HEALTH AND NUTRITIONAL STATUS AMONG THE CHRONIC AND OCCASIONAL RICE BEER DRINKERS: A COMPARATIVE STUDY.

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ABSTRACT:

Many indigenous communities like Santal, Munda, Bhumij, Lodha, Sabar, etc. more than 11 types of major Scheduled Tribe communities residing in the different districts in West Bengal. More than half of the total Scheduled Tribe population of the state is connected in Paschim Medinipur, Purba Medinipur, Jalpaiguri, Purulia, and Bardhaman districts. Of the remaining districts, Bankura, Jhargram, Uttar Dinajpur, and Dakshin Dinajpur have a sizable Scheduled Tribe population and having their unique ethno-socio-cultural lifestyle with making rice beer brewing techniques using wild herbs and local rice varieties popularly known as Handia or Hariya. Fermented drinks are generally connected with the culture and existence of ethnic tribes throughout the world. Traditional rice beer of West Bengal in India is an indispensable part of tribal lifestyle attached cultural and religiously with them. The present study is focused on a comparative study of the health and nutritional status among the chronic and occasional rice beer drinkers population on the basis of calculating their different types of anthropometric measurements and blood pressure.

Keywords: *Anthropometric measurements, Rice Beer, Health and Nutrition, Scheduled Tribe.*

1. GENERAL INTRODUCTION.

Health and nutrition are important elements in the development process. Adequate nutrition enhances physical health, thereby improves immune systems and reproductive health fitness. Both nutrition and health increase life expectancy, which is known to be important for development[1]. Although primarily health is a function of nutritional status, other factors like availability, quality and cost of health care services, living standards, sanitary conditions, quality of drinking water, and economic condition are also important[2]. With the significant development in treatments and medical services, people have become highly aware and cautious about their health and fitness. In tribal societies, the concept of health, fitness, and diseases varies between different tribal groups[3]. In a tribal habitat, a person is usually considered to be afflicted with some diseases if he/she is incapable of doing the routine work, i.e., incapacitation from work is the universal index of poor health. Thus the concept of ill health becomes a functional one and not clinical. Reproductive health is also very poor among most tribal communities. Health problems prevalent in tribal areas include endemic infectious diseases like malaria, tuberculosis, and diarrheal diseases, apart from malnutrition and anemia. What is worrying is that the prevalence of chronic diseases such as hypertension and diabetes mellitus, hitherto rare in these populations, is rising, and stroke and heart disease are now the leading causes of death[4].. Since the beginning of human civilization, fermented foods have occupied an integral part in the culture and traditions of many ethnic communities throughout the world. Fermented food is very significant to the human diet especially the tribal community viz. Santal, Munda, Lodha as well as in developing countries as it is an inexpensive technique used by world communities across the globe for food preservation along with enhancement of nutritional and sensory values of food [5,6].Fermentation is brought about by microorganisms that transform the raw materials into biochemically and organoleptically useful products with harmful products like phytates, tannins, and polyphenols beings destroyed or detoxified. Most of the tribal community spend their life in the forest and consumed Haria with local alcohol (Mahua). The tribal beliefs that haria is a very energetic food for daily activities as day labor. Fermentation is a process in which food is exposed to bacteria and yeasts, either via

inoculation or naturally through the air. Beneficial microorganisms beat out the kind that can kill you, and eat up the carbohydrates in the food. The results are interesting flavours, textures, and smells. Before refrigeration, curing meats, pickling vegetables, and clabbering milk was the only way to extend the life of perishables. And if fermented foods haven't been cooked, they are really good for health (cooking kills off the beneficial bacteria) [7]. Handia (Also handi or hariya) is a rice beer originating from the Indian subcontinent, popular in the Indian states of Bihar, Jharkhand, Odisha, Madhya Pradesh Chhattisgarh, and West Bengal. Tribal people generally live in villages and maintain a large number of traditional cultural practices. After a whole day's struggle for livelihood, they drink rice beer in good amount and start enjoying with their traditional musical instruments, songs, and dances. Rice beer is also consumed during festivals, marriages, and other ceremonies regularly. It is almost impossible to determine when these tribal people started preparing rice beer but certainly, it is a good improvisation of natural and direct fermentation of boiled rice when kept for a few hours soaking in water. The main point of modification is the addition of a specially formulated starter mixture in the boiled rice.

