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Assessing Nutritional Well-being in Preschool Children: A Comparative Study of Kerala and Gujarat

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Abstract:

A healthy population will always determine a country's economic strength; hence assessing the nutritional status of the children is crucial for the development of the nation. Every nation on earth strives to capitalize on its demographic dividend, which is significantly influenced by the quality of physical and mental health of the populace. The level of nutrition consumed by infants in the early years of life affects both their physical and mental health in the latter stage of life.

For a person to survive without any physical and mental retardation and have a bright future, the government and parents must supply healthy food during the early years of life. In this context it is essential to evaluate the nutritional status of the children based on some key indicators such breast-feeding, vitamin intake and iron consumption. Since ignoring children during their formative years would invariably result in problems later in life and those generations would be a burden on the economy, it should have been given a priority for all states to review the situation of child nutrition. In this respect, the National Family Health Survey (NFHS)-5 published by the Ministry of Health and Family Welfare (MoHFW), Government of India, is used in the study to evaluate the nutritional status of children between Gujarat and Kerala.

Introduction:

An essential step in understanding the general well-being of the nation's future generations is the evaluation of children's nutritional status. Such an effort would highlight the current child nutrition inadequacies, which are a crucial consideration when formulating child nutrition policy. Identification of vitamin -A deficits, the percentage of children who are stunted and underweight, as well as the extent to which breast milk is given to newborns, is crucial information for the government to consider seriously. In order to ensure that children determine the future of any country, it is critical to ensure their healthy growth and development by providing sufficient nutrient intake, including vitamin, minerals, carbs, and fats. Academicians have proposed that, in underdeveloped nations like India, where most parents are illiterate in delivering nutritious contents to their children, particularly in the early years of birth, attempts to assess the child's nutritional status are an important first step in those countries. In nations where the nutritional condition of children is lowered, government involvement is crucial.

The National Family Health Survey (NFHS) of the Ministry of Health and Family Welfare (MoHFW) disseminates information at the state and national levels on a variety of topics, including fertility, infant and child mortality, family planning practice, maternal and child health, reproductive health, nutrition, anemia, domestic violence, the utilization and quality of health and family planning services. The paper assesses children's nutritional condition in two states: Kerala and Gujarat. The information provided by the National Family Health Survey-5 is a used for assessing

children's nutritional status and the samples collected usually shed light on the availability of children's health conditions and the extent to which the two states of Kerala and Gujarat are advanced in the category of children's nutritional status.

Objective of the study:

The study aimed to determine the nutritional status of children between Gujarat and Kerala based on the National Family Health Survey (NFHS)-5 published by the Ministry of Health and Family Welfare (MoHFW), Government of India for the year 2019-21.

Methods and Materials Used for the Study:

The study is based on secondary sources of data from the National Family Health Survey (NFHS)-4 and NFHS-5 reports, both of which were released by the Ministry of Health and Family Welfare (MoHFW), Government of India. In addition to these findings, material from the Gujarat and Kerala health departments as well as the World Health Organization has been cited in scholarly journals and websites. The Socio-Economic Review 2021-2022 released by the Government of Gujarat and the Economic Review of Kerala released by the Government of Kerala have also been evaluated in order to comprehend the fundamental economic situations of Gujarat and Kerala.

Economy, Population and Housing Characteristics of Kerala and Gujarat:

Kerala has a population of only 2.76 percent in India but provides 4.11 percent of the nation's Gross Domestic Product, compared to Gujarat's 4.99 percent population and 8.36 percent contribution. Gujarat has a total area of 196024 square kilometers, whereas Kerala has a geographical area of 38864 square kilometers. Gujarat is more industrialized than Kerala, according to a sector-by-sector comparison of the two states, the industrial sector in Gujarat accounts for nearly 44.50 percent of the State's Gross Domestic Product (GDP), whereas the service sector makes up nearly 64 percent of Kerala's GDP in the year 2021-2022. This study compares the nutritional status of the children of two states, which is more pertinent given that Kerala, which is known for having a high level of human development across the board-including in the areas of health, education, and life expectancy- is known as the Kerala Model of Development. It is also important to look at how Gujarat's industrialized states fare when it comes to the nutritional status of its children compared with Kerala.

