



An evaluation of inter district disparities in child nutrition outcomes across fourteen districts of Kerala, A district wise correlation analysis using NFHS-5 Data

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Abstract

Even though Kerala has shown rapid improvements in health care access and services, the inter district disparities in Kerala with respect to health care is a matter of great concern. The present study focuses mainly on three child malnutrition indicators namely stunting, wasting and underweight across the fourteen districts of Kerala. The study utilized the NFHS data on the above-mentioned indicators and the data on health indicators such as Infant Mortality Rate (IMR), Neonatal Mortality Rate (NMR) and the percentage of children fully immunized. The main objectives of the study were to examine the inter district disparities with respect to the child nutrition across the districts in Kerala and to identify high performing and low performing districts. The study also tried to analyze whether there was any correlation between the health indicators such as IMR, NMR and the selected malnutrition indicators of the study using Spearman Rank Correlation. District wise analysis was made to identify the variations in the child malnutrition indicators. The findings of the study highlighted significant variations in the child nutrition outcomes across the fourteen districts of Kerala. The study revealed that the districts such as Malappuram and Wayanad shows high percentage of stunted, wasted and underweight children where as the districts such as Ernakulam, Pathanamthitta and Alappuzha shows better child nutrition outcomes. Correlation results showed a significant negative association between percentage of children fully immunized and the percentage of children stunted across the districts and also strong positive correlation between the various malnutrition indicators. The study indicates the prevalence of malnutrition in certain districts of Kerala and highlights the significance of district wise policies and nutrition programme especially in the identified low performing vulnerable districts to reduce malnutrition among children and also the critical role of health nutrition programme such as Integrated Child Development Services, Poshan Abhiyaan etc. in eliminating the child chronic and acute malnutrition.

Keywords: Stunting, wasting, underweight, imr, nmr, immunization coverage

Introduction

Child malnutrition poses a serious risk of child morbidity and remains one of the alarming public challenges faced especially by the developing countries. The various forms of malnutrition are seen among the children such as stunting, wastage and underweight reflecting both chronic and acute malnutrition. Within India, Kerala is a state recognized for its better health outcomes compared to other states. However, the inter district disparities in Kerala is a matter of public concern. The recent data from NFHS 5 indicates that some districts in Kerala shows high prevalence of stunting, wastage and underweight among the child beneficiaries. Existing inter district disparities signifies the importance of the present study. Additionally, the various health nutrition outcomes such as Infant Mortality Rates, Neonatal Mortality Rates are highly influenced by the child nutrition outcomes. Better child nutrition outcomes help to decline IMR and NMR rates also immunization coverage helps in preventing life threatening diseases. Thus, the present study tries to examine the inter district disparities with respect to child nutrition outcomes and contribute in identifying the vulnerable districts of Kerala.

Integrated Child Development Services

Realizing the severity of the situation and the intergenerational threat undernutrition poses, Government of India has initiated certain programs and schemes to eliminate stunting, wasting and underweight among the children. Integrated Child Development Services (ICDS)

introduced in 1975 is one of the oldest and long-term programme with the objective to reduce malnutrition. The core six services provided under the ICDS scheme are Supplementary nutrition, preschool non formal education, nutrition and health education classes, health checkup, immunization and referral services. These services are mainly delivered through the Anganwadi centers. ICDS have significantly declining the stunting, wastage and underweight across the districts but the persisting prevalence implies adopting strong district specific strategies to enhance the effectiveness of programme.

Kerala's Health Profile And The Importance of A District Level Analysis of The Nutrition Outcomes

While Kerala exhibits a positive picture compared to other states of India in regard to various health nutrition indicators, it still faces the problem of double burden of malnutrition where there is coexistence of multiple forms of malnutrition such as chronic and acute malnutrition. According to recent NFHS data the average percentage of stunting, wastage and underweight are 23.4%, 15.5% and 19.7%. Certain districts in Kerala such as Wayanad, Idukki, Malappuram etc. have larger concentration of tribal population compared to other districts. It is identified that in such districts the malnutrition indicators such as stunting, wasting and underweight are high. Thus, a district level analysis of child nutrition outcomes is critical to implement district level policies to reduce malnutrition among the children.