2. AIMS AND OBJECTS OF STUDY.

The aims and objective of my project work are

- To search out the affect of haria among long term haria consumer than short time haria consumer.
- To find out the present nutritional and health status among long time haria consumer and short time haria consumer.
- To screening out the frequency of vomiting among long term haria consumed people than other group.
- Finally, a comparative account has been made to realise the real scenario among the both consumer.

3. ABOUT HARIA (RICE BEER).

Rice beer is prepared at a household level for regular consumption in almost all the tribes involving a common process in West Bengal. Rice is cooked and spread over a mat for 1-2 hours for cooling. After cooling, an appropriate amount of starter culture (Bakhar) is mixed with cold cooked rice of approximately 50 g in 1 kg. The mixture is placed in a container (Clay-made pot) and covered with banana leaves so that minimum vapors can escape out of the container, covered with some rug or old clean cloth, and kept for 3 days. After 3 days, water is added and kept again for 2 days. The water is extracted out and consumed as un-distilled rice beer. For distilled rice beer, the mixture is heated and the vapour is collected in another container placed on the top of the container. The vapours from the top container are lowed to pass through a bamboo or plastic pipe into another container containing cold water for distilled rice beer. The tribes of West Bengal use varieties of plants and rice to impart taste and flavour to the rice beer; this may be attributed to the different rice varieties and plant species used by the tribes of West Bengal.

4. STARTER CULTURE.

The traditional starter used for the preparation of haria is bakhar. Bakhar is typically made of different plant parts. The major plants used for bakhar preparation were Cissampelospareira L. roots, Diospyrosmelanoxylon Roxb. Bark& leaves, Lygodiumsmithianum C. Presl. Whole plants, Orthosiphonrubicundus (D.Don) Benth.tubers, Ruelliatuberosa L. tubers, bark, and roots, and bark of Terminaliaalata Roth. These plant parts are considered essential for bakhar activity. Without these, the ferment will rot. In general, bakhar is kept in a dry place [8]. Usually, 2–3 g (2 g during summer and 3 g during winter) of starter dust is mixed with 200 g of parboiled rice and then fermented for haria preparation. Therefore, haria can be put into a unique category of rice-based beverage that is blended with an herbal mixture [9].

5. EFFECTS ON THE BODY.

When compared to traditional wine (made from grapes or other fruits), as well as beer, wine made from rice contains more alcohol. Its alcohol content can be in the range of 18% to 25 %. In comparison, regular wine usually contains 10% to 20 % alcohol, where beer ranges from 4% to 8% alcohol [10]. Therefore, it is natural to assume that drinking too much of this wine - or any other alcoholic beverage for that matter- might not be beneficial for the body. Moreover, because of rice wine's higher alcohol content, the familiar side effect of alcohol - such as nausea, blurry vision, lost balance, lost muscle control and a hangover - might be felt earlier than consuming a similar portion of drink with less alcohol content[11].

- Nausea: Sickness at the stomach, especially when accompanied by a loathing for food and an involuntary impulse to vomit.

- Blurry vision: Blurry vision is the loss of sharpness of eyesight, making objects appear out of focus and hazy.
- Blurred vision can affect both eyes, but some people experience blurry vision in one eye only.
- Lost balance: Loss of balance or dizziness is frequently described as a feeling about to fall or pass out, that is spinning, lightheaded, giddy, or tilting when trying to walk straight [12].

6. NUTRITIONAL IMPORTANCE.

In haria lactic acid(1.42%) production by LAB exerts beneficial effects on human health as they restrict the growth of pathogens as well as provide anti-allergic, immune-stimulatory, anti-tumour, and anti-ulcer effects. Production of malto-oligomers makes it an ultimate product for human consumption as it prevents the growth of pathogenic gastrointestinal microflora, has low calorific value, low viscosity, low water activity, and high moisture retaining capacity. During the fermentation of herbal metabolism process, many sugar derivatives are produced such as β-d-manopyranosepentaacetate; 1, 2, 3, 6-tetra-O-acetyl-4O-formyl-d-glucopyranose; 2,3,4,5-tetra-O-acetyl-1-deoxy-β-glucopyranose. These saccharides derivatives can conjugate with different components, like proteins and also various receptors of glycosylate present on the membrane of pathogenic bacteria and digestive tract wall of animals to promote their activities[13]. For instance, some conjugates are involved with the immune system like alpha-d-mannan/protein that enhances the activity of the immune system [14].The presence of phenolics and flavonoids can be correlated with the free radical scavenging and anti-mutagenic property of the product that prevents several degenerative disorders and risk of heart diseases. Due to its low alcoholic content (0.781.38%) compared to other alcoholic drinks (8-60%), consumers can intake a sufficient amount of this drink as it compensates the loss of water from the body during heavy labor work in the summer season. Although, there is a tribal practice of using Bakhar tablets in ailing mumps there is a belief that Haria cures diseases like jaundice, dysentery, etc. Maria tribe of Baster district also use this tablet as a mild painkiller. While ranu tablets are used for treating cholera by the Gond tribe of Surguja district. The product is non-toxic, cheap, and thus acts as a food supplement [15].In addition, it is also used as a remedy for skin, eye and hair, and heart-protective agent [16].

