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A Cross Sectional Study on The Health-Related Demography of The Scheduled Caste (SC) Population in Selected Areas of Thiruvananthapuram District, Kerala State, India

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Abstract

This study was conducted to know the health statistics of the historically marginalized Scheduled Caste people (SC) in 5 SC predominant village councils of Thiruvananthapuram district. This is an observational, cross-sectional survey study planned after due approval from the institutional ethical committee. The Ayurveda Mobile Health Care Programme (AMHCP) project team of the institute conducted door-to-door household surveys and face to face interviews between April 2022 and March 2023 to collect data. A total of 6047 (2800 males and 3247 females) SC individuals from 1612 households were surveyed through 230 tours. Very few participants of the survey had socioeconomic characteristics like addictions (12.82%), drinking unpurified water (3.42%) or houses with open or no drainages (1.31%). Also, none of them were using open field for toilet purpose (0%). As far as most common reasons for visit to health care centre is concerned, non-communicable diseases were the reason for 86.04% to visit. It has become imperative that diet and lifestyle related-awareness be raised, although Kerala is one of the states with highest literacy rate, as the comparitive proportion of Anaemic and Diabetic population is on a rise. On screening, 8.38% were hypertensive, 53.36% were Anaemic and 27.62% had abnormal blood sugar levels. The data gathered through the current study can provide preliminary data for acquiring insights and can definitely aid in future decision making of our nation. The study recommends the expansion of health care facilities to the residents of most remote locations of Kerala.

Keywords: *Observational Study, Kerala, Scheduled Caste, Thiruvananthapuram, Cross Sectional Study*

IEC number: 9–19/2020/RARILSD/Tvpm/Tech./IEC/109 dated 30.04.2022

INTRODUCTION

Background

The Scheduled Castes (SCs) are officially designated groups of people and one among the most disadvantaged socio-economic groups in India (National Human Rights Commission, 2021). Broader cultural issues like caste, gender, poverty, educational attainment, and socioeconomic status have an impact

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on health inequities. Article 46 of Indian Constitution, which required particular protection and measures for SC development (Ministry of Social Justice & Empowerment, 2019), specifically acknowledged the necessity and implemented Scheduled Caste Sub Plan (SCSP) in April, 2006 (Ministry of tribal affairs, 2014).

The SC population in Kerala state constitutes 9.10% of the whole population, according to the 2011 population census. Majority of SC population share sporadic housing with other individuals. As far as Thiruvananthapuram district is concerned, 12.27% of SC population of Kerala state reside there, which is about 10% of the its whole population. The most economically poor communities belonging to SC are the Vedar, Chakkaliar, Nayadi, Vettuvan and Kalladi (Ministry of Home affairs, 2021).

With regard to Kerala, progressive governmental policies and historical peculiarities have helped the state's population health indices to outperform those of the rest of India despite having moderate income levels (Ministry of Home affairs, 2021). Because of its achievements and progress in the field of health, Kerala state in India is often quoted as a model. The life expectancy at 60 years of age is 17.9 and 21.9 for males and females, respectively (2014-2018). The maternal mortality ratio has significantly declined from 81 to 43 per 1,00,000 live births. Ever since the inception of National Health Mission (NHM) in 2005, the State has shown a significant decline in Infant Mortality rate (IMR) from 14 (2005) to 6 (2019), which is exceptionally lower than the national average of 30. As far as NCD's are concerned, it is reported that as high as 54.8% of all deaths are premature in the State, while disability or morbidity accounts for 45.2%. Ischemic heart disease,Chronic Obstructive Pulmonary Disease (COPD), Diabetes type 2, other musculoskeletal are the major causes of DALYs (disability-adjusted life years) in the State (National Health Mission, 2021).

Published studies on health-related demography of SC population in selected areas of Thiruvananthapuram district of Kerala so far are not available with sufficient details, except that some aspects are covered in census data and district health survey data, and so the article explores the same.

Objectives

The primary objectives of the study were documentation of health status, socio-demographic status, health seeking trends.

METHODOLOGY

Study Design: This is an observational, cross-sectional survey study planned after due approval from the institutional ethical committee (IEC clearance number: F. No. 9:9–19/2020/RARILSD/Tvpm/Tech./IEC/109 dated 30.04.2022)

Study setting: AMHCP team conducted surveys at five villages/areas namely, Poovachal, Nettayam, Kanjiramkulam, Perumkadavila and Uzhamalakkal having majority of SC population of Thiruvananthapuram district as per the census 2011 (Fig 1) (Department of economics and statistics, 2023).

