

IMPACT OF EXERCISE, DIET, SMOKING & OBESITY UPON LIFE EXPECTANCY

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Abstract

Despite zenith in the field of scientific knowledge, any pin pointed factor behind the phenomenon of longevity and life expectancy has not yet been known. There are so many contributors that work together in affecting the span of life expectancy. Review of the literature reveals that participation in physical activities and exercises, use of proper diet, healthy lifestyle behaviour, avoidance of smoking and obesity are vital and they all have crucial role in determining the length of the life span. This paper is aimed at to review the existing body of literature in perspectives of the factors contributing or otherwise with reference to the longevity and life expectancy. The factors examined in this paper include exercise & physical activity, diet and smoking. In view of the existing literature it has become evident that life expectancy is something that can be extended to a desirable limit provided consolidated efforts are put forth with reference to health care and healthy life style behaviour.

Keywords: Life Expectancy, Exercise, Diet, Obesity, Smoking

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1. Introduction

Statistics from the World Health Organization show that, for the last many years, positive trend in perspectives of life expectancy of the world's population has been observed and at present life expectancy has been at its peak. The exact reason or specific contributor working behind longevity or otherwise of the life expectancy has not been pin pointed and scientific explanation to this phenomenon has yet to be explored. However, genetics, culture, lifestyle behaviour, exercise, obesity, smoking, diet, occupation etc. are known to be the key contributors in this regard. One most interesting thing is that round the globe, female live longer than male for about 5-7 years. It has so far also been a mystery and no scientific evidence in this context has been identified. Kalben (2002) has concluded that female live longer than men; this difference of life expectancy existed since 1750 and at present male has been confronted to greater mortality than female.

Life expectancy and longevity have been the most important issues attracting attention of the health and social scientists for the last few decades. To examine the role of the determinants of longevity and life expectancy has been the core problem of interest for them. The researcher has taken four main factors e.g. exercise, diet, smoking and obesity that play significant role in the longevity and life expectancy.

2. Review of Literature

2.1 What is Life?

Life refers to the living organism having the property survival, growth, reaction to stimulation and reproduction etc. Life is the factor that differentiates living beings humans, birds and beasts from the lifeless (dead) things like stone. Life denotes the time

period when a person is alive and not dead. It has always been the innate quest of all living beings to have the maximum duration of life. Life comes once and its longevity and expectancy vary from place to place. Irrespective of its length, it is vital and its value can not be denied. In this review paper different factors that either affect or contribute to the longevity of human's life are the pivot of focus.

The quality, expectancy and longevity of life differ from nation to nation, country to country, generation to generation, class to class and specie to specie. For example in humans, Jeanne Calment of France had the recorded longest lifespan of 122 years, 164 days. (1875–1997) (https://en.wikipedia.org/wiki/Oldest_people). While in animals, the Bowhead Whale is reported to have longest life span of 211 years. (www.mnn.com/earth-matters/animals/stories/10-animals-that-live-the-longest) and the shortest life span in animals is associated with Mayflies, which is 24 hours (<https://themysteriousworld.com/top-10-shortest-living-animals-in-the-world/>). In global perspectives the highest life expectancy is 83.74, 83.31 and 82.84 years which belongs to the people from Hong Kong (China) Japan and Italy respectively. Similarly, the lowest life expectancy rate for humans at earth is 49.18 years

which is associated with the citizens of Swaziland placing them at 201st place in the world. (United Nations Department of Economic and Social Affairs (29 July 2015 "United Nations World Population Prospects: 2015 revision"). Pakistan is at 130th position with 66.4 years of life expectancy (World Health Statistics, 2016). There are a number of factors that contribute to the longevity or otherwise of human's life. The first and foremost

responsible factor that prevents the longevity of life is the poverty. *“The greater one’s income, the lower one’s likelihood of disease and premature death”* National Center for Health Statistics (2012). On account of poverty, poor and deprived class hardly manages for hygienic food, proper health care and maintenance of the healthy environment. The result of which has always been poor health and shorter span of lives. In addition to that, there are some behavioral and environmental factors that also play significant role in affecting the life expectancy of the population. These include genetical history, occupation, climatic conditions, diet, smoking, obesity, regular participation in exercise, healthy habits etc. Focus of this study is to examine the role of Exercise, Smoking, Diet and Obesity upon health and longevity and expectancy of life.

