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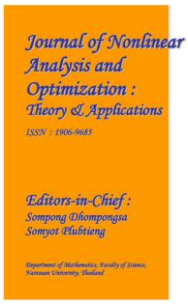

DETERMINANTS OF CONSUMPTION EXPENDITURE ON HEALTH IN URBAN MAHARASHTRA IN MARCH 2019

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Abstract
This study uses the CPHS data published by CMIE and investigates the determinants of consumption expenditure on health among urban residents of Maharashtra, India, in March 2019. Utilising a combination of quantitative data analysis and socio-economic indicators, we aim to elucidate the factors influencing individuals' healthcare spending patterns in this specific geographical and temporal context. Drawing from a sample of urban households in Maharashtra, data was collected on various socio-economic demographics, healthcare utilisation, and expenditure patterns. Through regression analysis and other statistical methods, we analyse the relationship between consumption expenditure on health and factors such as income levels, education, household size, health insurance coverage, and access to healthcare services. Preliminary findings indicate significant associations between consumption expenditure on health and several determinants, including income levels and education. Additionally, we explore the impact of healthcare-seeking behaviour, healthcare infrastructure, and availability of health insurance on healthcare spending patterns. The results of this study have implications for healthcare policy formulation, resource allocation, and the design of interventions aimed at improving access to quality healthcare services in urban Maharashtra. This research contributes to the existing literature by offering insights into the socio-economic and demographic factors shaping healthcare expenditure in urban settings, particularly within the context of Maharashtra. By identifying key determinants of healthcare spending, this study informs evidence-based decision-making and facilitates the development of targeted interventions to enhance healthcare access and affordability for urban residents in Maharashtra and similar regions.

Keywords:
Health expenditure, socio-economic, demography, urban

Introduction
The period of March 2019, just prior to the onset of the COVID-19 pandemic, holds significant importance for studying the determinants of consumption expenditure on health in Urban Maharashtra. This timeframe provides a baseline understanding of healthcare spending patterns and factors influencing expenditure before the pandemic's disruptions.
By isolating pre-existing socio-economic, demographic, and healthcare system factors, researchers can clarify the underlying determinants of spending before the pandemic altered healthcare systems and consumer behaviours.
Understanding expenditure determinants before COVID-19 allows anticipation of potential changes in healthcare spending patterns during and after the pandemic, such as shifts in income levels, employment status, or access to health insurance due to economic impacts.
Insights gained from this pre-pandemic study offer timely guidance for policymakers in preparing and adapting healthcare policies and interventions to address emerging challenges, informing targeted interventions to mitigate pre-existing disparities in healthcare access and affordability.

Additionally, analysing healthcare expenditure determinants pre-COVID-19 provides insights into the healthcare system's resilience to external shocks, aiding strategies for building resilience and preparedness for future health crises.
This research contributes to long-term planning efforts aimed at improving healthcare access, affordability, and quality in urban Maharashtra, identifying systemic challenges and promoting sustainable healthcare delivery models.
Conducting research on healthcare expenditure determinants just before COVID-19 ensures continuity in research efforts, facilitating a comprehensive understanding of healthcare expenditure dynamics in urban Maharashtra and informing policy, planning, and resilience-building efforts in anticipation of future health crises.

Review ofLiterature

While numerous investigations have explored the contrast in healthcare spending between males and females, most have centred on overall average healthcare expenditure, with the exception of Moradhvaj D (2023). In contrast to many of these studies, this particular research focuses into the intra-household differences in health expenditure. It conducts a comprehensive analysis of the variation in average health spending within households, considering various socioeconomic factors such as religion, sector, and income. Moreover, it scrutinises gender-based discrepancies in medical expenses concerning hospitalisation cases over a 365-day period, examining disease-specific statistics and disparities in average expenditure between males and females based on the nature of ailments. Furthermore, the paper endeavours to ascertain the influence of each socioeconomic and demographic factor on the prevailing gender gap in average medical spending.
Numerous investigations have looked into the gender gap concerning healthcare spending, yet few have specifically examined healthcare expenses within households. In their 2014 research, Maharana and Ladusingh analysed the evolving trends of gender-based inequality in healthcare and food spending among elderly individuals in India. Utilising data from the National Sample Survey Organization (NSSO), encompassing the 55th and 64th rounds on household consumption expenditure, the authors uncovered substantial differences in healthcare expenditure between elderly men and women. Their findings indicated consistently higher healthcare expenses for males compared to females across various health-related items such as medication, X-rays, ECG tests, pathology examinations, physician/surgeon fees, hospital and nursing home fees, as well as other medical costs, spanning both time periods examined.
In a research by Ram (2021), probes into the factors affecting healthcare expenditure in Eastern Uttar Pradesh, using secondary data from the NSSO's 75th round on health-related social consumption. The Heckman two-step model analysed healthcare decision-making at the household and individual levels. Key findings highlighted determinants of higher healthcare spending, including household heads aged 31-60 and above 60, households larger than five members, non-Hindu and non-ST categories, urban residency, higher economic status, and usage of private hospitals. Additionally, the education level of the household head and chronic illnesses among members increased expenses. Notably, households with female heads spent less on healthcare. The study also found a significant reliance on private hospitals, escalating healthcare costs and financially impacting vulnerable groups.

