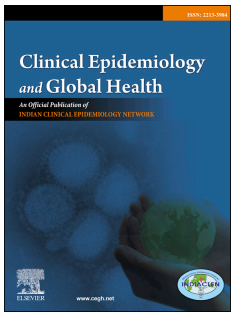


# Determinants of nutritional status among schedule tribe women in India

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# Determinants of Nutritional status among Schedule Tribe Women in India

**Abstract:**

**Objective:** This research aimed to learn how various socio-demographic factors are associated with nutritional status among Indian Scheduled Tribe reproductive women. Moreover, to understand the spatial variation of Nutritional status among Scheduled tribe women in the current scenario.

**Methods:** The study shows the distribution of underweight, normal, overweight and obese Scheduled Tribe women in India from the National Family Health Survey (NFHS-5), including 1,66,172 women from Schedule tribes reproductive age group. The multinomial logistic regression model was used to analyse how different background factors are associated with BMI.

**Results:** The study observed that among tribal women, 17.4% are underweight, 13.2% overweight, and 2.97% obese. Approximately one-third of the tribal women in the reproductive age group have normal BMI. The age group 15–24 has the highest percentage of underweight, whereas the age group 35 and beyond has the highest prevalence of overweight and obesity.

Most of the socio-demographic factors are associated with nutritional level among Scheduled tribe women; The wealth quantile shows the maximum impact on nutritional health among Scheduled tribe women.

**Conclusion:** Scheduled Tribe people are one of the most vulnerable groups in India. As a result, this population is at high risk in practically every health parameter. They continue to depend heavily on subsistence farming for income and survival. The findings provide further evidence that

the religion, place of residence, wealth status, age group, education, marital status, parity and family size are some important determinants that are directly associated with nutritional status among tribal women in India. History of neglect and discrimination concerning economic distribution and social status. It is necessary to concentrate on improving regional and community-based development methods and planning and executing appropriate techniques to promote holistic healthcare practices for all.

**Keywords: Body Mass Index, NFHS-5, Cross-Sectional Study, Reproductive Health, Malnutrition**

## Introduction:

### Who are the Scheduled Tribes:

The Scheduled tribes, as defined under the Indian constitution mainly based on primitive indigenous people who have socially backwards arising from injustice and neglect by the dominant society. Till now, Scheduled Tribes have been India's most disadvantaged social and economic group (1). The Scheduled Tribes are tribes that have been notified under Article 342 of the Constitution of India; Constitution does not define the tribe, but some common characteristics can be identified: self-identification, language, distinct social and cultural entity, economic underdevelopment, and geographically isolated (2). Tribals have different lifestyles, languages, and cultural traditions than India's established society, and they traditionally inhabitant the forest, hills, deserts, and mountains.

### Profile of scheduled tribe:

As per the Indian Census, 104.3 million people belong to the Scheduled tribe community out of 1.21 billion. India has the world's largest tribal population, with tribal people accounting for 8.6% of the country's total population (*5*). Almost 75 tribal groups are the most vulnerable among 705 ethnic groups in India., each with its own social and cultural characteristics (6). There are 533 tribal groups in India, with 62 in Odisha (7).

India's population, especially STs, is undergoing demographic, socio-economic and health transformations in today's interconnected globe. The ST males number about 5.25 crores, whereas ST females number 5.20 crores. The decadal growth of the ST population in 2011 compared to 2001 demonstrates that the ST female population growth rate (25%) is higher than the ST male population growth rate (23%).

**Background of nutritional status among Scheduled Tribe Women's:**

Insufficient healthy food consumption among ST women causes poor health and severe health consequences. According to the latest National Family Health Survey report (2019–21), nearly 13% of Indian women are underweight, while 33.2% are overweight. Almost 17.4% of tribal reproductive women belong to underweight. The overall development is changing the trends of the underweight population in Scheduled tribe communities; the trends gradually decline. According to some recent studies, malnutrition affects 25.3% of tribal women in India (8).

**Relevance of the study and Objective:**

The entire ST group suffers from a lack of proper food intake (9,10). The health difficulties that ST women face must be appropriately acknowledged and examined before any relevant action can be taken. The discrepancies between spatial and regional levels must be investigated. However, current research on geographical differences in nutritional status among ST women in Indian states

has been limited. In light of this, the goal of this research was to learn how various background variables influence nutritional status among Indian ST reproductive women.

