

Perspectives of longevity among Kurichia tribe (Indian Hunter-Gatherers)

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Abstract

Introduction: To study the Perspectives of longevity among Kurichia Tribe (Indian hunter-gatherers), Kerala, India.

Materials and Methods: Kurichian Tribe, Descriptive and Case study analysis.

Results: The full zodiac life cycle provided though Indian scriptures defines more than hundred years for a human individual, but it is not so evidenced completely. Consequently, it is important to note that, all the nearest kith and kin of centenarians of Kurichia tribe (Indian hunter-gatherers) of Kerala State, successfully lead their life more than 100 years among whom these tribal are free from specific disease during their life eventhough they look weak and fragile. They have active life and sometimes they are accustomed to walk for a longer distance in their earlier times. But the only draw back noticed is poor visión. At present, the older generations are very much worried about the younger generation wherein translating themselves to the modernization of acculturation which may affect the good health of their community. Atleast one member in a family lived more than 95 years either in three generation which appeared as a heredity of longevity. The ratio of women is more than the men. The centenarians are living alone with out their spouses and no one is under poor economic status. Majority of them had domestic relationships. The findings of the present study revealed the culture and the nature of some parameters were culture-specific determining factors of longevity.

Conclusion: All variables played a relatively interactive, in the continued biological process and psychological health for longevity.

Keywords: Socio-cultural, Nutrition, Longevity, Centenarians.

Introduction

Earlier studies in recent years explains the health and healthy needs of the aged population in the World have received increased attention by the medical profession, social workers, politicians and the general public. It is a subject of much controversy, particularly as regards the mode of financing medical care. The health of the aged population includes more than medical care, as most physicians recognize; that is, health may be broadly defined to include mental and social as well as physical well-being. In these terms, it is pertinent to call attention to a considerable body of research literature concerning the sociocultural aspects of aging.¹

Aging, from the view of sociocultural perspective is defined to be the value system of society and not by physical deterioration or by time. A person is sociologically old when he is so regarded and treated by the members of his society and when he defines himself as being in this category. Sociological interest in aging focuses upon the cultural value system that defines changes in status and role and upon the meaning of these changes to the aged themselves and to the members of their groups. Sociologists are concerned with the conditions under which self-conceptions change over time for varying groups. As such, their studies are complementary to the biological investigation of the aging process. Further, sociologists are interested in the problems of personal and social adjustment associated with this process.¹

One of the big gaps in our knowledge concerns the health needs of older people. With the population over age 65, increasing rapidly and the length of life beyond 65 increasing, we should know more about the health status of this population, as well as its behavior with respect to health. In at least one study concerned with the health needs of older adults it was found that these people defined health in terms of being active. That is, activity per se allows older persons to satisfy their need for independence and thus to live up to society's requirements. The members of this particular group often considered themselves well, despite ailments, as long as they were able to meet the requirements of everyday living.² Preventive medical care in the form of visiting a physician for routine medical examinations is not widely practiced by the older population. Studies in Baltimore, in Hunterdon County, New Jersey, and in Pittsburgh show that persons over age 65 are the most reluctant to take advantage of voluntary health examinations.^{2,3} This practice seems particularly inappropriate for an age group prone to those diseases which have a slow and relatively inconspicuous onset. Here is an area of research in which the social sciences may contribute to ways to get elderly persons to make fuller use of existing health facilities and services.^{2,3} But, at present Cho et al., (2012) found the oldest-old (age 80 and older) were supposed to satisfy with meaning of successful longevity/ageing which depends on the criteria focussing on psychological emotions like health, economic status

and happiness.⁴ Significance of self-rated functioning as opposed to objective measures of health and functioning revealed in some other studies.^{5,6}

Hence, the higher percentage of the aged population (absolute number and proportion) is faster, is a difficult challenge to the Medical Health systems. A progressive increase of life expectancy it should be calculated as the healthy increased longevity life without any morbidity or disability as these are high among the aged population. Eventhough among the Asian Community is observed a transition in the morbidity particularly among Indian ethnicity, a surprise to observe Kurichia tribe (hunter-gatherers) of Kerala, enjoying a long period of healthy longevity (without any age-related chronic problems), in the state of drastic change of life style due to the interaction of Industrialization.

