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# The Status of Maternal and Child Nutrition in Ethiopia

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**Abstract:** Malnutrition is devastating problems, particularly for the poor people who have no access to enough and nutritious foods. The objective of this paper was to compile different research and intervention work results to identify the status and to use it for further effective and targeted intervention. The prevalence of anemia among children 6-59 months is increased from 44% (2011) to 57% (2016) which is very risky that needs further fast intervention. Some studies show that prevalence of stunting and acute malnutrition have decreased over the past decade in Ethiopia but remain high, with 38% of children under 5 years stunted and 10% wasted. Some Survey report has shown that nutritional status in the studied area was categorized in low levels in under five year children and recommended that it needs to plan strategies and preventive public policies. The report has indicated also that anemia prevalence among Ethiopian women decreased from 27% to 17%, but these numbers obscure important regional differences. However, some reports show that 38% of the women were undernourished and 22% were anemic. Global nutrition report has also indicated that anemia is severe in women aged 15-49 years in Ethiopia (19.2%). About 22% of women of reproductive age are undernourished, leaving their children predisposed to low birth weight. This review paper has revealed that prevalence of maternal and children malnutrition is still high in Ethiopia. Some studies had indicated that determinant factors like social conflicts, flooding, drought, and disease have a high contribution in existing malnutrition. Therefore, it would be advisable to plan further intervention strategy from government and other responsible body to tackle this malnutrition problem by finding ways to prevent/ reduce this determinant factors.

**Keywords:** Intervention, Malnutrition, Micronutrients, Stunting, Underweight, Wasting

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## 1. Introduction

Ethiopia is the second most populous country in Africa with a current population of 102.4 million with a fertility rate of 4.2 children born per woman [1]. Although Ethiopia has the fastest growing economy in the region; it remains one of the poorest, with 23 percent of its population living below \$1.90 a day [2]. Based on these evidences, it can be estimated that nutritional status of the people may not meet standard required. Thus, it is better to have timely information to make necessary intervention.

Hunger and malnutrition are devastating problems, particularly for the poor and unprivileged [3]. Micronutrient deficiencies in women of reproductive age (WRA) are known to impair health, Pregnancy outcomes and growth as well as the development of their offspring [4]. Women are vulnerable to micronutrient deficiencies due to inadequate dietary intake, lack of availability of food, inequitable

distribution of food within the same household, lack of knowledge about the importance of dietary diversity and frequent occurrence of infectious diseases [5]. Globally anemia and Vitamin A deficiency (VAD) prevalence in women are decreasing; however, regions of Africa (and Southeast Asia) still have alarming rates of anemia in WRA, including pregnant women (PW,) and the prevalence of VAD is also reported to be high in PW [6]. The Proceedings of the 8<sup>th</sup> Africa Nutrition [7] has revealed that stunting reduction strategies of national nutrition plans in Africa and other concerned sectors will necessarily need to be revised to address all causes of stunting if the commitment for reducing stunting by 40% is to be achieved by 2025. This shows that further intervention is needed to reduce this problem.

A significant contributing factor to infant and child mortality, poor nutritional status during childhood also has implications for adult economic achievement and health [8]. Some evidence in developing countries indicated that malnourished individuals, that is, women with a body mass

index (BMI) below 18.5 showed a progressive increase in mortality rates as well as increased risk of illness [9]. Even though interventions are being made at different stages, it can be understood from this study that malnutrition still exists in our country.

Globally, under nutrition in children is highly prevalent and remains a big challenge [10]. The prevalence of stunting in children below five years in East Africa averages about 48 percent [11], which is the highest in the world. The recent report of nutrition status in Ethiopia is worse than in other East African countries [4]. To reduce this problem different responsible institution like universities, Agricultural, health and others have made many interventions. But, some literatures shows that still now the degree of malnutrition in Ethiopia is at a high stage and may needs further interventions to mitigate it.

Therefore, the aim of this review will be to collect different evidences related to maternal and child nutritional status in our country, Ethiopia which will be used for further intervention in mitigating of the current malnutrition problem.

