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## Study on impact of nutritional garden on health status of Lodha tribal women in Mayurbhanj district of Odisha

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### Abstract

The population of Lodha people in Odisha is estimated to be around 9088 people (2011 census), with the majority of them living in the Mayurbhanj district of Odisha. Malnutrition, inadequate consumption of protein and energy rich diet as well as deficiencies in the key micronutrients such as iodine, vitamin A and iron are the major factors in the occurrence morbidity and mortality of Lodha tribal women in Mayurbhanj district. Though vegetables are well known as the most important source of these micronutrients, yet the per capita vegetable consumption in selected villages of Lodha inhabiting areas was very low. The present study was conducted in 2019-20 and 2020-21 to study the impact of Nutritional garden on the health status of the Lodha tribal women, so that it will be helpful for planning and monitoring Programmes for the betterment of Lodha Tribal women. The study was covering a sample of 300 Lodha tribal women of Moroda, Suliapada, Baripada and Shamakhunta block. Study reveals that the nutritional garden results a positive attitude in the Lodha tribal women towards changes in health status of their family members. The intervention of Nutritional garden has a significant impact on the haemoglobin status, occurrence of the diseases such as osteoporosis, eye disease, constipation, joint pain, scurvy and clinical symptoms such as, general appearance, hair, eye, face, teeth and gum. The rest of the parameters were found to be statistically non-significant with the intervention of Nutritional garden.

**Keywords:** Health, nutritional garden, impact, lodha tribal women, consumption and intervention

### Introduction

The tribal people of India is 8.6% of the total population of the country (Census of India, 2011) <sup>[1]</sup>. Scheduled tribes are considered as the economically and socially underprivileged by Indian governments and they require special attention and protection against exploitation and injustice (Census of India, 2011) <sup>[1]</sup>. As per Census of India, 2011 <sup>[1]</sup>, Madhya Pradesh has the most STs (15.3 million), followed by Maharashtra (10.5 million), Odisha (9.5 million), Rajasthan (9.5 million). The seven states of Madhya Pradesh (14.7%), Maharashtra (10.1%), Odisha (9.2%) and Rajasthan account for more over two-thirds of ST population (8.8%). The tribal are the homogenous population culturally healthy, have developed strong religious belief system and they desired to lead their life style in their own way. The Lodhas and Kharias are two special category tribal communities in Odisha's Mayurbhanj region that are considered vulnerable (Bhuyan *et al.* 2021) <sup>[5]</sup>. Lodha is the particularly Vulnerable Tribal Group in Mayurbhanj district and were seen during the early years of British ruling in India. The British government exploited this tribal populace of jungle area, who were traditionally dependent on forest for their livelihood. They were sickened but they were cruelly silenced. Because they were dispossessed and had no other ways, so they adopted criminal lifestyles and recognized as a criminal tribe. Like other social groups, this tribe also faces difficulty in related to social, economic, health and nutritional security. The women of this category have miserable condition (Bhuyan *et al.* 2021) <sup>[5]</sup>. The WHO has defined health as "a state of complete physical, mental and social well being and not merely the absence of disease or infirmity" (WHO, 1948) <sup>[3]</sup>. Tribal mothers have a great risk of anaemia, under nourishment and the girl child gets less than the nutritional intake (Maiti *et al.* 2005) <sup>[2]</sup>. There is scanty study on Nutritional health status of Lodha tribal women in this district. So this study will try to go through the health aspects of the Lodha tribal women and to reduce nutritional deficiency an intervention on Nutritional garden was given and its impact was studied.

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This study will be helpful for the researchers, policy makers, extension workers, ITDA and health officials and different government officials directly or indirectly concerned and worked for health status of tribal women.