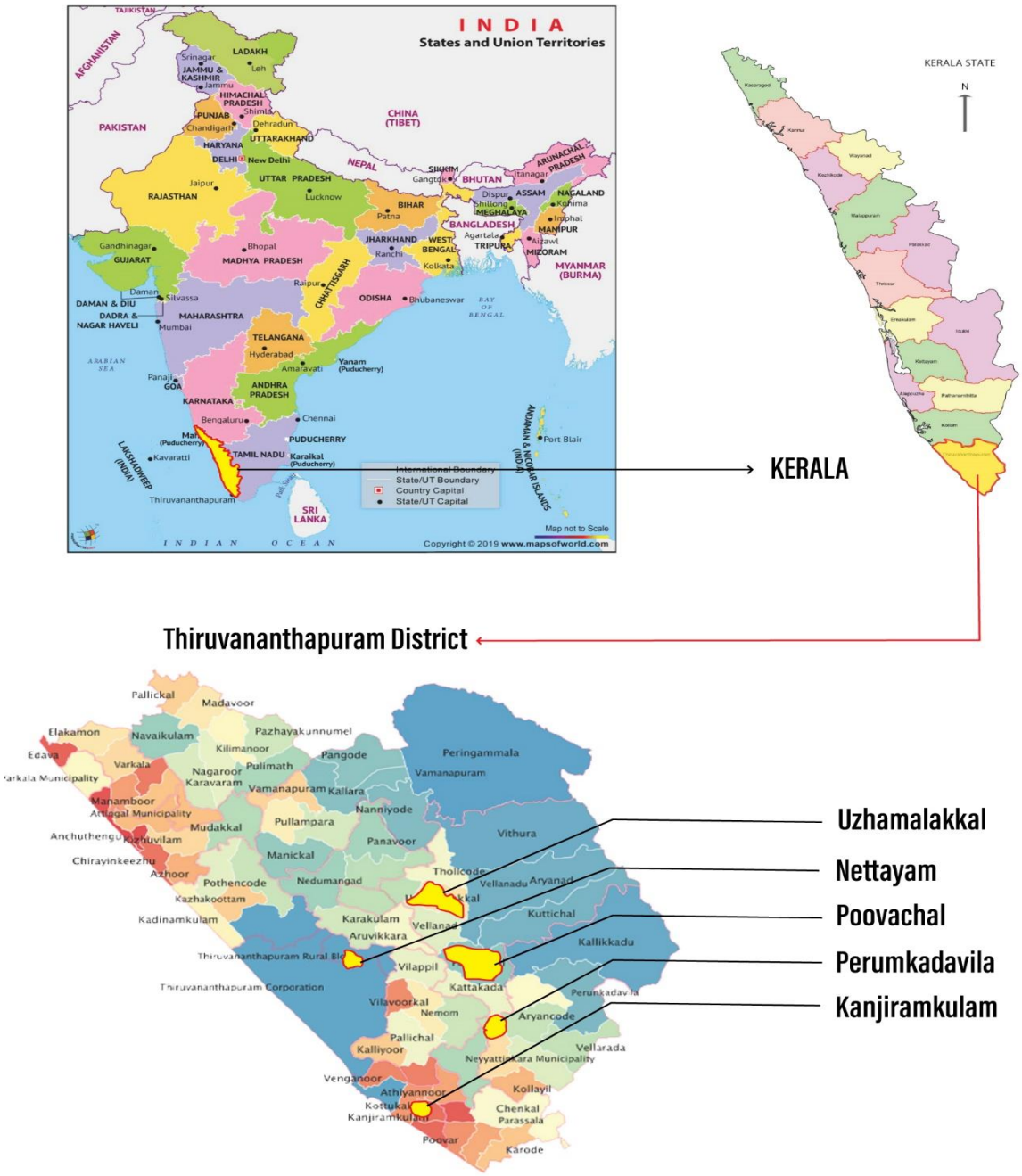


Fig 1: Map of India, Kerala and Thiruvananthapuram district showing the surveyed areas

Areas having majority of SC population of Thiruvananthapuram district as per the census 2011 were selected for the study. The study's selection of the area in the vicinity of the institute took into account the viability of making daily up-and-down trips to these settlements. Before the study started, the village council officials were made aware of the project and its execution strategy and was conducted between April 2022 and March

2023. Participants were recruited in the study through convenience sampling. Informed verbal consent of the participants was taken. As per the census reports, SC communities residing in these villages belong to Sambavar, Cheramar, Vedar, SC Nadar, Pulayar Thandan, Mannan, Paravan, Kuruva and Vannan. [4] Prevalent diseases in the area during last year as per the records of local authorities' records include Hypertension, Diabetes, Arthritis, skin diseases.