## 2. Maternal and Children Nutrition Status

Poverty often creates food insecurity that prevents access to sufficient, safe, and nutritious food to meet basic dietary needs, resulting in severe vulnerability to both physical well-being and mental health [2]. According to [12], nutritional status in the study area among study population was categorized in low levels in under five year children. According to this survey, there is a need to plan strategies

and preventive public policies based on these district specific risk factors to alleviate early malnutrition among under- five children.

Moreover, the nutritional status of children is a manifestation of a host factors, including household access to food and the distribution of this food within the household, availability and utilization of health services, and the care provided to the child [13].

### 2.1. Nutritional Status in Women (Ethiopia)

The Government of Ethiopia has been giving special emphasis on maternal and child health. Even though many efforts had been made, Ethiopia is still one of main countries with the worst rate of maternal and child mortality accompanied by severe malnutrition [14]. Malnutrition is mostly observed in rural areas of the country as indicated by many literatures. Findings of the 2000 Ethiopia DHS [15] showed that 25% of women in the reproductive age group (15-49 years) fall below the cutoff of 18.5, indicating that the level of chronic energy deficiency (CED) is relatively high. According to this report, the mean height of Ethiopian women was 156 centimeters, and about 4% of them were shorter than 145 cm. The percentage of women whose height was below 145 centimeters is highest in Tigray (4.8%) and lowest in Dire-Dawa (1.4%). A recent report by [9] has also revealed that malnourished individuals, that is, women with a body mass index (BMI) below 18.5 showed a progressive increase in mortality rates as well as increased risk of illness. By comparing this evidence, it can be determined that the nutritional status of Ethiopian women is not improved as expected and needs further intervention.

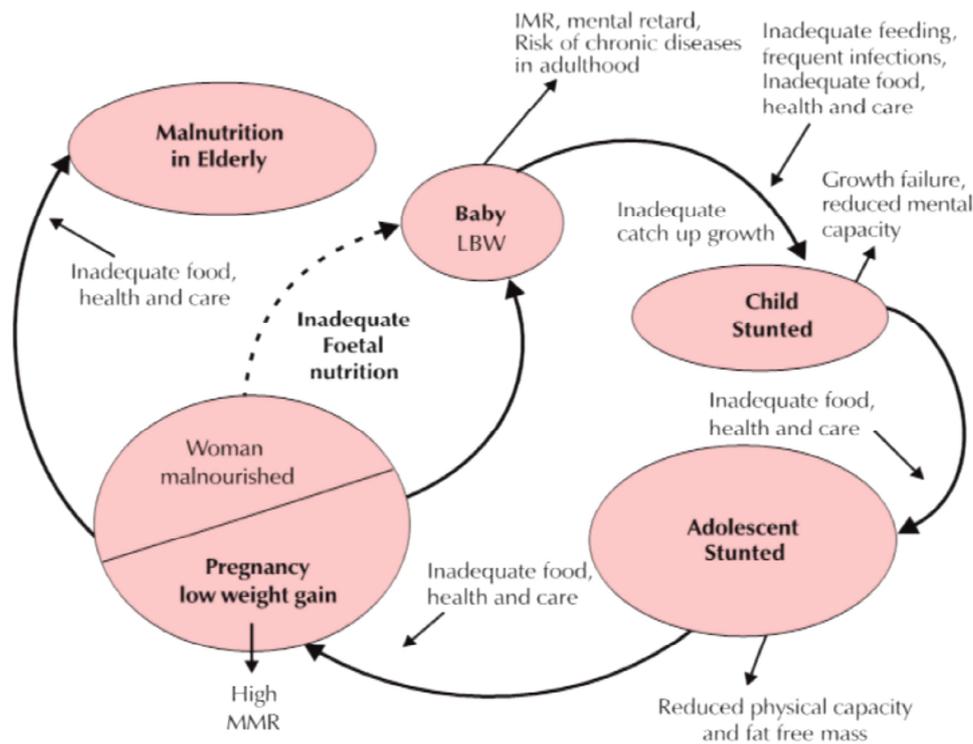


Figure 1. Nutrition throughout the lifecycle. [11].