**Data and methods:**

**Data:**

The National Family Health Survey (2019–2021) was used to collect data for this investigation. The International Institute for Population Sciences (IIPS), Mumbai, acted as the nodal agency for this nationwide sample survey, which took a variety of socioeconomic, demographic, and health data at the district level. The NFHS-5 research is unique in that it collects precise data on various factors that affect mother and child health, including nutrition and anaemia. The study focused on reproductive women aged 15 to 49 years old.

The current study is based on data collected from 28 Indian states and 8 union territories. This research looked at the data of 1,66,172 women from ST. Different socio-economic and demographic parameters were used as independent variables, whereas BMI was used as a dependent variable. Caste, marital status, religion, age group, wealth quantile, place of residence, and state-wise distribution are some of the socio-economic, demographic, and geographical characteristics. The Multinomial logistic regression model was used to determine how background variables or factors influence nutritional status.

**Statistical Analysis:**

The multivariate approaches were utilised to determine how much variance there was in the order of BMI among Scheduled tribe women concerning their background variables. The complete data analysis was done with STATA software. The association between variables was determined using the chi-square test. Last but not least, the study looked at the regional variation in nutritional status

among Scheduled tribe women throughout India's 28 states and 8 union territories. The data in the figures were analysed using spatial tools (QGIS: 2.18.25).

**Result:**

**Table a: Body mass index (BMI) and differential factors:**

One of the most critical health indicators for determining nutritional status is body mass index (BMI). Table a displays the various background variables and the BMI among Indian tribal women in the reproductive age group. Among the tribal women, 17.4% are underweight, 13.2% overweight, and 2.97% obese.

**Age group and BMI:** The age group 15–24 has the highest percentage of underweight, whereas the age group 35 and beyond has the highest prevalence of overweight and obesity.

**Marital status and BMI:** The prevalence of underweight is more among married tribal women (25.68%) than unmarried tribal women (14.44%). On the contrary, unmarried (15.81%) and others (15.05%) are more overweight than married ones (5.97%).

**Religion and BMI:** The highest prevalence of underweight is found among the tribal women belonging to the Hindu (25.8%) religion. Overweight is highest among the women in the other category (19.15). Moreover, the tribal women in the Muslim are most obese (4.24%) in comparison to any other religion.

**Place of residence and BMI:** In terms of residence, tribal, rural women are more underweight than urban tribal women, with the inverse outcomes for overweight and obesity.

**Level of education and BMI:** Underweight is most prevalent among the tribal women with no education (19.29%) and lowest among the tribal women with higher education (11.48%). Contrarily, overweight and obesity are lowest among the tribal women with no education 12.02%

and 2.36%, respectively, and highest among the women with higher education 16.74% and 4.01%, respectively.

**Wealth Quantile and BMI:** The poorest tribal women are found underweight (23.99%) than the tribal women in any other wealth quintile, and overweight and obesity are more prevalent among the tribal women in the richest wealth quintile 24.74% and 7.98%, respectively than the women belonging to any other wealth quintile.

**Parity and BMI:** Tribal women with zero parity have the highest prevalence of underweight (24.02%). Overweight and obesity are most prevalent among tribal women, with two parity of 17.22% and 4.31%, respectively.

**Family size and BMI:** The larger the family, the greater the chance of becoming underweight. From the table, tribal women belonging to families with the member more than 7 have the highest prevalence of being underweight (21.56%). On the other hand, overweight (15.49%) and obesity (3.58%) are most prevalent in families with less than four members.

**Spatial variation of BMI:** The table also shows a regional variation of BMI among the tribal women of India. Tribal women in the western (29.63%), central (27.52%) and eastern (25.12%) regions are more underweight and southern regions are most prevalent overweight (20.09%) and obese (7.08%) tribal women.