Research Methodology

The study focuses on the factors influencing health expenditure in urban areas of Maharashtra during March 2019. The study uses data published in CPHS by the Centre for Monitoring Indian Economy. Study has analysed the data using descriptive tools like Graphs and has inferred based on the regression and chi square analysis.
Studying health expenditures in urban Maharashtra in March 2019 is relevant because it helps understand how socio-economic and demographic factors, as well as income levels, affect people's spending on healthcare. By examining these factors, researchers can gain insights into the healthcare needs and priorities of urban residents in Maharashtra. Here's why it's important: Understanding how socio-economic and demographic factors influence health expenditures can shed light on disparities in healthcare access. It can reveal whether certain groups face barriers to accessing essential healthcare services due to factors like income level or education. Examining how income levels impact health

expenditures can provide insights into the affordability of healthcare services for different socio-economic groups. It can highlight whether lower-income households are disproportionately burdened by healthcare costs and whether this affects their ability to access necessary medical care. Analysing health expenditures can help identify the healthcare needs and priorities of urban residents in Maharashtra. It can reveal where people are allocating their healthcare spending, whether it's on preventive care, chronic disease management, or acute medical treatments. Understanding the relationship between socio-economic factors, income, and health expenditures can inform healthcare policies and interventions. Policymakers can use this information to design targeted healthcare programs that address the specific needs of vulnerable populations and promote equitable access to healthcare services. Overall, examining health expenditures in urban Maharashtra in March 2019 provides valuable insights into the intersection of socio-economic factors, income, and healthcare utilisation. It can help inform efforts to improve healthcare access, affordability, and quality for all residents in the region.

H01: There is no significant association between the consumption expenditure on health of the households on their socio economic factors and income during the study period

H11: There is significant association between the consumption expenditure on health of the households on their socio economic factors and income during the study period

Results and Discussion

To understand the findings, the expected and observed frequency table of the responses are obtained and presented as follows.

Table 1 Age profile of the members of the households surveyed

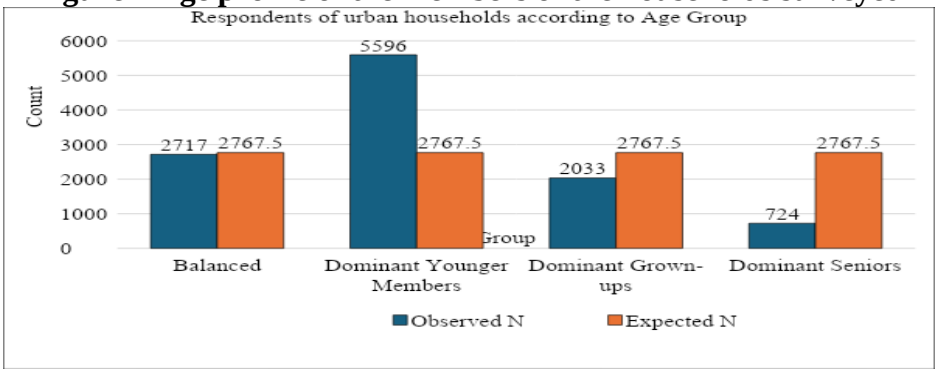
	Observed N	Expected N	Residual
Balanced	2717	2767.5	-50.5
Dominant Younger Members	5596	2767.5	2828.5
Dominant Grown-ups	2033	2767.5	-734.5
Dominant Seniors	724	2767.5	-2043.5
Total	11070		

Source: Analysis based on data collected from CPHS- March 2019

The above table indicates the observed and expected counts of the age groups of the urban households in Maharashtra, as well as the residual values which represent the difference between the observed and expected counts. The observed number of Balanced households is 2717, which is slightly less than the expected number of 2767.5. For the Dominant Younger Members group, the observed number is 5596, which is significantly greater than the expected number of 2767.5. The observed number of Dominant Grown-ups and Dominant Seniors are 2033 and 724 respectively, both of which are less than the expected number of 2767.5.