### Materials and Methods

The study was conducted in 10 villages of Morada, Baripada, Shamakhunta, and the Suliapada block of Mayurbhanj district, as Lodha tribal people are concentrated in these villages. The study was conducted on 2019-2021. A total of 300 Lodha tribal females were selected randomly, in the age group of 18-45 years and belonged to non-pregnant and non-lactating categories. In the selected villages the data collection

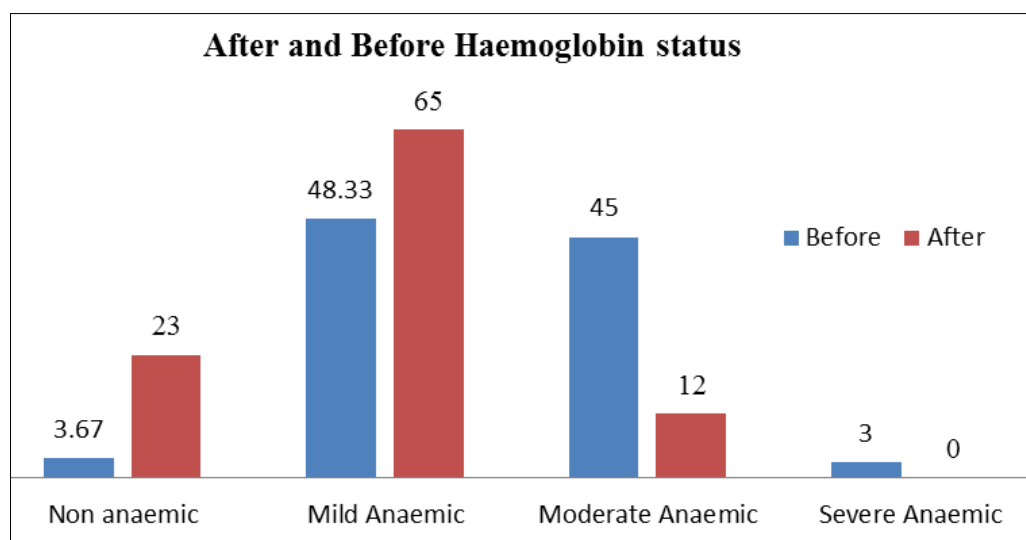
started from one end of the village to another side. The information on the socio-demographic profile was collected from each of the households through the pre-designed and pre-tested interview schedules.

Data was collected from the respondents about health aspect by clinical and Biochemical method through pre-designed interview schedules. After intervention of Nutritional garden, the similar data was also collected from the respondents. Statistical analysis like paired t-test and chi square test were done to analyse the level of significance with the help of SPSS 21.0 version and MS Excel 19.0 and MSTAT.

### Result and Discussion

**Table 1:** Impact of Nutritional garden on Haemoglobin status of the Lodha Tribal women (n= 300) as per WHO classification

Category	Hb level (WHO Standard)	No of the respondents (n=300)		% of the respondents	
		Before	After	Before	After
Non anaemic	>12.0 gm/dl	11	69	3.67	23
Mild Anaemic	10.0-11.9	145	195	48.33	65
Moderate Anaemic	7.0-9.9	135	36	45	12
Severe Anaemic	<7.0	9	-	3	-



**Graph 1:** Impact of Nutritional garden on Haemoglobin status of the Lodha Tribal women (n= 300) as per WHO classification

