A STUDY ON SOCIO-ECONOMIC FACTORS AND COST OF CARDIOVASCULAR DISEASES

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ABSTRACT

CVDs (Cardiovascular Diseases) are the leading causes of death worldwide. They are responsible for 175 million deaths worldwide each year, accounting for 10% of all deaths. Eighty percent of these occur in middle or low-income countries. The key point is that, while CVD mortality is decreasing in developed countries, it is increasing in low- and middle-income countries, with developing countries accounting for approximately 85 percent of all heart deaths. While it is widely acknowledged that CVD is a significant and growing epidemic, less attention has been paid to the fact that this disease is a major cause of significant health disparities between rich and poor people. Evidence of the socioeconomic determinants of CVD, particularly in developing countries, suggests an inverse relationship between socioeconomic status (SES) and CVD mortality. Individuals with lower socioeconomic status have a lower capacity for rehabilitation. Furthermore, socioeconomic factors such as employment and wages influence the rate of death due to the effect on lifestyle risk factors before and after a heart attack. One of the most serious issues in CVDs is socioeconomic inequality. The goal of this study was to look into the distribution and relationship of SES among CVD patients with heart disease in Salem, Tamil Nadu.

Key Words: Cardiovascular Disease, SES, Rehabilitation, Epidemic, Mortality, Risk Factors.

Introduction

CVDs are the world's leading causes of death. Every year, 17.5 million people die in the world, accounting for 10 per cent of the total number of deaths. Of these, 80 per cent occurs in middle or low-middle or low- income countries. The key points are that while the CVD trend in developed countries is down, it is upward in low-and middle-income countries, with around 85 per cent of heart deaths occurring in developing countries. While it is well- recognised that CVD is the key cause of widespread health inequities in health status between the rich and the poor. Evidence of the socio-economic elements of CVD, especially in developing nations, suggests the inverse relationship between the socio- economic statuses (SES) and the frequency of CVD deaths. While cardiovascular risk factors and diseases first appeared in higher SES groups, the risk factors of the disease have increasingly spread to lower SES groups over the last 50 years. Many studies have already shown that cardiac patients with better-prescribed medications compared to lower SES classes. After a heart attack, lower SES classes will face more severe long- term health effects. In almost all western countries, socio- economic inequities have been reported in the prevalence and incidence of CVD deaths.

CVD in World Scenario

CVDs are a leading cause of death worldwide. Combined, CVD resulted in 17.9 million mortality (32.1 per cent) in 2015, up from 12.3 million (25.8 per cent) in 1990. CVD deaths are more common at a given age and have increased in much of the developing world, while they are decreased in most of the developed world since the 1970s. Coronary heart disease and stroke account for 80% of male CVD deaths and 75% of female CVD deaths. The majority of coronary diseases affect older people. In the United States, 11% of persons between the ages of 20 and 40 have CVD, 37% of people between the ages of 40 and 60 have CVD, 71% of people between the ages of 60 and 80 have CVD, and 85% of those over the age of 80 have CVD. In the industrialised world, the average age of death from coronary heart disease is over 80, compared to around 68 in the poor world. Disease incidence occurs seven to ten years earlier in males than in women, affecting low- and middle-income countries more than high-income countries. There is little information on the socioeconomic trends of CVD in low- and middle-income nations, but in high-income countries, low-income and low-educational status are consistently related with a greater incidence of CVD. Strategies that have resulted in increased socioeconomic inequality have been connected to increased socioeconomic disparities in CVD, implying a cause-and-effect relationship. Socioeconomic differences in cardiovascular disease are caused by psychosocial variables, occupational exposures, lifestyle behaviours, and access to and quality of health care. To address inequalities in CVD and noncommunicable illnesses, the Commission on Social Determinants of Health advocated more fair distributions of power, resources, education, housing, environmental conditions, diet, and health care.

CVD in India

CVDs were the leading cause of death in India and worldwide also. This epidemiological shift is primarily attributed to an increase in the prevalence of CVDs and lifestyle factors for CVDs in India. India is a wide and socio-economically diverse society, and there may be proof of all the stages of this transformation in the country. Other striking aspects of CVD epidemiology in India include high death rates, premature CHD, and the burden. Data from RGI have been used to show regional variations in CHD mortality and evidence of epidemiological change. CVD claims the lives of 17.5 million people per year around the world. Of these, 20 percent died in high-income countries, 8 percent in upper middle- income countries, 37 percent in lower middle-income countries, and 35 percent in low- income countries, such as India. Epidemiological data indicate that the health changes are occurring rapidly in low and middle-income countries where CAD (coronary artery disease) is more prevalent among illiterates and those with low socio-economic background.

