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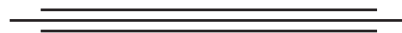
Contents

Original Articles

- | | |
|--|----|
| Child Stunting in India: New Figures with Flagrant Challenges
Indresh Kumar | 9 |
| Role of Two Question Canadian Nutritional Screening Tool in Plastic Surgery
K Sri Harsha Reddy, Ravi Kumar Chittoria | 17 |

Review Articles

- | | |
|--|----|
| Takra (Buttermilk) a Wholesome Probiotic Therapy in Grahani W.S.R to Irritable Bowel Syndrome
Pooja Devi, Sandeep S. Sagre | 23 |
| Relationship Between Yoga and Nutrition
Dhananjay Mankar, Priyanka Devi | 31 |
| Guidelines for Authors | 37 |



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Child Stunting in India: New Figures with Flagrant Challenges

Indresh Kumar

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Abstract

Around 144 million children worldwide still suffer from stunting, even though the incidence of the condition has been steadily declining for the past 30 years. More than any other factor, stunting has negative long-term effects on a child's physical and cognitive development. In the Global Hunger Index 2022, India ranked 107 out of 121 countries, with the highest child-stunting rate in the world at 35.5%. Indian, however, noted improvement in two parameters of child stunting from 38.7% in 2012-16 to 35.5% in 2017-21. Telangana, Gujarat, Kerala, Maharashtra, and West Bengal all have high rates of child stunting. There has been progressing, but persistent inequality still exists. Infant and child care practices, hygiene, and inadequate food security in the poorest households are among the immediate and underlying factors that contribute to stunting. This article deliberates on challenges and prevention statistics for stunting. The results of the study show that even after the efforts being made by the government, the old challenges have remained.

Keywords: Stunting; Height-for-age; NHFS-4; NHFS-5; Child health; Physical development; Underweight.

INTRODUCTION

Indian children are among the shortest children in the world. This article uses data from the National Family Health Survey-5 (NFHS-5) to examine the height complexity and heterogeneity of children in

the country. It has been found that the height-for-age (stunting) of children in India has improved between National Family Health Survey-4 (NHFS-4) 2015-16 and NHFS-5. While this is significant, the increase is small considering the overall short length of India and India's economic progress.²

The average height of the children of a population is an important measure of its human development. The distribution of height in a population reflects the health and well-being that children experience at a young age.¹ What happens to infants and children is important to their achievement, health, and survival throughout life. For decades, policymakers, researchers, and everyone concerned about the well-being of children have agreed on the simple fact that India's children are among the shortest in the world. Unfortunately, for almost the past decade we have relied on one main source for this fact. That source is a survey

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conducted in 2019-21. Even Bangladesh, Nepal, and other countries have released data from several new demographic surveys. A researcher could be forgiven for questioning that some decision-makers are indifferent to facts about children's height.³

That changed in 2019 and 2021: NFHS-5 was completed. Across India, surveyors took measurements of a representative sample of 1,80,867 children under the age of five. The researchers expected that with faster economic growth and other improvements in human development, the average height of children would have increased from a decade earlier. But India catching up with the rest of the world.¹

Stunting, wasting, and being underweight was significantly higher using WHO charts. The prevalence of stunting and wasting changed from high to medium and critical to poor when the reference changed from the World Health Organization (WHO) to synthetic Indian charts (SC).⁴ All Z-scores showed an improving trend with an increasing wealth index. On SC, almost all WHZ (wasting) from the richest to poorer were >-0.5 (clinically significant), whereas on WHO charts all wealth classes had WHZ <-0.5 . For children under the age of 6 months, WHZ from richest to poorest was between -0.97 and -0.89 by WHO and 0.27 and 0.38 by SC.⁵

METHODOLOGY

This article is based on narrative review methods and reports published by international agencies as well as Indian government are included in this study. Peer review refereed journal articles were included in this study and retrieved from NCBI electronic library which was published from 2017 to 2022.

RESULT AND DISCUSSION

Difference in figures

The estimated number of underweight, malnourished, and severely malnourished children under 5 years of age is obtained under NFHS conducted by the Ministry of Health & Family Welfare. As per the recent report of NFHS-5, the nutrition indicators for children under 5 years have improved as compared with NFHS-4. Stunting has reduced from 38.4% to 35.5%, Wasting has reduced from 21.0% to 19.3% and Underweight prevalence has reduced from 35.8% to 32.1%.¹

In recent research, we analyzed children's height data from the NFHS-5. Statistics researchers summarize children's heights as height-for-age standard deviations, which show how much a population of children differs from the distribution of heights of healthy children on average. A height for age mean of '0' indicates that the population is healthy. Unfortunately, this number is usually negative for a sub-population of Indian children.⁶

Between 2015-16 and 2019-21, the average height for age of Indian children increased from -1.48 to -1.00 overall. This is a major and significant improvement that reflects the achievements made in human development. In terms of average height, there has been improvement across rural and urban children, among boys and girls, in the plains states of northern India and the rest of India.^{1,7}

One way of looking at the statistics is that the most deprived places in India are now in as bad a condition as the whole of India was 10 years ago. In the year 2015-16, the height for age of children 3, 4, and 5 years of age in India was -2.11 . This is almost enough to classify him as a 'thigna'. Stunting is a condition that reflects extreme levels of deprivation. In 2019-21, the average rural child of these ages in the 'focus states' Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh had a height for age of -2.06 .^{3,8}

Complete list of the districts that are taken into account in this study, as well as how their percentage of stunted children changed between NFHS-4 and NFHS-5. Maps showing the prevalence of childhood stunting in India's districts over the two time periods. From 2015 to 2016, childhood stunting varied from 12.4% in Kerala's Ernakulum district to 65.1% in Uttar Pradesh's Bahraich district. In contrast, between 2019 and 2021, the rate of childhood stunting varied from 13.2% in the Jagatsinghpur district in Odisha to 60.6% in the Pashchimi Singhbhum district in Jharkhand.^{1,10} However, the comparative analysis of childhood stunting from the two rounds of the NFHS reveals that there were a total of 278 districts in 2015-16 with a percentage of childhood stunting higher than the national average (38.4%); There are 283 districts in 2019-21 that are higher than the national average of 35.5%. According to the findings of the change detection study, there are 231 districts in which the prevalence of childhood stunting increased between the years 2015-16 and 2019-21. Among these areas, the Kowhai locale of Tripura and the Kozhikode region of Kerala showed the most noteworthy expansion in youth hindering (27.5% and 25.4% respectively) over the most recent 5 years. On the other hand, childhood stunting was

decreasing in 411 of 692 districts.¹¹ The Madhya Pradesh districts of Bhopal and Tikamgarh saw the largest decreases (27.2% and 22.2%, respectively). There are fifty districts in which childhood stunting did not significantly change.

