for responding to stressors and maintaining internal homeostatic integrity. Individual differences in reactivity may cumulatively lead to major individual differences in neuroendocrine aging as well as age related risks for disease. Certain psychological factors can influence patterns of endocrine reactivity there for perception of control and certain type of behavior pattern may influence increased reactivity with age. In that respect positive psychology as the scientific study of positive human functioning and flourishing on multiple levels that include biological, personal, relational, cultural and global dimensions of life can to the great extend maintain homeostatic balance there fore reduce excessive physiological activation.

We believe that psychology of positive human functioning will arise, which achieves a scientific understanding and become a tool for effective interventions to build thriving individuals that seek to find and nurture genius and talent to make life more fulfilling for older cohorts.

In general, instead of assuming that long life is gift of providence we should start to believe that our own efforts made a difference. Lastly, we can conclude that later years should be a time when life becomes whole. In that respect, active actuation is not just a way to survive to furthestmost old age, it is the road to absolute freedom.

REFERENCES

1. Maier H, Gampe J, Jeune B, Robine JM, Vaupel WJ. Supercentenarians. Demographic Research Monographs. Springer pub. 2010; 322
2. Perls T. Health and disease in people over 85. BMJ. Dec 22;339:b4715. doi: 10.1136/bmj.b4715. 2009
3. Poulain M. On the age validation of supercentenarians. In: Maier H, Gampe J, Jeune B, Robine JM, Vaupel JW. (eds.). Supercentenarians. Demographic Research Monographs. Springer -Verlag: 2010; 3-30
4. Schoenhofen E, Wyszynski DF, Andersen S, Pennington J, Young R, Terry DF, Perls TT. Characteristics Supercentenarians. of 32 Journal of the American Geriatrics Society. 2006; 54: 1237-1240
5. Hansen MV, Linkletter A. How to make the rest of your life the best of your life. Publisher Thomas Nelson Inc, 2006; 297
6. Newman A, Glynn N, Taylor A, Sebastiani P, Perls T, Mayeux R, Christensen K, Zmuda M, Barral S, Lee H, Simonsick E, Walston D, Yashin I, Hadley E. Health and function of participants in the Long Life Family Study: A comparison with other cohorts. Aging (Albany NY). Jan. 11. PMID: 21258136. 2011
7. Junger J, Zusková K, Bakalár P. Cvičenie ako prostriedok zlepšovania kvality života seniorov. In: Kvalita života a rovnosť príležitostí z aspektu vzdelávania dospelých a sociálnej práce: zborník príspevkov z vedeckej konferencie s medzinárodnou účasťou, 24. – 25. novembra 2004 v Prešove. Prešov: Filozofická fakulta PU v Prešove, 2004; 299 – 304 [in Slovak]
8. Pullmannová Švedová M. Ponuka športovo – rekreačných zariadení a ich dopad na regionálny rozvoj. In: Zborník z Medzinárodnej vedeckej konferencie. Význam ľudského potenciálu v regionálnom rozvoji, 2011; 218-228 [in Slovak]
9. Spirduso W, Francis L, MacRae P. Physical Dimensions of Aging 2th edition. Champaign, IL, Human Kinetics, 2005; 373
10. Givens L, Frederick M, Silverman L, Anderson S, Senville J, Silver M, Sebastiani P, Terry F, Costa T, Perls T. Personality traits of centenarians' off spring. J. Am Geriatr Soc, 2009; 57(4):683-5.
11. Sadigh M. Good interpersonal relationships act as a buffer against stress. The black E.O.E journal 23/3 edition. 2007; 81
12. Adams R, Nolan G, Andersen L, Perls T, Terry F. Journal of Am.Geriatr. Soc. 2008; 56(11):2089-92
13. Stern A, Andersen L, Gavett E. Executive functioning. In A. E. Budson & N. W. Kowall (Eds.), The handbook of Alzheimer's Disease and other dementias. West Sussex, UK: Wiley-Blackwell, 2011; 369-415
14. Vincent B, Checler F. A proteins. Current Alzheimer Research Journal. Bentham Science publisher, 2012; 9(10): 140-156
15. Barral S, Cosentino S, Costa R, Matteini A, Christensen K, Andersen L, Glynn W, Newman B, Mayeux R. Cognitive function in families with exceptional survival. Neurobiol Aging, 2012; 33(3): 619
16. Prem S, Fry P, Corey M, Keyes M. New frontiers in resilient aging. life strengths and well-being in late life. Cambridge university press, 2010
17. Jones N, Yang M, Zhang Y, Jones N, Kiely D, Marcantonio R, Inouye K. Does Educational Attainment Contribute to Risk for Delirium? A Potential Role for Cognitive Reserve. J Gerontol Med Sci. 2006; 61(12): 1307-1311
18. Thomas A. 14 surprising signs you will live longer than you think. E. Ay about you Magazin <http://www.aymag.com/AY-Magazine/> issue December. 2010
19. Powell A. Decoding keys to a healthy life. Science and health. New Harvard. Edu.gazette, 2012; 8: 2-15.
20. Center for Disease Control and Prevention: Morbidity and Mortality Weekly Report. 2011; 60(44): 1513-1548 at <http://www.cdc.gov/mmwr/pdf/wk/mm6044.pdf>. 11.
21. Ljunquist B, Berg S, Lanke J, McClearn E, Pedersen L. The effect of genetic factors for longevity.

-
- A comparison of identical and fraternal twins in the Swedish Twin Registry. *J. Gerontol A Biol Sci Med Sci.* 1998; 53(6): 441-446
22. Phillips L. Role of lifestyle and dietary habits in risk of cancer among Seventh-day Adventists. *Cancer Res.* 1975; 35: 3513-3522.
 23. Poulain M, Pes G, Salaris A. Population where men live as long as women. Villagrande Strisaili, Sardinia. *Journal of Aging Research.* 2011: 1-10 doi:10.4061/2011/153756. 2011
 24. Mitchell MB, Miller LS, Woodard JL, Martin P, Davey A, Burgess M, Poon LW. Georgia Centenarian Study. Regression-Based Estimates of Observed Functional Status in Centenarians. *The Gerontologist*, 2010 doi: 10.1093/geront/gnq087.
 25. Perls T, Kunkel M, Puca A. The genetics of exceptional human longevity. *Journal of Am Geriatr. Soc.* 2002; 50(2): 359-68. PMID: 12028221
 26. Austad, N. A. Proč stárneme. Prek.Čechová. Praha: Mladá fronta. 2002; 205 [in Czech]
 27. Puca A, Daly J, Brewster J, Matise C, Barrett J, Shea-Drindwater M, Kang S, Joyce E, Nicoli J, Benson E, Kunkel M, Perls T. A genome-wide scan for linkage to human exceptional longevity identifies a locus on chromosome 4. *Proc. Natl. Acad. Sci. USA.* 2001; 28:98(18):10505-8. PMID:11526246
 28. Šulc I, Valanský M: Racionálny životný štýl - prevencia k zmenám telesnej hmotnosti a kvalite zdravia. In: *Rekreačný šport, zdravie, kvalita života.* Košice. 2012 [in Slovak]

Address for correspondence:

Ivan Uher, Department of physical education and sport, University P. J. Šafarika, Košice Slovakia, email: ivan.uher57@gmail.com

Received: 4.03.2013; Accepted: 6.05.2013; Published online: 17.05.2013

www.PhysActiv.ajd.czest.pl