2.2. Life Expectancy

Life expectancy or longevity refers to the assumed span of life and to be more specific, it is the normal period that a person is likely to live. In simple words, it is the expected time duration between birth and death. Life expectancy is also defined as the age to which half the population of a given age can expect to live. Life expectancy is associated with the overall mortality level of a population. World Health Organization report 2004 has defined

life expectancy as “Average number of years that a newborn is expected to live if current mortality rates continue to apply.

Merriam Webster dictionary defines Life Expectancy as “The average number of years that a person or animal can expect to live” Life expectancy is the blended output of the lifestyle behavior of the masses at large, health facilities, socio-economic condition of the society, composition and intake of diet and

genetical factors. Life expectancy is the indicator the quality of life and overall prosperity of the nation (Rogers & Wofford, 1989)

A good deal of work has already been done in this regard and diverse factors have been diagnosed which are associated with the longevity of life. Candore, et al. 2006, Dupre, Liu, & Gu, 2008 and Lin et al., 2012 have concluded that the factors affecting longevity have not fully been understood and it has generally been assumed that various etiologies e.g., biological, environmental, and psychosocial factors work together in this context. Life pattern, habits, exercise, smoking and diet play vital role in determining longevity of life (Jankovic et al., 2014). The role of the use of balanced diet is also vital with reference to the maintenance and promotion of health and longevity of life. Fruit and vegetable rich diet has very positive role in reduction of the risk of mortality (Wang et al., 2014).

As a matter of fact, at present on account of a number of reasons, life expectancy has considerably been increased. The rate of life expectancy in the world has shown two fold increase during the last two centuries (Oeppen, 2002). The present scientific advancement in the area of health sciences, life span of the people has been improving at a good pace. An average life expectancy for the world's population in 2015 was 71.4 years (Global Health Observatory (GHO) data 2016).

3. Exercise, Physical Activity and Life Expectancy

Life expectancy is the pivot round which the story of wellness, health, socio-economic condition of the society, health related facilities, lifestyle behavior, and prevention of a number of fatal diseases revolve. It has generally been established that participation in exercises and physical activities contributes to the maintenance and overall improvement of the health and fitness of

the participant. Exercise refers to the planned activities, normally done during the course of any training or for the purpose of fitness of the body. Kylasov & Gavrov (2011) have elaborated the term exercise as physical exertion carried on for the maintenance and improvement of physical fitness, health and wellness. Physical activity refers to the structured and unstructured bodily movement performed during everyday life. The proactive role of exercise in terms of promoting positive health has been universal. Inactive and sedentary life style leads towards deterioration of the quality of health and shortening of the overall life span. WHO Report (2011) highlights vitality of the active life claiming that globally, 6% of the total deaths occur on account of physical inactivity which makes around 32 lack deaths a year and out of these deaths, about 670000 deaths are premature. Active lifestyle markedly increases the span of life expectancy of both genders.

Available literature has widely endorsed this linkage and it is well established phenomenon. The life full of action has got very positive and long lasting impact upon quality and longevity of life. The fit and healthier is the person the higher is the life expectancy. Samitz, et al. (2011) as well as Warburton, et al. (2010) have reported a mean reduction of mortality of 31% to 35% in persons who participate in regular leisure-time or daily life physical activity compared to that in inactive persons.

Research has documented the relationship between participation in exercise and improved life expectancy. Gremeaux, et al. (2012) have concluded their review studies which firmly endorse the relationship between exercise, increased life expectancy and better quality of life.