In addition, Moran-I statistics were calculated to determine the extent to which Indian districts are geographically clustered regarding childhood stunting. For the years 2015 to 2016, the Moran's-I value was 0.652 (P-value .001), whereas for the years 2019 to 21, it was 0.520 (P-value .001). The close clustering of districts with a similar prevalence of childhood stunting was illustrated by the high value of Moran's I.¹²

Once the presence of clustering is confirmed, univariate Local Indicators of Spatial Association

(LISA) cluster and significance maps (Fig. 'a' and fig. 'b') were used to identify the significant clusters of childhood stunting for both periods. Comparing the 'b' cluster maps it was evident that most of the high-high clusters consist of districts of Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, and Gujarat during 2015-16 and 2019-21.^{1,14} However, additional hotspots were found in the districts of Karnataka and Chhattisgarh during 2019-21. Low-low clusters were from the district of Tamil Nadu, Kerala, Punjab, and Haryana during both periods. In addition to these, during 2015-16 few of the cold spots were also from Himachal Pradesh and Telangana whereas in 2019-21 excluding a few of these cold spots, new cold spots came from Rajasthan.¹⁵

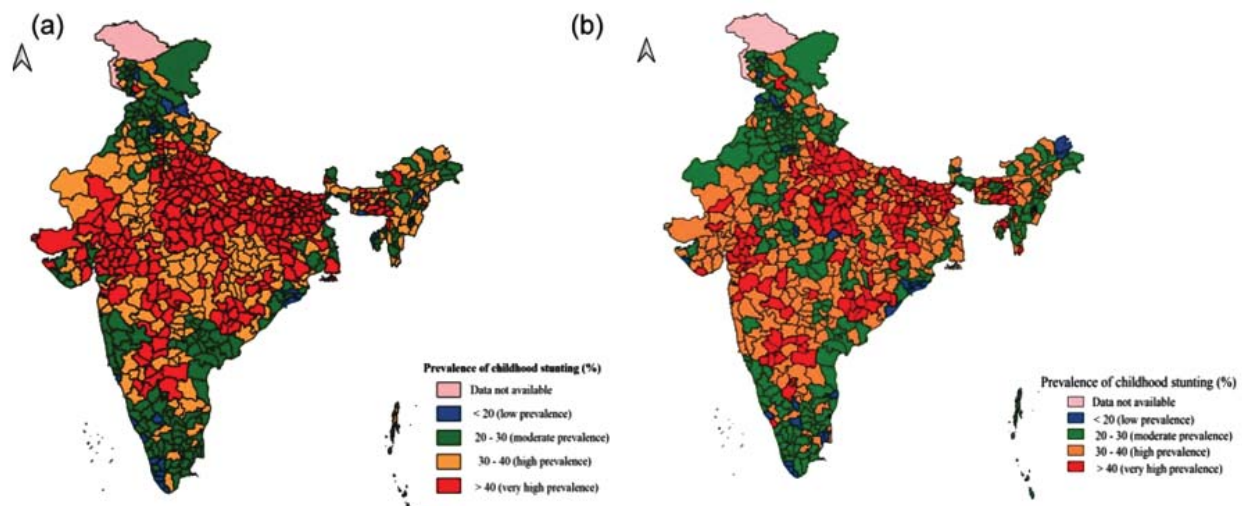


Fig. : District-level prevalence of childhood stunting in India during (a) 2015-16 (NFHS-4) and (b) 2019-21 (NFHS-5)

Similar Challenges

Although Indian children are now taller on average, the earlier pattern of discrimination still exists. Comparing NFHS-4 and NFHS-5, the average height-for-age of children in each caste group appears to be increasing. Nevertheless, the difference in height between the children of the deprived castes and those of the general castes remains the same as before. In both cycles of the survey, SC/ST (SC/ST) children were almost half a standard deviation shorter than the general caste children. At the same time, other backward class (OBC) children were shorter than the general caste children by about three tenths of a standard deviation.¹⁶ In addition, compared to the average height of general caste children in 2015, the average height of SC/ST children in 2015 makes India's children among the shortest in the world. This

article uses data from the NFHS-5 to examine the height complexity and heterogeneity of children in the country. It has been found that the height-for-age (height-for-age) of children in India has improved between 2015-16 and 2019-21. While this is significant, the increase is small considering the overall short length of India and India's economic progress. A subtle pattern of gender discrimination is also present in the NFHS-5 data.¹

The Length has also Improved in the rest of the world

The increase in the average height of children in India between 2015 and 2020 is significant and a matter to be celebrated. But we conclude that progress was modest and slow because growth must be considered in some context. One context is the rapid economic growth of India. According

to World Bank estimates, India's per capita income almost doubled during this period.¹⁷

Another important context is that of international comparison. India was at the bottom of the distribution of height-for-age of children in 2015-16, and it was the same in 2019-21. In only a few countries was the average child height as low as in the focus states of India in 2015-16. In recent years, no country has measured the height-for-age of children as low as it was in 2015-16 in the focus states. The average height-for-age of children in these states also increased between 2015 and 2021, but not enough to move them from the bottom, or above poorer large states such as Ethiopia, Nigeria, and the Democratic Republic of the Congo.³