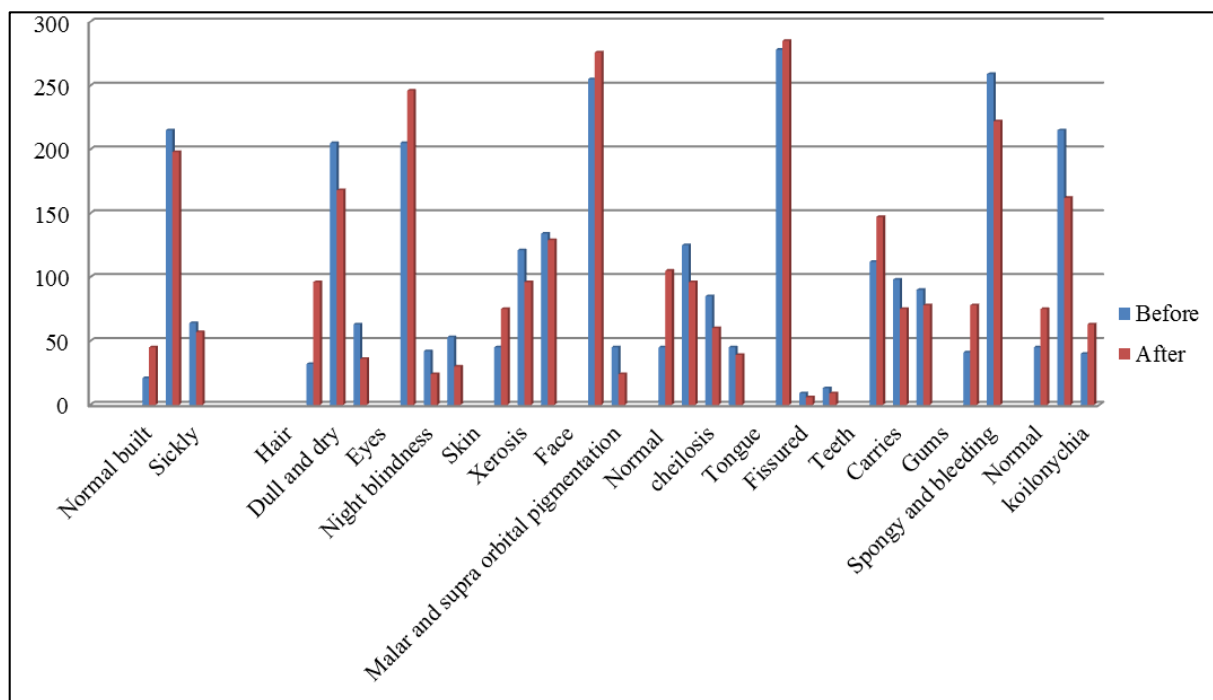
Table-1 and Graph-1 show Nutritional garden had to some extent impact on haemoglobin status of the Lodha tribal women. Before establishment of Nutritional garden 3.67% of the respondents were non anaemic, 48.33% were mild anaemic, 45% were moderate anaemic and 3% were severe anaemic but after introduction of Nutritional garden the percentage of non anaemic was increased to 23%, mild

anaemic percentage increased to 65%, moderate anaemic percentage reduced to 12% and the Lodha tribal women suffering from severe anaemic conditions were not found. Suri (2020) [4] found the similar findings that before development of nutrition garden 91% of the women suffered from anaemia but after development of nutrition garden it was reduced to 62%.

**Table 2:** Impact of Nutritional garden on clinical symptoms of Lodha Tribal women

Sl. No.	Signs and Symptoms	Before Frequency (n=300)	Before Percentage (%)	After Frequency (n=300)	After Percentage (%)	Difference
1	<b>General Appearance</b>					
	Normal built	21	7	45	15	8
	Thin built	215	71.7	198	66	-5.7
2	<b>Hair</b>					
	Sickly	64	21.3	57	19	-2.3
	Normal	32	10.7	96	32	21.3
3	<b>Eyes</b>					
	Dull and dry	205	68.3	168	56	- 12.3
	Easily pluckable	63	21	36	12	- 9

	Normal	205	68.3	246	82	13.7
	Night blindness	42	14	24	8	-6
	Pale conjunctiva	53	17.7	30	10	-7.7
4	<b>Skin</b>					
	Normal	45	15	75	25	10
	Xerosis	121	40.3	96	32	-8.3
	Dyspigmentation	134	44.7	129	43	-1.7
5	<b>Face</b>					
	Normal	255	85	276	92	7
	Malar and supra orbital pigmentation	45	15	24	8	-7
6	<b>Lips</b>					
	Normal	45	15	105	35	20
	lesions	125	41.7	96	32	-9.7
	Angular stomatitis	85	28.3	60	20	-8.3
	cheilosis	45	15	39	13	-2
7	<b>Tongue</b>					
	Normal	278	92.7	285	95	2.3
	Fissured	9	3	6	2	-1
	Scarlet and raw	13	4.3	9	3	-1.3
8	<b>Teeth</b>					
	Normal	112	37.3	147	49	11.7
	Carries	98	32.7	75	25	-7.7
	Mottled enamel	90	30	78	26	-4
9	<b>Gums</b>					
	Normal	41	13.7	78	26	12.3
	Spongy and bleeding	259	86.3	222	74	-12.3
10	<b>Nails</b>					
	Normal	45	15	75	25	10
	Brittle	215	71.7	162	54	-17.7
	koilonychia	40	13.3	63	21	7.7