The duration and intensity of physical activity do vary in terms of its impact upon quality of health and longevity of life however its

overall output is positive and encouraging. Lee and Skerrett (2001) and Warburton, et al. (2006) claim that physical exertion of moderate intensity is positively associated with good health and increased life expectancy. Wen, et al. (2011) have concluded that individuals who participated in the low intensity physical activities had 14% reduced risk of all-cause mortality and 3-years longer life expectancy compared to the group of inactive individuals. People with inactive and sedentary lifestyle behaviour remain prone to a number of fatal ailments and shorter life span. Lee and Skerrett (2001) have documented that engagement in physical activities help prevent the chronic diseases and premature death. There is around 20% to 35% lower risk of death among active and fit ones compared to the people with sedentary lifestyle (Warburton et al., 2006 and Samitz et al., 2011). Bulk of evidence is available that establishes linkage between active practical life and increased life expectancy. *Increased amount of life expectancy in physically active compared to inactive persons ranged between 0.43 and 4.21 years* (Fraser and Shavlik, 2001, Jonker et al., 2006, Menotti et al., 2006, Byberg, Melhus & Gedeberg, 2009, Nusselder et al., 2008, 2009;).

Engagement in physical activities yields health benefits and enhancing life expectancy irrespective the age or body composition of the participants. Moore, et al. (2012) have

concluded that the role of physical activity is significant during adulthood in perspectives of longevity regardless of the weight category of the subjects, normal weight, overweight, or obese. However there are some other aspects of one's life like genetics, social status & healthy behaviour which also play predominant role in the increase of life expectancy but the role of physical engagement cannot be ignored (Perls & Terry, 2003). Similarly Wen, et al. (2011) have found that taking part in exercise for 15

minutes on daily bases reduces the risk of all causes mortality up to 14% and they further maintain that additional 15 minutes of exercising further reduces this risk up to 04%.

4. Diet and Life Expectancy

Quality, availability and use of right kind of food are also the determinants in perspectives of the attainment of quality of health and life expectancy. Body weight and Body Mass Index (BMI) are the most common indicators that not only reflect lifestyle and nutritional status of the individual but they are also associated with the span of mortality and life expectancy. Loss of the body weight has two way impact with reference to mortality. If loss of the body weight occurs as a result of prolonged starvation and malnutrition, it will increase the mortality rate but if weight loss occurs in the process of the management of the excess body weight, it may reduce the mortality (Casper, 1995). According to the common understanding with reference to the BMI and mortality, they have got very close relationship, when BMI increases, mortality will increase and vice versa. Most studies have found a U-shaped relationship between BMI and mortality (Tsukamoto and Sano, 1990, Cornoni-Huntley et al., 1991, Casper, 1995,).

The type and combination of different nutrients contained in the food determine usefulness or otherwise of the food for the user. For example, excessive caloric intake is accumulated in the body and stored in the form of fats which makes the person overweight or, in severe cases, obese posing real threat to the quality of health and longevity of life. Abdus and Rangazas (2011) have concluded that an intake of 3500 kcal in addition to body's normal requirement results in one pound of fats deposit in the body. Besides excessive intake of fats, high protein intake has

reportedly been associated with increased risk of mortality (Nilsson, 2012; Noto, Goto, Tsujimoto, & Noda, 2013; and Levine, 2014). Similarly, Wang, et al. (2014) have found that use of fruit and vegetable was associated with reduced risk of mortality. Khaw, et al. (2008) examining impact of the healthy life style including active daily routine, avoidance of smoking and proper use of fruit and vegetables, have found that 14 years of difference in life expectancy was noted among the people who remained stuck to these behaviours and those who remained indifferent in this regard.

5. Smoking and Life Expectancy

Smoking is injurious to health as it harms nearly every organ of the body and significantly reduces both quality as well as expectancy of life. Smoking causes a number of cardio-respiratory problems including lung cancer, respiratory and heart diseases as well as lip, mouth, throat, bladder, kidney, stomach, liver cancer. A Report of the Surgeon General (2014) has revealed that in USA smoking takes the death toll of 480,000 people annually which exceeds the number of deaths caused jointly by AIDS, alcohol, road accidents, illegal drugs and suicide. The report further reveals that annually one of every five deaths is associated with smoking (Morbidity and Mortality Weekly Report 2013). Smoking has got very negative and