Participants: 6047 SC members (2800 males and 3247 females) from 1612 households of selected areas of Poovachal, Kanjiramkulam, Perumkadavila and Uzhamalakkal village councils and Nettayam ward of Thiruvananthapuram district, Kerala were surveyed.

Study Tools: Structured Questionnaire

Variables

i. Information about each Village/ Area:

ii. House information:

Caste, Religion, Kuppuswamy Socioeconomic status, Type of House, No. of family members, ventilation and availability of clean drinking water, source of drinking water supply, toilet facilities, drainage facility, most common reasons for visit to health care centre, number of children, women and elderly per household, frequency of visit to health care centre in one month for any person residing in a household, expenditure incurred to tackle health issues per month

iii. General & Health Related Information of each person above 18 years:

Name, sex, age, marital status, Mean age at first marriage, education, Occupation, addiction, History of chronic disease, Immune Status, Menstrual history of women, Preference for Ayurveda for health issue

Quantitative variables: No. of family members, women and elderly per household, frequency of visit to health care centre in one month for any person residing in a household, expenditure incurred to tackle health issues per month, age, Mean age at first marriage, age, Blood Pressure, Hb levels, Blood sugar levels

Data sources/Measurement

For a year, selected villages were visited weekly to conduct population surveys, which were done using standardised forms to capture sociodemographic and health information. A dedicated project team was engaged for this purpose. For the purpose of raising awareness among the residents about the team's impending visit, the village officials were notified two days in advance. To gather information from the population, the study team went to SC houses in the designated villages. For the same, face to face interviews were performed using structured questionnaires regarding all variables. Oral informed consent was obtained from the participants. Screening of anemia, Diabetes mellitus, Hypertension were also specifically done only to those who were willing for it. Quantitative variables like blood pressure were measured using Sphygmomanometer. Measurement of sitting Blood pressure was done using Omron. Automatic glucometer Accuchek was used to record capillary Random Bood Sugar level. Capillary Haemoglobin levels were recorded using Automatic Haemoglobinometer Quick chek plus. Project staff were trained and followed up to ensure accuracy and quality of measurements.

Bias: Selection bias was avoided by confirming the caste of the study participants with Ration cards issued by Government of India. Adequate training was given to survey staff regarding flawless and unbiased documentation of data. As convenient sampling was done, chances of sampling bias is also there.

Study size: 6047.

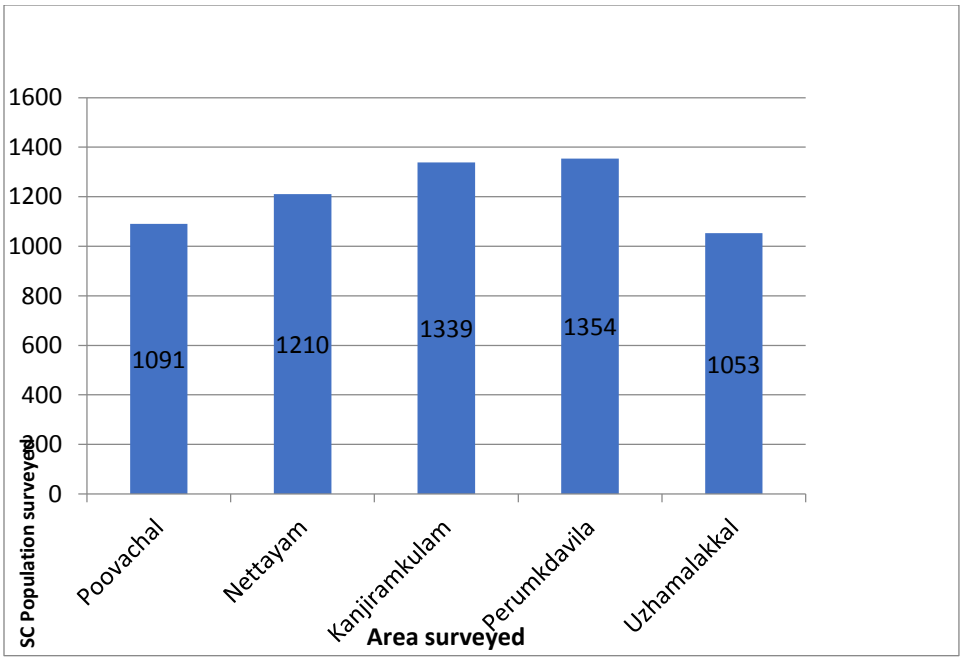
Research oriented public health programme is executed by CCRAS in SC dominant areas. Under this programme, health care services are being provided at their door steps along with creating awareness about health, nutrition and hygiene. As a part of this programme, 6047 population was selected for survey to know the health related socio demography.