Background of the study

Socio- economic inequity is one of the big problems of the CVD. The purpose of the study was to investigate the distribution and relationship between selected cardiac risk factors, the type of CVD, and the SES of heart patients. SES is a composite measure of the economic and sociological status of a person. SES has become a strong determinant of wellbeing, as a general rule, rich people tend to be healthier than poorer people. It highlights three main determinants of wellbeing, such as healthcare, exposure to the environment and health behaviour. Some of the criteria of SES as the highest level of education achieved, parent's education, present profession, net income, family income, wealth and other variables are highly influenced by the people's health and healthcare services. The socio-economic determinant is a broad domain with many sub-factors such as socialization, income, and education. However, WHO defines it as "the circumstances under which people are born, grow, live, work, as well as the systems in place to deal with illness and disease". Socio-economic conditions either contribute to or detract from peoples and societies well-being. This factor has been consistently linked to CVD, which has a direct or indirect impact on the CVD burden.

Study Objectives

➢ To examine the socio- economic profile of CVD affected patients in Salem District.

➢ To analysis the association between the socio- economic variables and the cost of CVD treatments.

Methodology

The study draws on primary data that has been collected from CVD affected patients of Salem District in Tamil Nadu. The researcher seeks to investigate the analysis the relationship between the socio-economic factors of CVD patients and its treatment costs. In order to analyse the objectives, the researcher used statistical tools as averages and ANOVA.

Review of Literature

Kaplan &Keil (1993) explained that the associations between income and cardiovascular health are similar to those found for education, with the caveat that many studies show nonlinearity in the relationship between income and cardiovascular outcomes. Monteiro et.al (2001), most previous studies on this issue relied on a single SES indicator, such as an education, income or wealth index. However, studies have found different effects for individual SES indicators. Galobardes (2003) several studies have found that risk factors for CVDs are prevalent in lower SES groups. Galo (2009) Health behaviors may also act as a buffer between a negative social environment and an increased risk of CVD. Social capital factors such as social support and stability are related to health habits and CVD risk and vary across the socio-economic framework. Samuel (2012), examined the multiple regression analysis was used to investigate the relationship between SES indicator and CVD risk factors in rural South Indians. They also stated that higher SES, as measured by household possessions was associated with a more adverse CVD risk factor profile in both rural and urban populations. Using data from the. Majid et. al (2019) mentioned that in lower SES categories, the level of CVD risk factors was higher, so SES can be a good indicator of both CVD risk factors and CVDs. Their SES risk factors and heart disease style research showed that if the sample size of the target group was greater, smoking and valve disease might have a substantial association with each other.

CVD Overview in Tamil Nadu

According to a new study published in the September 2018 issue of the health journal The Lancet, cardiac disease killed more Indians (28 percent) than any other NCD in 2016. According to the study, The Changing Patterns of CVDs and their Risk Factors in the States of India: The Global Burden of Disease Study 1990-2016, deaths from CVDs increased from 1.3 million in 1990 to 2.8 million in 2016, and more than half of the deaths from heart ailments in 2016 were in people under the age of 70. The CVD crude mortality rate in Tamil Nadu is about 360-430/100000, the highest in the country. The maximum incidence of diabetes and heart disease in Indian countries is predicted to occur in 2025 and CVD would be the main cause of mortality. The Department of Health and Family Welfare, Government of Tamil Nadu has a strong agenda for preventing the occurrence of NCDs among the individuals in the State as it believes prevention is better than cure. Tamil Nadu Health System Projects Pilot initiative for addressing the rising incidence of NCDs aimed to create awareness about the diseases, especially CVDs in the first phase and encourage screening and initiative lifestyle changes to prevent future occurrence of the diseases.

Social Profile of CVD

To evaluate the socioeconomic patterns and associated risk factor for cardiovascular disease (CVD) among the Indian population. The link between the CVD and SES is still positive even after 25 years of liberalisation of the Indian economy. Wealthy people

are getting more and more exposed to CVD risk, but the burden of CVD mortality lies with disadvantaged individuals who cannot get expensive medicines and interventions. Healthcare facilities are badly affected by the health of weaker areas of India, expensive out-of-the-pocket expenditures and less favoured regulations. To analyzing the SES and treatment behavior of CVD patients, the researcher has selected the Salem District of Tamil Nadu as the study area.

The social profile of the respondents includes an explanation of religion, the culture, the type of family and their residential area. The Table 1, survey indicates that the majority of respondents (62.1 per cent) are rural and the other 107 (37.9 per cent) are urban. This revealed that the majority of rural people have been affected by heart attacks relative to urban ones.