**Figures a-c: show state and union-territories wise geographical distribution in Underweight, Overweight, Obese among Scheduled tribe women in India. [Figures a-c pasted]**

**Figures a-c: Administrative boundaries and BMI:** As per administrative boundaries, Gujarat has the most significant proportion of Scheduled tribes underweight (32.96 %); following that comes Odisha (29.89%), Dadra & Nagar Haveli and Daman Diu (29.82%). Sikkim (3.34%) and Arunachal Pradesh (4.19%) are states with the most negligible proportion of scheduled tribe

women in the underweight category. In most states and union territories, more than 50% of tribal women are in the normal weight category. Most north-eastern states, Meghalaya (78.77%), Nagaland (75.98%), Assam (71.72%), and Mizoram (71.01%), have the highest proportion of tribal women in the normal weight category. At the same time, Puducherry (41.18%), Chandigarh (44.44%) and Punjab (47.02%) are among the lowest. Looking at the overweight, Puducherry had 44.12% of their tribal women in this category; following that comes Goa (29.62%), Sikkim (28.67%), and NCT of Delhi (28.53%). Jharkhand (4.84%) and Rajasthan (5.22%) have the lowest proportion of tribal women in the overweight category. Chandigarh (22.22%) and Punjab (15.89%) have the highest proportion of scheduled tribe women who are obese. In comparison, Rajasthan (1.09%) and Jharkhand (1.2%) are the states which have the lowest proportion of tribal women with obesity.

**Table b: Establishing the Relationship between Independent and dependent variables:**

Multinomial logistic regression has been used to examine how several demographic factors affect body mass index (BMI) among tribal women of reproductive age; the result of multinomial logistic regression is shown in table b. Religion, Place of Residence, Wealth Index, Age Group, Education, Marital Status, Parity, and Family Size were used as independent variables, whereas BMI was the dependent variable. In this study, we have run two separate models where religion, place of residence and wealth index are the independent variables in the first model. Age group, education, marital status, parity, and family size are the five new independent added to the first three variables in the second model. The main reason for running these two models is to see how much variation happened due to adding some new variables from the first model to the second model. In the first model, we found that 6% of variations in the body mass index happened due to religion, place of residence and wealth index. Where is in the model 2 result found that 8% variation happened due

to religion, place of residence, wealth index, age group, education, marital status, parity, and family size. We can explain the difference in the p-value of all the variables between the first and the second model because the second model has a higher value of $R^2$, so we explained the second model.

**Relationship between Religion and BMI:** Tribal women in the Muslim religion are 42% less likely to be underweight than the Hindus. Similarly, Christians and others are 51% and 20% less likely to be overweight than the Hindus, respectively. On the other hand, Muslim tribal women are 1.65 and 1.77 times more likely to be overweight and obese than Hindus.

**Relationship between Place of residence and BMI:** Rural tribal women are 1.11 times more likely to be underweight and 7% and 39% less likely to be overweight and obese than tribal women in the urban area.

**Relationship between Wealth quantile and BMI:** Schedule tribe women from the poorer, middle, richer and richest wealth quintiles are 12%, 25%, 38% and 51% less likely to be underweight than the tribal women in the poorest wealth quintile, respectively. The prevalence of underweight decreases as the wealth quintile increases. Furthermore, as the wealth quintile increases, the chance of being overweight and obese also increases. Compared to the tribal women in the poorest wealth quintile, poorer, middle, richer and richest are 1.64, 2.34, 2.97 and 3.69 times more likely to be overweight, respectively. A similar pattern can be seen in the case of obesity.

**Relationship between Age group and BMI:** With increasing age, the probability of being underweight declines; tribal women in age groups 25-34 and 35-49 are 37% and 54% less likely to be overweight than the women in the age group 15-24 respectively. On another side, the probability of being overweight and obese increases as the age increases. Tribal women in the age

group 25-34 and 35-49 are 1.75 and 2.47 times more likely to be overweight than women aged 15-24, respectively.

**Relationship between Level of education and BMI:** Tribal women with primary, secondary, and higher education are 19%, 19%, and 40% less likely to be underweight than tribal women with no education, respectively. In contrast, they are 1.09, 1.26 and 1.29 times more likely to be overweight than the reference category. The chance of getting underweight decreases with an increase in education, and the chances of being overweight and obese increase with an increase in educational level.

**Relationship between Marital status and BMI:** Unmarried Scheduled tribal women and other women have a 40% and 30% less likely probability of being underweight than married women. In contrast, unmarried tribal women and other tribal women are 1.94 and 1.71 times more likely to be overweight than married tribal women.

**Relationship between Parity and BMI:** Parity also shows a good interrelationship with BMI. If the women have more parity, have more likely chances to be underweight.

**Relationship between Family Size and BMI:** The size of the family has an impact on nutritional health as well. Our research discovered that women from large families are more likely to be underweight, while women from small families are more likely to be overweight or obese.

