The Impact of Socio-economic Factors and Lifestyle on Chronic Illnesses Among Rural Households in Kerala, India

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Abstract

The growing prevalence of chronic diseases poses a severe threat to the lives of rural people in Kerala. Lifestyle changes among rural households and the Corona-19 pandemic have further accelerated this trend. The objective of this study was to assess the prevalence level of chronic ailments and the socio-economic conditions and lifestyle-allied risk factors contributing to chronic illnesses among rural households in Kerala using cross-sectional data. The result highlights that rural people have an alarmingly high prevalence of chronic disorders (43%), and most of them (70%) suffer from multiple chronic diseases. Lifestyle changes such as the transition from traditional to junk food, unhealthy eating habits, alcoholism, smoking, reduced physical activity, an over-inclination to social media and TV shows, and the Corona-19 pandemic have significantly contributed to this rising trend. Hence, the State Health and Food Safety Departments should collaborate to promote a healthy lifestyle among the people through their awareness campaigns and other effective interventions.

Keywords: Lifestyle changes, chronic illnesses, the Corona-19 pandemic, lifestyle-allied risk factors, rural households.

Introduction

Health is a crucial instrument of social and economic advancement. Healthy people can only contribute to the social, economic, and political development of the nation. Hence, health affects every human action and determines the future of both the individual and the nation. The Human Development Report (1990) stated that people are a country's true wealth, and the primary intent of development is to foster conditions that enable people to lead a long and healthy life. But, economic development is accompanied by a change in lifestyle habits and dietary patterns that encourage people to adopt a sedentary lifestyle and eat unhealthy foods, leading to an increase in chronic diseases (Simon & Vollmer, 2017).The prevalence of chronic ailments among Indians has risen to alarming levels as a result of rapid economic advancement and rising westernisation of lifestyle in recent decades (Pappachan, 2011). Changes in lifestyle deter people from exercising and promote an unhealthy way of life, which can lead to a variety of health problems that can eventually progress into chronic diseases with potentially fatal implications *(*Tabish, 2017*)*.

Kerala could make significant advances in the human development index and health indicators, which are among the best in India and on par with the standards of many advanced countries. Hence, the state is expected to have a lower prevalence rate of morbidity. However, there exists the Kerala Paradox, known as "Low Mortality with High Morbidity Syndrome," which refers to the state's high prevalence of chronic disorders, which lead to high morbidity (Panicker & Soman, 1985; Cheryl, 2015).

Kerala has the highest recorded morbidity rate of 245 per 1000 people, compared to 75 per 1000 people nationwide in 2018 (National Statistical Office [NSO], 2020). The morbidity rate in Kerala was

therefore more than thrice the national average. Kerala has the highest rate of non-communicable diseases [NCDs] among Indian states (Ghosh & Arokiasamy, 2010; Jana & Chattopadhyay, 2022). According to a district-wise analysis of morbidity in Kerala, Kottayam district has the highest prevalence rate in the period 1995–2014 (Paul & Sengupta, 2017; Paul et al., 2020). The rising cases of chronic disorders in Kerala pose a grave threat to the lives of people. The bulk of total mortality among people aged 40 to 60 is caused by chronic illnesses. The excessive morbidity impeded human development and raised concerns about quality and affordability of health care (Centre for Development Studies, 2006). Kerala has both the highest percentage of senior citizens and the highest prevalence of non-communicable diseases in the nation when compared to other states (Revu et al., 2023).

The survey of the literature indicates that the morbidity rate in Kerala is on the rise substantially. The majority of studies concentrated on estimating morbidity levels and patterns using information from the National Sample Survey Organisation's first three rounds of morbidity surveys, which spanned the years 1995–2014. Furthermore, there is a strong link between changing lifestyles, socio-economic factors, and the Corona-19 pandemic and the rate of chronic morbidity in Kerala, but there is no study to look into the impact of these factors on chronic illnesses among rural households in Kerala. In this backdrop, this study seeks to fill this knowledge gap and attempts to assess the prevalence level of chronic ailments and lifestyle-allied risk factors among rural households in Kerala, the state with the greatest literacy rate and the least poverty (NITI Aayog, 2023).