This tribal population (Kurichia) a hunter-gatherer live in Wayanad plateau, inhabiting the trijunction of Kerala, Karnataka and Tamilnadu are unique tribal community in South India. They practice matriliney who live in enormous joint and follow a commune type of family organisation. About 12% of them are Elderly compared with their general population which almost closer to that of many developed countries. This size is compared significantly the elderly population (7.5%) of Kerala state and to the national level (6.5%) of India. Centenarians are frequent among them. The aim of the present study is to focus on ethnic or intracultural perception of this centenarians and the mentioned ethnographic account of Kurichia tribe (Indian hunter-gatherers) may throw light towards Perspective of longevity among them.⁷

Socio-cultural and Economic Aspects: The Kurichian are habituated to live in enormous joint families, called as *Mittom* or *Tharavadu* who are noted for matrilineage giving benefits to leadership and its succession, heredity of the property, management of the family and family name (head of the lineage is called as *Karanavan*). This *Karanavan* will act as an example even after his retirement for the other successors. Usually they have a Medicinal man called *Pittan* who will also participate in doing the other social rituals & functions. They live besides their cultivated lands. The distance from one settlement to another may be 8 km. The joint family system and the lineage has been threatened indirectly due to the social changes around them living near to the urban culture and evolved nuclear families gradually and the adaptation of the patrilineage. The *Karanavan* mentions other senior person or eligible individual to implement the orders, in his absence. The *Karavanan* is titled for collective ownership rights, plays central role in economy generation and distribution to all without any bias.

One Kitchen and the consumption of food in one place is practiced among their joint families. Very rare to note an individual family living separately in a distance with their own kitchen but involved in the

control of *Karanavan*. Women and even widows received utmost respect due to the matrilineage system.

The relationship with strangers or other communities will be maintained in distance by the leader of the *Tharavadu* (cluster), presuming that, they will be contaminated due to their encounter. If such thing happens, women folk particularly bath immediately. Women during their menstrual period, are kept in a separate hut for a week and not even allowing children and husband to touch. The older family lady (Muthachi) is known to enjoy all facilities and privileges. Elderly Indian hunter-gatherers Kurichia tribe is known for their sense of equality, within their community any kind including sexual abuse and gender discrimination is not noticed in. However, this tribe is in transition from traditional culture with the influence of neighbour communities due to modernization and the younger people are in stress to leave the original tradition and imitate the rapid socio-culture of modern surrounding groups.

Diet and health: The older generation of Kurichia Tribe usually live between 85-101 years or more celebrating a healthy life. During the period of research, it was surprised to not that, the older generation of this tribe are observed to be much more active than the healthy youngsters. The common longevity and total health of Kurichia tribe always depends on the consumption of foods like finger millet (raagi: is an annual herbaceous plant widely grown as a cereal crop in) and wild hunted meat as their staple foods linked with regular intake of tubers and Green leafy vegetables from their cultivated land. Usually, they walk miles everyday which provides essential physical exercise and observed that, they are not prone to overweight and obesity.⁷ One of the case study Mr. Chandran with an age of 102 years expressed that, in his life time he never bought food items from the general and available stores except salt and never boarded a vehicle with a fear that, he may be polluted by touching the non-Kurichias. And also he opined that, his father and grandparents lived happier than him. The changes due to modernization and urbanization are going to be powerful to destroy our community. He is highly ethno-centric and is very much unhappy to notice that the youngsters do not want to consume forest products which are the hidden secret of culture (due to the imitation of external culture) and losing their health and secret of their health and longevity. And worried as the indigenous knowledge system will be buried with him.

But due to the prohibition imposed by the Forest Department, the hunting for meat in the forest was reduced. The decrease of Paddy cultivation and increased attitude towards commercial crops resulted in the scarcity of Brown rice, Green leaves, tubers. Respondents were habituated to use chemical fertilizers and pesticides in the place of natural. Sadness started among the older men with this change as the younger people are in happiness. The older generation expressed that, their father and grandparents lived more happier

than them. This transition will eradicate their community. He expressed that, "I am very unhappy to notice that the younger generation youngsters do not want to consume forest products which are the hidden culture and losing their health and secret of our health and longevity". Also opined that, the indigenous knowledge system will be buried with the older generation.