**Discussion:**

We analyzed India data from NFHS-5 to determine the prevalence of malnutrition among Scheduled Tribe women in India. The Sample was 1,66,172 tribal women for this study based on research, which was taken because 1,66,172 Scheduled Tribe women attended all the questions taken in this research. Some socio-demographic variables that directly or indirectly affect religion, place of residence, wealth index, age group, education, marital status, equality and family size,

and nutritional status. Not only these, but many other factors also affect the nutritional status. These factors are not individual.

Many researchers have tried to understand the relationship between overweight or obesity and demographic factors. Middle-aged women show a lower rate of physical activity and metabolism than others. On the other hand, energy requirement decreases, so eating regular or routine can also lead to weight gain.

Also, established cultural or social values about the care and diet provided during and after pregnancy make women gain more weight. In addition, newly married young women are more health-conscious and more physically active than older women with children (11).

For nutritional status, it is challenging to classify individuals based on religion to more or less determine what kind of food variation in their daily consumption and measure their nutritional status. Religion will have a minimal role until database evidence supports this theory. However, religiously, even diverse food preparation practices with rituals have little effect on nutrition.

Economic, health, medicine, food, and so on compared to the rural area, so in most urban areas, people consume more food due to greater economic strength and purchasing power parity compared to the rural area, which impacts nutrition. Wealth is an essential factor in nutrition. Since they belong to the poorer class, they have less financial strength, and this directly affects their daily food consumption because lower-income contributes to lower purchasing power, creating more overweight people (15).

People with higher education levels are more likely to find underweight people. Because the educated have an awareness of health and nutrition, overweight and obesity are sometimes found even among the educated. However, some paradoxes also found that those who wanted to lose weight reported lower food intake than those with a lower BMI.

Marital status, equality and family size are the most interrelated population characteristics. If a married woman belongs to a large family in India, women eat almost all family members after meals, consuming the rest of the food, resulting in malnutrition among them (15).

The nutritional status of women depends on different characteristics. Various studies have found that women's wealth status plays the most crucial role in their nutrition. Also, age of mothers, place of residence, religion, education, family size, marital status, parity, environmental condition, what kind of food and drink to use, smoking behaviour, alcoholic and tambaku consumption, and what fuel is used for cooking and latrine (16,17).

**Results – India**

The women of Scheduled Tribes are linked to inadequate intake of nutrients such as vegetables, which can lead to increased iron deficiency in women and a lack of eating habits and knowledge (18–21).

Among the tribal women, 17.4% are found underweight, 13.2% overweight, and 2.97% obese. Approximately one-third of the tribal women in the reproductive age group have normal BMI. The age group 15–24 has the highest percentage of underweight, whereas the age group 35 and beyond has the highest prevalence of overweight and obesity. Unmarried Tribal women are more likely to be underweight than married women, but the opposite has happened in the case of obesity (22).

In terms of place of residence, tribal and rural women are more underweight than urban tribal women, with the inverse outcomes for overweight and obesity. In the urban and rural context, scheduled tribal women in rural areas are more likely to be underweight, while overweight and obesity are more prevalent in urban areas. . A study found a similar result in urban India, that most of the overweight and Obese women found in Urban India, specifically in metropolitan cities. Moreover, Scheduled tribes are found to have less percentage of the overweight and obese

population as compared to other populations. On the other hand, non-poor higher educated women were more likely to be overweight and obese (22).

Underweight is most prevalent among the tribal women with no education (19.29%) and lowest among the tribal women with higher education (11.48%). Contrarily, overweight and obesity are lowest among the tribal women with no education 12.02% and 2.36%, respectively, and highest among the women with higher education 16.74% and 4.01%, respectively. The educational status also shows a positive relationship with BMI. With increasing educational level performances, overweight and obesity are also rising. A study done in Northeast India supports the result of our study (23).

The poorest tribal women are more likely to be underweight (23.99%) than the tribal women in any other wealth quintile, and overweight and obesity are more prevalent among the tribal women in the richest wealth quintile 24.74% and 7.98%, respectively, than the women belonging to any other wealth quintile. Scheduled Tribe women from poor economic backgrounds are more likely to be underweight than women of another economic status. Overweight and obese depending on the woman's status; A similar study was conducted in 54 underdeveloped and developing countries among women of reproductive age (24).

