FACTORS ASSOCIATED WITH ANEMIA AMONG CHILDREN  
6 MONTHS TO 5 YEARS OLD

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ABSTRACT

Anemia has been a persistent and significant public health problem among children below 5 years of age. Anemia among children negatively affects their growth, cognitive development and economic productivity later in life. Data from the 7th National Nutrition Survey conducted in 2008 by the Food and Nutrition Research Institute (FNRI) was used to determine the association of socio-economic, feeding practices and other factors with anemia prevalence of children. The study also determined the association of anemia with the prevalence of underweight, stunting and wasting. A total of 2,406 children 6 months to 5 years old from the Biochemical Survey component of the 7th NNS were included in the study. Descriptive statistics were computed to describe the demographic profile of the children. Bi-variate cross tabulations between anemia status and the variables were generated to compare the prevalence of anemia for each of the categorical variables. Correlations between the anemia status and each one of the variables were determined using Chi-square test of independence. The level of significance was set at $\alpha=0.05$. Results showed higher prevalence of anemia among children 6-23 months compared with children 24-60 months (45.8% versus 16.1%). Higher anemia prevalence in children 6-23 months was associated with households with heads below 50 years old, education below college level and occupational groups of agricultural and unskilled workers/common laborers, households without electrical services, without water-sealed toilets, and are food insecure. Among children 24-60 months, higher anemia prevalence was associated with households that live in makeshift houses. Participation to the deworming program showed a positive association with lower anemia prevalence among the 6-23 months. Underweight and stunted children and those who have not taken any vitamin or mineral supplements, and have had recent episodes of infection are more likely to become anemic. Analysis of feeding practices of infants 6 to 23 months revealed higher prevalence of anemia among infants exclusively breastfed for more than six (6) months. Based on the results, promotion of proper child feeding practices in terms of duration of exclusive breastfeeding and timely introduction of complementary foods as well as increased availability and access of iron supplements, deworming and poverty-reduction and food security initiatives are recommended to reduce anemia among children.
INTRODUCTION

Anemia is a medical condition where there is reduction in the oxygen transporting capacity of blood usually caused by abnormally low number of circulating red blood cells (RBC). Population that are at most risk to anemia include infants, and pregnant and lactating women; though preschoolers, adolescents, and the elderly are also at risk of being inflicted with anemia. Anemia negatively affects children’s physical and intellectual development as well as their future economic productivity. The results of this study will help policy makers and program managers in refocusing anemia-reduction and prevention initiatives to reduce anemia among children, most especially the infants.

The study aims to identify factors that have significant association with the anemia status of children aged 6-60 months based on the results of the 7th National Nutrition Survey (NNS) conducted by the Food and Nutrition Research Institute. Specifically, the study aims to:

1. Determine the prevalence of anemia among children 6-60 months old using the data of the 7th NNS
2. Determine and assess the association between prevalence of anemia and socio-economic characteristics of the household, participation to deworming program and selected hygienic practices
3. Determine and assess the association anemia and infections, and intake of vitamins and supplement
4. Determine and assess the relationship of the prevalence of anemia with the infant feeding practices of children aged 6-23 months
5. Determine the association of anemia status with underweight, stunting and wasting among children
MATERIALS AND METHODS

- Study Population: A total of 2,459 children 6 to 60 months from the Biochemical Survey Component of the NSHIS were included in the study. Children were grouped into 2 age groups: 1) 6 to 23 months and 2) 24-60 years old.
- Hemoglobin Measurement: Whole blood samples were collected and analyzed for hemoglobin levels through spark-hematocrit method.
- Anthropometric Data: Weight and height measurements were taken using standard techniques.
- Feeding Practices and Food Intake: Data on the infant feeding practices of children 0-23 months were asked from their mothers and/or caregivers using a structured questionnaire. For older children, food intake data was collected using 24-hour food recall.
- Socio-economic Data and Other Health Related Information: Socio-economic data and information on other variables was collected through the administration of questionnaires.

RESULTS

Anemia Type of Toilet in the Household

- Descriptive statistics were computed to describe the demographic profile of the children. Bivariate cross tabulations between anemia status and the variables were generated to compare the prevalence of anemia for each of the categorical variables. Comparisons between the anemia status and each of the variables were determined using Chi-square test of independence. The level of significance was set at α=0.05. Degrees of association were measured through Cramer’s V values and logistic regression analysis. Statistical analysis was done using Statistical Packages for the Social Sciences (SPSS) version 16.0 and Intercooled Stata Version 7.0.

- Anemia prevalence was higher among the 6-23 months old than the 24-60 months (p value=<0.001).
- Anemia among children 6 - 23 months was higher in households without water-sealed toilets (p value=<0.001).

Prevalence of Anemia in Children 0-6 Months: Philippines, 2008

- Prevalence of anemia in children 0-60 months by type of toilet of the households

- Anemia status of children 0-6 months and 24-60 months

- Nutritional Status
  - Underweight, Stunting, Wasting
  - "Based on WHO-CDS"

- Feeding Practices
  - Breastfeeding, Complementary feeding

- Food Intake
  - "Based on WHO-CDS"

- Government Program Participation
  - Nutrition Education
  - Food-For-School

- Health Information
  - History of vitamin A treatment

- Government Program Participation
  - Immunization, Deworming, Supplementary Feeding
Anemia and Deworming

Among children 6-23 months, anemia was lower in children who were dewormed (p value=<0.007).

Anemia and Child Feeding Practices

Anemia was higher among children still exclusively breastfed after six (6) months than children exclusively breastfed under six (6) months (p value=<0.007).

Anemia and Household Socio-economic Characteristics

Anemia among children 6-23 months was higher among children from food insecure households (p value=<0.001).

Research and Development
In the 6-23 months old, anemia was highest in households headed by agricultural and unskilled workers (p value= <0.001) and those without formal schooling and education below college (p value= <0.001).

Anemia prevalence in children 6-23 months was also higher among households with young household heads (<50 y o) (p value= 0.008) with no electrical services (p value= <0.001) . Anemia in older children (24-60 months) was higher in households that live in makeshift houses (p value= 0.031).

Anemia among children 6-23 months is lower in children taking vitamins or supplements than those who are not taking (p value= 0.001).

Underweight (p values=<0.001, <0.003) and stunted (p values=<0.001, <0.001) children in both age groups are more likely to be anemic. Wasting was not associated with anemia.
CONCLUSION

Anemia is more prevalent in children 6-23 months than in older children 24-60 months. Low educational attainment and agricultural or unskilled occupation of the household head, lack of water-sealed toilets and electricity in the household and household food insecurity were associated with high anemia prevalence in children 6-23 months. Among older children 24-60 months, children from households living in makeshift houses have higher risk of being anemic. On the other hand, intake of vitamins or supplements, participation to deworming program and exclusive breastfeeding of infants for more than six (6) months was associated with low anemia prevalence in children 6-23 months. Underweight and stunting was also associated with higher anemia prevalence in both age groups of children.

RECOMMENDATIONS

- Intensive promotion and improved delivery of infant and young child feeding (IYCF), iron supplementation, deworming, health practices through the Garantisadong Pambata (GP) Program at the local level

- Poverty reduction and strengthened implementation of food-insecurity and hunger mitigation programs