Working Environment: Kurichias possess strong physique. Though they are agriculturists, they are fond of hunting though it is banned. The work environment of Kurichias is located in the midst of two hills. Both men and women and grown up children participate in various tasks of cultivation. They usually walk for many miles every day which provides essential exercise. The work load is distributed among them as per the advice of headman.

Ecology: The Ecology of this tribe has many factors like pleasant climate and very good rainfall to lead as many centenarians. Kurichia tribe ecology has an excellent factor to have centenarians as with a pleasant climate and good rainfall. But the older generation are expressing that, the percentage of rainfall is gradually decreasing due to the deforestation and the climatical changes, environment affecting the health and traditions are due to intruders. The land ownership is collective, facilitating them to lead an unstressful economic life. But the younger generation are in transition after modern life resulting slowly in economic insecurity among them.

As mentioned before, the elderly hunter-gatherers Kurichia tribe is closer to that of many developed countries. Here are the few studies to understand their centenarian life-styles.

Case 1

A centenarian called Mr. Raman aged 102 years hails from Taravad of Tatchaerakolli living with her own daughter and her children with a joint family of 46. He has two sisters and three brothers, except his immediate sister who died at the age of 93. Raman has been blessed with 5 sons and 3 daughters. He was not enabled to walk but expresses any complaint about his health but haunts for vision. When he was young, he was engaged himself in various agricultural activities. He always like to have food produced from his own fields. He always denies to encourage smoking and alcoholism but he enjoys to chew betel leaves and nut powder. He is having a habit of having bath and praying god after returning from his cultivation work. And he expresses that, the longevity he obtained from his food habits and traditional style. He explains that, he got the methods of using medicinal plants is due to the knowledge given by his elders. Further, he informed that, he used more forest treasure which he utilised for the well-being of his tribal people but, he is worried very much that, the present youth are not focussing on the knowledge of the traditional treasure of the forest because of their attraction towards the modern medicine. And he worried that, "no one is

there to transmit my knowledge of this utilisation of forest treasure after his death.

Case 2

From the Olancherry Taravad, Mrs. Ammani (105 years), a widow whose husband died at the age of 103 years. She was living with her Elder daughter and her children. She hails from a joint family consisting of 16 members. She has accompanied with 5 sisters and 2 brothers but they all died at 90's due to the advancement of age but without any specific illhealth. She was blessed with 4 sons and 3 daughters. She lost the capacity of walking and standing but have poor vision. She is happy with her present condition and surviving by recollecting memories about her family members and by playing with the children. The family members feels that, Ammani is a good asset to the younger generation because she reveals many things about their ancestors, their might and valor in historicity and purity in relation to other communities. Since during her childhood, she has been involved herself in different agricultural activities and taking care of the family. Her preference is always to consume the food derived from the forests and from her own cultivated lands. She is still fond of / consume her own indigenous food eventhough her digestion power is low. Chewing betel leaf and nut powder is the regular habit of her. She never went outside of her territory and don't have any awareness of the world. Once, she was requested to give a pose for photograph and by crying she expressed, that was the first time for a pose to photograph and felt sad that, this pollutes her and makes her longevity to decrease. In collecting the data, information on her age at menarche was raised and immediately she felt very shy with a smile. She confirms that, she is in good health except she couldn't walk and poor vision. Also revealed that, her mother and the other family members were more in good health than her at the time of their centenarians. After giving birth to 8 children also, she worked continuously in her cultivated lands until her 80s. She confirms that, only the indigenous food and the culture alone contributed for their long and healthy life believing that, consuming *Cassia Tora*, *Brown rice*, *finger millet* (raagi) and *wild meat* along with other products of forests are the only secrets of their longevity. The stress-free life she continues is acquired by the respect shown by the family members.