The study attempts to answer the following research questions:
1. What is the prevalence level of chronic illnesses and their patterns among rural households in Kerala?
2. What is the impact of lifestyle changes on chronic illnesses among rural people in Kerala?

The specific objectives of the study are as follows:
1. To estimate the prevalence level of chronic illnesses and their pattern among rural households in Kerala.
2. To identify the lifestyle-allied risk factors and the socio-economic conditions contributing to chronic illnesses among rural people in Kerala.

Methodology

This cross-sectional study was undertaken in Kottayam district of Kerala. Some of the unique characteristics of the study area include a very high literacy rate, a high degree of human development, a higher standard of living, and greater access to health care facilities. A sample survey was conducted in 10 randomly chosen Panchayats in this district and gathered data from 375 respondents through an interview schedule in 2022. The survey collected responses to questions related to socio-economic conditions, lifestyles, and chronic diseases among the respondents. Statistical Package for Social Science version 18.0 was used to analyse the gathered data. Cross-tabulation and Chi-square tests are employed in the analysis of the data. The link between socio-economic, demographic, and lifestyle characteristics with chronic illnesses was verified using Pearson's Chi-square test. By examining the socio-economic conditions and lifestyles of morbid respondents, the study attempts to identify the risk factors that lead to chronic ailments.

Results and discussion

Incidence of chronic diseases

Table 1 reveals that of the total 375 respondents, 162 (43%) were suffering from various chronic ailments. The most prevalent chronic illnesses identified were hypertension, diabetes, respiratory diseases, and heart disease. The reported numbers of cancer and arthritis patients are found to be relatively low, accounting for 6 percent and 3 percent, respectively. A notable finding is that of the 162 reported sick respondents, an overwhelming majority of them (113, 70%) had multiple chronic disorders. Hypertension

and respiratory diseases (23%) are the most common multiple chronic disorders, followed by diabetes and hypertension (17%) and diabetes, hypertension, and respiratory diseases (12%).

The estimated rate of chronic ailments among rural households in Kerala is frighteningly high, and a sizable portion of them suffer from multiple chronic ailments. Kerala had greater rates of lifestyle diseases and hospitalisation than all other states (Paul & Sengupta, 2017; Paul et al., 2020). The chronic illness situation in Kerala has worsened, with one out of every three residents suffering from hypertension and one out of every five suffering from diabetes (Kerala State Planning Board, 2020). But this study finds that due to the Corona-19 pandemic, there has been a substantial rise in the number of reported multiple chronic diseases, as well as an alarming increase in the prevalence of hypertension, diabetes, respiratory diseases, and strokes among rural people in the state.

Table 1: Incidence of chronic diseases

Type of diseases	No. of respondents	
	Frequency	Percentage
Diabetes	7	4
Hypertension	10	6
Respiratory diseases	14	9
Arthritis	4	3
Cancer	10	6
Stroke	4	3
Hypertension & Respiratory diseases	38	23
Hypertension & Diabetes	28	17
Diabetes & hypertension & Respiratory diseases	20	12
Diabetes & hypertension & heart disease	18	11
Hypertension & Stroke	9	6
Total	162	100

Source: Primary data

Incidence of chronic diseases by gender

It is evident from Table 2 that the incidence of chronic illnesses is relatively higher in men (54%) than in women. Men have a greater rate of hypertension, diabetes, respiratory diseases, and strokes, and all the multiple chronic illnesses except hypertension and diabetes. Arthritis, and cancer, are reported to be more prevalent among women. A statistically significant link between gender and chronic illnesses was found by the study, χ^2 (1, $N = 375$) = 24.41, P = 0.001. The result indicates that in rural areas, men are more likely to suffer from chronic illnesses than women. The findings of other studies revealed that women are more affected than men and that chronic diseases are more prevalent in rural regions than urban areas (Suryanarayana, 2012; Kabir et al., 2009). Regardless of the types of morbidities found, the female population in Kerala consistently had higher self-reported morbidity than the male population (Paul & Singh, 2017). The rising incidence of chronic and multiple chronic diseases among men in rural areas is attributed to their unhealthy lifestyle and the impact of the Corona-19 pandemic. According to Patel et al. (2018), sedentary behaviour, poor eating habits, and unhealthy lifestyle choices were all factors in the rising prevalence of chronic illnesses among rural men. When exposed to pollution from industrial and agricultural practises, men were more likely to develop chronic illnesses (Torres et al., 2019).