Statistical methods: Being an observational study, the quantitative data were presented as numbers and percentages.

Ethical considerations: Ethical approval was obtained from institutional ethical committee. To protect participant rights and confidentiality, name and address of the surveyed participants are not disclosed in the article. Informed consent was obtained from the participants.

OBSERVATIONS AND RESULTS

The data of 1612 households and sociodemographic data of 6047 SC population,which includes 2800 males and 3247 females (Graph No. 1) were collected through door-to-door surveys and personal interviews.



Graph No. 1: Total Population Surveyed in 5 areas

Status of basic house facilities in the selected five villages: Regarding distribution of caste, Perumkadavila village council had highest number of houses with SC population compared to other places. Most participants were Hindus. On assessing the socioeconomic status of the participants as per Kuppuswamy Socio-economic status (Wani, R.T., 2019), majority of them belonged to upper lower class. As far as type of house is concerned, the greatest number of participants lived in semi pucca houses. Regarding ventilation, more than half of the homes surveyed had adequate facility. Almost all households had availability of clean drinking water. On assessing the source of drinking water, personal well or borewell or handpump was used by the majority. None of them were using open field for toilet purpose and majority had closed or covered drainages. (Table No. 1)

Table No.1. Distribution as per status of basic house facilities in the selected five villages

Kuppuswamy Socio-economic status	Upper (I)		Upper middle (II)		Lower Middle (III)		Upper Lower (IV)		Lower(V)		Total
	n	%	n	%	n	%	n	%	n	%	
	-	-	3	0.18	107	6.63	1337	82.94	165	10.23	1612

Religion	Hindu		Muslim		Sikh		Christian		Others		Total
	n	%	n	%	n	%	n	%	n	%	
Total	1452	90.07	0	0	0	0	160	9.92	0	0	1612

Type of houses	Kutcha		Semi Pucca		Pucca		Total
	n	%	n	%	n	%	
	150	9.30	854	52.98	608	37.72	1612

Proportion of households with adequate ventilation		Proportion of households with availability of clean drinking water	
n	%	n	%
937	58.12	1557	96.58

Source of drinking water supply Poovachal	Personal Well/Borewell/ Hand pump		Lake/River/Pond		Government pipeline at individual house		Common/communitywater tap		Privatewater supplier (Tanker etc.)		Other		Total
	n	%	n	%	n	%	n	%	n	%	n	%	
	1190	73.82	13	0.81	257	15.94	145	8.8	7	0.43	-	-	1612

Toilet Facility	Inside the house/plot		Public Toilet		Open Field		Other		Total
	n	%	n	%	n	%	n	%	
	1610	99.87	2	0.12	-	-	-	-	1612

Drainage Facility	Closed (Covered)		Open gutters		Indiscriminate disposal in open		Other		Total
	n	%	n	%	n	%	n	%	
	1591	98.69	21	1.06	-	-	-	-	1612

Health seeking trends: As far as most common reasons for visit to health care centre is concerned, non-communicable diseases were the most common reason. (Table No. 2).

Table No. 2. Most common reasons for visit to health care centre

Most Common Reasons													
	Infections		Ante Natal Care		Post Natal Care		Child health		NCDs		Other		Total
	n	%	n	%	n	%	n	%	n	%	n	%	
	38	2.36	2	0.12	23	1.43	117	7.26	1387	86.04	52	3.83	1612

Distribution of population surveyed: Of the 6047 SC population surveyed, majority belonged to 18-40 years of age. (Table No.3). Regarding sex distribution, females were more in number than males.