Case 3

Mr. N. C. Chandran (102 years) from Makkachira Taravad (Joint family) of Tirunelly Panchayat of Wayanad is one of the four generation consisting of sixty members. It is known that Mr. Chandan's ancestors also had shown such a lengthy healthy longevity. Mr. Chandan is the elder followed by ten siblings (4 brothers and 6 sisters) living as a joint family. In the Karichal Taravad, the only man with more than 100 years. He feels secure that, he don't have any disease and by his siblings. To say exactly that, he don't have the awareness

of the diseases and never go to the Doctors help. The cultural work & the habits of food are entirely varied compared to the present Young generation. He always depends for the food from his own cultivated land and forest. He never used to make a journey with the fear of contaminating himself by touching the other non-tribal. He was worried about the Young generation that, they are attracted by the external culture losing their health by having addiction towards bad habits like smoking and drinking (alcohol). This man never smoked and drunk in his life time. But he is habituated to consume betelnuts and betel leaves. He is not very much ambitious hence he does not have stress. He is walking with the help of a stick.

Case 4

Another centenarian belonging to Arikeri Taravad is Mrs. Ammani belongs who is a widow. She lost her husband at the age of 92. Her Elder son and her children are taking care of her. She is living in a joint family of thirty two person where her 3 daughters 4 sons are living. One of the son studied Medicine. 3 Elder sisters and 3 Elder sisters had accompanied since her birth. But unfortunately, her 2 elder brothers and 1 sister expired who completed their 100 years of life. She cannot walk or stand with poor vision. But, she expressed that, she is not having any specific complaints about her health. Due to the advancement of age, her siblings had died but did not express that, they died with any particular disease. She also depends on the food grown from her own cultivated land and from the forest derived plants and habituated to chew betel nuts and betel leaves. After the interview, her son's wife took her to bath her to remove the pollution of interview with us. She thinks that, her disability may be due to the acculturation occurring in her community and worried about the future generations.

Determinants of longevity

An analysis methods: The present piece of work has been carried out basing on the existing literature on Golden ager (>100 years) and on the Indian Hunter-gatherers (Kurichias).⁸⁻¹² Hence, this enabled us to select most relevant parameters which leads to lengthy Healthy longevity like Socio-demographic, Pedigree, Family history, Incapacity, Diet and Nutrition, Stressfulness and coping strategies, Personality, Communication, Perception, Life Style and Community support System and family relations. All the ages, gender and economic levels were interviewed informally. Our team visited their families frequently to know all the socio-demographic aspects and cultural – traditional situations along with their food and health, social security and about the Global changes particularly socio-cultural perspectives of the longevity. The Golden agers were traced from the electoral rolls, compared with the electoral rolls and acquired the information from them and their related families.

Analysis: Living 100 years is a rare in the modernized world but, it is significant to note that, a tribe like Kurichia who are hunters and gatherers are becoming success to have their life beyond 100 years. It is noticed that, they did not face to suffer for any particular disease during their life. Eventhough they look weak and fragile, they are found to be in good health. Usually they have an active life walking for longer distances in younger ages but only problem is that they are only suffering with poor vision and some old people are unable to walk. They are healthy mentally but, they expressed their stressfulness about their future generations who are not having confidence on their tradition and culture affecting the health, due to Modernization or to say exactly about the imposition of other cultures into them which affects their entire tribal community negatively. But, with regard to family and social relations, they have little bit happens that, the youngest did not give respect to the elders.

It was observed from their daily intake of food that, all the centenarians were non-vegetarians. Usually, they contact their own tribal medicinal man in case of any health ailment and never go to an allopathic doctor. Alcoholism and smoking are strictly prohibited among them but used to chew betel leaves and nuts. They maintain hygiene regarding their surroundings and the methods of food preparation to maintain their healthy life. In each family it was noted that, many people lived for at least 95 years and found to be a hereditary character of lengthy longevity among them. Higher percentage of women were observed than men along with many widowed persons. No one among them was said to be poor economically and they maintain very cordial relationships among them. Any deaths observed may be due to mainly of their routine work (may be felling from the trees, snake bites, accidents in the water and hunting or by any natural calamities). But, any degenerative diseases (problems of heart, cancer, problems due to obesity and diabetes mellitus) are uncommon among them.¹³

Consumption of Food: A common food habits was observed between this hunter-gatherers (Kurichia) and the other hunter-gatherers,¹⁴⁻¹⁶ like leafy vegetables, vegetables, fruits, tubers, whole grains, nuts, chicken, meat, fish and forest derived products like honey. Usually, these Kurichias are fond of consuming fresh meat which is hunted by them. But due to the prohibition of hunting by the Government, consumption of meat has been suddenly reduced. 3 day dietary information has been collected using a pretested Schedule by a nutritionist getting the information from a period of a month.