7. CHRONIC DRINKER AND OCCASIONAL DRINKER:

Chronic drinking is defined by drinkers who drink more than the recommended one (for women) or two (for men) drinks a day, or more than seven (for women) or 14 (for men) drinks in a week, according to the National Institute of Alcohol Abuse and Alcoholism (NIAAA).
Occasional drinkers: they drank less than 1 day per week (for instance once or twice per month) and drinking a maximum of 3 drinks for men and 2 drinks max for women.

8. ANTHROPOMETRIC ASSESSMENT.

Anthropometry is based on the fact the fact the physical state and gross composition of the body and when it is influenced by diet and nutrition then, we can call it Nutritional Anthropometry. Jelliffe, D.B.(1996) explains the measurements of the variations of the physical dimensions and gross composition of the human body at different age levels and degrees of nutrition are nutritional anthropometry. It should be recommended that other factors, such as illness due to infection or infestation may also affect the growth and physical status of the body. Anthropometry measurement such as height, weight, skin fold thickness and different circumference of different part of the body are valuable indicator of nutritional status. Farmer of the circumference of head, chest and mid-arm are very important.

8.1 Weight:

For weight measurement we have used human weighting machine. Subject stands the platform of the machine with minimum clothes and exerting equal pressure on both feet. We have taken the weight reading from the scale with accuracy for 0.5 kg.

8.2 Height:

Vertical distance from the floor to the vertex (maximum bulge of the top of the head) of the body while standing in stretched erect posture, feet together and firmly placed on the ground, weight equally distributed on both feet, looking straight ahead, palm flat against side of the thigh. A vertical measured rod or a scale fixed to a wall can be used. The height must be measured without shoes and the subject must stand on a flat floor by the scale. His feet should be parallel with the heels, buttocks, shoulders and back of the touching the upright portion of the

cale. The head piece should be either a metal bar or a wooden touch the hair and make contact with the top of the head.

8.3 BODY MASS INDEX (BMI)

BMI is a mathematical formula which correlates with the body fat of an individual .The BMI of each individual is calculated from the formula Wt(Kg)/ Ht(m)^2 by putting the value of weight in kg and height in meter square. Other way, We have took help from two nutritional index for assess each cases.

Physical Measurements formula of BMI= $\frac{Weight\ (kg)}{Height(m)^2}$= kg/m$^{2.}$

Cut off value of Body Mass Index (BMI) [17].

BMI	**Classification**
<18.5	Underweight
18.5 - 24.9	Normal weight
25.0 - 29.9	Overweight
30.0 - 34.9	Class I obesity
35.0 - 39.9	Class II obesity
≥ 40.0	Class III obesity

MUAC=Mid-Upper Arms Circumstances:
WHO cut of points MUAC <23cm =Under nutrition.

Even if the BMI is within a normal range, but risk for disease may be increased. According to the World Health Organization (WHO), a healthy **WHR** is: 0.9 or less in men. 0.85 or less for women.

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Waist-to-hip ratio chart.

Health risk	Women	Men
Low	0.80 or lower	0.95 or lower
Moderate	0.81–0.85	0.96–1.0
High	0.86 or higher	1.0 or higher

9. MEASUREMENT OF BLOOD PRESSURE AND PULSE RATE.

As a general guide: ideal blood pressure is considered to be between 90/60mmHg and 120/80mmHg. High blood pressure is considered to be 140/90mmHg or higher. Low blood pressure is considered to be 90/60mmHg or lower. The blood pressure measurements were made of after the completion of the anthropometric measurements. Left and Blood pressure was taken with a sphygmomanometer and stethoscope after the participator had been seated in a released position for five minutes. Prior to taking measurements, subjects were instructed to lie on the bed and then the left arm was placed at the inside of the body. Two former measurements were recorded and average for analyses. A five minutes relaxation period between the two measurements was maintained for all subjects, systolic Blood Pressure (SBP) and Diastolic Blood Pressure (DBP) we recorded to the nearest mm of Hg as the appearance (phase-1) and disappearance (phase-2) of korotk off sounds respectively.