Objectives of The Study

The main objectives of the study are to examine the prevalence of the malnutrition indicators such as stunting, wasting and underweight among the children across fourteen districts of Kerala. To assess the district level variations in the immunization rates, Maternal Mortality Rates (MMR), Infant Mortality Rates (IMR), Neonatal Mortality Rates (NMR) and to identify whether there exists any correlation between the malnutrition indicators and Immunization coverage, MMR, IMR and NMR. District level analysis of child nutrition outcomes across the districts helps to identify the districts with high percentage of malnutrition indicators and implement district level policies to reduce malnutrition.

Methods And Tools of Analysis of The Study

A cross-sectional ecological study using NFHS data on percentage of stunting, wasting and underweight among children across 14 districts of Kerala was performed. The ecological method helped to assess the inter state disparities with respect to the child malnutrition outcomes and to examine whether there is any association between the health indicators and malnutrition indicators.

The dependent variables of the study include the child nutrition indicators such as stunting, wasting and underweight and independent variables include percentage of immunization coverage, Infant Mortality Rates, Maternal Mortality Rates. Data extracted from NFHS were entered and analyzed using SPSS software. As the number of districts are only fourteen, Spearman Rank Correlation was

performed to analyze the association between the malnutrition indicators and health indicators.

Conceptual Framework of The Study

The present study highlights the point that child malnutrition is not only influenced by the proper diet and morbidity diseases but also other factors such as maternal health, mortality rates etc. In this study, malnutrition indicators such as stunting, wasting and underweight represents both chronic and acute malnutrition. Stunting percentage shows whether the child suffers from chronic malnutrition and wasting shows whether the child is acutely malnourished and underweight reflects both acute and chronic malnutrition.

The conceptual framework of the study is based on the idea that the health indicators such as immunization coverage, Infant Mortality Rates, Maternal Mortality Rates and Neonatal Mortality Rates does influence the child nutrition outcomes implying that higher immunization coverage, reduced mortality rates significantly reduce stunting, wasting and underweight among children. The hypothesis of the study assumes that there is negative association between the immunization coverage and malnutrition indicators and positive correlation between IMR, MMR and NMR and malnutrition indicators.

Analysis And Results of The Study

In the present study district analysis of Child nutrition indicators across the fourteen districts of Kerala were analyzed using the NFHS 5 data on stunting, wasting and underweight across the fourteen districts of Kerala.