Reasons for unsatisfactory progress

Improvements in length were limited because the determinants of length increased slowly. An important determinant is an open defecation which spreads germs and diseases which prevent children from growing to their full potential. Open defecation has declined, but the practice was still prevalent in most rural households in 2021.¹⁸

Another important factor is the nutrition of the mothers. Women in India are underweight, especially at the age when they are most likely to become pregnant. The low social status of young women deprives them and their children of the body mass they need for the growth and nutrition of the next generation.¹⁹

The root causes of stunting in India reflect social forces and social inequality gender discrimination in the case of maternal nutrition, and untouchability in the case of open defecation. These factors and forces should be at the center of efforts to improve the health and height of children in India.^{1,3,20}

CONCLUSION

Child stunting is measured by the growth of children in proportion to age. As per the survey data, the proportion of child stunting has increased in Telangana, Gujarat, Kerala, Maharashtra, and West Bengal. Stunting has reduced from 38.4% to 35.5%, place with country level. The study, which was the first in a line of studies to comprehend the change in the prevalence of childhood stunting at the NHFS (2015-16 to 2019-21), helped identify the districts with high priority and aided in the formulation of policies and program implementation. The study excludes historical antecedents that are known to influence the prevalence of childhood

stunting, such as poverty, inequality, and food insecurity. Even so, the study will help researchers and policymakers plan and implement policies to effectively control childhood stunting in India by assisting with district specific studies.

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Role of Two Question Canadian Nutritional Screening Tool in Plastic Surgery

K Sri Harsha Reddy¹, Ravi Kumar Chittoria²

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Abstract

The purpose of this article is to convey the importance of nutrition in plastic surgery, to suggest outpatient nutritional interventions within the surgical care setting, and to assist the plastic surgeon in incorporating nutrition as a key practise enhancement strategy for the care of wound patients in the future. Nutritional state has a well-known impact on surgical results. Malnutrition is widespread among the hospitalized patient population, and up to 1 in 4 plastic surgery outpatients are at risk for malnutrition. Micro- and macronutrients are essential for optimal wound healing. Certain patient populations in the field of plastic surgery are more vulnerable to malnutrition, hence, universal screening and interventions should be implemented. Exposure and incentive interventions have been used in outpatient settings to increase optimal nutritional consumption and overcome obstacles. Universal screening utilising established and quick measures like the Canadian Nutritional Screening Tool (CNST) is suggested in the clinical context. Such screening should be accompanied by proper blood tests, BMI measures, and, if necessary, immediate referral to a dietitian. The term "rehabilitation" was coined with the help of surgery, and it refers to the dietary optimization of patients as well as the promotion of functional capacity development prior to surgery.

Keywords: Canadian Nutritional Screening Tool (CNST); Malnutrition; Nutritional screening tool.

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INTRODUCTION

Patients pre-operative health, including their nutritional status, has the greatest impact on surgery results.^{1,2} On admission, up to 45 percent of hospital inpatients are malnourished.⁴ A universal nutritional screening platform was established in response to the scale of the problem, based on the Integrated Nutrition Pathway for Acute Care⁵ and recommendations from the American Society for Parenteral and Enteral Nutrition.⁶ The 2 question Canadian Nutritional Screening Tool (CNST)⁷ is used for universal triage in this screening platform.

This nutritional screening technique is simple to apply in a crowded tertiary care facility, practical in an outpatient setting, and accurate.⁸ The objective of this article is to emphasise the relevance of nutrition in plastic surgery, to recommend outpatient nutritional therapies in the context of surgical care, and to aid plastic surgeons in adopting nutrition as a substantial practise enhancement approach for patient care.

MATERIALS AND METHODS

Table 1: Question Canadian Nutritional Screening Tool (CNST)¹⁵

	Date		Date	
	Admission		Rescreening	
	Ye	No	Yes	No
Ask the patient the following questions*				
Have you lost weight in the past 6 months without trying to lose this weight?				
If the patient reports a weight loss but gained it back, consider it as NO weight loss.				
Have you been eating less than usual for more than a week?				
Two "YES" answers indicate nutrition risk+				

* If the patient is unable to answer the questions, a knowledgeable informant can be used to obtain the information. If the patient is uncertain regarding weight loss, ask if clothing is now fitting more loosely.

The CNST consists of 2 questions:

1. Have you lost weight in the past 6 months without trying to?
2. Have you been eating less than usual for a week?, where 2 "yes" answers indicate nutritional risk.

The patient details are as follows: 35 year old female admitted in Burns ICU with 25% second degree burns. The CNST was applied initially prior to admission and the patient was managed accordingly.

RESULT

According to the 2-question Canadian nutritional screening tool the patient was found to have no nutritional risk; hence, patient was managed conservatively with adequate intravenous fluids resuscitation and nutritional requirements as per standard guidelines and regular dressings.

The patient's course in the hospital was uneventful; she recovered well and was discharged in a timely manner.

DISCUSSION

In surgical patients, proper nutrition is critical. Macronutrients are required for wound healing

This study was conducted in the Department of Plastic surgery in a Tertiary care centre in South India. Departmental ethical clearance and consent from the subject was obtained. In this study, we have used the 2-question Canadian nutritional screening tool (Table 1)¹⁵ to assess the nutritional risk of the patient under question. It is simple (2 questions taking <5 minutes), shows good sensitivity and specificity, and accurately predicts adverse outcomes when validated against the Subjective Global Assessment gold standard.⁵

at all stages. Protein deprivation, for example, causes a prolongation of the inflammatory phase by reducing fibroblast proliferation, proteoglycan production, and neo-angiogenesis.⁹ Wound healing necessitates proper nutritional support, but wounds also raise basal caloric and protein requirements.⁹ Micronutrients are also important in the healing process of wounds. Vitamin A stimulates fibroblasts, whereas vitamin C enhances collagen synthesis and fibroblast proliferation, and zinc is required for protein and collagen synthesis.¹² The amino acids arginine and glutamine have been extensively researched.¹³ Arginine supplementation has been proven to improve wound tensile strength and glutamine supplementation has been demonstrated to improve nitrogen balance and immune function following major surgery, trauma, or sepsis, despite the fact that there are no current guidelines for its usage in clinical practise.¹³ Malnourished people have a weaker immune system, which results in lower T-cell function, phagocytic activity, complement, and antibody levels. This puts them at a higher risk of wound infection.¹⁰ The plastic surgeon should be concerned about delayed wound healing and an increased risk of post-operative wound problems and infections due to a reversible dietary cause.

Over the last few decades, the relevance of nutrition in holistic patient care has sparked a

nutritional revolution. The introduction and execution of whole parenteral feeding in the late 1960s was a key innovation. The high incidence of protein calorie malnutrition in hospitalised and postoperative patients underscored the importance of establishing a nutritional care plan. Various nutritional assessments and quantifications of nutritional deficits have now been devised to identify people who are at risk.¹¹⁻¹⁴ In connection to head and neck reconstructions, burns, patients receiving chemo or radiotherapy, such as breast oncologic reconstructions, and wounds, nutrition is especially important to the plastic surgeon.⁹

Importantly, if diagnosed, malnutrition is a reversible condition. Following a clinical examination, it is recommended that a rapid nutritional screening tool, such as the CNST, be used to facilitate the recognition and screening of malnutrition risk, in addition to documenting patients' BMI. These measurements can be taken by nursing professionals as part of normal quick clinical examinations prior to clinical encounters. Patients' self-reporting of the CNST's two questions upon presentation to the clinic could be an appropriate alternative if there are limits or a manpower shortage. Blood tests, including albumin/prealbumin levels, might be ordered by the plastic surgeon as a first-line inquiry if clinical suspicion for malnutrition is present, as indicated by two "Yes" answers on the CNST.

As part of the "prehabilitation" paradigm, prompt referral to a dietician for perioperative nutritional optimization should be reinforced. Further investigations, such as blood tests to examine patients' macro (eg, albumin) and micronutrient status (eg, vitamins A, B12, C, D, E, iron, folate) are also highly beneficial in identifying particular reversible deficiencies after adequate nutritional specialist consultation. Prehabilitation is the metabolic augmentation of a patient's preoperative status in order to increase physiologic reserves, and it includes physical activity, psychological evaluation, and nutrition treatment. Preoperative therapies may include glycemic control advice, access to weight loss programmes, or assistance with personally tailored workouts. The capacity to test or intervene on a patient's nutritional condition may be influenced by system, practise, and patient restrictions. Nutritional optimization should be possible in this era of patient-centered care, especially in perioperative patients at risk of malnutrition.

The Canadian Nutritional Screening Tool (CNST) is a new hospital based tool developed by

the Canadian Malnutrition Task Force. A study carried out by Karen et al reported that 1:4 plastic surgery patients are malnourished. The data granularity was insufficient to further elucidate the nature of the nutritional risk, the type of plastic surgery consult, and the impact of nutrition on post-operative complications.⁴

In our study it was found that CNST tool could be performed by nursing staff as a routine assessment or in case of shortage of personnel patient's self-reporting is acceptable. This tool was found to be found be rapid, easier to use, feasible; simple to apply in a crowded tertiary care facility, practical in an outpatient setting, and accurate. It can be also be used as a screening tool to order further investigations to rule out malnutrition in patients. The limitations of our study is that, since this single case report study, definite conclusions cannot be made. This study can also be used as the basis for a larger prospective study to determine the efficacy of CNST and if nutritional interventions could optimise patients before surgery.

CONCLUSION

Once diagnosed, malnutrition is a treatable condition. Following a clinical evaluation, we would advise plastic surgeons to promote the diagnosis and screening of malnutrition risk by using a fast nutritional screening tool such as the Canadian Nutritional Screening Tool (CNST) in conjunction with recording patients' BMI. These measurements can be used as standard quick clinical assessments before clinical visits.

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Takra (Buttermilk) A wholesome Probiotic Therapy in Grahani W.S.R to Irritable Bowel Syndrome

Pooja Devi¹, Sandeep S. Sagre²

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Abstract

Background: An extremely common, chronic, and frequently disabling condition of the gut-brain connection, is irritable bowel syndrome (IBS). It is characterised by recurring stomach pain and changes in bowel habits. *Grahani* is the seat of *Jatharagni* and *Grahani Dosha* is one among the *Mahagadas*. *Grahani* is a disease of great clinical relevance in today's modern era because of its direct link with the improper food habits and stressful lifestyle of the present time. Vitiation of Agni affects the digestion process and vitiates proper formation of further dhathus, so one should give importance to the management of Agni.

Aim: Ayurveda described various treatment modalities for the management of *Grahani Roga*. In this article we tried to summarize the effect of *Takra* (buttermilk) in *Grahani Roga* with the help of Ayurvedic principles and pharmacodynamics.

Methods and Materials: Various Ayurvedic texts like *Charaka Samhita*, *Susruta Samhita*, *Astang-Hridaya* and relevant modern medical science books.

Conclusion: *Shamana* and *Shodhana chikitsa* modalities are adopted to treat *Grahani* but diet and lifestyle are the most important modalities to be followed to control or cure the condition. *Takra* is compared with *Amrita* because of its qualities. *Acharya Vagbhata* states that *Takra* does *Srotoshodhana* and helps the *rasa* to reach the *srotas*. *Takra* by its different *gunas* acts as *tridosha shamaka*, it is very helpful in the patients suffering from *agni vikriti* have different types of dosha dushti.

Keywords: *Grahani dosha*; *Grahani roga*; *Agni*; *Takra*; *Shamana chikitsa*; Irritable Bowel Syndrome (IBS)



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INTRODUCTION

In this current era, faulty dietary habits and a sedentary lifestyle are key causative factors for diseases. *Grahani Roga* is *Tridoshatmaka*, which occurs because of the vitiation of *Pachakagni*, *Samana vayu* & *Kledaka Kapha*. The word *Grahani* is derived from Dhatu "Graha" which means, to catch, to hold, or to get.

“Annasya grahanaad grahani mata”(Ch.Chi.15)

The word *Grahani* is derived from *Dhatu* “*Graha*” which means, to catch, to hold, or to get.

Due to its function of *Annagrahana* (holding), it is known as *Grahani*, so *grahana*, *dhara*, *pachana*, *shoshana* and *munchana* are the functions of *Grahani*.

Ayurveda defines *Grahani* as the location of *jatharagni* which absorbs the *prasada bhaga* and pushes down the *kitta bhaga* for expulsion (*Dharana* of *apakwaanna* and *Visarjana* of *pakwa anna*). It is the *shasti pitha dhara kala* between the *amashaya* and *pakwashaya*. The disease that is affecting the *grahani adisthana* is known as *grahani roga*. Improper food habits lead to *Agni dooshana*, *agnimandhya*, and causes *grahani vikara*. Because *grahani* is *agnimandya* *janya roga*, *deepana*, *pachana*, and *agni chikitsa* should be prioritized.

Takra (buttermilk) is one of the *aharadravyas* described in Ayurveda with lots of medicinal properties. The use of *Takra* is indicated as a single drug or as an *Anupan* or as a *pathya* (wholesome) in various diseases like *Grahani* (sprue), *Arsha* (piles), *Atisara* (diarrhea), etc.

Takra is given equal importance to that *Amrita*. Acharya Vagbhata states that *Takra* does *Srotoshodhana* as a result of this, *Rasa* reaches the *Srotas*. *Takra* by its different *Gunas* acts as *Tridosha shamaka* because of its specific property it is very helpful for patients suffering from *Agni Vikriti*.

Thus *Takra* is a very important component in treating patients suffering from diseases connected with *Agni* among which *Grahani Roga* is one.

Irritable Bowel syndrome [IBS] is a chronic, often debilitating, and highly prevalent disorder of Gut-Brain interaction. It is characterized by recurrent abdominal pain and changes in bowel habits in the absence of structural abnormalities of the gut.

The presentation may vary with diarrhea dominant or constipation dominant and some present with mixed symptoms. Acute psychological stress and psychiatric diseases also affect gut motility.

Young women are 2-3 times more prone to IBS than men. IBS symptoms are linked to *Grahani roga* in the Classics, as explained in Ch.Chi.15, Su.Ut.40, and AH.Ni.8.¹⁻³

Irritable bowel syndrome (IBS) is one of the most common functional bowel disorders, with a

prevalence of 11.2% globally and varying from 4.2% to 7.5% in India.⁴ IBS is a multifactorial disease, that presents with symptoms like abdominal pain, stool irregularities, and bloating associated with somatic, visceral, and psychiatric co-morbidities.

MATERIALS AND METHODS

Various Ayurvedic texts like *Charaka Samhita*, *Susruta Samhita*, *Astang-Hridaya*, and *Astang Samgraha* and relevant modern medical science books and websites have been referred for compilation of this article.

Grahni roga:***Nidanas:***

Improper food habits like *adhyashana*, *virudhanna*, *vishamasana*, *Desha*, *Kaal*, *Ritu Vega* *dhara*, *Virechana*, *Vaman*, *Asamya* *prayog* of *sneha*, *Abhojana*, *Ajirna*, *Atibhojan*, *Vishmashan*, *Guru*, *sheeta*, *Atiruksha*, *Dushit bhojan* leads to *Agni dooshana* which further causes *agnimandhya* and *grahani vikara*.

Lakshanas:⁵

Muhurdra-*muhurbadha mala*, *Ati Srushta Mala* *Pravritti*, *Vibbadha Mala* *Pravritti* i.e, occasional hard and soft stool, *Arochaka* (anorexia), *Vairasya* (altered taste in tongue), *Trishna* (polydipsia), *Tama Pravesha* (darkness in front of eye), *Shotha* (oedema), *Asthi Ruk* (pain in bones), *Chardi* (vomiting), *Jwara* (fever), *Tiktaamla* *Udgara* eruptions.

Bedha:⁶

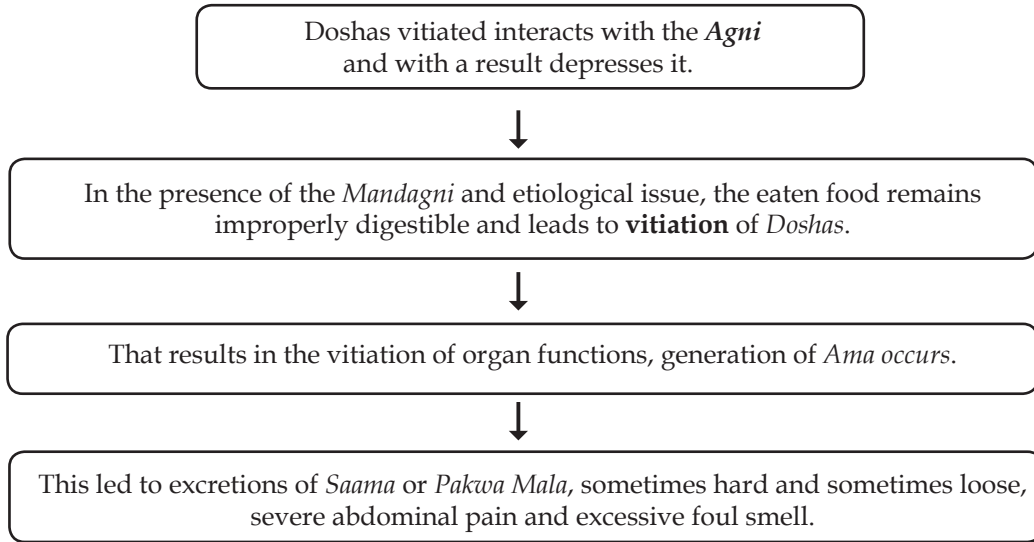
- **Acc. to Acharya Charaka 4 types:**

1. *Vatika*
2. *Paitika*
3. *Kaphaja*
4. *Sannipatika*

- **Acc. Madava Nidana 6 types:**

1. *Vatika*
2. *Paitika*
3. *Kaphaja*
4. *Sannipatika*
5. *Samgrahagrahani*
6. *Ghatiantra Grahani Roga*

Samprapti (Pathophysiology):

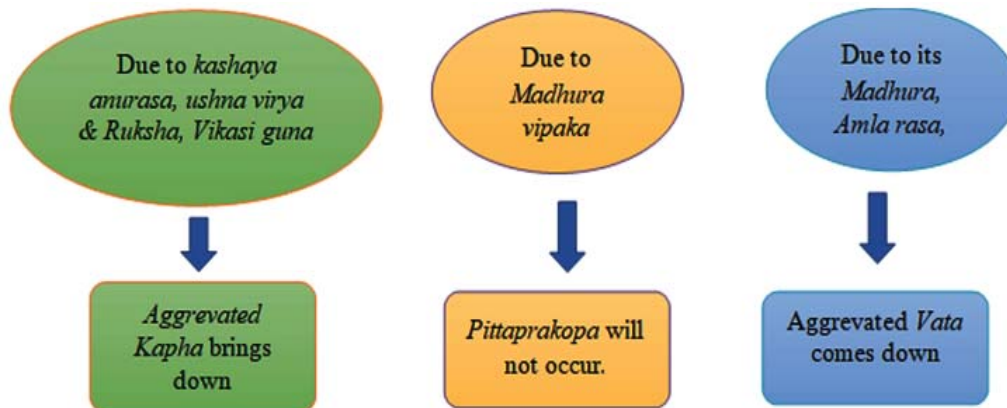


Samprapti Ghatak



Chikitsa:

- ✓ *Agnimandhya* is very important factor in the *Samprapti* of the disease *Grahani Dosha*. Thus, it thought to be mainly treated for *Agnivardhana* by *Deepana* and *Pachana* medication. All the treatment modalities of *Ajirna* and *Atisara* should be enforced within the management of *Grahani Ashrita Dosha*.
- ✓ Throughout this stage, the vitiated *Dosha* are still confined to the actual *Ashaya* (i.e. *Grahani*).
- ✓ *Grahani* roga general treatment is described by *Acharya charaka* are *Snehana*, *Svedana*, *Shuddi* (purificatory measure), *Langhana*, *Dipana*, *Churna*, *Lavana*, *Kshara*, *Madhvarista*, *Sura*, *Asava*, *Takra*, *Dipana*, *Ghrita* etc.
- ✓ Also, treatment principle of treatment *Grahani* is mainly based on the avastha of the vyadhi. *Grahanipresenting* with *Ama lakshana* is treated with *Vamana*.
- ✓ Whereas *grahani* with *Leena*, *pakwashayasthaana* is treated with *deepana* and *virechana*. *Shareeranugatasaama* is treated with measures of *langhana* and *pachana*.⁷
- ✓ Various *Deepana Pachana* drugs described in various classics should be administered along with follow of *Laghu* and *Supachya Ahara*.

Probable mode of Takra in Grahani:

- ✓ Rasa of takra is Madhura, Amla and Kashaya Anurasa which is having Laghu, Ruksha Guna, Ushna virya and Mdhura vipaka. It does Tridosahara, Agni deepana, Hrudyā, Kapahavata shamaka and acts as Grahi.
- ✓ Takra has been proved a great importance in udara and arsha rogas also. Grahani dosha is a condition related with a agnivikruti. In this condition takra is useful by means of its deepana grahi laghvāt property.⁸
- ✓ Takra is Grahi dravya which is better choice in Grahani dosha because it does the Deepana, Pachana which helps in rectifying Mandagni.
- ✓ Takra is Srotoshodhaka, helps in the proper absorption of Rasa. Hence the probable mode of action based on its properties & samskara.

Various formulations of Takra in different diseases:

1. In vataja disorders like Vataja atisara: Takra + saindava lavana
2. In pittaja disorders like Dakodara (Acitis): Takra + sharkara
3. In kaphaja conditions like Stholaya (Obesity): Takra + kshara and Trikatu
4. In grahani Takra acts as Rochana, Pustiprada, Balya, Bastishoolavinashana Along with Hingu, Jeeraka, Saindava lavana.

MEDICINAL PREPARATION OF TAKRA

Takrarista prepared with takra along with Yavani, Amalaki, Pathya, Maricha each 3 pala i.e, 144 gms and Saindhava, Sauvarchala, Vid, Oudbhida, Samudra lavana (five types of salts) each 1 pala i.e, 48 gms acts as Agniddeepanartha. It helps in relieving conditions

of shotha, Gulma, Prameha, Krimi, Arsha & Udara roga.⁹

Role of buttermilk (Takra) as per modern understandings.

Buttermilk is rich in potassium, vitamin B-12, calcium, phosphorous and probiotics which help strengthen the digestive system and the immunity of the body. Thus buttermilk plays an important role in many conditions of the body.¹⁰

Fatty and amino acids are produced with the aid of vitamin B12. It transforms the body's glucose into energy. B12 helps to generate new nerve cells and wards off anaemia and stress.

Effects of caseins on human health are: increase of amino acid oxidation and protein synthesis, strongly inhibit proteolysis, appetite suppression, anti-hypertensive, immunomodulatory activities, anti-thrombotic, ACE-inhibitory activity.¹⁰

Potassium and calcium, both of which are abundant in buttermilk and are known to be helpful for bone health. Because buttermilk is relatively easy to digest, it is advised for gastrointestinal problems. Lactic acid in buttermilk is far more gastrointestinal friendly than lactose in whole milk.¹¹

The protein contents of buttermilk, with a percentage of 3.2% corresponds approximately to the content of skim milk. Caseins cover 77-81% of all the existing proteins in buttermilk.

DISCUSSION

The word Grahani can be understood in three ways in which. Grahani Avayava, Grahani Dosha & Grahani Roga. The impaired Agni results in structural defect & functional impairment of Grahani leading to Grahani Roga.

Unwholesome dietary pattern & stressful lifestyle are the main contributory factors to the development of *Grahani Roga*. The main symptom is change in bowel Habits (*Atisrusta Mala Paraavrutti & Atibaddha Malapravrutti*) beside other symptoms based on Dosha treatment principles of *Grahani Roga* is *Deepana & Pachana* during which *Takra* acts as *Tridoshagna*, *Deepana*, *Pachana* & *Srotoshodhaka*. Organic process values of *Takra* additionally recommend that *Takra* also strengthen the immunity and helps to take care of the health by preventing diseases.

CONCLUSION

Buttermilk is a complete food since it contains all the necessary macronutrients. It is nutritious and has every component needed for a well-balanced diet. It is a complete meal that may be consumed anywhere at any time because it contains proteins, carbs, minimum fats, vitamins, and necessary enzymes. Every diet should include it, and daily consumption is recommended.¹²

Regular consumption of a buttermilk recipe also eases digestive issues. Buttermilk has been known to treat a variety of digestive issues, including: Incontinence in bowel motion, Chronic diarrheal syndrome, colon cancer and stomach infections.¹²

Increases Immune Levels By Preventing Illnesses
Lactic acid bacteria are prevalent in *Takra*. This bacterium strengthens the immune system and aids the body in warding off harmful diseases found in common meals.¹³

Probiotics can moderate gut motility by a direct action on enteric nervous system or via epithelial cells. It has been known that probiotics could interact with the enteric nervous system to attenuated diarrhea from infectious or secretory diarrhea. In experimental studies, *Lactobacillus* inhibited post infective intestinal hypercontractility through an unidentified, heat labile fermentation product and by blocking calcium dependent potassium channels.^{14,15}

It's used as *Aushadhi* within the form of *Takrarista* & acts as a *Pathya* in the form of different dietary preparations. It may be used as each preventive & curative within the patients of *Grahani*.

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Relationship Between Yoga and Nutrition

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Abstract

Good health can be maintained through two key players which are diet and exercise. Yoga is one of the best ways to stay fit and healthy. It can improve health, flexibility, strength, posture, and so much more. According to studies, nutrition and Yoga have many overlapping advantages, including improved digestion, stress management, mindfulness, increased energy, and even detoxification. Yoga is all about taking deep breaths and building physical strength. Thus, a person should pay attention to his or her eating habits as well, so that the body is not involved in intensive digestive activity.

Yoga is a holistic philosophy that attempts to cleanse, strengthen, and develop all levels of our human existence. Good nutrition not only benefits our yoga practice, but it also benefits our whole mental and physical wellness. Because many yoga postures involve bending the abdomen, those who practice yoga tend to adopt healthful eating habits. A study conducted in the United States found that young American adults who practiced Yoga daily were more attentive to choosing healthy foods, which lowered their food cravings. With people's sedentary lifestyles, especially in urban areas, and an increasing incidence of NCDs, yoga, together with good nutrition, can be highly beneficial for those living in a developing country like India.

Keywords: Yoga; Nutrition; Diet; Food; Health; Exercise; Asana; Dietary pattern; Yoga practitioner.

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INTRODUCTION

Diet and exercise are the two important key players in maintaining good health. Yoga is an art and science of living a healthy and disciplined life. The word “yoga” is derived from the Sanskrit word “yuj” which means “to unite” and was first mentioned in the Rig Veda and the development of yoga can be traced back to over 5,000 years ago. In the late 1800s and early 1900s, the yoga masters from India started travelling to the west to promote yoga. In the early 1900s, Hath Yoga was very strongly promoted by T. Krishnacharya,

Swami Sivananda and many other Indian yogis.¹ Yoga is one of the best ways to stay fit and healthy and increase our physical strength, flexibility and posture. Many yoga postures are related to bending of the abdomen, therefore people practicing Yoga tend to adopt healthy eating practices.

Nutrition is the combination of all the processes by which a living organism obtains and utilizes the nutrients essential for survival, growth and the repairing worn-out tissues. The food we consume fuels our body to function by various metabolic processes. The major components of a balanced nutrition diet consist of carbohydrates, fats, proteins, vitamins, minerals and water.

Today with the sedentary lifestyle of the people mostly in the urban areas, with increase in the number of NCDs, Yoga, along with proper nutrition can be beneficial for the people living in a developing country like India.

The objective of the study were

1. To understand the relationship between yoga and nutrition.
2. To understand the effect of yoga practice on people's nutrition choices.

METHODOLOGY

A descriptive study is conducted based on secondary data to understand the relationship between yoga and nutrition and the effect of yoga practice on the nutrition choices of people. Secondary data was collected from research papers, chapters of books, newspapers articles, blogs and international journals. The data collected from the above sources have played a pivotal role in developing the conclusion of the study in an efficient manner.

Global Prevalence of Yoga

Yoga has now become one of the most popular forms of exercise in the world. According to the International Yoga Federation more than 300 million people across the globe are practicing yoga all over the world and the number is increasing everyday.²

Currently there are several types of yoga. The one mostly practiced is the one described by Patanjali. This was introduced in America by Swami Vivekananda.³

Yogic Approach to nutrition

The main mantra of Yoga diet is "Eat for nutrition and not to satisfy emotions or for pleasure." Yoga and Ayurveda had long back laid the foundation of dietetics in India. the main interest of a yogi is not developing physical abilities and strength but to be able to control his body and atma.³ And to achieve he has modifications in his life habits which includes dietary moderations too.

Yoga has always laid strong emphasis on holistic diet and there are valuable guidelines for diet in the traditional yoga books like *Hatha Yoga Pradipika* and *Gheranda Samhita*.⁴

According to these books, food is divided into three types:

- **Sattvic diet:** This pure and balanced diet provides the utmost energy and gives peace and mental clarity. It includes fruits, vegetables, sprouted grains, milk, curd, tubers, etc. it is similar to the modern day scientific balanced diet but more wisely planned.
- **Rajasic diet:** This diet consists of hot, spicy, salty food which is suppose to increase jealousy, anger, selfishness but also increases confidence and intelligence.
- **Tamasic diet:** Thus diet consists of food which makes one sleepy, lazy and pessimistic. This includes foods like meats of big animals, mushrooms, deep fried food, onions, butter, liquor and other stimulants.³

According to these books "mitahara" meaning controlled adequate diet containing lubricants and is palatable should be consumed by the yogis and only in quantity that fills half of the stomach and rest of the space must be left the movement of air. A yogi should eat fresh butter, ghee, sugar, sugarcane, jiggery, coconut, dates, etc and "*Sattvika Ahar*" i.e. food which are easily digestible.⁵

The main aim of yoga is self realization of oneself through 'niras' or 'nirodh' which means complete termination of all the distraction in the mind and consciousness. Our five senses get triggered by different stimulators surrounding us which then disturbs the systems of our body and according to Yoga these disturbances can be controlled by proper diet, physical exercises and keeping a positive outlook on life.⁵

Effect of Yoga on Digestion

Many yoga postures are known to stimulate the

digestive organs which increase their efficiency. There are Yoga asanas which are associated with the twist and release of breathe, which reduces the blood flow to the organs and enables fresh oxygenated blood to deliver it to the food.

Pranayama involves holding and releasing of breath which directly affects the nervous system and increases its activity. Salty food, alcohol, smoking and having very hot or very cold food are considered as external stimulating factors for the nervous system. Meat, eggs, and fish rich in sodium are also prohibited as they can make the yogi very sensitive during certain postures. As most of the yoga postures are strenuous, thus vegetables fibers and proteins are expected to repair the damaged tissues.

Some recent researches have shown that yoga practices reduce basal metabolism while in a meditative state and decrease urea, blood sugar, and blood cholesterol levels.⁵

Yoga and people's dietary choices

However the dietary pattern of an individual depends on many aspects and is a complex behavioral process. An individual's food choices is influenced by the group or society he comes from, food familiarity, availability, cost, taste preferences, culture, convenience and many other factors. Many cross sectional studies have shown that the yoga practitioner have a better dietary pattern than their counterparts who live a sedentary lifestyle. A study conducted in Thai women showed that those who practiced yoga had lower fat intake than those who practiced Tai Chi.⁶

A U.S. based study has shown that the young American adults engaged in daily yoga practice also tended to be mindful of their eating habits and reduced their food cravings. Another study showed that who practice yoga at home had an increase in the uptake of fruits and vegetables.³

Still there is no direct clear evidence available to show the effect of yoga on weight related health.

Effect of Yoga on the lives of the people

According to a comparison survey published in American Study in 2016, 80% of the yoga practitioners have a good balance in life as compared to the non practitioners which was only 65%. The Harvard Health Publishing claimed that people who practice yoga regularly are 20% more likely to have a positive insight into their physical and mental health as compared to the non-practitioners. Earlier yoga used to focus only

on spiritual wellbeing but now the focus had shifted to mental and physical wellbeing too. In a survey conducted by Newswire, 56% of the yoga practitioners participated in the yoga sessions to relieve stress, 52% of the people took the sessions to for physical and mental support and 49% to become healthier and fitter.⁷

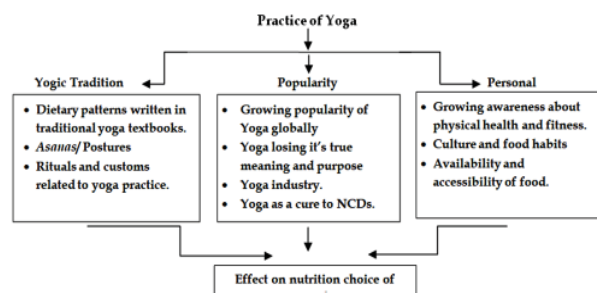
Yoga and eating disorders:

The main types of eating disorders are anorexia, bulimia and some other unidentified disorders. Yoga is proven to have improved eating disorders. A study conducted among 158 women who practiced yoga regularly had a more positive outlook on their body and had a higher level of self acceptance.⁸ However, yoga can only decrease the severity of these disorders but cannot wholly terminate the illness.

Yoga as an industry

The yoga industry is now worth of around \$80 billion. Yoga in the western world has become a luxury. According to data from Eventbrite, an average yoga practitioner spends about \$40 on single yoga session.

Today in the corporate world, the diseases like cardiac problems, diabetes, cancer and obesity and depression are constantly increasing and are causing lot of loss in the businesses. Now there are millions of yoga studios in the cities all around the world and many were reported to promote branded foods saying that they balance energy levels and cleanse the body and more. Many organic food companies are also promoting their products to the people practicing yoga.⁹ Many corporate offices now include yoga sessions for their employees. There is a mix of the eastern practice of yoga with the western business world. The yoga studios represent a blend of style and fashion with sustainable and holistic values. Yoga from spiritual pursuit has now changed into a body centric pursuit and many companies are now benefitting from it.⁶



The above framework described how the practice of Yoga affects the people's nutrition choice.

Limitation

The study is based on limited secondary data and thus the level of generalisability is small.

CONCLUSION

Yoga has close relationship with diet and nutrition coming from the ancient scripts and different asanas. Along with improving mindfulness and stress management, Yoga also improves digestion and encourages the person to have healthier food. However, Yoga has now lost its true essence and has become a way of weight loss. Many brands are promoting different food items to compliment weight loss along with yoga. The true principles of yoga are based on finding peace and calmness. The NCDs increased among the people all around the globe especially after the COVID-19 pandemic. Yoga should be made compulsory in all the schools and children must be taught yoga a young age. This will make them healthy humans in the future and increase their productivity. On the other hand, the underlying principle must be taught to the people so that yoga does not turn into a mere way of losing weight.

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[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. *J Oral Pathol Med* 2006; 35: 540–7.

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Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antiseptics. State of the art. *Dermatology* 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. *J Periodontol* 2000; 71: 1792–801.

Unpublished article

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Personal author(s)

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No author given

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Reference from electronic media

[9] National Statistics Online – Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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