The nutritional status of Scheduled Tribe women varies widely depending on factors such as rural housing, illiteracy and poor economic status. These factors can be detrimental to Scheduled tribal Women, as 75% of health infrastructure focuses on urban areas, while most tribals live in rural areas. A study done in the Darjeeling district of WestBengal, India, supports our findings (25).

Research has found that Scheduled Tribe people are mainly engaged in agricultural labour and day labourers, which is the main reason for economic backwardness. As a result, there is food supply instability, which contributes to the health of people of Scheduled Tribes, especially women. The

tribal population in India is oppressed, discriminated against for social and economic equality and suffers from poverty (26).

Scheduled Tribe people are one of the most vulnerable groups in India. As a result, this population is at high risk in practically every health parameter. They continue to depend heavily on subsistence farming for income and survival. History of neglect and discrimination concerning economic distribution and social status. Furthermore, their awareness and awareness about a healthy lifestyle is limited. Similarly, traditional norms and belief systems and illiteracy, all of which contribute to various health and social problems, make it challenging to realize the health services required.

**Conclusion:**

The Scheduled Tribes are one of India's most vulnerable communities. This group is in danger in almost every health indicator. Subsistence farming is one of the major sources of income and survival. Economic inequality and social position have a long history of neglect and injustice. Furthermore, their knowledge and understanding of a healthy lifestyle are limited. In traditional belief systems, illiteracy contributes to various social and health problems, making it challenging to provide the necessary health services.

There is a need for the Central and State Governments to reform the existing policies related to nutrition, such as ICDS, and POSHAN Abhiyaan. Furthermore, public health care facilities and delivery systems must be enhanced and raise awareness. The study findings might help policymakers adopt suitable policies to enhance women's health.

**Declarations**

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This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

**Ethics approval and consent to participate**

Since it is secondary data and it is available in the Public domain for free on the NFHS- 5 - IIPS website. There is no need for ethical clearance.

**Consent for publication**

Not Applicable.

**Availability of data and material**

The study is based on secondary data analysis. No data was collected for this study. The data are available for free on the NFHS 5 website (The DHS Program - Datasets Account Home).

**Competing interests**

We declare that We have no competing interests.

**List of abbreviations**

IIPS: International Institute for Population Sciences

NFHS: National Family Health Survey

BMI: Body Mass Index

ST: Scheduled Tribe

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**Table a: Nutritional status of Scheduled tribe women by different socio-demographic characteristics in India, NFHS-5 (2019-21)**

| Background Characteristics | Scheduled Caste Women | | | | |
|---|---|---|---|---|---|
| | Underweight | Normal | Overweight | Obese | Sample Size |
| **Age Group** | | | | | |
| 15-24 | 27.03 | 66.69 | 5.21 | 1.07 | 54,223 |
| 25-34 | 14.38 | 68.60 | 14.09 | 2.93 | 52,364 |
| 35 above | 11.27 | 64.29 | 19.69 | 4.74 | 59,585 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Marital Status** | | | | | |
| Married | 25.68 | 67.14 | 5.97 | 1.22 | 43,454 |
| Unmarried | 14.44 | 66.16 | 15.81 | 3.59 | 1,14,879 |
| Others | 14.81 | 66.48 | 15.05 | 3.66 | 7,839 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Religion** | | | | | |
| Hindu | 23.88 | 63.11 | 10.38 | 2.62 | 86,293 |
| Muslim | 12.98 | 65.87 | 16.91 | 4.24 | 22,926 |
| Christian | 9.38 | 72.97 | 14.96 | 2.69 | 43,099 |
| Others | 9.23 | 67.71 | 19.15 | 3.91 | 13,854 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Place of Residence** | | | | | |
| Urban | 11.12 | 62.58 | 20.01 | 6.30 | 27,256 |
| Rural | 18.63 | 67.19 | 11.86 | 2.32 | 1,38,916 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Education** | | | | | |
| No Education | 19.29 | 66.33 | 12.02 | 2.36 | 43,289 |
| Primary | 16.72 | 67.06 | 13.17 | 3.05 | 21,524 |
| Secondary | 17.70 | 66.08 | 13.15 | 3.07 | 85,590 |
| Higher | 11.48 | 67.77 | 16.74 | 4.01 | 15,769 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Wealth Index** | | | | | |
| Poorest | 23.99 | 67.95 | 6.91 | 1.15 | 59,631 |
| Poorer | 17.08 | 68.35 | 12.36 | 2.21 | 44,951 |
| Middle | 13.19 | 65.62 | 17.34 | 3.85 | 30,039 |