Table 2: Incidence of chronic diseases by gender

Type of diseases	Gender		
	Male	**Female**	**Total**
Diabetes	3 (43%)	4 (57%)	7 (100%)
Hypertension	6 (60%)	4 (40%)	10 100%)
Respiratory diseases	9 (64%)	5 (36%)	14 (100%)
Arthritis	1 (25%)	3 (75%)	4 (100%)
Cancer	3 (30%)	7 (70%)	10 (100%)
Stroke	3 (75%)	1 (25%)	4 (100%)
Hypertension & Respiratory diseases	20 (53%)	18 (47%)	38 (100%)
Hypertension & Diabetes	13 (46%)	15 (54%)	28 (100%)
Diabetes & hypertension & Respiratory diseases	11 (55%)	9 (45%)	20 (100%)
Diabetes & hypertension & heart disease	11 (61%)	7 (39%)	18 (100%)
Hypertension & Stroke	7 (78%)	2 (22%)	9 (100%)
Total	87 (54%)	75 (46%)	162 (100%)

Source: Primary data

Incidence of chronic diseases by age

As per Table 3, the age group of 60+ (47%) has the highest prevalence of chronic diseases, followed by the age group of 41–59 (30%). Seventy-seven percent of those who reported chronic illnesses were over the age of 40. The most commonly reported chronic ailments among young people up to 30 years of age were hypertension, respiratory diseases, and diabetes, accounting for 8 percent. The link between age and chronic diseases was verified using a chi-square test of independence, and the results demonstrated a statistically significant relationship between the two variables, χ^2 (2, $N = 375$) = 6.94, P = 0.031. The majority of elderly people have two or more ailments, as well as multiple risk factors from their lifestyle (Thankappan et al., 2010; Sarma et al., 2019). Four of the five most commonly reported symptoms among the elderly are chronic ailments (Mukherjee & Levesque, 2012). With an increasing percentage of the population turning older, chronic diseases like diabetes and cardiovascular disease are on the rise quickly (Simon & Vollmer, 2017). During the COVID-19 pandemic, the elderly and those with multiple chronic diseases were at higher risk of infection (Sebastian et al., 2021). Kerala has the biggest proportion of elderly people among the Indian states, which fuels the prevalence rate of chronic illnesses in the state. Kerala's morbidity pattern has changed, owing primarily to population ageing as a result of decreased birth rates and youth migration to other nations (Krishnasami, 2004). The incidence of chronic diseases is generally low in the younger age groups in rural areas. However, it is also worth noting that the incidence of hypertension and respiratory diseases is reported in the lower age groups. Hence, the risk of developing chronic disorders becomes acute over time due to the adverse impact of ageing.

Table 3: Incidence of chronic diseases by age

Type of diseases	Age group				
	Up to 30	31- 40	41- 59	60+	Total
Diabetes	Nil	2 (29%)	2 (29%)	3 (42%)	7 (100%)
Hypertension	2 (20%)	2 (20%)	3 (30%)	3 (30%)	10 100%)
Respiratory diseases	3 (21%)	4 (29%)	3 (21%)	4 (29%)	14 (100%)
Arthritis	Nil	Nil	1 (25%)	3 (75%)	4 (100%)
Cancer	Nil	1 (10%)	3 (30%)	6 (60%)	10 (100%)
Stroke	Nil	Nil	2 (50%)	2 (50%)	4 (100%)
Hypertension & Respiratory diseases	6 (16%)	8 (21%)	10 (26%)	14 (37%)	38 (100%)
Hypertension & Diabetes	2 (7%)	3 (11%)	9 (32%)	14 (50%)	28 (100%)
Diabetes & hypertension & Respiratory diseases	Nil	2 (10%)	7 (35%)	11 (55%)	20 (100%)
Diabetes & hypertension & heart disease	Nil	2 (11%)	6 (33%)	10 (56%)	18 (100%)
Hypertension & Stroke	Nil	Nil	3 (33%)	6 (67%)	9 (100%)
Total	13 (8%)	24 (15%)	49 (30%)	76 (47%)	162 (100%)

