# HOUSEHOLD FOOD SECURITY AND NUTRITIONAL STATUS AMONG CHILDREN UNDER TWO YEARS OLD IN EAST KOLAKA DISTRICT, SOUTH EAST SULAWESI PROVINCE, INDONESIA

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**Abstract, Context:** Household food security and Nutritional Status. **Aims**: to explore the association of household food security and nutrition status among children under 2 years old in East Kolaka District, South East Sulawesi Province, Indonesia.
**Methods and Material**: Household food security was measured using a short version of United States Security Survey Module (US–HFSSM) questionnaire. Nutritional status of children under five measured by anthropometric measurement with indicator z–score of WHZ, WAZ, and HAZ. Hemoglobin measurement was done using portable hemoglobin photometer with cyanmethemoglobin method. **Settings and Design**: cross sectional. **Statistical analysis used**: Chi Square.
**Results**: More than half of the households (53.80 %) were categorized as high or marginal food secure, 34 % food insecure without hunger and 11.4 % food insecurity with hunger. Prevalence of underweight, stunted, wasted, and anemia of under 2 years old children in this area were 15.9 %, 20.5 %, 8.4 % and 63.6%. There was no significant association between household food security status with underweight, stunting, and wasting (p= 0.714, p= 0.94, p=0.25). Anemia in children who suffer food insecure household with hunger was significantly higher than those in children from food secure households (p= 0.037).
**Conclusions**: There was no significant association between household food security status and under 2 years old children nutritional status. However anemia in children from food insecure household with hunger was significantly higher than those in children from food secure households.

**Keywords:** Anemia, children nutritional, food security, hemoglobin.

## Background

Recent data suggest the number of people who suffer from hunger has been growing. An estimated 821 × $10^{-6}$ people in the world (one out of every nine people in the world) are undernourished[1]. People with hunger and food deprivation are regularly not getting enough food to conduct an active life[2]. In 2013 number of poor people (the population with monthly per capita expenditure below the poverty line) in Indonesia reached 28.07 × $10^{-6}$ (11.37 %). Numbers of poor people in rural areas (17.74 × $10^{-6}$ people) are higher than urban areas (10.33 × $10^{-6}$ people) [3]. Food scarcity and food insecurity remains a visible reality among this segment. People who live in poor households are prone to experiences food insecurity condition which affect their well–being. Household food insecurity is particularly prevalent in developing countries like Indonesia[2]. Food security is a great significance worldwide as governmental and non–governmental achievement to reach Sustainable Development Goals (SDGs), a world without hunger and malnutrition in 2030[1].

Nutritional status of under–five–children in Indonesia is a serious public health problem where stunting reach 37.2 % in 2013[4]. Household food security is one of underlying

factors of children nutritional status. Household food insecurity can negatively affect food consumption, including reduced dietary variety, nutrient intake, and nutritional status of household members including children. Food insecurity affects health and well–being throughout the life cycle and has been associated with child dietary intake and weight status[5]. In children, adolescents, and adults, their food insecurity correlates with the other negative nutrition and non-nutrient-related outcomes. The outcomes include poor academic achievement, lack key nutrients intake, increased risk of chronic disease, poor health, development of chronic disease, poor disease management, and poor functions of psychological and cognitive[6].

Children in food insecure households (mild, moderate, and severe) in Vietnam, Ethiopia, and Bangladesh showed a significantly higher risk under nutrition. Household food security is assumed to influence the children's nutritional status by compromising quantity and quality of dietary intake[7]. Household food insecurity may be related to protein energy malnutrition. This is evident in a quarter of children in the world who experience stunting, wasting, and underweight[8].

Research on the relationship between household food security and children's nutritional status has led to mixed results. Studies from Hackett et al. and Saha et al. in 2009 have reported a positive correlation between household food security and nutritional status of preschool children[9]. Meanwhile, study from Osei et al. found no relationship or a negative association between household food security with malnutrition among children. East Kolaka is a rural area in South East Sulawesi Province. The rural households were less educated, and had limited access in electrical appliances. In Indonesia about 84 % food–insecure households live in rural area. More food–insecure households without and with hunger were found in rural areas[10]. Accordingly, this study aims to explore the correlation between household food security and nutrition status among under 2 years old children in East Kolaka District.