Table No.3. Distribution according to age

0-5		5-18		18-40		40-60		60 and above		Total
n	%	n	%	n	%	n	%	n	%	
172	2.85	714	11.80	1966	32.51	1720	28.45	1475	24.39	6047

Health related demographic status of SC adult population surveyed:

From the age wise distribution of marital status, there were only very few females who were married below the age of 18 and males who were married below the age of 21. From the age wise and sex wise distribution of Education status, it was observed that the proportion of illiterate people was very low. (Table No.4 and Table No.5).

Table No.4. Age wise distribution of Education status

Villages/areas	Age group	Education level																
		Not applicable (as age <6 years)		Illiterate		Primary (5thclass)		Middle (8th class)		High School (10th class)		Intermediate or diploma		Graduate & above		Other		Total
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Total	<18	209	23.58	51	5.75	213	24.04	160	18.05	176	19.86	55	6.20	22	2.48	0	0	886
	18 & above	22	0.42	166	3.21	662	12.82	829	16.06	1680	32.55	1123	21.75	674	13.05	5	0.09	5161

Table No. 5. Sex wise distribution of Education status

Villages/areas	Sex	Education level																
		Not applicable (as age <6 years)		Illiterate		Primary (5thclass)		Middle (8th class)		High School (10th class)		Intermediate or diploma		Graduate & above		Other		Total
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Total	Male	80	2.85	78	2.78	378	13.5	467	16.67	892	31.85	604	21.57	300	10.71	1	0.04	2800
	Female	151	4.65	139	4.28	497	15.30	522	16.07	963	29.65	575	17.70	396	12.19	4	0.12	3247

Regarding the occupation according to age and sex, the least number were unemployed who were able to work. From the addiction status, majority had no addictions, and most people were addicted to alcohol. The highest percentage of alcohol and smoking addictors were in Kanjiramkulam among the 5 places (Table No.6).

Table No:6. Distribution according to type of addiction

Villages/areas	Tobacco chewing		Tobacco snuffing		Smoking (Bidi/Cigarette/Hukka/ other)		Alcohol		Cannabis derivative		Opium derivative		Other		None	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Total	9	0.14	19	0.31	227	3.75	514	8.50	1	0.01	5	0.08	0	0	5272	87.18

Also, a very small proportion reported that either they already quit their addictions or were willing to quit. Also, very few were already aware of adverse effects of their addiction (Table No.7).

Table No: 7. Details with respect to addiction

Villages/areas	Proportion of participants reporting lifetime history of any type of addiction		Percentage of participants already quit their addictions		Average age of starting of the habit /addiction	Proportion of people (out of Total number participants who reported addiction) willing to quit		Proportion of people (out of Total number participants who reported addiction) who were aware of adverse effects of their addiction	
	n	%	n	%	n	n	%	n	%
Total	574	9.49	38	0.62	29.47	199	3.29	48	0.79

Those with history of chronic disease and those who undergone treatment for it was also very less. As far as the immune status of the population is concerned, a small number of participants in the age group 18 years and above had reduced immune function. (Table No.8).

Table No: 8 Proportion of participants with reduced immune function (i.e.<6 ISQ score)

Age groups	0-5 years		5-<18 years		18 years and above		Total
	n	%	n	%	N	%	
	0	0	0	0	143	100%	143

On assessment of the menstrual cycles among the SC adult females in the age group 18- 50 years, majority were having normal regular painless cycles. (Table No.9).