**Graph 2:** Impact of Notional garden on clinical symptoms

The table-2 and graph -2 reveal the intervention of Nutritional garden had also impact on different clinical symptoms. In case of general appearance of the respondents 7% of the respondents had normal built but after development of nutritional garden it was increased to 15% of the respondents having normal body built. Similarly 71.7% of the Lodha tribal women had thin body built but after interventions of nutritional garden it was dropped down to 68% of the respondents having thin body built and lastly 21.3% of the

respondents had sickly body built and it was lowered down to 19% after establishment of nutritional garden. This indicated Nutritional garden had impact on the body built of the Lodha tribal women. The study resulted development of Nutritional garden had also impact on the clinical symptoms of hair. 10.7% of the Lodha tribal women had normal hair whereas after establishment of Nutritional garden the percentage of the normal hair increased to 32% of the respondents having normal hair. Similarly 68.3% and 21% of the respondents

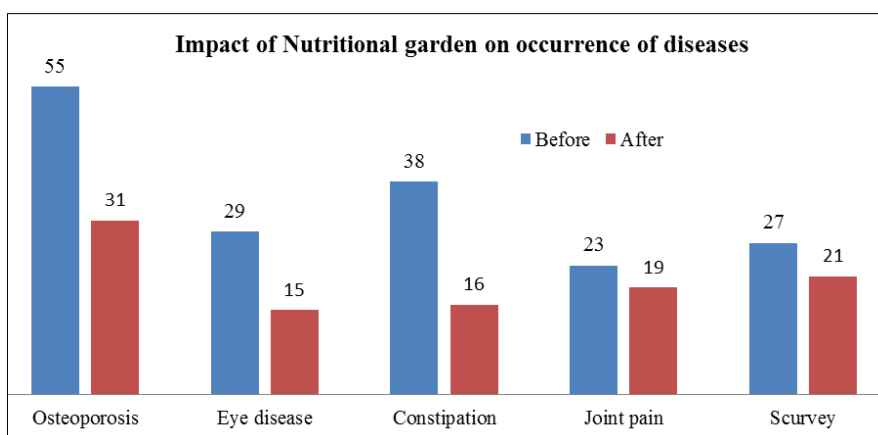
were having dull and dry hair and easily pluckable hair respectively but after establishment of nutritional garden it was dropping down to 56% and 12% for both dull and dry hair respectively. The study reveals before establishment of Nutritional garden 68.3% of the respondents had normal eye but after kitchen garden set up 82% of the respondents had normal eye. Before establishment of Nutritional garden 14% and 17.7% had night blindness and pale conjunctiva whereas after establishment of Nutritional garden 8% and 10% had night blindness and pale conjunctiva respectively. The study emphasized the effect of kitchen garden on the clinical symptoms of skin and resulted 15% had normal skin before development of kitchen garden and it was increased to 25% of the respondents had normal skin after development of nutritional garden. The study remarked there is also effect of kitchen garden on the clinical symptoms of face, 85% of the respondents had normal face but after development of Nutritional garden the percentage of the normal face increased to 92%. Before kitchen garden development 15% of the tribal women suffered from Malar and supra orbital pigmentation but after introduction of Nutritional garden it was reduced to 8%. The study resulted 15% of the respondents had normal lip before the establishment of Nutritional garden but it was increased to 35% of the respondents having normal lips after establishment of Nutritional garden. The different clinical symptoms of the lips like lip lesions, angular stomatitis and cheilosis were found among 41.7%, 28.3% and 15% of the respondents but after set up Nutritional garden the deficiency symptoms like lip lesions, angular stomatitis and cheilosis were reduced to 32%, 28% and 13% respectively. The study shows that 92.7% of the respondents had normal tongue but

after development of kitchen garden the percentage of the normal tongue was rising to 95% among the respondents. The other clinical symptoms of the tongue like fissure and scarlet raw was commonly seen among 3% and 4.3% of the Lodha tribal women but after development of Nutritional garden it was dropping down to 2% and 3% of the respondents having these symptoms. The study resulted 37.3% of the Lodha tribal had normal teeth whereas after development of Nutritional garden the percentage of the normal teeth was increased to 49% among the respondents. The other clinical symptoms of the teeth like carries and mottled enamel were found among 32.7 and 30% before establishment of Nutritional garden but it was lowered among 25% and 26% of the Lodha tribal women respectively.

The research reveals that the normal gums were seen in 13.7% of the respondents but after the establishment of Nutritional garden it was increased to 26% of the respondents. The clinical symptom like spongy and bleeding gum was found among 86.3% before establishment of Nutritional garden but it was lowered to 74% among the respondents after development of the Nutritional garden. The study concluded 15% of the lodha tribal women had normal nails before development of Nutritional garden but after development of Nutritional garden 25% of the respondents found to be 25%. The clinical symptoms of the nail like brittle and koilonychia was found among 71.7% and 13.3% of the respondents respectively before establishment of Nutritional garden but after development of nutritional garden the symptoms like brittle and koilnychia reduced to 54% and 21% among the respondents.

**Table 3:** Impact of Nutritional garden on occurrence of diseases of Lodha Tribal women

Diseases	No of the respondents (n=300) (Before)	% of the respondents (Before)	No of the respondents (n=300) (After)	% of the respondents (After)	Difference (%)	t-value
Osteoporosis	165	55	93	31	24	
Eye disease	78	29	45	15	14	
Constipation	114	38	48	16	22	
Joint pain	69	23	57	19	4	
Scurvey	81	27	63	21	6	



**Graph 3:** Impact of Nutritional garden on occurrence of diseases

Table-3 and Graph-3 remark the impact of Nutritional garden on the occurrence of diseases of Lodha tribal women, the graph shows among the respondents 55%, 29%, 38%, 23% and 27% were suffered from Osteoporosis, Eye disease, Constipation, Joint pain and Scurvey respectively before the intervention of Nutritional garden at their backyard whereas

the occurrence of the diseases like Osteoporosis, Eye disease, Constipation, Joint pain and Scurvey were reduced to 31%, 15%, 16%, 19% and 21% respectively among the Lodha tribal women after development of Nutritional garden at their backyard.

**Table 4:** Statistical analysis of Impact of Nutritional garden on hemoglobin status, disease occurrence and clinical classes

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Haemoglobin status before	2.4733	300	.61960	.03577
	Haemoglobin status after	1.8900	300	.58226	.03362
Pair 2	Osteoporosis before	.5500	300	.49832	.02877
	Osteoporosis after	.3067	300	.46188	.02667
Pair 3	Eye disease before	.2900	300	.45452	.02624
	Eye disease after	.1800	300	.38483	.02222
Pair 4	Constipation before	.3633	300	.48176	.02781
	Constipation after	.1433	300	.35100	.02026
Pair 5	Joint pain before	.2300	300	.42154	.02434
	Joint pain after	.1900	300	.39296	.02269
Pair 6	Scurvey before	.2700	300	.44470	.02567
	Scurvey after	.2100	300	.40799	.02356
Pair 7	General appearance before	2.1433	300	.51349	.02965
	General appearance after	2.0400	300	.58269	.03364
Pair 8	Hair before	2.1033	300	.55409	.03199
	Hair after	1.8000	300	.63351	.03658
Pair 9	Eyes before	1.4933	300	.77801	.04492
	eyes after	1.2800	300	.63478	.03665
Pair 10	Skin before	2.2967	300	.71439	.04125
	Skin after	2.1800	300	.80608	.04654
Pair 11	Face before	1.0200	300	.14023	.00810
	Face after	1.0800	300	.27175	.01569
Pair 12	Lips before	2.2833	300	.71045	.04102
	Lips after	2.1100	300	1.03026	.05948
Pair 13	Tongue before	1.1167	300	.43630	.02519
	Tongue after	1.0800	300	.36612	.02114
Pair 14	Teeth before	1.9267	300	.81865	.04726
	Teeth after	1.7700	300	.83632	.04828
Pair 15	Gums before	1.8633	300	.34407	.01986
	Gums after	1.7400	300	.43937	.02537
Pair 16	Nails before	1.9833	300	.53292	.03077
	Nails after	1.9600	300	.67818	.03915

The table-4 reveals that the haemoglobin level (biochemical test) of the respondents before and after intervention of Nutritional garden was  $2.4733 \pm 0.61960$  and  $1.8900 \pm 0.58226$ . The symptoms of osteoporosis, eye disease, constipation, joint pain, scurvey, general appearance, hair, eyes, skin, face, lips, tongue, teeth, gums and nails before intervention of Nutritional garden was  $0.5500 \pm 0.49832$ ,  $0.2900 \pm 0.45452$ ,  $0.3633 \pm 0.48176$ ,  $0.2300 \pm 0.42154$ ,  $0.2700 \pm 0.44470$ ,  $2.1433 \pm 0.51349$ ,  $2.1033 \pm 0.55409$ ,  $1.4933 \pm 0.77801$ ,  $2.2967 \pm 0.71439$ ,  $1.0200 \pm 0.14023$ ,  $2.2833 \pm 0.71045$ ,  $1.1167 \pm 0.43630$ ,  $1.9267 \pm 0.81865$ ,  $1.8633 \pm 0.34407$ ,  $1.9833 \pm 0.53292$ . Whereas the symptoms of osteoporosis, eye

disease, constipation, joint pain, scurvey, general appearance, hair, eyes, skin, face, lips, tongue, teeth, gums and nails after intervention of Nutritional garden was  $0.3067 \pm 0.46188$ ,  $0.1800 \pm 0.38483$ ,  $0.1433 \pm 0.35100$ ,  $0.1900 \pm 0.39296$ ,  $0.2100 \pm 0.40799$ ,  $2.0400 \pm 0.58269$ ,  $1.8000 \pm 0.63351$ ,  $1.2800 \pm 0.63478$ ,  $2.1800 \pm 0.80608$ ,  $1.0800 \pm 0.27175$ ,  $2.1100 \pm 1.03026$ ,  $1.0800 \pm 0.36612$ ,  $1.7700 \pm 0.83632$ ,  $1.7400 \pm 0.43937$  and  $1.9600 \pm 0.67818$ . All the clinical symptoms were higher in before intervention of Nutritional garden and were lowered down among the Lodha tribal women after intervention of Nutritional garden.

**Table 5:** Paired Sample Correlations

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Haemoglobin status before & Haemoglobin status after	300	-.068	.237
Pair 2	Osteoporosis before & Osteoporosis after	300	.602	.000
Pair 3	Eye disease before & Eye disease after	300	.733	.000
Pair 4	Constipation before & Constipation after	300	.541	.000
Pair 5	Joint pain before & Joint pain after	300	.886	.000
Pair 6	Scurvey before & Scurvey after	300	.848	.000
Pair 7	General appearance before & General appearance after	300	.774	.000
Pair 8	Hair before & Hair after	300	-.093	.107
Pair 9	Eyes before & eyes after	300	-.050	.385
Pair 10	Skin before & Skin after	300	.133	.021
Pair 11	Face before & Face after	300	.046	.431
Pair 12	Lips before & Lips after	300	.008	.897
Pair 13	Tongue before & Tongue after	300	.067	.247

Pair 14	Teeth before & Teeth after	300	.273	.000
Pair 15	Gums, before & Gums after	300	.118	.041
Pair 16	Nails before & Nails after	300	-.039	.502

Table-5 shows the Paired sample correlation value was significant ( $P=0.000$ ) in the occurrence of the diseases such as osteoporosis, eye disease, constipation, joint pain, scurvy

and clinical symptoms, general appearance and teeth of the respondents before and after intervention of Nutritional garden. This may also affect the study.