## Methods

This study uses cross sectional research with aim to measure household food security and nutritional status. There were 30 Clusters Each cluster was represented by one village. This study selected randomly 30 villages from 122 villages in East Kolaka District. The selected villages come from 12 sub–district. Probability Proportional to Size (PPS) sampling was performed to get the minimal number of under 2 years old children in each village. The subjects (under 2 years old children) were randomly selected from cohort book from Integrated Health Centre. ENA (Emergency Nutrition Assessment) software was used for sample randomization. The sampling technique used was simple random sampling. The sample was households with eligible children. They were selected from the sampling frame of each hamlets. When there were two children or more present in the selected household, only the youngest child was selected. The subject were selected after randomization with certain criteria such as; residing in East Kolaka District, willing to be a respondent, and not suffering from serious illness. The researcher collected 429 subject for the study. The study was approved by the Ethical Committee of Medical Faculty, University of Indonesia. The ethical review boards of Faculty of Medicine Universitas Indonesia and Dr. Cipto Mangunkusumo General Hospital, Indonesia, approved the study protocol no. 210/H2.F1/ETIK/2014.

Data collection was carried out using several methods, such as structured interview, anthropometric measurement, and biochemical examination (Hemoglobin). Structured questionnaires with open–ended questions were used for data collection. All questionnaires were pre–tested and revised accordingly. The Interview was done to mothers of under 2 years old children with a structured questionnaire. The questionnaires consisted of questions on demographic data of the household, six item US–HFSSM questionnaire to measure household food security, coping strategy and household expenditure. Socio economic status classified based on monthly household expenditure. The expenditure mentioned is the regular amount of money for living, included daily groceries like food, drinks, education fees, cigarettes, gasoline, and rental expenses[11]. The interview took approximately 1 h for each subject.

Anthropometric measurement was conducted for under–two–year–old children include of body weight and length. Body weight of the children was measured using SECA 876 electronic scale. The scale should be placed in a flat surface and the starting point should be set on 0 kg. The children measured in mother hold. Mothers were asked to stand on the weighing scale and set the weighing scale into 0 point, and then child was put into mother's arms. Body weight was measured twice, to the nearest 0.1 kg. If two measures differed by > 0.1 kg, a third measure was obtained. The mean of the two measures was used in the analysis[12].

Length of the children was measured by shorr board. At least two examiners were needed

in this measurement. The child was placed face upward, with the head toward the fixed end of the board and the body parallel to the board's axis. The shoulders should rest against the surface of the board. One examiner brings the child's had into contact with the fixed board headboard and positions the head so that Frankfurt plane is vertical. The second examiners hold the subject's feet, without shoes, toes pointing directly upward, and keeping the subject's knees straight, bring the moveable footboard to rest firmly against the heels and read the length. Recumbent length was measured twice, to the nearest millimeter. During the measurement subjects were prohibited to wear a shoe and not wearing diapers. If the two measures differed by > 0.5 cm, a third measurement was made.

Hemoglobin measurement was done to children above 6 months using portable hemoglobin photometer "Hemocue" with cyanmethemoglobin method. The blood drop comes from finger prick was drawn up into the microcuvette by capillary action and inserted into HemoCue photometer. When the microcuvette was filled there should be no air bubbles within the chamber and blood should not cover the outside of the microcuvette windows. Results were displayed after (45 to 60) s in g $dl^{-1}$ on an LCD display. The reading of hemoglobin result was done twice. The mean was used for the analysis.

The nutritional status of under 2 years old children was analyzed by using anthropometric indices, which were weight–for-age z-score (WAZ), length–for–age z–score (HAZ) and weight–for–age z–score (WAZ). Conversion of anthropometric measurement data into z–score indices were performed using WHO Anthropometric Software 2005. Data entry and statistical analysis were conducted using SPSS program version 20. The food security score calculation was mention in Table 1. Chi–square test was used to see the proportion significant difference. Tests of significance are two–tailed with p**–**value of ≤ 0.05 meaning statistically significant. All data was analyzed with 95 % confidence interval.

**Tabel 1.** Summary of Household Food Security Calculation

| Variables | Component Of variables | Value for each | Score classification |
|---|---|---|---|
| Food security | - Q1 : Anxiety or perception that the household food budget or food supply was inadequate | Often or sometimes =1; never true=0; don't know= . | Raw score<br>0 to 1 high or marginal food security<br>2 to 4 Food insecurity without hunger<br>5 to 6 Food insecurity with hunger |
| | - Q2 : Perceptions that the food eaten was inadequate in quality<br>- Q3,Q4,Q5,Q6 : Reported instances or reduced food intake for adult | Often or sometimes =1; never true=0; don't know= .<br>Q3,Q5,Q6 yes = 1; never = 0 ; don't know = .<br>Q4 some months but not every month and almost every month = 1; only 1 month or 2 months =0; don't know=. | |

## Results

Total subject of this study was 429 children under 2 years old. The mean of age was 12 mo. More than half of the children were came from (12 to 23) months age groups (51.3 %) the rest came from (0 to 6) months age group (21 %) and (7 to 11) months age group (27.7 %). Distribution of boys and girls in this study was almost equal (boys 47.3 %; girls 52.7 %).