Table No: 9. Distribution with respect to menstruation

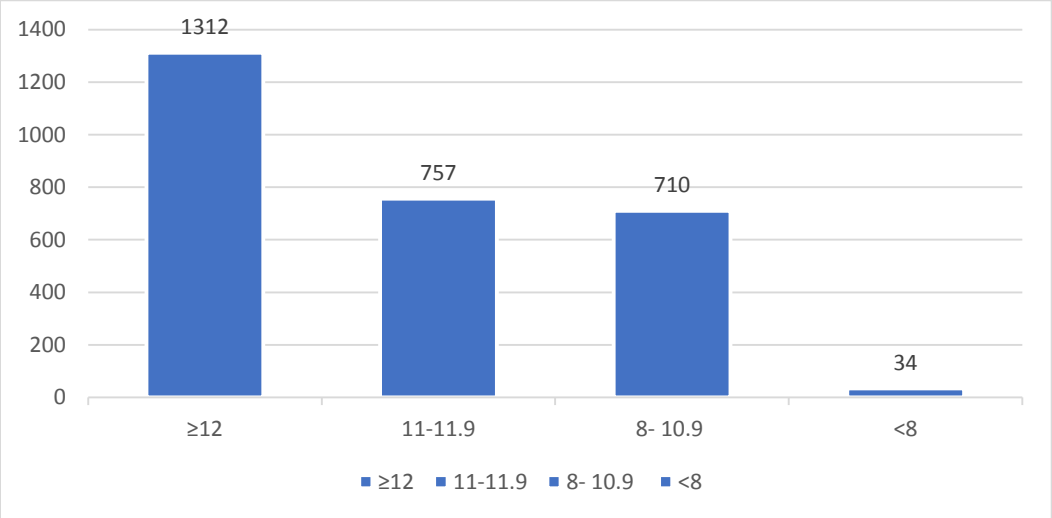
Regular		Irregular		Painful		Scanty		Excess		Normal flow		Menopause		Amenorrhoea due to pregnancy		Amenorrhoea		Menses not started		Other	
n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
902	59.57	90	5.94	81	5.35	8	0.52	85	6.47	711	52.11	237	10.	22	1.38	2	0.13	37	0.13	0	0

Almost all participants were willing to prefer Ayurveda for any health issues. (Table No.10).

Table No: 10 Proportion of participants willing to prefer Ayurveda for any health issues

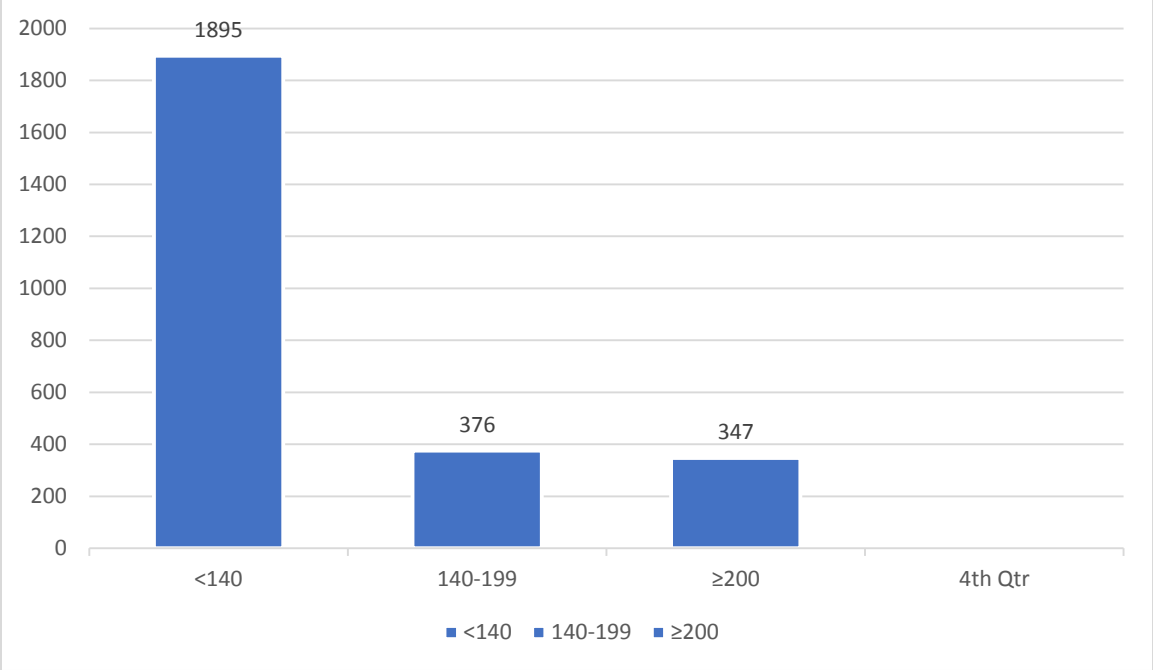
Preference of Ayurveda for any health issues	n	%
	6008	99.36

Among the 2813 participants screened for anaemia, majority of the participants had Haemoglobin (Hb) level ≥12 (World Health Organisation, 2020). (Graph No.2. Hb level (gram%) of surveyed population).