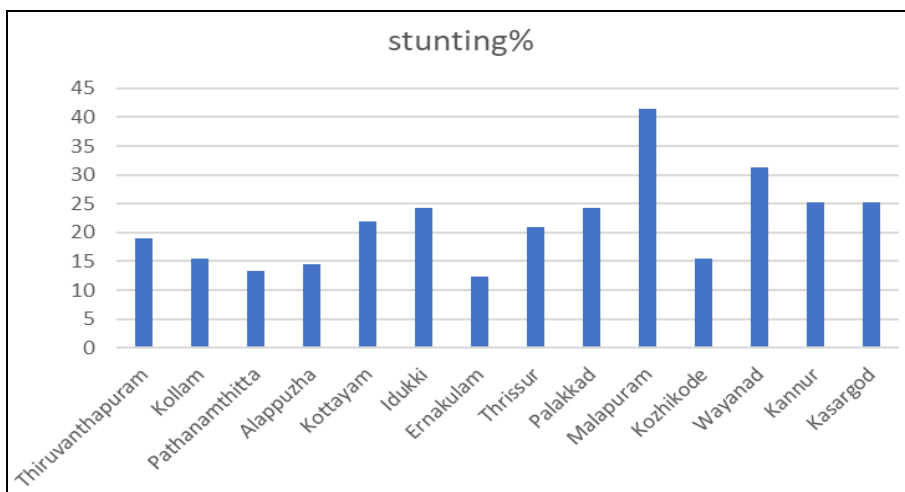


Fig 1: Prevalence of Stunting Across 14 Districts Of Kerala

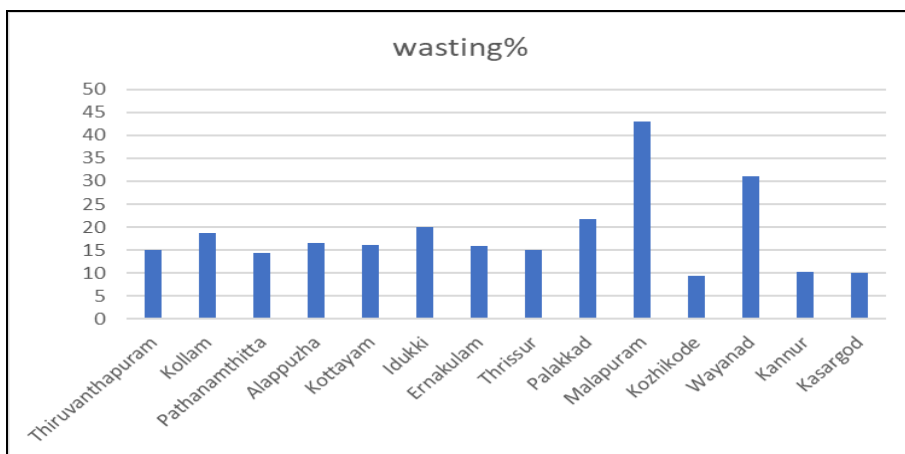


Fig 2: Prevalence of Wasting Across 14 Districts of Kerala

The above chart shows the prevalence of stunting across the fourteen districts of Kerala. As seen in the chart among the fourteen districts of Kerala, the higher prevalence of stunting is seen in the districts such as Malappuram (41%), Wayanad (31%) and Idukki, Palakkad, Kannur and Kasargod where stunting ranges between 24-25%. Moderate prevalence of stunting is shown by the districts such as Kollam, Kozhikode and Thrissur. Among the fourteen districts lowest prevalence is shown by districts such as Ernakulam, Pathanamthitta and Alappuzha. This highlights that in districts such as Wayanad, Palakkad and Malappuram where there is high percentage of tribal population the chronic malnutrition is high among the children.

The above graph shows the prevalence of wasting across the fourteen districts of Kerala. The districts such as Malappuram, Wayanad, Palakkad and Idukki show the highest prevalence of wasting. Districts such as Thiruvanthapuram, Pathanamthitta, Ernakulam and Thrissur show moderate level of prevalence of stunting and districts such as Kannur, Kozhikode and Kasargod shows least prevalence of stunting. Presence of wasting reveals that child has low weight for its height and reflects acute

malnutrition which can be due to improper intake of diet, recent illness etc. The prevalence of wastage shows such children are in higher risk of getting infectious diseases. The districts such as Malappuram have very high population density and Wayanad is a district with larger share of tribal population compared to other districts of Kerala. These can be the reasons contributing to higher percentage of wasted children in such districts.

District wise analysis results show the prevalence of all three malnutrition indicators such as stunting, wasting and underweight in certain districts like Wayanad and Malappuram. These districts are identified to be the highly vulnerable districts. The coexistence of all the three malnutrition indicators reveals that the children belonging to these districts are in high-risk category and are exposed to various forms of nutritional vulnerabilities. In contrary, the districts such as Ernakulam, Alappuzha and Pathanamthitta shows less presence of such indicators reflecting better nutrition outcomes in such districts. Such districts have better access to the health care infrastructural facilities compared to the identified vulnerable districts.

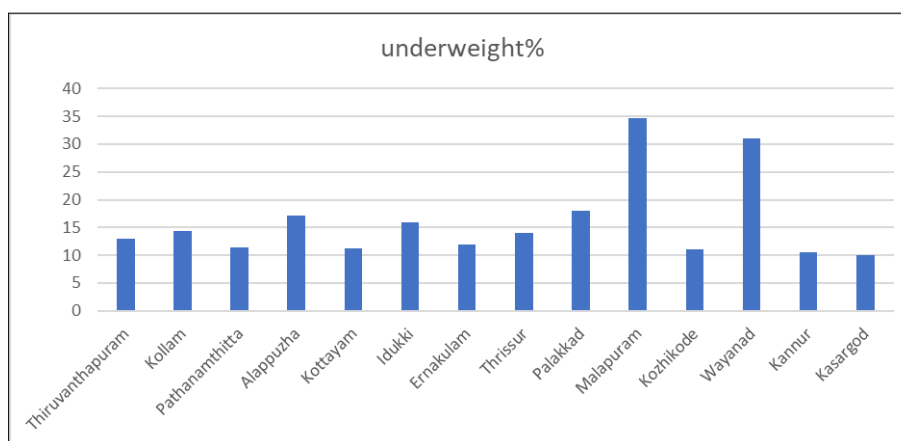


Fig 3: Prevalence of Underweight Across 14 Districts of Kerala

The above graph depicts the prevalence of underweight among the children across the fourteen districts of Kerala. Districts such as Malappuram and Wayanad demonstrates higher prevalence of underweight among the children and rest of the districts reflects same level of underweight.