This concludes that there is a significant difference in the proportion of age groups, with the majority of households being in the Dominant Younger Members group and very few being in the Dominant Seniors group. The above information is represented in a bar chart shown below.

Figure 1 Age profile of the members of the households surveyed



Source: Analysis based on data collected from CPHS- March 2019

H01B: There is no significant difference in the proportion of the gender groups of the urban households in Maharashtra.

H_{11B}: There is a significant difference in the proportion of the gender groups of the urban households in Maharashtra.

To test the above null hypothesis, the non-parametric Chi-square test is applied. The results are as shown in the below table.

Table 2 Gender profile of the members of the households surveyed

	Test Statistics
Chi-Square	2847.845[a]
df	3
p-value	.000

Source: Analysis based on data collected from CPHS- March 2019

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 2767.5.

The above table indicates that the p-value is 0.000. It is less than the standard p-value of 0.05. Therefore, the Chi-square test is rejected. Hence we see that, there is a significant difference in the proportion of the gender groups of the urban households in Maharashtra.

To understand the findings, the expected and observed frequency table of the responses are obtained and presented as follows.

Table 3 Chi Square Test based on the Gender Profile of the households surveyed

	Observed N	Expected N	Residual
Balanced	3955	2767.5	1187.5
Female Dominant	2473	2767.5	-294.5
Male Dominant	4051	2767.5	1283.5
Exclusively Female or Male	591	2767.5	-2176.5
Total	11070		

Source: Analysis based on data collected from CPHS- March 2019

The above table indicates the observed and expected counts of the gender groups of the urban households in Maharashtra, as well as the residual values which represent the difference between the observed and expected counts. The observed number of Balanced households (3955) and Male Dominant households (4051) are greater than the expected number (2767.5). For the Female Dominant group, the observed number (2473) is less than the expected number (2767.5). The observed number of Exclusively Female or Male households (591) is significantly less than the expected number (2767.5).

This concludes that there is a significant difference in the proportion of gender groups, with the majority number of households being either Balanced or Male Dominant, and very few being Exclusively Female or Male. The above information is represented in a bar chart shown below.

H_{01C}: There is no significant difference in the proportion of the occupation groups of the urban households in Maharashtra.

H_{11C}: There is a significant difference in the proportion of occupation groups of the urban households in Maharashtra.

To test the above null hypothesis, the non-parametric Chi-square test is applied. The results are as shown in the below table.

Table 4 Occupation Profile

	OCCUPATION_GROUP
Chi-Square	505.907[a]
df	3
p-value	.000

Source: Analysis based on data collected from CPHS- March 2019

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 2767.5.

The above table indicates that the p-value is 0.000. It is less than the standard p-value of 0.05. Hence we say, there is a significant difference in the proportion of occupation groups of the urban households in Maharashtra.

To understand the findings, the expected and observed frequency table of the responses are obtained and presented as follows.

Table 5 OCCUPATION_GROUP

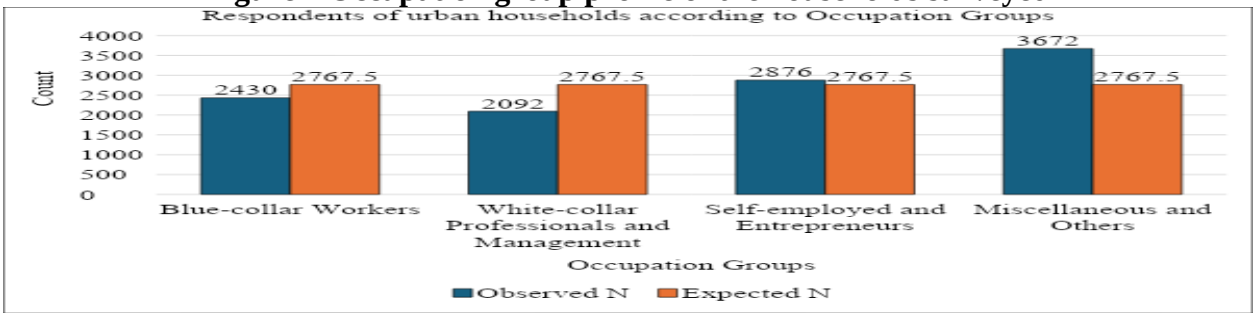
	Observed N	Expected N	Residual
Blue-collar Workers	2430	2767.5	-337.5
White-collar Professionals and Management	2092	2767.5	-675.5
Self-employed and Entrepreneurs	2876	2767.5	108.5
Miscellaneous and Others	3672	2767.5	904.5
Total	11070		

Source: Analysis based on data collected from CPHS- March 2019

The table above indicates the observed and expected counts of the occupation groups of the urban households in Maharashtra, as well as the residual values which represent the difference between the observed and expected counts. The observed number of Blue-collar Workers (2430) and White-collar Professionals and Management (2092) are less than the expected number (2767.5). For the Self-employed and Entrepreneurs group, the observed number (2876) is greater than the expected number (2767.5). The observed number of Miscellaneous and Other households (3672) is significantly greater than the expected number (2767.5).

This concludes that there is a significant difference in the proportion of occupation groups, with the majority of households being either Self-employed and Entrepreneurs or Miscellaneous and Others, and fewer being Blue-collar Workers or White-collar Professionals and Management. The above information is represented in a bar chart shown below.

Figure 2 Occupation group profile of the households surveyed



Source: Analysis based on data collected from CPHS- March 2019

H_{01D}: There is no significant difference in the proportion of the education groups of the urban households in Maharashtra.

H_{11D}: There is a significant difference in the proportion of education groups of the urban households in Maharashtra.

To test the above null hypothesis, the non-parametric Chi-square test is applied. The results are as shown in the below table.

Table 6 Education Profile of the households

	EDU_GROUP
Chi-Square	577.067[a]
df	2
p-value	.000

Source: Analysis based on data collected from CPHS- March 2019

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 3690.0.

The above table indicates that the p-value is 0.000. It is less than the standard p-value of 0.05. Therefore, the Chi-square test is rejected. Hence it is evident that, there is a significant difference in the proportion of education groups of the urban households in Maharashtra.

To understand the findings, the expected and observed frequency table of the responses are obtained and presented as follows.

Table 7 EDU_GROUP

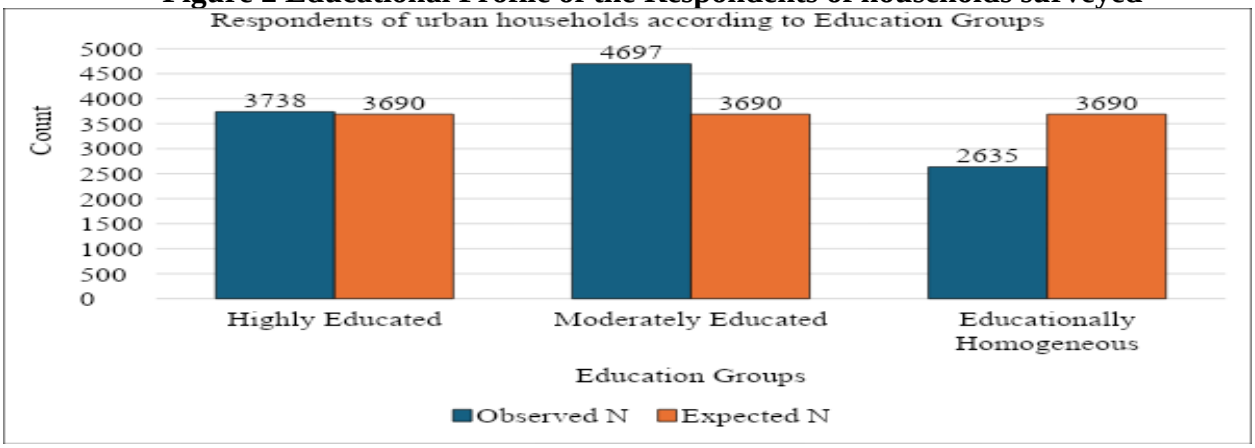
	Observed N	Expected N	Residual
Highly Educated	3738	3690.0	48.0
Moderately Educated	4697	3690.0	1007.0
Educationally Homogeneous	2635	3690.0	-1055.0
Total	11070		

Source: Analysis based on data collected from CPHS- March 2019

The above table indicates the observed and expected counts of the education groups of the urban households in Maharashtra, as well as the residual values which represent the difference between the observed and expected counts. The observed number of Highly Educated households (3738) is slightly greater than the expected number (3690.0). For the Moderately Educated group, the observed number (4697) is significantly greater than the expected number (3690.0). The observed number of Educationally Homogeneous households (2635) is less than the expected number (3690.0).