10. DIETARY ASSESSMENT.

Diet survey constitutes an essential part of any complete study of nutritional status of individuals or groups. We followed the interview method for the purpose of dietary assessment. Some of the interview techniques are

- Diet recall,
- Diet history,
- Food frequency questionnaire etc.

Here we followed the diet recall (7 day) method. We asked the individual persons of the chronic *haria* consumer and occasional *haria* consumer.

11. STATISTICAL ANALYSIS OF DATA.

The calculated data was analyzed by the mean value, standard deviation, standard error and T-test. Data were represented as Mean ±SE[18].

11.1 RESULT.

The present study had a total of 50 haria consumed people. Who were participated in the present study, among them 25 long time haria consumer and 25 short time haria consumer . During survey we have applied questionnaire method to collect data and descriptive statistics anthropometric data in derived variable among the haria consumer. The present study revealed effect of haria on tribal people in Paschim Medinipur district (WB).

Table-1: Nutritional Status Analysis: Chronic & Occasional Drinkers' people.

	Chronic drinker			Occasional drinkers		
	As per BMI	As per MUAC	As per WHR	As per BMI	As per MUAC	As per WHR
Under Nutrition	36%	32%		8%	4%	
Normal	74%	78%	100%	84%	96%	100%
Over weight	Nil		Nil	8%		Nil

BMI=Body Mass Index, MUAC=Mid-Upper Arms Circumstances, WHR= Waist Hip Ratio

Blood pressure Status Analysis: Chronic & Occasional drinkers people.

Blood pressure	Chronic drinker	Occasional drinkers
Low	Nil	Nil
Normal	92%	72%
Hypertension-1	8%	28%

Table-2: Statistical Analysis of Anthropometric variable of Chronic drinkers peoples.

Statistical Category	Height (cm)	Weight (kg)	BMI (kg/m^2)	MUAC (cm)	Waist (cm)	Hip (cm)	WHR (cm)	SBP (mm of Hg)	DBP(mm of Hg)
Mean	1.58	48.02	19.20	24.12	77.38	84.80	0.91	112.48	69.95
S.D	0.07	6.61	2.13	2.48	7.94	6.45	0.05	9.37	6.23
S.E	0.01	1.32	0.43	0.50	1.59	1.29	0.01	1.87	1.25

Table-3: Statistical analysis of Anthropometric data of occasional drinkers.

Statistical category	Height (cm)	Weight (kg)	BMI (Kg/m^2)	MUAC (cm)	Waist(cm)	Hip(cm)	Waist hip ratio (cm)	SBP (mm of Hg)	DBP (mm of Hg)
Mean	1.57	52.28	21.26	26.56	76.84	83.68	0.92	114.56	76.72
S.D	0.06	5.30	1.92	2.33	7.87	6.87	0.06	8.84	6.83
S.E	0.01	1.06	0.38	0.47	1.57	1.37	0.01	1.77	1.37

Table-4 : Representation of chronic haria consumers people and occasional haria consumers people at Khejurdanga in West Medinipur, Data were represented as Mean±SE.

Parameters	chronic haria consumers	chronic haria consumers
Height(cm)	1.58 ± 0.01	1.57±0.01
Weight (kg)	48.02 ± 1.32	52.28 ± 1.06
BMI (kg/m^2)	19.20± 0.43	21.26± 0.38
MUAC (cm)	24.12 ± 0.50	26.56 ± 0.47
Waist Hip ratio(cm)	0.91±0.01	0.92±0.01
SBP (mm of Hg)	112.48 ±1.87	114.56 ±1.77
DBP (mm of Hg)	69.95 ± 1.25	76.72 ±1.37

12. DISCUSSION.

A cross sectional study on rice beer (haria) consumers in the age group 30-40 years in the rural area of Khejurdanga, at Paschim Medinipur district in the West Bengal state of India on a sample consisted of 25 chronic rice beer consumers and 25 occasional rice beer consumers were conducted. In this study, besides socio-economic and demographic characteristics of rice beer consumers, anthropometric measurements of people such as height, weight and MUAC, BMI, waist circumference, hip circumference, and waist-hip ratio were made. The primary sources of income of the families are daily labour in the study areas.

After analysis of the collected data, it could be revealed that the Height between the two groups is not significantly different from each other.

The study has been revealed that the weight between two groups of people is significantly differing from each other. The weight in chronic rice beer (haria) consumers is significantly differing from occasional rice beer (haria) consumers. The occasional rice beer consumers were taken better nutrients foods and living a healthy lifestyle than the chronic rice beer consumer. This outcome reflects in the study it may be due to the chronic rice beer consumption and lack of intake of others nutrients foods as well as low income and lack of awareness regarding health that affects the health status especially the body weight among peoples.

According to the American Psychiatric Association, substance abuse or excessive use of substances, including Haria and drugs, cause an individual to suffer from clinical impairments as well as the dramatic loss of academic, professional, and social skills[19].

Haria abuse also dramatically alters the diet and in most cases, it leads to irregular eating patterns and poor nutrition. As a result, previously healthy adults may begin to experience significant health problems shortly after the haria abuse begins.

Metabolism refers to the way the body breaks down food and uses it for nutrients and energy. Cells throughout the body must receive adequate amounts of nutrients, including sugar in the form of glucose to use for energy, growth, and repair from damage. Poor diet and nutrition, which often occurs secondarily to abuse of haria, can lead to brain damage, organ damage, and different types of diseases[20].

In a healthy body, an assortment of amino acids and other nutrients are needed to avoid organ damage and disease. Prolonged and excessive haria consumption interferes with these processes [21].

High levels of the body cannot store haria, so once it is consumed it is quickly broken down to facilitate excretion from the body. It contains 'empty calories that often make people feel as if they are full, especially if they consume large quantities of it. Large amounts of haria damage the intestinal tract, which then decreases the body's ability to absorb and utilize vitamins, minerals, and other nutrients from the food that is eaten[22].

Our study is also revealed that the BMI of the chronic haria consumer group is significantly different from the occasional haria consumer group at the level of ($p<0.001$), (Table-1). These are may be due to the low intake of 1st class protein included in their daily diet and skip two or more meal frequencies.

The harmful effects of haria may be greater in persons with lower BMIs than with higher BMI[23].

This study also consists with another result that MUAC in chronic haria consumer group is significantly less than the occasional haria consumer group at the level of ($p<0.001$), (Table-1). These may be due to the low intake of 1st class protein, and 2nd class protein, and a healthy diet.

Due to the lack of 1st class protein contain in the diet consumer are suffering from low body weight as well as low BMI, low MUAC of the body.

Our study is consistent with another result that the waist-hip ratio between the two groups is not significantly different from each other ($p>0.05$),(Table-2). This study is also similar to the consumption of haria decrease body weight but does not resist the waist-hip ratio in people.

This study is also consistent with another result that Systolic blood pressure of the adult in a chronic haria consumer group is significantly less than the occasional haria consumer group children at the level of ($p<0.05$), (Table-2).

The present study is also revealed that the diastolic blood pressure of adults in the chronic haria consumer group is significantly less than the occasional haria consumer group people during prolong haria consumption at the level of ($p<0.001$), (Table-2).

It is also noted that haria effect on body weight, especially when it is consumed on empty stomach, The chronic haria consumer group are more affected than the occasional haria consumed group at the level of ($x^2=p<0.05$), (Table-4:) .

13. CONCLUSION.

After long discussion and studied all the literature we conclude that although we are all concerned that haria is a very nutritious health food, it keeps our stomachs cool and mood-altering stimulant. It relaxes tribes during the course of hard work. It stimulates them to be angry, confusion and hesitant. Due to its low alcoholic content compared to other alcoholic drinks, consumers can intake a sufficient amount of this drink as it compensates for the loss of water from the body during heavy work during the summer season. But from this project work, it has been noted that people who consumed haria around 4 litters or above per day and for a long time, affected their normal health, and they suffer from heavy vomiting and anxiety.

We found that the chronic haria consumer group is more affected by haria than the occasional haria consumer group, due to some nutrient intake. It is found that the effect of haria on health is more in a long time haria consumed people due to excessive amount of haria consumption for long time, skip of two or more meal per day and living low socio-economic condition.

A paucity of time, funds, and manpower forced us to conduct a cross-sectional study. Comparatively, a longitudinal study is a better indicator of the health problems of a study population.

Now some recommendation has been made for the better living condition in the rural area.

- Haria is an alcoholic food drink, so do not drink Haria on the empty stomach.
- During Haria consumption some protein type of food will be required.
- The older person (above 60) should not drink haria as usual.
- Haria should be drunk in a hygienic way because various types of bacterial diseases would be found.

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