**Table 6:** Paired Sample t- test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Haemoglobin status before - Haemoglobin status after	.58333	.87880	.05074	.48348	.68318	11.497	299	.000**
Pair 2	Osteoporosis before - Osteoporosis after	.24333	.42981	.02482	.19450	.29217	9.806	299	.000**
Pair 3	Eye disease before - Eye disease after	.11000	.31341	.01809	.07439	.14561	6.079	299	.000**
Pair 4	Constipation before - Constipation after	.22000	.41494	.02396	.17286	.26714	9.183	299	.000**
Pair 5	Joint pain Before - Joint pain after	.04000	.19629	.01133	.01770	.06230	3.530	299	.000**
Pair 6	Scurvy before - Scurvy after	.06000	.23788	.01373	.03297	.08703	4.369	299	.000**
Pair 7	General appearance before - General appearance after	.10333	.37388	.02159	.06085	.14581	4.787	299	.000**
Pair 8	Hair before - Hair after	.30333	.87972	.05079	.20338	.40329	5.972	299	.000**
Pair 9	Eyes before - eyes after	.21333	1.02860	.05939	.09647	.33020	3.592	299	.000**
Pair 10	Skin before - Skin after	.11667	1.00320	.05792	.00268	.23065	2.014	299	.045*
Pair 11	Face before - Face after	-.06000	.30006	.01732	-.09409	-.02591	-3.463	299	.001**
Pair 12	Lips before - Lips after	.17333	1.24705	.07200	.03165	.31502	2.407	299	.017*
Pair 13	Tongue before - Tongue after	.03667	.55045	.03178	-.02588	.09921	1.154	299	.250
Pair 14	Teeth before - Teeth after	.15667	.99772	.05760	.04331	.27003	2.720	299	.007**
Pair 15	Gums before - Gums after	.12333	.52508	.03032	.06367	.18299	4.068	299	.000**
Pair 16	Nails before - Nails after	.02333	.87865	.05073	-.07650	.12316	.460	299	.646

Table-6 reveals the difference between before and after intervention of Nutritional garden is highly significant ( $P=0.000$ ) with the occurrence of the haemoglobin status, occurrence of the diseases such as osteoporosis, eye disease, constipation, joint pain, scurvy and clinical symptoms such as, general appearance, hair, eye, face, teeth and gum and rest of the parameters were found to be statistically non-significant with the intervention of Nutritional garden

### Conclusion

Mayurbhanj is a tribal conquered district and major portion of this district of 58.72% (as per census of India, 2011) [1] is inhabited by the tribal people. In general the tribal communities of India are being neglected, discriminated in terms of earnings, education, physical condition and also social status which in return affect their nutritional and health status. Convenience and affordability of nutrients are very much vital to lead a healthy and prosper life. To support these nutrients to their accessibility, nutritional garden was intervened and its impact was studied. The nutritional garden results a positive attitude in the Lodha tribal women towards changes in health status of their family members. The present results might be helpful for the policy makers to prepare an apt strategies for the all round development of health among the tribal people in general and tribal women in particular. The intervention of Nutritional garden has a significant impact on the haemoglobin status occurrence of the diseases such as osteoporosis, eye disease, constipation, joint pain, scurvy and clinical symptoms such as, general appearance, hair, eye, face, teeth and gum and rest of the parameters were found to be statistically non significant with the intervention of Nutritional garden.

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### References

1. Government of India. Census of India 2011. Scheduled castes and scheduled tribes. New Delhi, Registrar General and Census Commissioner of India. 2011. [www.censusindia.gov.in](http://www.censusindia.gov.in) [Accessed 19 April 2021].
2. Maiti S, Unisa S, Agarwal PK. Health Care and Health among Tribal Women in Jharkhand: A Situational Analysis. *Stud. Tribes Tribal*. 2005;3(1):37-46.
3. WHO. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June 1946, and entered into force on 1948 April 7.
4. Suri S. Nutrition Gardens: A Sustainable Model for Food Security and Diversity. ORF Issue Brief No. 369, Observer Research Foundation. 2020.
5. Bhuyan J, Behera S, Mohanty D. Assessment of Nutritional Status based on BMI of Lodha tribal women in Mayurbhanj district of Odisha. *Journal of Research ANGRAU*. 2021;49(3):45-57.