Table 2 presents the distribution of mothers and households characteristics of 429 (weighted total) children aged (0 to 23) mo. The mean age of the mother was about (28 and 33) years old for father, it means most of the parents were still young. The sample had a low percentage of working mothers (28 %) with most of them (33.5

%) completed elementary school and only 7.5 % attended university or higher. Most of the mothers work as a farmer and others were government employee, private employee, entrepreneur and student. More than half of households surveyed had more than four people, and 83.9 % had one under–five child. According to number of people who contributed to household's income, there were 69.7 % households that had only one working member. Most of the households had a complete parent. More than a half of households included as medium socio economic status.

Table 2 also showed that more than half of the households (53.80 %) categorized as high or marginal food secure based on US–HFSSM category. In the households with food insecure status, most of them can be categorized as food insecure without hunger. About 45.4 % of households in our sample experienced some amount of food insecurity in the 12 months prior to the survey, and 11.4 % of them categorized as food insecure household with hunger. The wasting, stunting, and underweight prevalence was 15.9 %, 20.5 %, and 8.4 % respectively. The mean or median of WAZ, HAZ, and WHZ was in negative value. Prevalence of anemia was high (63.60 %), more than a half of under2 years old children have anemia.

**Table 2.** General characteristic of mothers and households

| Variables | n (%)[1] |
|---|---|
| Age of mothers in years (mean ± SD) | 28.02 ± 6.57 |
| Mother's education | |
| No and < 3 years of schooling | 35 (8.2) |
| Graduated elementary school | 144 (33.5) |
| Graduated junior high school | 118 (27.5) |
| Graduated senior high school | 100 (23.3) |
| Attend university or higher | 32 (7.5) |
| Mother's occupation | |
| Housewife's | 309 (72) |
| Farmer | 71 (16.6) |
| Other | 49 (11.4) |
| Number of household | |
| ≤ 4 people | 195 (45.5) |
| > 4 people | 234 (54.5) |
| Number of U5 children | |
| 1 Child | 360 (83.9) |
| ≥ 2 Child | 69 (16.1) |
| Number of people contribute to income | |
| 1 people | 299 (69.7) |
| ≥ 2 People | 130 (30.3) |
| Socio Economic Status | |
| Low (≤ IDR 1 000 000) | 71 (16.6) |
| Medium (IDR 1 001 000 to IDR 2 000 000) | 221 (51.5) |
| High (> IDR 2 001 000) | 137(31.9) |
| Household Food Security Status[2] | |
| High or marginal food secure | 231(53.8) |
| Food insecure without hunger | 146 (34.0) |
| Food insecure with hunger | 49 (11.4) |
| Children Nutritional Status | |
| Underweight | 68 (15.9) |
| Stunting | 88 (20.5) |
| Wasting | 36 (8.4) |
| Anemia | 215 (63.6) |

As food insecurity, status becomes more severe, the higher the percentage of coping strategies adopted (Table 3). Borrowing money from family was the most performed coping strategy of food insecure households with hunger (61.2 %). Buying a cheaper food, borrowing food from small shop limiting food portion, and limiting mealtime were also performed by food insecure households with hunger. Most of the food insecure households without hunger chose buying a cheaper food as their coping strategies (40.4 %). Interestingly some of the food secure households also had a coping strategy, although very small households take this strategy. Most of

the food secure households chose to borrow foods from “warung” as their coping strategy (9.1 %).

**Table 3.** Coping Strategies with Household Food Security

| Coping strategies | Household Food Security Status (Based on US-HFSSSM Category) | | | |
|---|---|---|---|---|
| | Food secure (n=231) | Food insecure without hunger (n=146) | Food insecure with hunger (n=49) | P–value |
| Buy cheaper food | 19 (8.2 %) | 59 (40.4 %) | 27 (55.1 %) | P < 0.001 |
| Borrow money from relatives to buy food | 17 (7.4 %) | 49 (33.6 %) | 30(61.2 %) | P < 0.001 |
| Borrow food from "warung" | 21 (9.1 %) | 48 (33.1 %) | 22 (44.9 %) | P < 0.001 |
| Hunting, harvest immature crops | 18 (7.8%) | 34 (23.3%) | 11 (22.4%) | P < 0.001 |
| Consume food stock for the next season | 13 (5.6 %) | 19 (13 %) | 12 (24.5 %) | P < 0.001 |
| Ask HH member to eat in relatives | 6 (2.6 %) | 15 (10.3 %) | 8 (16.3 %) | P < 0.001 |
| Ask HH member to beg food to relatives | 6 (2.6 %) | 13 (8.9 %) | 7 (14.3 %) | 0.002* |
| Limited food portion | 6 (2.6 %) | 18 (12.7 %) | 23 (46.9 %) | P < 0.001 |
| Limited adult food for children | 4 (1.7 %) | 19 (13 %) | 16 (32.7 %) | P < 0.001 |
| Prioritize food for working HH member | 2 (0.9 %) | 12 (8.2 %) | 6 (12.2 %) | P < 0.001 |
| Limited meal time | 7 (3 %) | 19 (13 %) | 16 (32.7 %) | P < 0.001 |
| Fasting | 2 (0.9 %) | 3 (2.1 %) | 6 (12.2 %) | P < 0.001 |

Table 4 showed that prevalence of underweight (18.6 %) and stunting (29.1 %) were higher among the older children. Prevalence of wasting was higher among 0 to 5 month children (11.1 %). Prevalence of anemia was higher among 6 months to 12 months children (73.1 %). There was an association between children age with stunting ($p < 0.001$). Prevalence of underweight and stunting were higher among the boys (17.2 %) than the girls (24.1 %). Prevalence of wasting was higher among the girls (9.9 %) than boys (7.1 %). Prevalence of anemia was higher in boys (64.6 %) than girls (62.8 %). There was no association between children sex with nutritional status ($p > 0.05$). Prevalence of underweight (17.9 %), stunting (24 %), wasting (9.5 %) and anemia (70 %) were higher among the mothers who have low education background than mothers who have medium and high education background. There was no association between mother educations with nutritional status.

**Table 4.** Children Characteristic with Nutritional Status

| Characteristic | Nutritional Status | | | |
|---|---|---|---|---|
| | Underweight | p–value* | Stunting | p–value* |
| Children Age | | | | |
| 0 month to 5 months (n=90) | 8(8.9 %) | 0.103 | 6(6.7 %) | P<0.001 |
| 6 months to 12 months (n=119) | 19(16 %) | | 18(15.1 %) | |
| 13 months to 24 months (n=220) | 41(18.6%) | | 64(29.1 %) | |
| Children Sex | | | | |
| Boys (n=203) | 35(17.2%) | 0.455 | 49(24.1%) | 0.078 |
| Girls (n=226) | 33 (14.6%) | | 39(17.3%) | |
| Mother's Education | | | | |
| Low (n=179) | 32(17.9%) | 0.44 | 43(24%) | 0.311 |
| Medium (n=218) | 33(15.1%) | | 39(17.9%) | |
| High (n=32) | 3(9.4%) | | 6(18.8%) | |

*Chi Square Test, [1]p<0.01

**Tabel 4 a**. Children Characteristic with Nutritional Status

| Characteristic | Nutritional Status | | | |
|---|---|---|---|---|
| | Wasting | p–value* | Anemia | p–value* |
| Children Age | | | | |
| 0 month to 5 months (n=90) | 10 (11.1%) | 0.43 | - | 0.0071 |
| 6 months to 12 months (n=119) | 11 (9.2%) | | 87 (73.1%) | |
| 13 months to 34 months (n=220) | 15 (6.8%) | | 128(58.4%) | |
| Children Sex | | | | |
| Boys (n=203) | 16(7.1%) | 0.301 | 102 (64.6%) | 0.734 |
| Girls (n=226) | 20(9.9%) | | 113 (62.8) | |
| Mother's Education | | | | |
| Low (n=179) | 17(9.5%) | 0.75 | 98(70%) | 0.051 |
| Medium (n=218) | 17(7.8%) | | 103(60.9%) | |
| High (n=32) | 2(6.2%) | | 14(48.3%) | |

*Chi Square Test, [1]p<0.01

There were no significant difference between household food security with nutritional status (underweight, stunting, and wasting) (p > 0.01). There was an association between household food security using US–FSSM category with anemia (p < 0.05). The prevalence of underweight children in food secure households (16.9 %) was almost the same with food insecure households with hunger (16.3 %). The prevalence of stunting in food insecure households with hunger (20.5 %) was a little bit higher than in food secure households (20 %). The prevalence of wasting in food secure households (10.4 %) was also higher than in food insecure households (6.2 % and 6.1 %). Instead, the prevalence of anemia for children (6 to 23) months was higher in food insecure households with hunger (73.5 %) than food secure households (66.9 %).

**Table 5.** Association between household food security with nutritional status

| Household Food Security Status | Nutritional status | | | |
|---|---|---|---|---|
| | Underweight | p–value* | Stunting | p–value* |
| Food secure | 39 (16.9 %) | 0.714 | 47 (20.3 %) | 0.94 |
| Food insecure without hunger | 20 (13.7 %) | | 30 (20.5 %) | |
| Food insecure with hunger | 8 (16.3 %) | | 9 (18.4 %) | |

*chi-square test

**Table 5 a.** Association between household food security with nutritional status

| Household Food Security Status | Nutritional status | | | |
|---|---|---|---|---|
| | Wasting | p–value* | Anemia | p–value* |
| Food secure | 24 (10.4 %) | 0.256 | 117 (66.9 %) | 0.047 |
| Food insecure without hunger | 9 (6.2 %) | | 68 (54.8 %) | |
| Food insecure with hunger | 3 (6.1 %) | | 25 (73.5 %) | |

*chi-square test

## Discussion

Based on the result, the prevalence of food insecure household without hunger was 34 % and food insecure household with hunger was 11.4 %. Food insecure with hunger reflects food intake for adults had repeatedly experienced the physical sensation of hunger. Food security scale describes household members' condition as a group. Food security scale is not necessarily the condition of any particular household member[13]. Other study showed that as many as 77 % of families in urban area in Indonesia experience food insecurity[10].

Our data showed that as food security status becomes more severe, the higher the percentage of households employing coping strategies. There was an association between coping strategies with household food security ($p < 0.001$). Borrowing money from family was the most performed coping strategy of food insecure households with hunger (61.2 %), while most of the food insecure households without hunger chose buying a cheaper food as their coping strategies (40.4 %). Our results suggest that coping strategies were not employed only by food insecure households, but also by food secure households. These food secure households are only temporary because they can possibly become food insecure households at a later time[10].

A study from Usfar et al. also found that almost half of the food secure household in urban area employed coping strategies[10]. They suggested that the application of coping strategies in urban households proved successful in preventing households falling into food insecurity status. Combining food security and coping strategy indicators may help to identify transient food secure households. Shariff & Khor reported that the rural low–income Households in Malaysia used food–related coping mechanisms (cook whatever food is available at home and borrow money to buy food) during periods of food insecurity[14]. Decreased frequency and quantity of food intake, compromised diet in relation to food quality, food preference and food substitution, changes in food store, sale of assets and borrowing food or money were reported by families in Java during the Indonesia's economic crisis in 1998[15].

The prevalence of underweight under 2 years old children was 15.9 % and could be considered as medium prevalence based on WHO classification[12]. Surprisingly, the weight–for–age z–score of under 2 years old children tended to be better in households with food insecurity with hunger status. Household food insecurity will decrease household food supplies that will impact the food availability in the household[16]. Food availability will impact children's food intake. Household food security status alone may not be the factor for the mother to give appropriate diet for their children. In this case, mother's education may also have a big role, because most the mothers graduated from elementary school.

The prevalence of stunting under 2 years old children was 20.5 % and could be considered as medium level based on WHO classification[12]. Length–for–age reflects achieved linear growth and its deficit indicate long–term, cumulative inadequacies of health or nutrition. Stunting is caused by periods of inadequate food intake, poor food quality, increased morbidity, or a combination of those factors, thus results in a failure in achieving linear growth potential process[17]. The length for age z–score of under 2 years old children tended to be better in households with food insecure status. The highest prevalence of stunting was in food insecure households without hunger. Stunting resulted from under nutrition and infections since and even before birth. Stunting reflects the children health status in the past. In this case, our questionnaire only measure household food security in one period of time. Children age might also influence the result. This study result showed that there was an association between children age and stunting ($p < 0.001$). Study from Peiris & Wijesinghe also showed that

prevalence of stunting was very low in the first 6 months and increasing after one year among the boys and girls[18]. This study also find that prevalence of stunting were higher in the older age group. With the children getting older, the dietary requirements also become higher. It became very important to give appropriate feeding practices in the older children because most of them did not breastfed anymore.

The prevalence of wasting under 2 years old children was 8.4 % and could be considered as medium based on WHO classification[12]. Overall, the prevalence of anemic under 2 years old children was 63.6 % which is considered as severe public health according to WHO classification. The prevalence of Anemia was highest in food insecure household with hunger. WHO estimated 10 % to 20% of preschool children in developed countries, and an estimated 30 % to 80% in developing countries, are anemic at 1 years of age. These children will experience psychomotor development delays. In addition, after entering school age, they will also experience an impaired performance in tests of language skills, motor skills, and coordination, which is equivalent to an IQ deficit of 5 to 10 points[19].

Household food insecurity was not correlated with underweight, stunting, and wasting among children aged (0 to 23) months in East Kolaka District of Southeast Sulawesi Province ($p = 0.714$, $p = 0.94$, $p = 0.25$). Study from Osei et al. also found that there was no correlation between household food insecurity and children's nutritional status aged (6 to 23) months in Nepal's Kailali District[20]. The other studies showed a different result, Saha in 2009 found that household food security was a determinant factor of child growth in rural Bangladesh[21].

Household food security could be correlated with growth in several pathways. Household food insecurity could be a stressor to maternal anxiety and depression which contributed to negative parenting practices such as a negative effect on breastfeeding[21]. Other found that food insecurity will decrease the food availability in the households which can affect food intake of the household member[16]. This study did not assess maternal health and breastfeeding practices that might be the factor that affect children nutritional status.

The highly significant association between food security and coping strategies showed that our household food security data was internally reliable. However the fact that it was not significantly associated with nutritional status suggests other determinats may play a bigger role. Household food security is a precondition required for good nutrition outcomes but it is not sufficient on its own. Many studies stated that food availability and access on children's nutritional status can be influenced by other key determinants of child nutrition, such as maternal nutrition status and knowledge, maternal healthcare practices, intra household food usage and allocation, access to health services, and healthy environmental conditions namely good hygiene and sanitation[9];[20]. Other factor that influences children nutritional status was children age. The result could find the pattern of stunting and underweight more prevalent in food insecure household among (6 to 12) months children. Wasted children were more prevalent among (13 to 24) months children. Anemia among children aged (6 to 23) months was associated with household food insecurity in this study. The prevalence of anemia among food insecure household will determine household iron rich food availability that affects consumption of iron intake.

There were several limitations in this study. This study was a cross sectional study that cannot draw any causal conclusion. The data analysis was collected during a season in a year based on cross–sectional data, whereas data capturing seasonal trends are needed to fully understand the relationship between childhood nutrition and household food insecurity. This study did not assess the other key determinants of child nutrition, such as maternal knowledge of nutrition and healthcare practices, maternal nutritional status, intra–household food allocation and utilization, access to health services, and healthful environmental conditions.

Prevalence of underweight, stunted, and wasted of under 2 years old children in this area were 15.9 %, 20.5 %, and 8.4 %. Based on epidemiological criteria for assessing severity of under nutrition, these were categorized as medium. In general prevalence of anemic under 2 years old children was very high (63.6 %). More than half of the households (53.80 %) were categorized as high or marginal food secure, 34 % food insecure without hunger and 11.4 % food insecurity with hunger. There was no significant association between household food security status and under 2 years old children nutritional status. However anemia in children from food insecure household with hunger was significantly higher than from food secure households. Household food security may be a necessary prerequisite for good nutrition outcomes but it is insufficient on its own. Further study also needs to be undertaken to be able to identify the correlation between household food security and nutritional status of under 2 years old children in East Kolaka District taking into account other factors such as maternal knowledge of nutrition, healthcare practices, maternal nutritional status, intra–household food allocation, access to health services, and healthful environmental condition into consideration.

## Conclusion

Prevalence of underweight, stunted, and wasted of under 2 years old children in this area were 15.9 %, 20.5 %, and 8.4 %. Based on epidemiological criteria for assessing severity of under nutrition, these were categorized as medium. In general prevalence of anemic under 2 years old children was very high (63.6 %). More than half of the households (53.80 %) were categorized as high or marginal food secure, 34 % food insecure without hunger and 11.4 % food insecurity with hunger. There was no significant association between household food security status and under 2 years old children nutritional status. However anemia in children from food insecure household with hunger was significantly higher than from food secure households.

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