According to the National Family Health Survey (NFHS)-5 results, Gujarat has a higher rural population than Kerala, with 57 percent in Gujarat and 53 percent in Kerala. One of the most noticeable differences in family characteristics between these two states is that the survey shows that women lead 24 percent of homes in Kerala, whereas only 13 percent of households in Gujarat are being headed by women. Kerala was known for joint family residence in India but the survey result shows that Kerala has more nuclear households about 56 percentages than Gujarat where it is 52 percent only. Sex ratio figures shows that Kerala is having more favorable statistics than Gujarat overall and sex ratio for age below seven also. It is calculated by the report that overall sex ratio for Gujarat is 965 females /1000 males and the sex ratio for population under age 7 is 937 females /1000 males while in Kerala the overall sex ratio is 1121 females /1000 males and the sex ratio for population under the age 7 is 967 females/1000 males.

The sort of dwellings in which the population resides can be used as a measurement for the people's level of life. According to the report, 77 percent of Gujarat's population lives in pucca houses, and 95 percent of those families have access to adequate drinking water. In comparison, in Kerala, 83 percent of the population lives in pucca buildings, 100 percent of dwellings are electrified, and 95 percent of households have better drinking water facilities.

Having a safe and clean sanitation facility is one of the most important components in preserving healthy and dignified homes and societies. The survey results are more positive to Kerala in terms of sanitation improvement since 99 percent of homes in Kerala have upgraded and clean toilet facilities, and communal toilet facilities cover 100 percent of the state. In Gujarat, 19 percent of total homes and 31 percent of rural families do not utilize toilet facilities; instead, they use open areas and fields. Community toilet facilities vary greatly, and no district has 100 percent toilet facilities in Gujarat.

The Importance of Assessing Children's Nutritional Status:

The concept of having adequate nutritional intake is critical for children since it has a significant impact on their physical, mental, and general growth therefore is vital to understand children's dietary, mineral, and vitamin needs. A good diet is essential for the development of a fit body, bone strength, and organ health. Adequate

nutrition is also essential for children's cognitive development, since it aids in the normal functioning of the brain and nervous systems, as well as the immune system. Having a better nutritional intake in food is to some extent described in the context of the children's energy and physical capacity, improving the children's disease prevention, and having a higher academic ability. (Binoy: 2022)

Malnutrition is a severe health issue among children that is under reported in many states, making it difficult for such states to implement improved nutritional policies for their children. Understanding children's nutritional status can help any state design food policies for children. The main task in ensuring a healthy generation and capitalizing on the demographic dividend is determining the nutritional requirements for individuals at various ages. It should be noted that a number of factors impact children's nutritional intake at many levels, including family income, culture, and educational level of the family groups.(Santhakumarn P:2017) People's behavioral changes are crucial in the area of nutritional intake of children since some still follow unhealthy and traditional dietary practices that may not always be medically correct (Prasetyo:2023).

Infant Feeding Comparison between Gujarat and Kerala:

Breastfeeding is vital for a child's nutritional development, but according to the survey, only 65 percent of children in Gujarat are exclusively fed under the age of six months, and just 38 percent of children get breast feeding during the first hour of life. The report emphasizes that, while the breastfeeding indicators have improved since NFHS-4, numerous newborns are still denied breastfeeding, which provides various nutrients for the children. In Kerala, 56 percent of children are breastfed before the age of six months, and 70 percent are breastfed during the first hour of life. Kerala has a far higher rate of first-hour breastfeeding than Gujarat, which has just 38%. The World Health Organization emphasizes that prelacteral feeding is extremely dangerous and that breastfeeding should be made mandatory for the child in the first three days of life. According to the report, 17 percent of children in Gujarat receive fluids other than breast milk in the first three days of life, and 88 percent continue to breastfeed at one year, with the percentage decreasing to 65 percent after one year to two years. In Gujarat, the median age of feeding is 25.1 months. In Kerala, only 8% of children are given fluids other than breastfeeding in the first three days of life which is very dangerous to children heath, compared to 17% in Gujarat. In Kerala,

94 percent of children are breastfed until the age of one, and 85 percent of children are breastfed until the age of two. In Kerala, the median age to which children are breastfed is 27.6 months, whereas in Gujarat it is 25.1.

The report highlights the disparity between Gujarat and Kerala in providing supplemental and nutritional food to children after six months. After six months, just 41% of children in Gujarat receive enough nutritional intakes, but 71% of children in Kerala do. This distinction reflects the educational and informational level of parents in each state. It is vital for parents to have basic understanding about the importance of nutritional intake for children, and Kerala leads in this category when compared to Gujarat. The World Health Organization recommends Infant and Young Child Feeding (IYCF) for children aged 6-23 months, yet just 6% of children in Gujarat are fed according to WHO guidelines, compared to 23% in Kerala. Malnutrition causes severe problems for the children's health and IQ level, and deficiency of Vitamin A in the infant stage and after breast feeding causes severe health problems for the children, affecting their eyesight and sometimes leading to measles and diarrhoea. In this area, the data demonstrates that Gujarat and Kerala have equal levels of success in feeding vitamin A. In Gujarat, 85 percent of children aged 9 to 35 months receive vitamin A, while 84 percent do in Kerala. The report also mentions the likelihood of anemia in youngsters owing to iron deficiency. According to the iron content food consumption of children aged 6-23 months, Gujarat has 46 percent of children who consume iron-rich foods, while Kerala has just 32 percent.

The table below summarizes the current state of infant feeding in Gujarat and Kerala.

Table- 1: Indicators of Infant Feeding between Gujarat and Kerala

Indicators of Infant feeding	Gujarat	Kerala
Breastfeed of children under the age of 6 months	65%	56%
Breastfeed of children during the first hour of birth	38%	70%
Percentage of child receives fluids other than breastfeed in the first three days of life	17%	8%
Percentage of child gets breastfeeds until one year	88%	94%

Percentage of child gets breastfeeds between 1 to 2 years	65%	85%
Median age to which child gets breastfeed	25.1(Months)	27.6(Months)
Percentage of children receives supplementary and nutritional food after six months	41%	71%
Percentage of children get food based on the WHO recommendations, Infant and Young Child Feeding (IYCF) for child aged between 6 to 23 months	6%	23%
Percentage of children receive vitamin- A aged between 9 to 35 months	85%	84%
Percentage of children have iron content food intake aged between 6 to 23 months	46%	32%

Source: National Family Health Survey-5, the Ministry of Health and Family Welfare (MoHFW), Government of India.

Children's Nutritional Status between Kerala and Gujarat:

Children's malnutrition is a severe public health concern in India. The country is projecting its demographic dividend throughout the world, yet studies have revealed some major concerns with malnutrition or under nutrition among the country's children. Officials in the government have determined that thirty-nine percent of children under the age of five are stunned or too short for their age, and twenty-five percent of children are wasted or too thin for their age of growth. The severity of under nutrition is demonstrated by data on underweight children as a result of chronic malnutrition. The statistics go on to explain that even in the first six months of life, when the children are breastfeeding, 27 percent of them are stunted and 32 percent are underweight, shedding light on the mother's health and parents' awareness of how to care for their children.

The National Family Health Survey (NFHS)-5 compares the malnutrition of children in Kerala and Gujarat and finds that the situation in Kerala is substantially worse than in Gujarat. In Kerala, between the four years of publishing the National Family Health Survey (NFHS)-4 and The National Family Health Survey (NFHS)-5, the percentage of stunted children increased from 20% to 23%, but in Gujarat,

while the percentage of stunted children is slightly higher than in Kerala, there is no increase in that percentage from the NFHS-4 to the NFHS-5, and it remains nearly the same at 39%. In the category of underweight of children also shows some increase in Kerala between NFHS-4 and NFHS-5 from 16 percentage to 20 percentage but in Gujarat though the rate was high in NFHS-4 which was 39 percentage of children which only slightly increased to 40 percentage from NFHS-4 to NFHS-5 and as far as the children wasted is concerned, Gujarat shows a marginal decline from 26 percentage to 25 percentage and in Kerala it is remained same in NFHS-4 and NFHS-5 with 16 percentage.

The following two tables, Tables 2 and 3, display the categorization of children under age 5 in the states of Kerala and Gujarat based on the World Health Organization's standards for height-for-height, weight-for-height, and weight-for-age. Here -3SD describes the severe low height-for-age, weight-for-age and weight-for-height, -2SD describes moderate height-for-height, weight-for-height, and weight-for-age and 0 to +2SD shows the normal height-for-age, weight-for-age and weight-for-height.

Table- 2: Percentage of malnourished Preschool children in Kerala

Background Characteristic	Height-for-age				Weight-for-age					Weight-for-height				
Age in months	Percentage below -3 SD	Percentage below -2 SD[2]	Mean Z-score (SD)	Number of Children	Percentage below -3 SD	Percentage below -2 SD[2]	Percentage above +2 SD	Mean Z-score (SD)	Number of Children	Percentage below -3 SD	Percentage below -2 SD[2]	Percentage above +2 SD	Mean Z-score (SD)	Number of Children
<6	8.6	22.9	-0.5	203	13.1	26.4	6.3	-0.8	193	11.5	28.7	0.0	-1.3	219
6-8	6.1	17.4	-0.3	121	5.6	19.1	2.7	-0.8	122	3.4	14.6	0.4	-0.9	127
9-11	11.8	22.8	-0.9	131	4.5	14.4	6.7	-0.3	133	5.3	13.4	0.9	-0.9	140
12-17	8.9	23.5	-0.8	246	5.0	18.3	4.1	-0.8	244	3.3	22.0	1.5	-1.0	253
18-23	11.2	33.1	-1.2	198	6.5	13.0	6.0	-0.6	198	3.0	21.5	2.1	-1.0	205
24-35	6.2	23.3	-1.0	528	6.5	17.2	2.8	-0.7	521	4.2	18.5	0.8	-1.1	535
36-47	5.2	24.3	-1.0	537	4.9	14.3	2.5	-0.7	521	3.8	18.4	2.3	-1.0	541
48-59	6.2	20.9	-1.1	562	3.8	11.5	4.6	-0.6	542	4.4	19.5	0.9	-1.1	561
Sex														
Male	8.3	25.6	-1.0	1,310	6.2	16.3	4.6	-0.7	1,283	3.9	20.7	1.4	-1.1	1,333
Female	5.9	21.0	-0.9	1,216	5.3	15.2	3.4	-0.7	1,191	5.4	18.6	1.1	-1.1	1,248

Source: National Family Health Survey-5, the Ministry of Health and Family Welfare (MoHFW), Government of India.

Table- 3: Percentage of malnourished Preschool children in Gujarat

Background Characteristic	Height-for-age				Weight-for-height				Weight-for-age		
Age in months	Percentage below -3 SD	Percentage below -2 SD[2]	Mean Z-score (SD)	Number of Children	Percentage below -3 SD	Percentage below -2 SD[2]	Percentage above +2 SD	Mean Z-score (SD)	Number of Children	Percentage below -3 SD	Percentage below -2 SD[2]
<6	15.7	26.8	-0.7	735	18.2	32.3	8.8	-1.0	667	14.6	31.8
6-8	13.6	25.0	-0.7	391	9.1	24.0	7.0	-0.9	386	10.2	27.4
9-11	16.1	30.5	-1.0	512	9.5	24.2	5.9	-0.8	501	11.3	31.3
12-17	19.6	39.7	-1.3	833	11.8	26.3	4.8	-1.0	836	15.4	35.8
18-23	26.6	48.6	-1.8	846	11.6	23.1	3.5	-1.0	839	15.4	39.8
24-35	20.7	42.5	-1.6	1,765	10.2	4.9	3.2	-1.1	1,719	15.4	43.5
36-47	16.5	42.9	-1.5	1,797	8.4	22.8	2.6	-1.1	1,759	14.1	41.7
48-59	15.8	37.3	-1.5	1,816	9.8	25.7	2.7	-1.2	1,750	15.2	44.2
Sex											
Male	19.4	40.0	-1.5	4,436	10.8	25.8	4.3	-1.1	4,321	15.1	40.3
Female	17.1	38.0	-1.4	4,260	10.4	24.4	3.6	-1.1	4,136	13.9	39.0

Source: National Family Health Survey-5, the Ministry of Health and Family Welfare (MoHFW), Government of India.