Green leaves like *Alternanthera sessilis*, *Clorodendron*, *Cassia tora*, *nymphaea nouchali*, vegetable like hydrocotyle, and roots like *Ceropegia* and *elaecarus*.^{7,17} The food they consume are rich in Omega-3 fatty acids, rich in antioxidants, essential amino acids, minerals, soluble fiber and low in saturated

fatty acids. The ancient classical scripture Rajasik diet is followed by the tribal people.

Humans usually supposed to be appearing in an environment of rich in nutrition which is against towards our selected genomic constitution. But, since a century onwards, all the dietary habits has been changed consuming the diet leading to many health problems. Generally, carbohydrates which is refined intake has been increased, and a decrease of complex carbohydrates, essential amino acids, minerals, vitamins and antioxidants. The present 21st century marked a reduce in the intake of Omega fatty acids, rich in antioxidants, proteins and minerals vis-a-versa gradual increase in the consumption of carbohydrates (mainly refined), saturated and trans fat and salt was evidenced compared to Paleolithic period.¹⁸⁻²⁰ The dietary changes with sedentary behaviour, stress, pollution, tobacco chewing and the consumption of alcohol had led to a change in the human genome originating to many degenerative diseases. The Paleolithic protective diet ie., Mediterranean, Indo-Mediterranean, Japanese including DASH diet was evidenced in the earlier studies.²¹⁻²³ The traditional concepts of nutrition particularly Rajasic diet and the intracultural perception of centenarians among the Indian hunter-gatherers foods consumed by Indian hunter-gatherers also support the consumption of natural foods similar to these diets.²³ The beneficial effective diets had clearly explained that disease CVD including coronary heart disease reduced risks of type 2 diabetes mellitus and whole grains against various types of cancer.

In continuation, the present research explains that, predictive variables leading to lengthy longevity across cultures were almost similar, as the some of the factors are traditional-specific (cultural). The biological and mental health was but-for-causation for longevity, various factors showed inter-relative, functioning and effective role towards the lengthy healthy Longevity. . It is important to conduct research and observe the neighbour tribals of Kurichia, also all other tribal groups of India, to make a comparative study towards their healthy longevity.

It is to be noted that, the present research findings expressed that the factors determined for longevity since generations were equal, eventhough the manner of different variables were specific culture. The biological and psychological health was supporting for their longevity while the different variables in total played a interrelative, determining and dynamic role in the process of longevity. Therefore, it is relevant to continue research among other neighbor tribal groups of this tribe Kurichia and other tribal populations of whole India, to have a comparative knowledge about these tribes to explore the other secrets of their longevity.

Acknowledgements

The first and the last authors are verymuch thankful to the Director, Tribal Development Office,

Mananthavady, Waynad district, Kerala and their Social Workers for their extensive help and co-operation in collecting the data from the Kurichian Tribe. Also, we thank the leader of the tribal group and the tribal people (Kurichia) for thier involvment/voluntary participation in providing the exact data in making success of this Project.