devastating effects particularly upon respiratory functioning and it has been the most common cause of mortality associated with lungs cancer in both genders. In light of the Surgeon General Report (2014) smoking causes 87% of the lungs cancer related deaths; 90% and 80% in male and female respectively. McGinnis and Foege (1993) have concluded that smoking and sedentary lifestyle have been the most dominant causes of death in the American population. Similarly, Thun, et al. (1995); Paffenbarger, et al. (1993) and Paffenbarger, et al. (1986) claim that people who do not smoke and follow active life style, have

greater life expectancy. With reference to life expectancy, literature shows that smoking has got very negative impact upon expectancy and longevity of life. Disagreement exists among the researcher about the intensity of the impact of smoking upon life expectancy. For example, Jha, et al. (2013) have concluded that on average, smoking lessens about 10 years of the life expectancy of the smokers. Ozasa, et al. (2008) conducted a study upon Japanese populations and found that smoking reduced the life expectancy by about 4 years in both men and women.

The role of adherence to the healthy life style and avoidance of smoking is more important than exercise and nutrition with reference to lessening the risk of mortality. Ahmed, et al. (2013) have documented that avoiding smoking lengthens life expectancy significantly. Mamun, et al. (2004) found that non-smokers cardiovascular patients have got eight years of life expectancy in excess compared to the smokers.

Ill effects of smoking have not been confined only to the smokers, it do has alike negative effects for the passive smokers, though they do not smoke but remain in the company of the smokers for a longer period of time.

Indirect or passive smoking is also reported to have been associated with health problems as well as premature mortality. According to the US Surgeon General Report (2006), "Exposure to passive smoking can also cause disease, disability and even death". WHO Facts-sheet (2015) claims that globally, smoking causes about six million deaths annually. In view of the present growing trends towards smoking, it is expected that by the expiry of the current century, smoking will have caused one billion deaths (Jha, 2012).

6. Obesity and Life Expectancy

Globally, the problem of obesity has been in the shape of epidemics which has been at its climax now. The second half of the previous century is regarded as the period of its outbreak when pro-obesity global situation provided favouring environment to the promotion of obesity (Egger & Swinburn1997). At present, in global perspectives, obesity has become one of the greatest health's threats and premature deaths among the masses. Maintenance of the healthy weight has now become global health concern as it affects health, longevity and life expectancy. Obesity is the major risk factor causing chronic diseases which is the leading cause of premature deaths in the world. World Health Organisation, (1998). Banegas, et al. (2003) and Kelly, et al. (2009) have concluded that around 9% of the global deaths were considered to be associated with obesity. The long term and alternate impact of the obesity is directly associated with the life expectancy. It causes a number of fatal diseases that alternately leads towards premature death. In light of the report of the Department of Health and Children (2005), *58% of type 2 diabetes, 21% of heart disease and between 8% and 42% of certain cancers are believed to be attributable to obesity.*

The extract of more than hundred studies confirms that higher mortality rate exists among the obese people (Flegal, Graubard, Williamson, & Gail 2005, Flegal, Kit, Orpana, & Graubard 2013). Similarly, Peeters, et al. (2003) have concluded that in comparison to the people with normal body weight, obese people have got about seven years reduced life expectancy.

7. Conclusion

After evaluation of the existing body of knowledge it is concluded that, in addition to a few other factors, the role of participation in exercises, diet, smoking and obesity is decisive in determining the quality of health & life and life expectancy. Proper medical care, better living conditions, better socio-

economic conditions, participation in community activities are also associated with the good health and better life expectancy. Considerable work has already been done focusing upon the relationship between lifestyle and longevity. Healthy lifestyle behaviour includes use of proper diet, avoiding smoking, healthy habits and active daily routine of life (Huijbregts et al., 1997; Osler & Schroll, 1997; and Bath & Morgan, 1998). As a matter of common observation, people following healthy lifestyle have better quality of life as compared to the ones following unhygienic and sedentary lifestyle. Healthy lifestyle contributes in enhancing life expectancy by years (Manuel DG, Schultz 2001).

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