This concludes that there is a significant difference in the proportion of education groups, with the majority number of households being Moderately Educated, and fewer being Educationally Homogeneous. The above information is represented in a bar chart shown below.

Figure 2 Educational Profile of the Respondents of households surveyed



Source: Analysis based on data collected from CPHS- March 2019

H_{01E}: There is no significant difference in the proportion of the household size of the urban households in Maharashtra.

H_{11E}: There is a significant difference in the proportion of household size of the urban households in Maharashtra.

To test the above null hypothesis, the non-parametric Chi-square test is applied. The results are as shown in the below table.

Table 8 Family Size Profile of the households surveyed

	SIZE_GROUP
Chi-Square	2395.552[a]
df	2
p-value	.000

Source: Analysis based on data collected from CPHS- March 2019

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 3690.0.

The above table indicates that the p-value is 0.000. It is less than the standard p-value of 0.05. Therefore, the Chi-square test is rejected. Hence we infer that is a significant difference in the proportion of household size of the urban households in Maharashtra.

To understand the findings, the expected and observed frequency table of the responses are obtained and presented as follows.

Table 9 Chi Square test for family size

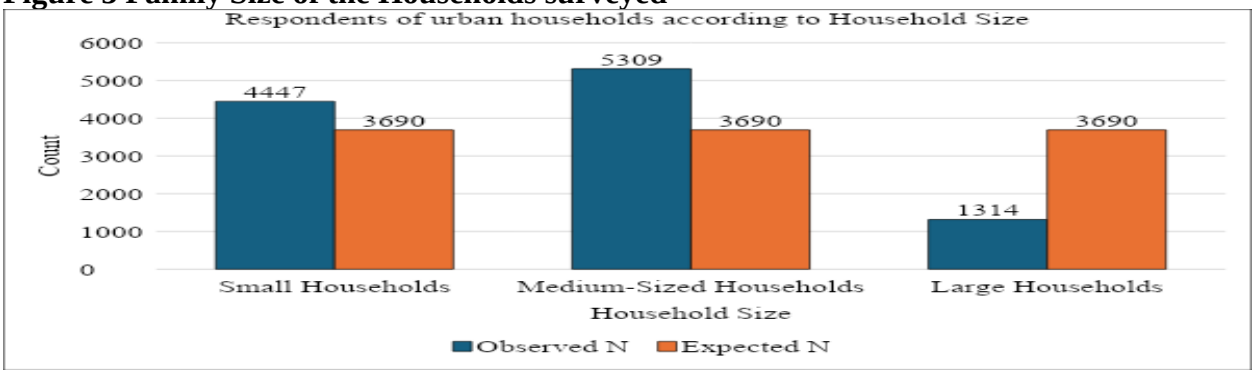
	Observed N	Expected N	Residual
Small Households	4447	3690.0	757.0
Medium-Sized Households	5309	3690.0	1619.0
Large Households	1314	3690.0	-2376.0
Total	11070		

Source: Analysis based on data collected from CPHS- March 2019

The table above indicates the observed and expected counts of the size groups of the urban households in Maharashtra, as well as the residual values which represent the difference between the observed and expected counts. The observed number of Small Households (4447) and Medium-Sized Households (5309) are greater than the expected number (3690.0). The observed number of Large Households (1314) is significantly less than the expected number (3690.0).

This concludes that there is a significant difference in the proportion of size groups, with the majority number of households being Medium-Sized, followed by Small Households, and very few being Large Households. The above information is represented in a bar chart shown below.

Figure 3 Family Size of the Households surveyed



Source: Analysis based on data collected from CPHS- March 2019

Dependent Variable: Adjusted Expenditure Health

Independent Variables: Adjusted Total Income, Age Group, Gender Group, Occupation Group, Education Group, Size Group.

Table 10 Anova

Model	Sum of Squares	df	Mean Square	F	p-value
Regression	1022094207.742	6	170349034.624	102.170	.000
Residual	18445515311.861	11063	1667315.856		
Total	19467609519.605	11069			

Source: Analysis based on data collected from CPHS- March 2019

a. Dependent Variable: M_EXP_HEALTH

b. Predictors: (Constant), SIZE_GROUP, EDU_GROUP, OCCUPATION_GROUP, GENDER_GROUP, AGE_GROUP, ADJ_TOT_INC

The above table indicates the p-value for the regression model is 0.000, which is less than the standard p-value of 0.05. Hence, the linear regression model is applicable.

Table 11 Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.229[a]	.053	.052	1291.246

Source: Analysis based on data collected from CPHS- March 2019

The model indicates moderate positive association (R = 0.229) between the independent variables and the dependent variable. The model explains 05.3% of the variance in the dependent variable (R Squared = 0.053), with Adjusted R Squared of 0.052.

Table 12 Coefficients

Particulars		Unstandardized Coefficients		Standardised Coefficients		
		B	Std. Error	Beta	t	p-value
1	(Constant)	323.024	75.657		4.270	.000
	ADJ_TOT_INC	.009	.000	.205	20.615	.000
	AGE_GROUP	95.011	15.747	.059	6.034	.000
	OCCUPATION_GROUP	-4.980	11.150	-.004	-.447	.655
	EDU_GROUP	-59.529	17.474	-.034	-3.407	.001
	GENDER_GROUP	-23.549	12.897	-.017	-1.826	.068
	SIZE_GROUP	6.333	19.247	.003	.329	.742

Source: Analysis based on data collected from CPHS- March 2019

a. Dependent Variable: M_EXP_HEALTHC

Predictors:(Constant), SIZE_GROUP, EDU_GROUP, OCCUPATION_GROUP, GENDER_GROUP, AGE_GROUP, ADJ_TOT_INC.

In the above results, the p-values for Adjusted Total Income, Age Group, and Education Group are less than the standard p-value of 0.05, which indicates that these variables are significant predictors of Expenditure on Health. However, the p-values for Occupation Group, Gender Group, and Size Group are greater than 0.05, which indicates that these variables are not significant predictors of Expenditure on Health for the urban households

Summary and Conclusion

Adjusted Total Income, Age Group, and Education Group influence the expenditure on health significantly, while Occupation Group, Gender Group, and family size of the households do not have an impact on the health expenditure of the households surveyed in urban Maharashtra in 2019.

This statement suggests that certain factors, specifically Adjusted Total Income, Age Group, and Education Group, significantly influence household expenditure on health in 2019, while others like Occupation Group, Gender Group, and family size do not have a significant impact. Household income plays a significant role in determining health expenditure.

Higher income households may have more financial resources to allocate towards healthcare expenses, such as insurance premiums, medical consultations, and treatments. According to Ram (2021) and Shyamkumar S, et al., (2022), The likelihood of encountering Catastrophic Health Expenditure (CHE) in terms of both occurrence and severity was found to be greater among less affluent households.
Different age groups may have varying healthcare needs and expenditure patterns. For example, older individuals and also the households with children aged 5 and below Ram (2021), Shyamkumar S, et al., (2022), may require more frequent medical care and medication for chronic conditions, leading to higher health expenditures compared to younger age groups.
Education level can impact health expenditure as individuals with higher education levels may have better health literacy and awareness, leading to proactive health-seeking behaviours and investments in preventive healthcare services.
The type of occupation may not directly influence health expenditure, as it is more closely related to income levels. However, certain occupations may offer better health insurance coverage or employer-sponsored healthcare benefits, potentially affecting health expenditure indirectly.
Gender may not have a significant impact on health expenditure, as healthcare needs can vary widely regardless of gender. However, there may be gender-specific health issues or disparities in access to healthcare services that could influence expenditure. A female dominated household, have increased household expenditures, but not much on health, this is in line with the findings of studies conducted by Ram (2021) and Shyamkumar S, et al., (2022).
While family size may affect overall household expenditure, it may not have a direct impact on health expenditure. However, larger families may allocate more resources to healthcare to meet the needs of multiple household members, but this relationship may not be statistically significant. Overall, understanding how these factors influence health expenditure can help policymakers and healthcare providers tailor interventions and services to meet the diverse needs of different demographic groups and socioeconomic backgrounds. Also, according to Shyamkumar S, et al., (2022) to alleviate CHE, it is essential to provide healthcare subsidies to households with elderly individuals and children.

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