References

1. Leo G. Reeder. Sociocultural Aspects of Aging Medical Points of View, VOL. 96. NO. 4 * APRIL 1962, California Medicine
2. Decicco L and Apple D: Health needs and opinions of older adults, Public Health Reports, 73:479-87, June 1958.
3. Commission on Chronic Illness: Chronic Illness in a Large City, Harvard University Press, 1957;208-16.
4. Cho J, Martin P, Poon LW. The older they are, the less successful they become? Findings from the georgia centenarian study. J Aging Res. 2012;2012:695854.10.1155/2012/695854 [PubMed: 22900178]
5. Pruchno RA, Wilson-Genderson M, Cartwright F. A two-factor model of successful aging. J Gerontol B Psychol Sci Soc Sci. 2010; 65(6):671-679.10.1093/geronb/gbq051 [PubMed: 20624759] Rowe JW, Kahn RL. Human aging: usual and successful. Science. 1987;237(4811):143-9. [PubMed: 3299702]
6. Vahia IV, Thompson WK, Depp CA, Allison M, Jeste DV. Developing a dimensional model for successful cognitive and emotional aging. Int Psychogeriatr. 2011;1-9.10.1017/S1041610211002055 [PubMed: 20550746]
7. Reddy KK, Rao AP, and Reddy TP. Serum vitamins E, A and lipid peroxidation levels in Kurichias, an Indian tribal population. Indian J. Biochem. Biophys., 1999;36:44-50. PMID: 10549160
8. Kinzel T, Wekstein D and Kirkpatrick C. A social and clinical evaluation of centenarians. Exp. Aging. Res., 1986;12:173-6. PMID:3830238
9. Poon LW, Clayton GW, Martin P, Johnson MA and Courtenay BC et al. The Georgia Centenarian Study. New York; Baywood Publishing Co, 1992;34:1-17.
10. Macigilian FB, Campana C, Ettore F, and Capponi E et al., Health status in Italian centenarians. Proceedings of the 15th International Congress of Gerontology, (ICG' 93), Budapest, Hungary, 1993:78.
11. Kumar V. Aging: Indian Perspective and Global Scenario. 1st Edn., Institute of Medical Sciences, New Delhi, India, 1996:474.
12. Abikusno N. Sociocultural aspects of the aged: A case study in Indonesia. Asia. Pacific. J. Clin. Nutr., 2002;11:S348-50. DOI: 10.1046/j.1440-6047.11.s1.1.x
13. Singh RB, Reddy KK, Fedacko J, Meester FD and Wilczynska A. et al., Ancient Concepts of Nutrition and the Diet in Hunter-gatherers. Open. Nutr. J., 2011*;4:130-5.
14. Loomis WF. Skin-Pigment Regulation of Vitamin-D Biosynthesis in Man. Sci., 1967:157:501-6. DOI: 10.1126/science.157.3788.501
15. Lee RB. What Hunters do for a Living: A Comparative Study. In: Man the Hunter, Lee, R.B. and I. Devore, (Eds.). Transaction Publishers, New York, ISBN-10:020233032X, 1968;41-8.
16. Singh RB, Moshiri M, DeMeester F, Juneja L and Muthusamy V. The evolution of low w-6/w- 3 ratio dietary pattern and risk of cardiovascular disease and diabetes mellitus. Nova Science Publishers, 2011.

17. Reddy KK, Reddy TPK, Reddy BK, Papa Rao A and Singh RB. A socio-cultural perspective of centenarians in a tribal community of South India. *Res. And. Dev. J.*, 2006;12:30-6.
18. Eaton SB, Eaton SB, Sinclair AJ, Cordain L. and Mann NJ. Dietary intake of long-chain polyunsaturated fatty acids during the paleolithic. *World Rev. Nutr. Diet.*, 1998;83:12-23. PMID: 9648501
19. Meester FD. Wild-Type Land Based Foods in Health Promotion and Disease Prevention: The LDL-CC:HDL-CC model. In: *Wild-Type Food in Health Promotion and Disease Prevention: The Columbus Concept*, Meester, F.D. and R.R. Watson, (Eds.). Humana Press, ISBN-10:1588296687, 2007.
20. Eaton SB. Evolution and Cholesterol. In: *A Balanced Omega-6/Omega-3 Fatty Acid Ratio, Cholesterol and Coronary Heart Disease*, Simopoulos, A.P. and F.D. Meester, (Eds.). Karger Publishers, New York, ISBN-10: 3805592248, 2009:46-54.
21. Fung TT, Chiuve SE, McCullough ML, Rexrode KM and Logroscino G. et al., Adherence to a DASH-style diet and risk of coronary heart disease and stroke in women. *Arch. Int. Med.*, 2008;168:713-20.
22. Katcher HI, Legro RS, Kunselman AR, Gillies PJ and Demers LM. et al., The effects of a whole grain-enriched hypocaloric diet on cardiovascular disease risk factors in men and women with metabolic syndrome. *Am. J. Clin. Nutr.*, 2008;87:79-90.
23. Trichopoulou A, Bamia C. and Trichopoulos D. Anatomy of health effects of Mediterranean diet: Greek EPIC prospective cohort study. Greek epic prospective heart study. *B.M.J.*, 2009;338:1-18. DOI: 10.1136/bmj.b2337