Source: Primary data

Incidence of chronic diseases by education and occupation

The incidence of chronic diseases is higher among the respondents with a Plus Two or above level of education (52%). The relationship between education level and the prevalence of chronic illness was investigated using a chi-square test of independence, which was shown to be statistically significant, χ^2 (3, $N = 375$) = 15.40, P = 0.002. The result reveals that the risk of developing chronic illnesses is greater among people with a higher level of education in rural areas. The prevalence of chronic disorders rises as one's educational status improves (Dilip, 2002; Krishnaswami, 2004). The evidence from the many other studies indicates that there is an inverse link between the attainment of a better education and the incidence of chronic disorders. In cross-sectional studies carried out by Johnson et al. (2021) and Smith et al. (2022), it was revealed that respondents with a higher level of education had a lower incidence of chronic ailments than those with a lower level of education.

Table 4 shows that housewives (28%) have the highest rate of chronic diseases, followed by farmers (25%), and private sector and government employees (24%). Hypertension, diabetes, respiratory diseases, arthritis, and cancer are the chronic diseases that are common among housewives. Students are also at risk of developing chronic illnesses, accounting for 5 percent of all chronic disorders reported. The most prevalent chronic diseases among students are hypertension, respiratory diseases, and diabetes. The association between type of occupation and chronic diseases is statistically significant, χ^2 (7, $N = 375$) = 67.00, P = 0.001.The incidence of chronic illness in rural areas is highest among housewives, retired farmers, private and government employees, and pensioners, due to their physical idleness and lack of regular exercise. The rising incidence of chronic diseases among homemakers in rural areas is attributed to

their physical inactivity and lack of regular exercise. Furthermore, in the past, rural women performed all household activities manually, such as grinding, washing, fetching water and firewood, and so on, but now all such tasks are primarily performed with the aid of modern household appliances. Women also used to assist their husbands or parents with farm work, but it is rarely seen now. All these changes made rural women physically inactive and susceptible to chronic illnesses. The burden of chronic disease in today's society is influenced by the dynamics of changing consumer lifestyles, such as decreased physical activity, and social tension (Wilson, 2010). People who are physically active, such as farm workers and labourers, in rural areas are less susceptible to chronic disorders. The high prevalence of chronic diseases is largely caused by low levels of physical activity and a large proportion of the elderly (Cheryl, 2015). This result suggests that people who follow a sedentary lifestyle and do not exercise on a regular basis in rural areas are more likely to develop chronic diseases.

Table 4: Incidence of chronic diseases by occupation

Occupation	Chronic diseases	
	Frequency	Percentage
House-wives	45	28
Farmers	41	25
Private sector employees	21	13
Government employees	18	11
Pensioners	16	10
Self- employed	8	5
Students	7	4
Labourers	6	4
Total	162	100

Source: Primary data

Incidence of chronic diseases by socio-economic classes

The prevalence of chronic illnesses is said to be relatively high (74%) among respondents in the general category. Members of the backward community are said to have a low incidence of such diseases (11%). There is a statistically significant link between caste and chronic illnesses. People belonging to the general category are more susceptible to chronic diseases than the backward communities in rural areas, χ^2 (2, $N = 375$) = 45.256, P = 0.001. The incidence of chronic ailments is substantially higher among people who fall into the Above Poverty Line (APL) category, accounting for 74 percent of the total reported chronic illnesses. Furthermore, only APL respondents were reported to have multiple chronic diseases. The relationship between economic status and chronic diseases is statistically significant χ^2 (1, $N = 375$) = 20.09, P = 0.001.The incidence of chronic illnesses is found to be very high among rural households belonging to general and affluent socioeconomic classes. The wealthier socio-economic groups had a greater incidence of chronic illnesses than the poorest (Safraj et al., 2012). In rural areas, the incidence of chronic illnesses is lower among people from lower socio-economic strata. The plausible reasons are that most of them are agricultural labourers who toil on the land for their living; they eat poorly; as well as the fact that they are less likely to seek treatment for any illnesses.