Improving of women nutritional status is very necessary to reduce negative effects of undernutrition, which happens through life cycle. The cycle of undernutrition can span across generations (Figure 1), and affects all stages of the life cycle. Young girls who grow poorly become stunted and are more likely to give birth to low-birth weight infants. If those infants are girls, they are likely to continue the cycle by being stunted in adulthood. The report by [16] has found that children of underweight mothers are more likely to be stunted and wasted than children of normal weight mothers. This could be explained by the presence of an intergenerational link between maternal and child nutrition means a small mother will have small babies who in turn grow to become small mothers [10]. Other study [2] has recently reported that child malnutrition is associated with maternal malnutrition and childbirth size. This report also revealed that the children of mothers, who are thin, with a body mass index (BMI) of less than 18.5, are more likely to be stunted, wasted, or underweight than the children of mothers who have a normal BMI. In general, malnutrition has direct and indirect impacts on individuals and nation that needs further intervention to reduce the number of affected people as possible through different strategy.

### 2.1.1. Micronutrients

**Iron** – Iron intake in Ethiopia was reported to be high (47–97.8 mg/d) and only 8–12% of the WRA had inadequate intake [17]. In contrast to this, Saldanha *et al.* in 2012 has indicated that prevalence of anemia was higher in pregnant women (32% to 62%) than women of reproductive age (19–61%) in Ethiopia [18].

Global nutrition report in 2016 has indicated that anemia is severe in women aged 15-49 years in Ethiopia (19.2%) [19]. It has indicated also that anemia prevalence among Ethiopian women decreased from 27%(2005) to 17%(2011), but these numbers obscure important regional differences. Ethiopia has a various ecology, with people of different food habits and culture that should be considered when talking about nutrition status. Depending up on these literatures, one can say that further intervention is needed for Ethiopian women who are being affected by this problem.

**Zinc** – The Mean dietary zinc intake ranged from 3.8–16.2 mg/d and 23–96% had inadequate intake in Ethiopia [17]. This literature review has shown that Zn deficiency is at 46% to 70% in Pregnant Women in Ethiopia. Global nutrition report [19] has reported the 34% of Zn deficiency in women of reproductive age in Ethiopia. As it depends on diet type, inadequate intake of zinc due to a primarily plant-based diet is by far the most likely cause of zinc deficiency in these populations.

**Iodine** - About 16% (2011) and 88%(2016) of the percentage of children 6-59 months living in households using iodized salt. The percentage of households not consuming adequately iodized salt (>15 ppm) ranged from 23% to 98% in Ethiopia [17] indicating that the prevalence of iodine deficiency was highest in Ethiopia (59%).

### 2.1.2. Maternal Stunting and Thinness

About 38% of the women were undernourished and 22% were anemic [20]. Twenty-two percent of women of reproductive age are undernourished, leaving their children predisposed to low birth weight, short stature, high risk of disease [21]. Thinness in women is a serious problem in Ethiopia (26% BMI < 18.5), as is stunting (13% < 150 cm in height) [17]. A recent small-sale study in Kersa sub-district of Oromiya region showed that 35% of non-pregnant women had a BMI lower than 18.5% [10]. The prevalence of anemia and thinness among women of reproductive age (15-49) is 17% and 27% in (2011) whereas it appeared to be 24% and 22% in 2016, respectively [21]. In this study, it can be understood that the prevalence of anemia was increased (17% to 24%) and the thinness problem decreased from 27% to 22%. This increment of anemia prevalence is a good indicator for showing the level of malnutrition in women in Ethiopia.

As reported by Girma W and Genebo. T, the proportion of women suffering from chronic energy deficiency (CED) malnutrition was significantly higher in rural areas than in urban areas [10]. The highest prevalence of chronic energy deficiency in women was observed in Somali (48%), followed by Affar (42%), Gambella (39%), and Benishangul-Gumuz (38%); it was lowest in Addis Ababa (18%) and Harari (25%), the two most urban areas. As expected, the prevalence of anemia in PW was high, ranging from 32% to 62%. This study shows that there is a regional difference in level of both chronic energy deficiency and anemia prevalence and this gap needs to be narrowed through effective intervention by responsible body.

The study conducted by Abdulhalik W., Tefera B., Shibani G. has reported that the burden of under nutrition is still high and although improved socio-economic status and dietary practices decreased the risk of under nutrition, poor health and environmental conditions were still significant risk factors [20]. This finding suggested the need to target this set of important determinants to significantly decrease the burden of under nutrition among young pregnant women. Even though this indicated that the improvement in socio-economic status and dietary practices decreased the malnutrition other studies have shown that the degree of its decrement is not significant. In general, it can be concluded that the degree of maternal malnutrition in Ethiopia is high and this problem is vary from region to region. This difference is mainly environmental problem like drought, flood, and erroneous heavy rain. Some literatures are evident that the cultural difference is the cause for this variation among regions. Thus, it might be said that further intervention is expected from government and other responsible bodies. Children are most vulnerable to malnutrition in developing countries because of low dietary intakes, infectious diseases, lack of appropriate care, and inequitable distribution of food within the household [22].

## 2.2. Nutritional Status in Children (Ethiopia)

Ethiopia is ranked sixth in terms of child mortality in the globe. Malnutrition account for 57% of the underlying causes of the deaths followed by HIV AIDS (11%) (Sadia, 2013)[14]. The improvement in child malnutrition from 50.7% of stunted children in 2005 [23] to 43% in the 2011 [24] shows us that the intervention by different responsible body bringing a change. The survey result revealed that 45.8% and 11.2% of sample children are stunted and wasted, respectively [25]. According to the 2011 survey, 44% of children under five are stunted, or too short for their age [29]. Prevalence of stunting and wasting have decreased over the past decade but remain high, with 38% of children under 5 years stunted and 10 percent wasted. Children in rural areas are more likely to be malnourished than those in urban areas, with variations in the severity of stunting and wasting by region [21]. It shows that Stunting is highest in Amhara (46%), Benishangul-Gumuz (43%), Afar (41%), and Dire Dawa (41%), whereas wasting is highest in Somali (22%), Affar (18%), and Gambela (14%). This result is somewhat similar with 2011 survey result (44%

stunting). In Amhara and benishangul-gumuz the percent of stunting is high which is 46% and 43% respectively.

Anemia prevalence in children 6 to 59 months of age also fell by about nine percentage points to 44% during the same period [17]. The USAID [21] reported that the prevalence of anemia was increased from 44%(2011) to 57%(2016) in Ethiopian children (6-59 months age). The report by [26] has revealed that anemia is found to be a severe public health problem among young children residing in rural districts of Wolaita zone based on WHO cut off point. Children aged 6-23 months were diagnosed to be anemic having hemoglobin level below 11g/dl. Poor dietary diversity, household food insecurity, maternal age, and occupation were significantly associated with child anemia. The report of USAID shows that consequences of malnutrition should be a significant concern for policy makers in Ethiopia, where about 5.8 million children under 5 years (38 percent) are suffering from chronic malnutrition (stunting), according to the most recent Demographic and Health Survey (DHS) (Central Statistical Agency [21, 27]. There is also recent report 29.1% of Ethiopian babies were "small" at birth [28].

*Table 1. Ethiopia Nutrition Data (DHS 2011 and 2016).*

Population 2016 (UNICEF 2017)	102.4 million	
Population under 5 years of age (0–59 months) 2016 (UNICEF 2017)	15.2 million	
	2011	2016
Prevalence of stunting among children under 5 years (0–59 months)	44%	38%
Prevalence of underweight among children under 5 years (0–59 months)	29%	24%
Prevalence of wasting among children under 5 years (0–59 months)	10%	10%
Prevalence of low birth weight (less than 2.5 kg) (of children whose birth weights are known)	11%	13%
Prevalence of anemia among children 6–59 months	44%	57%
Prevalence of anemia among women of reproductive age (15–49 years)	17%	24%
Prevalence of thinness among women of reproductive age (15–49 years)	27%	22%
Percentage of children 6–59 months living in households with iodized salt	16%	88%

Source: [21].

Based on some literatures it can be concluded that the nutritional status of children is still not well improved and needs further intervention. The prevalence of overall malnutrition was 46% whereas specifically, stunting was (22.6%), underweight (16.1%) and wasting (7.4%), respectively [30]. Children had a high rate of stunting (43.2%). Of the total sample, 13.6% were anaemic, 9.1% were Fe deficient and 5.3% had Fe-deficiency anemia [31]. The overall prevalence of stunting, underweight, and wasting were 33.4%, 24.5%, and 20%, respectively [32]. This result shows that acute malnutrition is very high (double with average wastage, 10%) in Ethiopia Somale which needs fast intervention. Eighteen studies were included and the overall pooled prevalence estimate of stunting, underweight, and wasting was

42.0%, 33.0%, and 15.0% respectively [33]. In this result, it is obvious that all stunting, underweight, and wasting high and the increment of wasting from 10% to 15% is a good indicator of acute malnutrition existence. Another author [34] has revealed by his study in Tigray region that prevalence of stunting, underweight and wasting were 31.6–33.7%, 11.7–15.7% and 4.4–4.8%, respectively. The weight-for-height (WHZ) and height-for-age (HAZ) values for children of fasting mothers were significantly lower ( $p < 0.05$ ) compared to those of non-fasting mothers. This result showed that there is a little improvements. For instance, wastage, which is addressed by many literatures, is 10% but decreased to 4.8% as indicated in this study. This is the only literature that indicates the decrement of stunting and wasting to 33.7% and 4.8% respectively.

*Table 2. Prevalence of under-nutrition among children aged 0-59 months in Ethiopia.*

Prevalence of undernutrition	Underweight	Stunted	Wasted
Sex of child (%)			
male	36.12	38.01	11.04
female	34.44	36.01	9.29
Residence (%)			
urban	20.26	21.23	7.21
Rular	38.21	40.04	10.75

Prevalence of undernutrition	Underweight	Stunted	Wasted
Age (months) (%)			
0.-12	16.26	11.75	9.44
13-24	43.42	42.80	18.54
25-36	44.69	43.18	9.11
36-59	37.66	45.38	7.22
total	35.35	37.03	10.10

Source: [35]

The report on Regional Overview of Food Security and Nutrition in Africa has shown that there is a plan to achieve a 40% reduction in the number of children under five years who are stunted and 50% reduction of anemia in women of reproductive age by 20130 [36]. To attain this, more effort will be needed to be made by different concerned bodies. All these literatures are evidence for presence of acute malnutrition, which needs attention by responsible body for mitigation of it. These studies have been done at different regions of Ethiopia but all of them indicate that still now the severity is high and needs interventions. The regional difference is seen which is due to drought, flooding, disease, and political stability.

Maternal education, nutritional status, and anemia were associated with child stunting. In addition, maternal nutritional status, place of delivery, and preceding birth interval were associated with wasting. Therefore, there is needed to enhance the nutritional status of children by improving maternal underweight nutritional status, maternal educational and maternal anemia status, prolonging birth interval, and promoting health facility delivery [16].

### 3. Conclusion and Recommendation

Malnutrition is a changing problem, particularly for the poor and unprivileged. Different studies in Ethiopia were reviewed and the status of maternal and child malnutrition was identified with objective to generate compiled information that may be used in further intervention. It has been revealed that about 38% of the women were undernourished and 22% were anemic. Also about 22% of women of reproductive age are undernourished, leaving their children predisposed to low birth weight, short stature, high risk of disease. Some literature has shown that the prevalence of anemia is still high (19.2%) in Ethiopia. Some survey result indicated that the previous interventions were effective and able to decrease stunting from 50.7%(2005) to 43% (2012) and then 38% (2018). This shows that Ethiopian national strategy in reduction of malnutrition in women and children has performed better. However, still the degree of stunting, underweight, and wastage are 38%, 24%, and 10% of children. The prevalence of anemia among children 6-59 months is increased from 44% (2011) to 57%(2016) which is very risky that needs further fast intervention. It is also increased among women of reproductive age (15-49) from 17% (2011) to 24% (2016). These are the common evidences whereas some studies shows its increments than these percent in different regions depending on culture, religion, access, and

other factors. This review paper has tried to touch all regions of Ethiopia and identified that malnutrition is still high even though the degree of its prevalence differ from region to region. Because, the regional difference due these factors needs to be given attention during intervention than the whole country's region. Prevalence of maternal and children malnutrition is still high in Ethiopia and it would be advisable to continue further interventions by government and other responsible bodies. Some studies had shown that determinant factors like social conflicts, flooding, drought and disease have a high contribution in existing malnutrition in Ethiopia. Because, it would be expected from government to calm the situation and find the way to escape from these problems through effective intervention. Some literature evidences reveals that religion and culture are influencing the current maternal and child malnutrition status. To avoid/reduce this problem, important training should be taken for mothers on how to care their children and effects of malnutrition on future of their children.

### References

- [1] UNICEF. 2017. The State of the World's Children 2017. Available at: <https://www.unicef.org/sowc/>
- [2] World Bank (2019). *Project Performance Assessment Report, Ethiopia, Nutrition Project (Ida-H3760)*, Report No.: 136172.
- [3] Genebo T, Girma W, Hadir J, Demmissie T. *The association of children's nutritional status to maternal education in Ziggaboto, Guragie zone South Ethiopia. Ethiop J Health Dev. 2001; 13 (1): 55–61.*
- [4] Grieger, J. A., Clifton, V. L. (2016). *A review of the impact of dietary intakes in human pregnancy on infant birthweight. open access journal, Nutrients (ISSN 2072-6643) available at: [http://www.mdpi.com/journal/nutrients/special\\_issues/nutrition-pregnancy](http://www.mdpi.com/journal/nutrients/special_issues/nutrition-pregnancy)*
- [5] Darnton-Hill, (2012). *Global burden and significance of multiple micronutrient deficiencies in pregnancy. Nestle Nutr. Int. Workshop Ser. 2012, 70, 49–60.*
- [6] Stevens, G. A.; Bennett, J. E.; Hennocq, Q.; Lu, Y.; De-Regil, L. M.; Rogers, L.; Danaei, G.; Li, G. Q.; White, R. A.; Flaxman, S. R. (2015). *Trends and mortality effects of vitamin A deficiency in children in 138 low-income and middle-income countries between 1991 and 2013: A pooled analysis of population-based surveys. Lancet Glob. Health 3, e528–e536.*
- [7] *Proceedings of the 8th Africa Nutrition Conference (2017), Addis Ababa – Plenary and keynote abstracts.*

- [8] Victora, C. G., de Onis, M., Hallal, P. C., Blossner, M., R. Shrimpton, R. (2010). "Worldwide timing of growth faltering: revisiting implications for interventions." *J. of Pediatrics*, 125 (3), pp. e473–80.
- [9] Yimer, M. (2018). *Review on Factors Affecting the Nutritional Status of Women in Ethiopia*. Interventions Obes Diabetes. 2 (1). IOD.00052.
- [10] Girma W and Genebo. T (2002). *Determinants of Nutritional Status of Women and Children in Ethiopia*. Calverton, Maryland, USA: ORC Macro.
- [11] ACC/SCN, 2000. *Fourth Report on the World Nutrition Situation*.
- [12] Dereje Danbe and Ayele Taye (2015). *Nutritional Status of Under- five Children in Hawassa Zuria District, Southern Ethiopia*. *American Journal of Health Research*, Volume 3 (5), 286-292.
- [13] Christiaensen L. (2001). Child Malnutrition in Ethiopia. Maternal Knowledge Augment. The Role of income. Africa Region. Working Paper Series. 2001; (22): 1-19. *Central Statistical Authority/Ethiopia and ORC Macro*. 2001. *Ethiopia Demographic and Health Survey 2000*. Addis Ababa, Ethiopia: Central Statistical Authority/Ethiopia and ORC Macro.
- [14] Sadia Beshir M. (2013). *MA Thesis: Explaining Child Malnutrition in Ethiopia: The Role of Socioeconomic Status and Maternal Health on Nutritional Condition of Children*. International Institute of Social Studies, International Institute of Social Studies (ISS), The Hague, The Netherlands December 2013.
- [15] Central Statistical Authority [Ethiopia] and ORC Macro. 2001. *Ethiopia Demographic and Health Survey 2000*. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Authority and ORC Macro.
- [16] Zufan, B., Melkitu, F., Zegeye, A., Tadesse, A. and Kindie, F., (2019). *Maternal characteristics and nutritional status among 6–59 months of children in Ethiopia: further analysis of demographic and health survey*. *BMC Pediatrics*, 19 (83). <https://doi.org/10.1186/s12887-019-1459-x>
- [17] Harika, R., Faber, M., Samuel, F., Kimiywe, J., Mulugeta, A and Eilander, A. (2017). *Micronutrient Status and Dietary Intake of Iron, Vitamin A, Iodine, Folate and Zinc in Women of Reproductive Age and Pregnant Women in Ethiopia, Kenya, Nigeria and South Africa: A Systematic Review of Data from 2005 to 2015: Nutrients*, 9, 1096; doi: 10.3390/nu9101096.
- [18] Saldanha, Lisa, S., Laura Buback, Jessica, M. White, Afework M, Solomon G. M, Alemzewed Ch, Hiwot A., and John B. Masones (2012). Policies and program implementation experience to improve maternal nutrition in Ethiopia: Food and Nutrition Bulletin, vol. 33, no. 2.
- [19] *Global Nutrition Report (2016): From Promise to Impact: Ending Malnutrition by 2030*. Washington, DC. ISSN: 2380-6443.
- [20] Abdulhalik W., Tefera B., Shibani G., (2018). *Burden and determinants of under nutrition among young pregnant women in Ethiopia*. *Maternal and Child Nutrition*; <https://doi.org/10.1111/mcn.12751>
- [21] USAID (2018). *Nutrition Profile: Ethiopia*.
- [22] Mussie Alemayehu et al (2014). *Nutritional status and associated factors among under-five children, Tigray, Northern Ethiopia*. *International J. of Nutrition and Food Sciences*, 3 (6): 579.
- [23] WHO (2013), 'Global Database on Child Growth and Malnutrition: UNICEF-WHO-The World Bank, 2012 Joint child malnutrition estimates – Levels and trends.'
- [24] CSA and ICF International. (2012). *Ethiopia Demographic and Health Survey, 2011*. Addis Ababa, Ethiopia and Calverton Maryland, USA, Central Statistical Agency and ICF International.
- [25] Tadiwos Z. and Degnet A. (2013). *Determinants of Child Malnutrition: Empirical Evidence from Kombolcha District of Eastern Hararghe Zone, Ethiopia*. *J. of International Agriculture* 52, No. 4; DLG-Verlag Frankfurt/M.
- [26] Analysis of the Ethiopian Demographic and Health Survey, 2011. *Children's Health and Nutritional Status*. Ethiop. J. Health Sci. 26, 243–250.
- [27] Mihiretu A., Mengistu M., Bereket, Y. (2018). *Prevalence and correlates of anemia among children aged 6-23 months in Wolaita Zone, Southern Ethiopia*. *Nutrients*, 7, 153–178.
- [28] Central Statistical Agency, (2017). *Ethiopia Demographic and Health Survey 2016*.
- [29] Alemu, T., Umeta, M., (2016). *Prevalence and Predictors of "Small Size" Babies in Ethiopia: In-depth*.
- [30] Abebe H, and Tigist (2018). *Children's nutritional status and its determinants in small towns, Sebeta Hawas district, Oromia, Ethiopia*. *J. of Food Science and Nutrition*, 1 (1).
- [31] Dawd G., Barbara J., