

Local Micro- Processing Units: A Panacea for Addressing Undernutrition among children

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Abstract

Highlighting disconcertingly higher incidence of early childhood malnutrition induced deficiencies and diseases concomitantly higher morbidity and mortality amongst children impairing their capacities and capabilities to learn, earn and grow, the article elucidated the need for establishing micro-food processing units at the village and town level for covering up this deficiencies in time effectively by processing, preparing, and delivering packaged food items of cereals, millets and animal products to expecting mothers and children at their thresholds. The article provides deeper insight into the causes and consequences of nutritious deficiencies and related infirmities in children across states in India. The core purpose of the paper is to accentuate the need for promoting and leveraging the potential of micro food processing units for making available, accessible and affordable processed nutritious food at local level using local talent, knowledge and resources. The study highlights the need for adopting two pronged strategy to counter undernutrition in childhood; proper and timely counselling of young married couples through mass awareness campaign on balanced nutritious diet and creating a supply chain for making available nutritious food items conveniently.

Keywords: *Undernourishment, Wellbeing, Nutritious, Cooperation*

Introduction

The pervading acute malnutrition culminating in under nutrition and various deficiencies and infirmities amongst children can be mitigated at the local level in cost effective way through promoting and leveraging the potential of ago based micro processing units. Undernutrition during childhood impairs the brain metabolism causing challenges in social, cognitive and emotional development. Human resources, innovative and productive human capital depends on the care and quality of care and food in early childhood. Early childhood education and diet, two vital pillars for quality human resources formation are linchpin for healthy, happy and prosperous nation. The development of three essential adolescent attributes capacity, capability and creativity so necessary for prompting entrepreneurship depends on healthy and happy childhood. Unfortunately, Children in India irrespective of region and status have always been deprived of both quality education and health services. The rearing, caring and upbringing of children remained a family affair without any external oversight and counselling. It is because of the insouciance and neglect of children's health and education that every third child is stunted (Low Height for age) and malnourished and every fifth child wasted (Low Weight to Height). The mass prevalence of undernourishment among children results in high infant Mortality rate (within one year) and survived infants not given adequate calories result in high child mortality rate (Within Five year). Childhood period of human life span astonishingly lacking in nutritious and balanced diet has wider and deeper ramification on health reflected in higher proportion of malnutrition children and adolescents compromising capacities and capabilities of future younger population. Rearing, nurturing and caring children effectively in time is an untrammled opportunity for the progressive, prosperous and peaceful nation as in their adulthood they shall be capable enough to unlock and unleash their potential for contributions in nation's building. The excruciating pain due to trauma, sufferings and above all the economic burden for bearing and nurturing undernourished kids not only drain the parents of their meagre income but also stifles their earning capacities. Euphoric married couples in India are always in haste conceiving first baby as proof of their blissful nuptial bonding and fecundity are ignorant or under informed on need and means for nurturing, caring and healthy upbringing. Processed food items manufactured and supplied by multinational

behemoths are inaccessible, unaffordable and not as per standard childhood requirements in India. Processed food both agro and animal has prophylactic and therapeutic effects. In the light of hitherto discussion the article shall deliberate on three issues.

- 1 Cause and consequences of prevalence of high malnutrition and related deceases and infirmities amongst children across states in India
- 2 Nudging and urging married couples to learn and practice innovative practices for rearing and nurturing healthy and happy infants and children
- 3 Promoting micro food processing units at local level for easy accessibility and affordability of nutritious food

Review of Literature

The Global Hunger Index (GHI) 2022, measures the extent of hunger in the countries on the basis of children's health and development puts India on very low ranking (107/121) vis-a vis our neighboring countries and other emerging economies. The percentage of anemic, underweight and stunted children in India is 67%,32% and 36%, respectively (NFHS-5) are worrisome as it undermines cognitive skills. The insouciance towards the tragic consequences of the malnutrition means the body does not have the vitamins and nutrients enough to grow. The imbalance between the nutrient the body needs and the nutrients it receives is known as malnutrition, which may take the form of under nutrition or obesity (Das UN,2010). Malnutrition is blanket term for under-nutrition, over nutrient and micronutrient deficiencies (Daniel Fancs.2022). A two way link exists between malnutrition and poverty, creating a vicious cycle with each fuelling the other (Faareha et al, 2020) .From a human development perspective, good health and nutrient are inherently valuable contributing to a child's physical and cognitive development (Ghosh S,2020). India, the largest country in Southern Asia has half of all children with wasting in the world live and stunted rate is 37.7% in 2022 (UNICEF,2023). India has high share of malnourishment children coexisting with a large stock of food grains and this may be due to lack of capacity to avail or access the food grains or prevalence of health problems(Zhou .L and Hitchens M, 2013).Homemade ready to use therapeutic food is best solution to prevent and treat malnutrition(Rajesh and Jigisha 2020)..The case For broadening access to universal food security and comprehensive coverage welfare cards for the needy population which is vital in declining maternal as well as child malnutrition in India(Panda B K ET AL, 2020). Undernourished adolescent girls and women give birth to underweight and often stunted babies and hence consequence of being both undernourished extended into adulthood (Dwi and Darwin,2002).Poverty create an environment in which factors such as inadequate food supply, limited purchasing power, poor health conditions and incomplete knowledge of nutrition produce and are a product of each other(WHO.1995).Millets have higher amount of minerals such as manganese, magnesium, phosphorous , iron, copper and potassium when compared with corn, sorghum an wheat and main nutrient are starch, lipid, fiber vitamin and minerals (Eugenia Ramashia S et al. 2021). It is observed that the type of protein that cereal contains does not parallel to the proteins that animal products contain (Gulati etal,2012). SDG 2 highlight the need to ensure access to safe nutritious and sufficient food for all people and also to eradicate all forms of malnutrition. UN Decade for Action on Nutrition (2016-25) was proclamation to provide all stakeholders with a unique opportunity to strengthen joint efforts to end all forms of malnutrition by 2025.

Health and wellbeing of Children: Deteriorating and Disconcerting

Countries and communities in particular denying and depriving children of adequate nutritious food every day is highly unethical, unjustified and unsustainable. Undernourished and unmindful married couples either do not or cannot provide nutritious diet to infants making them highly vulnerable to infections, morbidly and even mortality. Infants either not surviving or morphing into enfeebled and sick children are greater national loss and burdensome tragedies. The baby's journey of 1000 –day from conception to second birthday require not only parental care but surveillance, attention and oversight under a national

pledge and initiatives. Undernourished children enters in to adolescent stage with suboptimal physical growth and low cognitive skills and aptitude further compromises their future prospects as they do not have capacities to unlock their potential. At 1.42 billion people, India unlike other emerging economies has demographic advantage of the cohort aged (0-14) comprising 25.13% in 2022(World Bank). A decade or so they will join the working group to contribute in nation's building. Unfortunately, majority of them shall be unwell and unskilled as during the first decade of childhood both health and education were compromised due to inadequate or lack of balanced nutritious diet. To highlight the dismal picture of children health indicators the study compares states with very large population below poverty index concomitantly high IMR from the national average with states with very low share of population below poverty index along with low IMR as is found in developed economies. The vicious cycle of extreme poverty, low productivity, low income, low purchasing power of families deprive the infants and children of availability of nutritious diet continuously very high anemic population with negative impact on children's physical wellbeing concomitantly a very high Child mortality rate .Table-1highlights high degree of positive correlation between high incidence of poverty and high IMR and higher anemic culminating in malnutrition deficiencies in the form of stunting and wasting.

Table-1
Childhood infirmities and deficiencies

States	Population Below Poverty Index %	IMR %	Anemia %	Wasting g%	Stunting %	CMR %
MP	36	46	72.7	42	25	49.2
UP	37	41	66.4	17	39	59.2
Assam	31	40	68.4	21	35	39.1
Chhattisgarh	40	40	67.2	37	23	50
Odisha	38	38	64.2	18	31	41
ALL INDIA	24.7	30	67.1	18	31	30
Mizoram	9	3	46.4	9	28	24
Nagaland	25	3	42.7	19	32	33
Kerala	0.71	6	39.4	15	23	5.2
Sikkim	3.82	5	56.4	13	25	11.2
Goa	3.76	8	53.2	19	25	10.6

Sources: Poverty: Handbook of Statistics on India Economy, Reserve Bank of India Table154 (2020)

IMR (Infant Mortality Rate) per 1000 live births Ministry of Health and Family Welfare2022

Anemia: Children age 6-59 months who are anemic (<11.0g/dl) NHFS -5

Wasting (Low Weight-for-height) Ministry Of Women and Child Development NHFS -5

Stunting (Low Height-for-Age) Ministry Of Women and Child Development NHFS -5

CMR (Child Mortality Rate) Under Five Mortality Rate (per1000 live births) Economic Survey 2022-23

Poverty, Anemia and Infant Mortality Rate

Empirical investigations across continents have proved that the babies born to poor and anemic parents may have relatively low chances of survival beyond age two. The prenatal period is hardly cared for due to ignorance and lack of medical services. Parents in India bequeathing poverty and poverty induced health infirmities particularly anemia is the root cause of enfeebled and sick children. Malnourished parents are ignorant about bodily deficiencies and are least concerned procreate underweight, premature babies highly vulnerable to even minor infections. Poor parents' income is too meagre to buy nutritious diets for healthy upbringing of children concomitantly high infant mortality rate. It is gloomy and sad

commentary on seventy five years of freedom and progress that babies born in India have mortality rate more than thirty percent. International comparison put India in a very poor limelight. The married couples should be under medical surveillance as the close monitoring of vital parameters related to gestational period---from conception to birth should be the state responsibility as this has the potential to reduce not only high incidence and high of anemic children IMR but shall also be cost effective. Among BRICS nations, India underperformance shows that there exists vast scope of improving on various indicators of children's health as shown in Table2

Table-2
BRICS NATIONS: infirmities and deficiencies

Sr No	Nation	IMR %	Stunting %	Wasting%	CMR %
1	Brazil	13.0	7.2	3.3	14.7
2	Russia	6	---	3.4	5.4
3	India	30	35.5	18.7	32.6
4	China	6	4.8	1.9	7.3
5	South Africa	25	21.4	3.8	32.2

Source: THE WORLD FACTBOOK/ The World Bank 2020

The slow progress on these indicators shall be highly counterproductive. Children unwell and in healthy reaches adolescent stage with poor aptitude and highly vulnerable to infections and other communicable diseases. The days of learning and skilling are lost to medical leaves with humongous costs.

Anemic parents are very much prone to having children with malnutrition induced diseases that includes under nutrition responsible for stunted and wasted children having low cognitive skills and aptitude and because of too short height faces discrimination in the society and wasted children are so thin and weak that immunity is low making them vulnerable to life threatening diseases. The cost-effective therapeutic measures both for parents and children are successful in bringing down the IMR significantly but this is half done. Infants who survive but are anemic, stunted or wasted shall have unhealthy and uncertain life. The period from first birthday to fifth one which should have been for learning mother tongue, playing and growing happily remains mired in regular visits to local medical practitioners or counselling by anganwadi workers and most the time even hospitalization. The childhood become miserable if the parents go for second child before the first baby is five-year-old. Unhealthy mothers have to share their time and meagre resources with two siblings further compromising and complicating the already existing morbidity It is because of such factors and many other endogenous one that the child mortality rate across states is very high and countering it in time effectively need scientific family planning and welfare schemes at local levels involving all stakeholders. Mental health in age 7-12 has worsened, among children and parents alike culminating in probable mental disorder (NFHS -5)

Besides the status on poverty index, the socio-cultural norms related to nature and composition of food, its accessibility and affordability also has a profound impact on the IMR and CMR. There are many exceptions to the principle that IMR is highly influenced by the poverty. Nepal and Sri-Lanka with a very low per capita income have very low IMR and so is found in states of Nagaland and Mizoram doing far better on IMR front than Haryana and Gujarat states with high on income ladder along with High IMR. A close analysis reveals that it is nature of food particularly consumption of animal food, an easy source of protein being a quotidian norm in the families gives strong impetus to the healthy life. States in the Northern India where animal food is taboo due to religious practices have high IMR and CMR vis-a vis coastal and hilly states where animal and sea food consumption is quodian practice. Subsistence livestock rearing pervades in the hilly and North Eastern Region make animal food accessible and affordable. The quantity and quality of cereals, vegetables and dairy products is suboptimal and hence deficiency of proteins and vital vitamins prevails among family members. In the context of India, there are two different issues related to newly born babies which require different strategies. Firstly, neonate is underweight and unhealthy as the parents were anemic and during thy gestation period mother did not

take required diet. Secondly, Neonate was born healthy but during infancy suffered undernourishment as mother had been anemic and was not given diet as per medico norms. There is urgent need to adopt two pronged approach: Nudging on procreating and caring and making accessible processes nutritious food.

Nudge and Urge

Nuptial bonding, procreating and rearing children are natural instincts reflecting morality and above all a fundamental right. Achieving and sustaining total fertility rate at 2.1 is prerequisites for sustainable economic growth. That new borne are healthy and have poetical to survive and thrive should be nation's priority and collective responsibility. Unhealthy ones, vulnerable to deceases and survival rate too low comes with irredeemable wider economics, social and emotional cost is national tragedy. A formal mechanism having policies and practices for counselling, guidance and assistance to married couples on requirements and responsibility during the perinatal and post natal period should in built in primary health centers. Traditional approach of rearing and caring pregnant women, and infants is nor correct and helpful. Post-independence, the mother-Child protection, which has strong consequences and bearing on learning and earning capacities in adolescent and adulthood respectively has not been taken care of rather left to the community and family level with meagre resources and lack of modern technology and knowledge. This lackluster and insouciance resulted in India at the turn of the century had higher IMR and MMR relatively in the world. "Nudge and Urge" campaign managed at the local level with active collaboration and cooperation of local government, Local government in collaboration with NGOs and civil societies should make collective endeavors for addressing this early childhood acre effectively in time. Medical vans equipped with facilities for showing documentaries on myriads issues related to early childhood care should be parked on week days in different localities. Nurses trained for this particular field should prepare report card showing vital health parameters and there should be face to face counselling sessions for girls and women. One of the prerequisites for the success is data collection in the area and preparing a list of young married couples. There are a lot of misconception, misinformation and ignorance on significance of proper breastfeeding. Traditional methods as practiced by elderly women are unscientific, unhealthy and painful. Women in the prenatal phase need counselling and guidance on ways of having sufficient breast milk. Most of the time women feel ashamed to disclose various problems related to breastfeeding. Mother who have deficiency which are in fact curable go for cow's milk and goat's milk which is not recommended by the medicos as an healthy substitutes particularly for infants. There is an urgent need for proper lactation counselling for young mothers and mobile medico vans give safe and peaceful environment for this exercise. Female leaders, professionals and celebrities should be roped in for highlighting the gravity of the problem and also to nudge and urge girls and women to participate and cooperate for making this mission a success.

Micro –Food Processing Units

Poor, undernourished and ignorant parents neither realizes nor have resources for scientific and rational family planning, caring and nurturing of children consequently childhood is full of miseries and suffering. India, a food and fruits surplus nation deprive its children from nutritious diet compromising their wellbeing and cognitive skills. The promotion of micro food, fruits and vegetable processing units using local latent resources, raw material and recipes for tailor-made food items as per children's fondness and taste shall be a game changer in nurturing and sustaining the quality childhood. Table 3 shows the potential of agro sector for making available balanced nutritious diet to mothers and children.

Table-3
Position and Potential in Agro sector, 2020

Items	Global Ranking Production	Global Share (%)
Milk	1st	17
Bananas	1st	27
Mangos & Guavas	1st	39
Pulses	1st	20
Millets (Bazara&Jawar)	1st	40
Buffalo Meat	1st	43
Wheat	2nd	24
Rice	2nd	24
Sugarcane	2nd	23
Eggs	3rd	7

SOURCE: Ministry of Commerce & Industry, Ministry of Agricultural

The creation of micro –processing units at local level using the surplus in ago sectors can be game changer. The key to counter food insecurity and improve food quality simultaneously so as to ameliorate the children's' health requires adequate nutritious food avlability anywhere any time. It is no exaggeration to envision a robotic machine like an ATM for withdrawing cash, when the mothers are able to withdraw nutritious food packets anytime using their Nutri cards without any external influences. India is among the top five producers of major fruit, vegetables and animal products. Besides there are myriads local raw agro products which in the absence of technology and knowledge are not processed for consumption. The need is to mobilize latent local talent and resources for promoting entrepreneurship for creating micro-food processing units at the village and town level to process and prepare sumptuous sachets and packaged food exclusive for expecting mothers and children. Processing fruits, vegetables, millets and meat carries immense value generation capacities at myriad stages. Besides paradox of plenty prevails as major chunk of fruits, vegetables and meat gets rotten due to poor transport, storage and packaging facilities. To exploit and leverage the full potential of higher productivity of fruits and vegetables round the year and also to cover up the deficiency of low per capita consumption of fruits and vegetables, local authorities should take the lead d in promoting and sustaining he micro food processing industry through sharing knowledge , resources and markets. Micro –processing units should be women's centric where a group of local women shall be hired to share their knowledge for processing and preparation of food items which both mothers and children relish.

Conclusion

Prevention is better and cheaper than cure. Early childhood health and education with forward and backward linkages have cause and effect relationship. The costs of policies and practices for keeping mothers healthier concomitantly healthy Infants are much lower than the attending and curing undernourished children at later stage. There is need for collective endeavor for collaboration and cooperation to create a new cultural of nurturing and caring children by providing nutritious diet with great determination. There is need for formal mechanism to gather data expecting mothers infants and children so that a formal counseling sessions both digitally and in face-to face may be conducted in the locality. Women entrepreneurship need to be nurtured for creation and running the micro –food proceeding units.

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