Incidence of chronic diseases by dietary patterns and leisure-time activities

As per Table 5, non-vegetarians make up a sizable part of those with chronic illnesses (90%). The vast majority of respondents with chronic illnesses frequently consumed meat, fish, and eggs. There is a statistically significant association between the type of food consumed and the incidence of chronic

diseases, χ^2 (1, $N = 375$) = 17.75, P = 0.001. Chronic illnesses are observed to be more common among those who consume more than three square meals per day (54%). The relationship between the incidence of chronic diseases and the number of times food is consumed is statistically significant, χ^2 (2, $N = 375$) = 14.53, P = 0.001. Bakery items and fast food are consumed by the vast majority of these sick people (96%). The prevalence of chronic illnesses is higher among consumers of soft drinks (46%) than non-users. A statistically significant and strong positive correlation between the intake of bakery items and fast food and the prevalence of chronic diseases was found, χ^2 (1, $N = 375$) = 47.60, P = 0.001.

Table 5: Incidence of chronic diseases by type of food consumed

Type of diseases	Type of food consumed		
	Vegetarian	Non-vegetarian	Total
Diabetes	1 (14%)	6 (86%)	7 (100%)
Hypertension	2 (20%)	8 (80%)	10 (100%)
Respiratory diseases	4 (29%)	10 (71%)	14 (100%)
Arthritis	Nil	4 (100%)	4 (100%)
Cancer	1 (10%)	9 (90%)	10 (100%)
Stroke	Nil	4 (100%)	4 (100%)
Hypertension & Respiratory diseases	4 (11%)	34 (89%)	38 (100%)
Hypertension & Diabetes	2 (7%)	26 (93%)	28 (100%)
Diabetes & hypertension & Respiratory diseases	2 (10%)	18 (80%)	20 (100%)
Diabetes & hypertension & heart disease	1 (6%)	17 (94%)	18 (100%)
Hypertension & Stroke	Nil	9 (100%)	9 (100%)
Total	17 (10%)	145 (90%)	162 (100%)

Source: Primary data

The majority of respondents suffering from chronic diseases (64%) are heavy drinkers, smokers, or both (Table 6). They consumed liquor daily. The bulk of them consumed alcohol in their houses (59%), followed by bars (26%). Regular smokers accounted for 24 percent of those suffering from chronic illnesses. The study confirmed a statistically significant positive relationship between smoking and alcohol consumption and the incidence of chronic illnesses, χ^2 (2, $N = 375$) = 99.77, and 40.99, respectively, P = 0.001. The result shows that regular smokers and drinkers were more prone to chronic diseases in rural areas than non-users.

Table 6: Incidence of chronic diseases by smoking and alcohol consumption

Category	Chronic diseases	
	Frequency	Percentage
Alcohol	65	40
Non-users	58	36
Alcohol & smoking	30	18
Smoking	9	6
Total	162	100

Source: Primary data

Table 7 demonstrates that the vast majority of patients with chronic diseases spent their free time on social media, viewing TV shows and napping (73%), and did not engage in any regular exercise. The majority of them (55%) used their leisure time unproductively by watching TV and using social media for two to four hours. Another significant finding is that only 19 percent of these respondents engaged in some sort of exercise during their free time. There is a statistically significant link between leisure-time activities and the occurrence of chronic diseases among people in rural areas, χ^2 (3, $N = 375$) = 33.11, P = 0.001.

The intake of junk food, a non-vegetarian diet, fast food culture, alcoholism, physical inactivity, a lack of clean water, an unhygienic environment, pollution, etc. contribute to the growing number of chronic illnesses (Omran, 1971; Murray & Chen, 1992; Issac & Sadanandan, 2020). Healthy eating habits lower the chance of developing chronic conditions like diabetes, heart disease, and certain cancers (Schulze et al., 2018). Spending more daily leisure time involving a higher level of physical activity contributes to a lower risk of chronic ailments (Buchholz et al., 2017).