In Indian society, the religion of any person plays a vital role in fulfilling the functions of an institution. Religion acts as a deciding factor in the way a person lives, defines their social life, his behaviour and their philosophy. The religious composition of groups is therefore an important factor for the study of socio- economic position. As far as religion is concerned, the maximum or more than eight tenths of respondents (80.9 per cent) belong to Hinduism, though few Christians are almost one- tenth (13.5 per cent) and only less than one- tenths of Muslims (5.7 per cent) the other. Social status/ community have a crucial role to play in the socio- economic sense and is also a rigid factor in assessing the status of an individual in society. The social status is divided into four groups like BC, MBC, SC/ST and OC. Out from the total samples, 136 (48.2 per cent) respondents are in the MBC group, preceded by BC, SC/ST and OC are 104 (36.9 per cent), 39 (13.8 per cent) and 3 (1.1 per cent) respectively.

The social status/ community class / marital status has the status of an individual and, in addition to social duty and engagement, it has different responsibilities and obligations. Marital status details implied that more than eight tenths (89.0 per cent) are married, while fewer than one tenth (9.6 per cent) are unmarried and only four respondents are those who are diverse/ separate/widow. Out of a total, nearly 9 tenths, 193 (90.6 per cent) male respondents were married, 16 (7.5 per cent) were unmarried and only 4 are divorced or separated. And in connection with female studies, it was noted that more than eight- tenths (84.1 per cent) of females were married and that less than two- tenths (15.9 per cent) of females were unmarried.

In Indian culture, the family plays an important role and, as a general, traditional families exist in rural areas, but nuclear families are now emerging. The study indicates that most of the respondents live in a nuclear family of more than nine- tenths (95.7 per cent) and few followed, as in the joint family structure (4.3 per cent). Due to growth and economic factors, the common family system has slowly fallen down and nuclear families are now the majority. Moreover, this changing pattern in the family system is one of the key factors for raising the morbidity of CVDs.

Table 1: Social Profile of the Respondents

Details		Male	Female	Overall
Region	Rural	132(62.0)	43 (62.3)	175 (62.1)
	Urban	81 (38.0)	26 (37.7)	107 (37.9)
	Total	213 (75.5)	69 (24.5)	282 (100)
Religion	Hindu	170 (79.8)	58 (84.1)	228(80.9)
	Muslim	14 (6.6)	2 (2.9)	16 (5.7)
	Christian	29 (13.6)	9 (13.0)	38 (13.5)
Community	BC	76 (35.7)	28 (40.6)	104 (36.9)
	MBC	106 (49.8)	30 (43.5)	136 (48.2)
	SC/ST	28 (13.1)	11 (15.9)	39 (13.8)
	OC	3 (1.4)	0	3 (1.1)
Marital Status	Married	193 (90.6)	58 (84.1)	251 (89.0)
	Unmarried	16 (7.5)	11(15.9)	27 (9.6)
	Others	4 (1.9)	0	4 (1.4)
Type of Family	Nuclear	198(94.3)	72 (5.7)	270 (95.7)
	Joint	12 (5.7)	0	12 (4.3)

Source: Computing from the Primary Data

For the purpose of the study, 282 sample CVD patients in Salem City were categorised according to their monthly income attainment. Such households with monthly income less than Rs.5001 have been categorised as poor income groups, those with monthly incomes between Rs. 5001 and Rs. 10000 are low-income groups, Rs.10000 to Rs. 15000 are considered middle income groups, the upper middle-income group is between Rs. 15001 and Rs 20000. Income has been taken into consideration for the purposes of the classification of the sample households, as much of the earnings affect the notice of healthcare services. The

composition of sample households among these income groups is shown in Table 4.3. This table specifically excludes more than half of the respondents from contributing to the low-income group, the middle-income and upper middle-income classes have less than one- fifths of the respondents and the remainder of the groups as middle- income and the impoverished group has less than one- tenths of the respondents.

Table 2: Family Expenditure incurred Per Year

Expenditure Group	Mean Value (Rs.)
Food	25109.93
Education	19209.22
Cloth	6589.01
Medical	15070.92
Festivals & Others	9477.66
House Maintenance	10349.29
Entertainment	6491.14
Personal Habits	5395.39
Others	8007.09
Total Expenditure	105699.6

Source: Computing from the Primary Data

The above table explored that the family expenditure distribution of CVD affected patients. The mean value of all expenditures also presented in the respective table. It indicated that the most of the CVD affected patient's family spent more money for food, education, medical, house maintenance, festivals etc. The food expenses were the top most expenditure (Rs.25109.93) of the family of CVD patients because they were in taking balanced diet/ healthy food which have suitable for CVD patients. In continuation, the education expense (Rs.19209.22) comes in second category because the CVD patients are in middle aged person and their children are studying in schools or colleges, though their expenditure also a heavy burden of the family. Next, the medical expenditure (Rs.15070.92) was also one of another main expenditure variable of the CVD patient's family. The other mean expenditure values were also highlighted in this table.

Table 3: Analysis of Variance for Total Cost of CVD Affected Patients

Classification	Factors of Variables	Total Cost
Age	Below 30	119055.23
	31-50	150039.31
	51-70	127483.73
	71 & Above	143190.0
	F Value: 2.877, Sig. Level: 0.036	
Gender	Male	142402.46
	Female	120544.06
	F Value: 5.343, Sig. Level: 0.022	
Educational Qualification	Illiterate & primary	130542.94
	High School & Secondary	112087.82
	Higher Secondary & above	148669.93
	F Value: 5.186, Sig. Level: 0.006	
Marital Status	Married	137259.78
	Unmarried & others	135389.03
	F Value: 0.020, Sig. Level: 0.887	
Nature of Family	Nuclear	136739.76
	Joint	144127.50

	F Value: 0.132, Sig. Level: 0.717	
Family size	Individual	207168.33
	2-5	135190.27
	6 & Above	109180.38
	F Value: 7.750, Sig. Level: 0.001	
Social Status	BC	138219.13
	MBC	145368.35
	SC/ST & Others	107247.14
	F Value: 5.095, Sig. Level: 0.007	
Residence Area	Rural	132646.14
	Urban	144263.46
	F Value: 1.900, Sig. level: 0.169	
Individual Income	Below 30	122161.63
	10001-15000	110772.97
	15001 & Above	203355.25
	F Value: 48.045, Sig. Level: 0.000	
Family Income	Below 10000	120739.97
	10001-20000	107013.33
	20001 & Above	224637.17
	F Value:85.651, Sig. Level: 0.000	

Source: Computing from the Primary Data

Details on the data generated by the total cost of patients, depending on their age, shows that the mean value tended to be higher for those in 31-50 age groups. A higher active age group of affected CVD patients would be invested both directly and indirectly. The one-way ANOVA result also promoted a degree of significance with $p<0.03$. From the results, the mean total cost of patients in males was far higher than in females. The one-way ANOVA test result also argued that the mean average cost of care across their gender is not very important with a p value of <022. The table indicates that patients who achieved a higher secondary and higher stage spent a high amount with the mean value of medication. The one-way ANOVA test results also argued that the differential mean total cost of care across their educational level was of high significance with a p vale of <0.006. The total cost of the respondents suggests that the mean value was high for those who had married as opposed to another form of marital status. The one-way outcome of the ANOVA test also supported the overall total cost of care over and over. The one- way ANOVA test result also argued that the mean total cost of acre over marital status is not very important with a p value of <0.887.

Conversely, the overall cost of patients, the essence of the relationship, the joint family system has the highest mean value category with Rs.144127.50. In this regard, the findings of the ANOVA tests also turned out to be not important as $p<0.717$. The size of the Family that total cost was high in the individual member group with Rs. 144127.50, which was statistically important. The other category also indicates that, according to the report, the category 6 and above was very poor. Evidence available in the table highlights that, the mean total cost care of affected CVD patients is lower for those in the SC/ST population with mean Rs/ 107247.14, which has steadily increased with mean Rs. 145368.35 in the backward communities. The one- way ANOVA test result also said that these differentials mean overall healthcare expenditure throughout their caste were of high significance with $p<.007$. The birth rate of the patients affected by CVD is enormously high in urban areas spent directly and indirectly compared to rural areas. However, the mean value of $p<0.169$ was not important. The mean total cost of patients was lower for those whose individual income was stated to be marginally less than Rs. 10001- Rs. 15000 with mean Rs. 110772.97, which increased to Rs. 203355.25 with Rs. 150001 and above the level of income. The one-way outcome of the ANOVA test also claimed that these differentials mean total care as their income was highly important at $p<0.05$.

The details presented in the table highlights that the average overall care cost of the affected CVD patients was marginally lower for those with a family monthly income of less than Rs.10001- Rs.20000 as Rs. 1070133.33, which rose to Rs. 120739.97 and Rs.224637.17 of less than Rs.10000 and to more than Rs.20000 family income groups. The one-way ANOVA test result also mentioned that these variations mean overall care costs across their family income with a p value of <0.001.

Conclusion

According to the above analysis, CVD has a significant economic impact on both the individual and their relatives. CVD affects individuals in their mid-life period, affecting the future of the family relying on them, and weakening national growth by depriving them of their most profitable years of employment. The male community, the Hindu faith, and the MBC demographics make up the majority of the total survey respondents. Males are more afflicted by heart disease than females, according to the findings, because males have primary responsibility for the family and are more burdened than females. Almost half of respondents had a monthly salary of Rs. 5001- Rs.10000, with the majority of respondents being of working age. The majority of respondents work in the business/private or unskilled professions, according to occupation information. The majority of them spend their money mostly on food, education, and medical care. Family income and spending are two interconnected components of the simple household economy. The rise in CVD morbidity and death was influenced by socioeconomic factors such as earnings, profession, educational attainment, and so on. In conclusion, if the rising threat of an escalating CVD epidemic is ignored, the consequences for India's economic development are likely to be severe.

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