Spearman Rank Correlation Between The Child Nutrition Indicators And Health Indicators Across The Fourteen Districts Of Kerala

Spearman rank correlation was performed to analyze the association between the child undernutrition indicators (stunting, wasting and underweight) and health indicators (IMR, NMR and % of fully immunized) across the fourteen

districts of Kerala and the results are shown in the table. Stunting is referred to the condition where the child has low weight compared to the height and it reflects chronic malnutrition among the children, wasting refers to the low weight for height and it implies acute malnutrition among the children and underweight represents the condition where the child has low weight for their age and it covers both acute and chronic malnutrition. The key health indicators used in the study are Infant Mortality Rates indicates the number of infants under one year of age died per thousand live births in a given year, Neonatal Mortality Rate (NMR) referred as number of deaths within the first twenty-eight completed days of life per 1000 live births.

Table 1: Spearman Correlation Between The Child Malnutrition And Health Indicators

Variables	Stunting%	Wasting%	Underweight%	Fully Immunized%	IMR%	NMR%
Stunting%	1.000	0.351	0.238	-0.584*	0.488	0.137
Wasting%	0.351	1.000	0.911**	0.060	0.468	0.153
Underweight%	0.238	0.911**	1.00	0.090	0.453	0.188
Fully Immunized%	-0.584*	0.060	0.090	1.000	0.173	0.455
IMR%	0.488	0.468	0.453	0.173	1.000	0.838
NMR%	0.137	0.153	0.158	0.455	0.838	1.00

The correlation results showed a significant negative correlation between the stunting and percentage of fully immunized among the children which indicates that districts with better immunization coverage also had lower percentage of stunted children. The results also showed a positive relationship between the various malnutrition indicators such as wastage and underweight. This implied that districts with high percentage of wasted children also had high prevalence of underweight. Strong association was also seen between the IMR and NMR rates indicating districts with high Infant Mortality Rates also had high Neonatal Mortality Rates.

Findings And Conclusion

The present study did a detailed district wise analysis to examine the inter district variations on child malnutrition indicators and their association with the selected health indicators across the fourteen districts of Kerala. The findings of the study highlighted the prevalence of higher percentage of stunted, wasted and underweight in certain districts such as Wayanad and Malappuram. High population density and concentration of more tribal populations, low infrastructural facilities can be some of the contributing reasons. In contrary, districts such as Ernakulam, Alappuzha and Pathanamthitta shows very low prevalence and the districts such as Idukki, Kollam and Thrissur shows moderate prevalence. The findings highlighted that even though Kerala has achieved better performing health indicators compared to other states of India, there are huge inter district variations with respect to child nutrition outcomes in the state. The results of Spearman Rank Correlation draw a deeper insight to the negative association between the immunization coverage and stunting. This indicates that higher immunization coverage can reduce the rate of stunting in vulnerable districts such as Malappuram, and Wayanad. The findings suggesting taking measures to lower wastage and underweight prevalence in the vulnerable districts.

The study concluded by highlighting the importance of implementing district targeted programme to reduce the stunting, wastage and underweight. In order to reduce the interdistrict disparities it is vital to integrate various health programme such as Integrated Child Development Services and Poshan Abhiyaan. Giving special focus to tribal population, increasing the immunization coverage in the vulnerable districts, ensuring better health and infrastructural facilities, delivery of quality food will definitely contribute in improving the health indicator status of such districts.

Recommendations Of The Study

The findings of the study suggested the importance of implementing certain policy measures such as district targeted nutrition programme to reduce the prevalence of wasting, stunting and underweight in the identified vulnerable districts of Kerala. As these indicators demonstrate the presence of multiple forms of malnutrition among the children, ensuring advanced maternal care, child nutrition services are vital to reduce comorbidity. The study also recommended the importance of providing special attention to the districts which have higher percentage of tribal populations and economically backward households. The study also suggests the effective utilization of services provided under schemes such as Integrated Child Nutrition

Services. As the findings of the study shows a significant association between the stunting and immunization coverage the study strongly recommends increasing the immunization in low performing districts of Kerala.

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