| | | | | | |
|---|---|---|---|---|---|
| Richer | 10.07 | 62.92 | 21.03 | 5.97 | 20,519 |
| Richest | 8.10 | 59.18 | 24.74 | 7.98 | 11,032 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Parity** | | | | | |
| 0 | 24.02 | 67.18 | 7.29 | 1.51 | 54,514 |
| 1 | 14.82 | 67.11 | 14.70 | 3.37 | 23,488 |
| 2 | 13.11 | 65.35 | 17.22 | 4.31 | 36,005 |
| >2 | 14.59 | 66.09 | 15.92 | 3.40 | 52,165 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Family Size** | | | | | |
| Less than Four (<4) | 13.67 | 67.27 | 15.49 | 3.58 | 33,289 |
| Four to Seven (4 - 7) | 17.81 | 66.51 | 12.83 | 2.85 | 1,14,374 |
| Above Seven (7+) | 21.56 | 64.44 | 11.35 | 2.65 | 18,509 |
| Total | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |
| **Districts** | | | | | |
| North | 13.00 | 66.63 | 16.80 | 3.57 | 18,765 |
| Central | 27.52 | 63.48 | 7.26 | 1.75 | 25,416 |
| East | 25.12 | 63.92 | 8.73 | 2.23 | 23,918 |
| Northeast | 9.33 | 72.67 | 15.23 | 2.77 | 70,980 |
| West | 29.63 | 55.36 | 11.54 | 3.48 | 16,421 |
| South | 18.53 | 54.30 | 20.09 | 7.08 | 10,672 |
| **Total** | 17.40 | 66.43 | 13.20 | 2.97 | 1,66,172 |



**Note:** <18.5 kg/$m^2$= Underweight, 18.5-24.9 kg/$m^2$= Normalweight, 25-29.9 kg/$m^2$= Overweight, 30 and above kg/$m^2$=Obese

**Table b: Odds ratio showing the association between socio-demographic variables and nutrition (BMI) among Scheduled tribe women in India: Result from Multinomial logistic regression analysis**

| | Scheduled Tribe Women | | | | | |
|---|---|---|---|---|---|---|
| BMI ST | Model 1 | | | Model 2 | | |
| Background Characteristics | Underweight | Overweight | Obese | Underweight | Overweight | Obese |
| Religion | | | | | | |
| Hindu ® | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| Muslim | 0.60***[0.58,0.63] | 1.54***[1.47,1.61] | 1.64***[1.52,1.77] | 0.58***[0.55,0.60] | 1.65***[1.57,1.73] | 1.77***[1.64,1.92] |
| Christian | 0.51***[0.47,0.55] | 1.08[1.00,1.17] | 0.94[0.82,1.09] | 0.49***[0.46,0.54] | 1.13**[1.04,1.22] | 0.98[0.85,1.13] |
| Others | 0.81***[0.74,0.88] | 0.98[0.87,1.10] | 1.27*[1.06,1.53] | 0.80***[0.73,0.88] | 0.96[0.85,1.08] | 1.25*[1.04,1.51] |
| Place of Residence | | | | | | |
| Urban ® | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| Rural | 1.11***[1.06,1.17] | 0.93**[0.88,0.98] | 0.60***[0.55,0.65] | 1.11***[1.05,1.17] | 0.93**[0.88,0.98] | 0.61***[0.56,0.66] |
| Wealth Index | | | | | | |
| Poorest ® | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| Poorer | 0.86***[0.83,0.89] | 1.67***[1.57,1.77] | 1.87***[1.65,2.12] | 0.88***[0.84,0.91] | 1.64***[1.54,1.74] | 1.84***[1.62,2.09] |
| Middle | 0.72***[0.68,0.75] | 2.41***[2.27,2.56] | 3.34***[2.96,3.78] | 0.75***[0.71,0.79] | 2.34***[2.20,2.50] | 3.31***[2.92,3.76] |
| Richer | 0.57***[0.54,0.61] | 3.12***[2.92,3.34] | 5.39***[4.76,6.10] | 0.62***[0.58,0.66] | 2.97***[2.77,3.20] | 5.36***[4.70,6.11] |
| Richest | 0.42***[0.39,0.46] | 3.97***[3.68,4.28] | 6.12***[5.35,7.00] | 0.49***[0.45,0.54] | 3.69***[3.39,4.02] | 6.30***[5.43,7.30] |
| Age Group | | | | | | |
| 15-24 ® | | | | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| 25-34 | | | | 0.63***[0.60,0.66] | 1.75***[1.64,1.88] | 1.87***[1.64,2.14] |
| 35-49 | | | | 0.46***[0.43,0.48] | 2.47***[2.29,2.67] | 2.98***[2.60,3.43] |
| Education | | | | | | |
| No Education ® | | | | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| Primary | | | | 0.81***[0.77,0.86] | 1.09*[1.01,1.16] | 1.36***[1.21,1.53] |
| Secondary | | | | 0.81***[0.78,0.85] | 1.26***[1.19,1.33] | 1.32***[1.19,1.46] |
| Higher | | | | 0.60***[0.55,0.65] | 1.29***[1.19,1.41] | 1.09[0.94,1.26] |
| Marital Status | | | | | | |
| Married ® | | | | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| Unmarried | | | | 0.60***[0.57,0.64] | 1.94***[1.75,2.14] | 1.53***[1.27,1.83] |
| others | | | | 0.70***[0.63,0.77] | 1.71***[1.50,1.95] | 1.49***[1.19,1.88] |
| Parity | | | | | | |
| 0 ® | | | | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| 1 | | | | 0.94[0.87,1.01] | 1.05[0.96,1.15] | 0.99[0.84,1.17] |
| 2 | | | | 0.99[0.92,1.07] | 1.13**[1.03,1.23] | 1.29**[1.10,1.51] |
| 2+ | | | | 1.13**[1.05,1.22] | 1.11*[1.01,1.21] | 1.25**[1.06,1.48] |
| Family Size ® | | | | | | |
| <4 | | | | 1[1.00,1.00] | 1[1.00,1.00] | 1[1.00,1.00] |
| 4 - 7 | | | | 1.18***[1.12,1.23] | 0.89***[0.85,0.94] | 0.82***[0.75,0.90] |
| 7+ | | | | 1.27***[1.19,1.35] | 0.85***[0.79,0.92] | 0.68***[0.60,0.79] |

Note: Significant at * p<0.05; ** p<0.01; *** p<0.001; ® represent reference category, ® represent reference category

**Figure a-c:** States and UTs wise geographical distribution of BMI (Underweight, Normal, Overweight and Obese) among Scheduled tribe women in India (NFHS-5)
Sources: Authors generated the map using QGIS 2.18.25.