Anemia among children in Gujarat and Kerala:

Anemia is a dangerous condition brought on by a shortage of hemoglobin in blood cells, which will eventually impair the ability of the lungs to carry oxygen to body tissues and contribute to children's underweight and short stature (WHO). There are several forms of anemia in the human body, including iron deficiency anemia, vitamin B-12 refusal anemia, and hemolytic anemia, with iron deficiency anemia being the most prevalent variety. The National Family Health Survey (NFHS)-5 identified that Anemia is a serious problem among children and women in Gujarat compared with Kerala.

According to the National Family Health Survey (NFHS)-5, Gujarat saw a rise in the percentage of anemic children from 63 percent in the National Family Health Survey (NFHS)-4 to 80 percent in the National Family Health Survey (NFHS)-5. But there is only a mild increase of anemic children in Kerala in between National Family Health Survey (NFHS)-4 and 5 from 36 to 39 percentages. When compared to Kerala, Gujarat has higher statistics for various types of anemic children. While Kerala has two-fifths of children who are mildly anemic between the ages of 6 and 59 months, Gujarat has four-fifths of those same aged children. 3 percent of children who are severely anemic and 49 percent of moderately anemic children fall into this category in Gujarat. At the same time in Kerala, 15 percent of children have moderate anemia and 1 percent have severe anemia, which is a better statistic than Gujarat's.

Conclusion and suggestions:

The assessment of the child nutritious status of two states Gujarat and Kerala there is nothing striking achievements to be noted in any of the states. Comparatively in the categories of breastfeed of children during the first hour of birth Kerala outperforms than Gujarat with 70 percentages of children gets that nutritious where as Gujarat is having 38 percentage. The government of Kerala must go for 100% coverage in this area, and initiatives must be taken in Gujarat to increase the percentage of breastfeeding during the first hour from the present 38 percentage. In this regard, both states should work to end attempts to feed infants with fluids during their first three days of life which is very dangerous as far as the healths of the children are concerned. Gujarat and Kerala both should strive to make breastfeeding 100 percent mandatory during this time, despite the fact that only 8 percent of babies in Kerala and 17 percent of babies in Gujarat actually get fluids other than breastfeeding in the first three days of life. While Kerala is well ahead of Gujarat in terms of nutritious intake for young children and infants, it is still insufficient with a 23 percentage, according to the World Health Organization criteria and Gujarat displays a very low percentage of 6% in this category. But Gujarat outperforms Kerala in terms of the percentage of children whose diet has iron content between the ages of 6 and 23 months as well as in terms of breastfeeding children under the age of 6 months. Every other metric compares the two states are more or less equal. By making a comparison of the percentage of stunned children

Kerala has a lower rate of stunted children than Gujarat-23 as opposed to 39 percentage. In addition to these, there is a serious issue with the rise in the number of anemic children in Gujarat because its 80 percentage of children are anemic while Kerala is having 39 percentages.

Kerala slightly surpasses Gujarat in the area of children's nutritional intake based on the basic indicators used for assessment, however this is not a great accomplishment since Kerala is known for its high human development index in the areas of health, education and life expectancy. It only conveys the idea that, as compared to Gujarat, Kerala has performed slightly better. However, the examination in both states points to a substantial government engagement in the field of child nutrition. Action frameworks should include policies for children's nutrition and seek to solve the fundamental nutritional issues raised in the study. Despite having a high human development index, Kerala's shortcomings in the area of child nutrition is a major issue that requires immediate governmental response. The government should attempt to develop policies to implement within short time frames, medium and long time frames by connecting the many departments, such as the NGOs, health, and education.

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