Graph No. 2: Hb level (gram%) of surveyed population

Among the 2618 screened for diabetes, a small proportion of the respondents had high blood sugar levels (Kasper D et al; 2008, pp. 1553) (Graph No.3)



Graph No. 3: RBS level (gram%) of surveyed population

On assessing the Blood pressure about 1671 were screened in total, among which almost half of the participants had normal BP (Kasper D et al; 2008, pp. 2277) (Table No.11).

Table No.11. Area wise and Age wise distribution of Blood pressure level

Age range	Number of Screened Patients		Blood Pressure level													
			<120-<80 (Optimal)		120-129/80-84 (normal)		130-139/85-89 (normal high)		140-159/90-99 (Grade 1 light)		160-179/100-109 (Grade 2 Moderate)		≥180/≥110 (Grade3 Severe)		≥140/<90 (Systolic Hypertension)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Grand Total	1671	100	224	13.40	437	26.15	22	1.31	89	5.33	37	2.21	14	0.84	250	14.96

DISCUSSION

Among the SC population surveyed, majority belonged to Hindu religion. From the socioeconomic status of the respondents as per Kuppuswamy Socio-economic status, majority belonged to upper lower class. Scheduled Castes are the most disadvantaged subgroup in India regarding socioeconomic status next to Scheduled Tribes (STs) as per previous researches also, and the efforts by various institutions should be continued and augmented to uplift them to the maximum extent (Pradhan I., Kandapan B., Pradhan J., 2022). But very few had kutcha houses made of mud, grass, bamboo etc. Moreover, average area of household was also good. Almost all households were having availability of clean drinking water was maximum, the respondents were well aware of its necessity. Although Kerala rural water Supply and Sanitation agency is effectively supplying drinking water to the rural areas surveyed, a major share of population surveyed depended on personal well or borewell. Almost every house had toilet facilities inside the house plots / house and closed drainage facilities unlike many rural areas of North Indian states (Jain, A et al. (2023).

Regarding health care seeking trends, most common reason (86.4%) for visiting health care centres were Non communicable diseases, followed by child health problems. About 41 million (71%) of the 55 million deaths that occurred globally in research done in 2019 were related to NCDs Ramesh, S., Kosalram, K. (2023). So, it is high time to make people aware of the lifestyle changes, including Ayurvedic daily and seasonal re to be adopted for decreasing the disease burden caused by them.

Average number of children (<18 years age) per household was less in the survey compared to national average of 2.03 children per woman. Average number of women ≥18 years age per household and average number of elderly ≥ 60 years age per household was also good. According to the 2011 census, the older adults accounted for 8% of the total population of India. As per one study conducted by various Government medical colleges of Kerala, Kerala has the largest percentage of elderly adults (16.5%) and overall old-age dependence ratio is 19.6% (Thavody, J et al., 2023). Average frequency of visit to health care centre in one month for any person residing in a household was also less, one of its positive aspects is that atleast access to health care is better in the areas (Iles, R.A. (2018). The State was always ahead of the rest of the country in terms of provision of health care to its population. More than 90% of the villages in Kerala had access to a health dispensary and 8 about half of the villages had a health centre within two kilometres and 78% of the villages had access to a hospital within five kilometres from the late 1970s (Sree Chitra Tirunal Institute for Medical Sciences and Technology, 2021). Average expenditure the villages incurred to tackle health issues per month was high in this study.

As far as surveyed population is concerned, females were more compared to males, similar to sex ratio of Kerala which is 1084 for each 1000 male as per 2011 census (Ministry of Home affairs, Govt. of India. 2021). Regarding age, majority of them belonged to the age group 18- 40-year age group and least among was 0-5 years age group. From the age wise distribution of marital status in females, it was found that there were very few females who were married below the age of 18 and males who were married below the age of 21. But this statistic is quite reassuring, as India accounts for 40% of the 60 million child marriages worldwide, according to the National Family Health Survey (Ministry of health and Family welfare, Govt. of India, 2021).

Regarding literacy, for those below 18 years age, the number of illiterates were very less against the national statistics of 25.96%. The statistics was similar regarding the sex wise distribution of Education status, against the national statistics of 17.86% for males and 34.54% for females (Ministry of Tribal affairs, Government of Kerala, 2011). On assessing the education status only minority were illiterate and majority had high school education. Kerala, which has India's highest percentage of literacy, is renowned for its accomplishments in the fields of education and health. As far as the occupation is concerned, lesser proportion of the participants were only unemployed.

Regarding addiction, small percentage of participants reported lifetime history of any type of addiction, while majority of the respondents had no addictions. Most of the participants who had history of addiction were addicted to alcohol and addictions to drugs like Cannabis were comparatively less. Ministry of Social Justice and Empowerment had conducted a survey to know the prevalence of various substance abuse in 2018 and according to it, the prevalence is 14.6% for alcohol, 2.83% for cannabis. A scheme of National Action Plan for Drug Demand Reduction (NAPDDR) UNDER the ministry is working efficiently for addressing this problem with the support of Integrated Rehabilitation Centres for Addicts (lRCAs), Community based peer Led lntervention (CPLI) for early Drug Use Prevention among Adolescents and Outreach and Drop In Centres (ODIC), District De-Addiction Centres (DDACs) and Addiction treatment facilities (ATFs) in Government Hospitals (Ministry of Social Justice & Empowerment, 2022).

History of Chronic disease: - Among the population surveyed, small percent had history of chronic disease, and had been treated for any chronic illnesses. Globally, chronic illnesses now account for the majority of disability-adjusted life years, and throughout the past 20 years, South Asia has seen a quicker rise in morbidity from these conditions than the rest of the world. [28] The prevalence of chronic diseases is a significant public health indicator that is impacted by lifestyle, genetics, environment, healthcare policy, and demographic background. Unhealthy dietary habits, sedentary lifestyle, fast life, psychological factors like depression, decreased physical seem to be the main aetiological factors for the development of many non-communicable diseases.

Among the 2813 participants screened for anaemia, more than half of the respondents were anaemic and it is obviously an alarming proportion. More awareness was given to the people by the team for consuming more green leafy vegetables, milk etc. As per National Family Health Survey (NFHS) 5, the indices of anemia

(Haemoglobin <13g/dl) are 17.8 and 36.3 in women and men respectively in Kerala state (Ministry of health and Family welfare, Govt. of India, (2021).

Regarding the screening of Diabetes mellitus, among the 2618 patients screened for diabetes, a small proportion had abnormal sugar levels (RBS>140mg/dl). As per NFHS 5, the indices of Diabetes mellitus (Blood sugar level: 141-160 mg/dl) are 8.3 and 9.8 in women and men respectively in Kerala state (Ministry of health and Family welfare, Govt. of India, (2021).

Hypertension screening status: -On assessing the Blood pressure of the patients from the 5 areas, small proportion among the screened 1671 patients were screened in total.

Also, almost all respondents were willing to prefer Ayurveda for any health issues. Strengthening ayurvedic services and improving awareness may increase the utilization in the community. An integrated health system approach at the policy level is pivotal in mainstreaming Ayurvedic medicines. Increasing awareness and fortifying ayurvedic services could lead to a rise in utilization by the public. However, mainstreaming Ayurvedic medicines at the policy level requires an integrated health system strategy (Satyanarayana, P., Olickal, J.J., Thidil, N.E. (2023).

Limitation of the study are that as the survey is cross sectional study, temporal relation between cause and effect cannot be found out, say it would have been highly informative if the causes of prevalent disorders in both males and females can be explored. There are chances of recall bias and information bias. Moreover, study is expensive also.

CONCLUSION

Very few participants of the survey had socioeconomic characteristics like addictions, drinking unpurified water or houses with open or no drainages. Also, none of them were using open field for toilet purpose. Still, as NCDs were the commonest cause for visiting health care centres, it has become imperative that diet and lifestyle related-awareness be raised. The data gathered through the current study can provide preliminary data for acquiring insights and can definitely aid in future decision making of our nation. The study recommends the expansion of health care facilities to the residents of most remote locations of Kerala.

Acknowledgement

The successful implementation of the Ayurveda Mobile Health Care Programme under SCSP is the cumulative effort of officers and employees of the institute. However, the dedicated collective effort of the survey team of the institute made this program effective by conducting door-to-door surveys, medical camps, lab investigations and awareness classes. We also extend our thanks to the governing state machinery for extending their cooperation and effort in conducting surveys and medical camps. We also express our gratitude to the villagers for providing their cooperation in conducting surveys and to the patients who visited our medical camps.

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