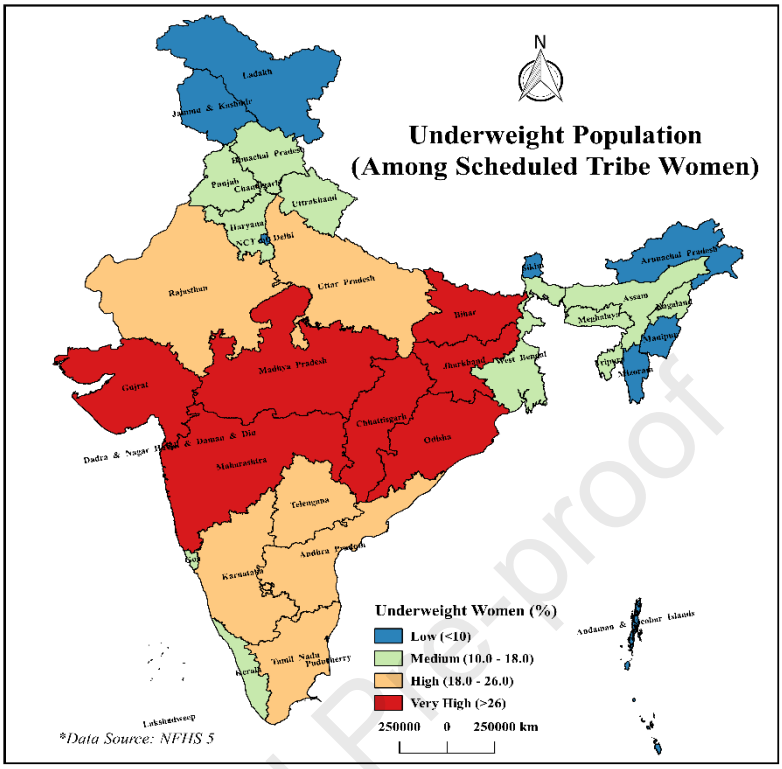


**Figure: a**

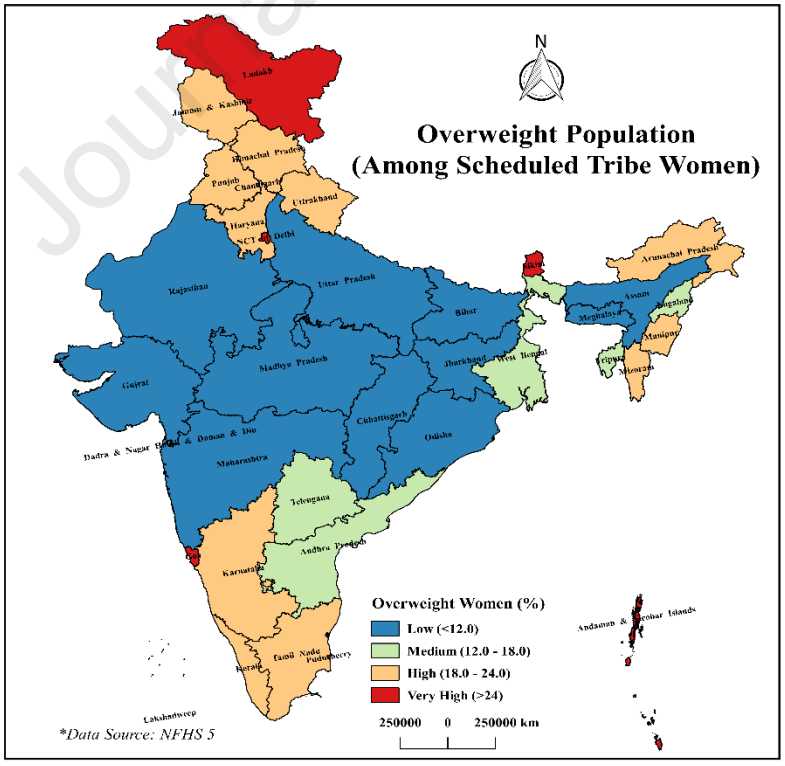


**Figure: b**

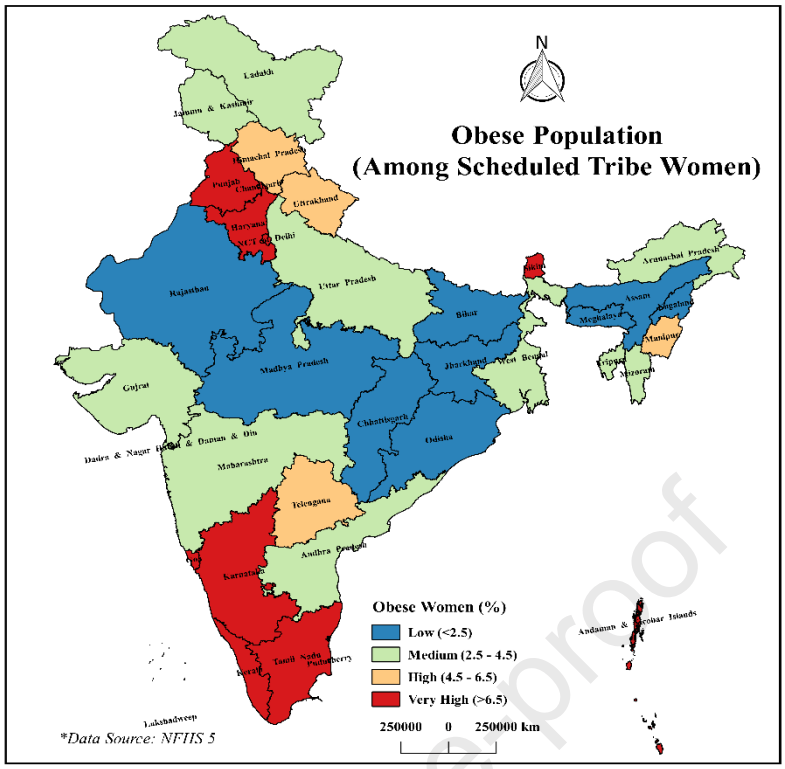


**Figure: c**