Table 7: Incidence of chronic diseases by leisure activities

Leisure activities	Chronic diseases	
	Frequency	Percentage
Social media, watching T.V. and Sleeping	117	73
Social media, watching T.V. & gardening	18	11
Exercise	15	9
Social media, watching T.V. & exercise	12	7
Total	162	100

Source: Primary data

In rural areas, the family's diet in the past was determined by the parents, or the grandparents, or both, and consisted only of home-cooked food. The majority of the food items were either self-produced or purchased from the neighbourhood markets. Additionally, they never ate junk food. But now, both wealthy and middle-class households, even in rural areas, often dine out, and the children in many homes decide what they eat, which is typically junk food. In teenagers, dietary choices were found to have a substantial association with the prevalence of NCD risk factors (Mathew, 2020). Most rural households now frequently consume meat, fried fish, dried fish, eggs, and processed salty foods. Overeating, defined as consuming more than three square meals per day, is common among the majority of rural households. These types of lifestyle changes also contribute to unhealthy eating habits among rural people, leading to the frequent consumption of non-vegetarian foods, bakery items, soft drinks, and fast food without realising that these foods contain harmful ingredients. The toxic materials contained in these types of foods result in a greater health risk. Furthermore, the State Food Safety Department is not doing a good job of ensuring that food served in restaurants and bakeries is hygienic, safe, and healthy. Moreover, Kerala is a consumer state. Almost all of the products on the markets come from other states. There is no reliable mechanism or stringent monitoring system in place to guarantee that these products are of the highest

quality and are safe to use. As a result, when customers buy these hazardous and low-quality products, their health is jeopardized.

In earlier periods, most rural people engaged in some physical labour on their land, and other family members used to help them in farm activities. But as a result of their children attaining better education and getting jobs in the country or abroad, the majority of these rural homes in Kerala have now become economically better off. So, their engagement in physical work has been substantially reduced, and they now spend their free time unproductively on social media and TV shows. The trend of excessive consumption of liquor and smoking is also on the increase in rural areas. The amount of money spent on alcohol consumption shows a rising trend. Both the rich and poor are more prone to the consumption of liquor. The rural youth's proclivity for alcohol consumption is growing, which will exacerbate the situation in the future. Sedentary lifestyles and physical inactivity both add to the burden of chronic disease. Sedentary lifestyles and physical inactivity both add to the burden of chronic disease. Being physically active alone, however, is not sufficient; one must also strive to lead a less sedentary lifestyle for the prevention of chronic disorders (González et al., 2017). Hence, the risk of emerging chronic diseases is greater among those who have sedentary lifestyles, unhealthy eating habits, and also those who consume unsafe foods.

Conclusions

The study highlights that rural people have an alarmingly high prevalence of chronic disorders (43%), and most of them (70%) suffer from multiple chronic diseases. The socio-economic conditions, changing lifestyles of rural people, and the Corona-19 pandemic have had a considerable impact on this development. Lifestyle changes, such as the transition from traditional to junk food, unhealthy eating habits, alcoholism, smoking, low levels of physical activity, over-inclination to social media, and TV shows, along with other related factors such as attaining a higher level of education, the nature of occupation, socio-economic status, the ageing of the population, and gender, have all substantially contributed to this rising trend in rural areas. The large number of cases of multiple chronic diseases reported is a serious problem and a source of concern and challenge for the state's health system. The primary healthcare system in Kerala was not well prepared to prevent NCDs and their management and became more adverse with the advent of the Corona-19 pandemic. The current healthcare system's reactions were marked by insufficient "supply-side" variables (i.e., medicine, equipment, and technology), poor NCD management policies and guidelines, limited resources, uncoordinated local-level leadership, and a dearth of human resources (Kabir et al., 2022).

Moreover, the high prevalence of chronic illnesses has a detrimental effect on the state's economic development. The state government has to spend a huge sum of money to address this health issue, which involves the diversion of funds from development efforts and potentially exacerbating the state's current financial crisis. It also leads to a lower level of economic activity in the state due to the loss of human capital and reduced labour productivity. Hence, the state and local governments should act immediately to arrest this trend so as to attain the potential economic growth and also to maintain the state's top position in health indicators in the country. The State Health and Food Safety Departments should work hand in hand to promote a healthy lifestyle among the rural population through their awareness campaigns and other effective interventions. Health for all will become a reality when all stakeholders are committed to waging a concerted battle against diseases by putting effective strategies and measures into action.

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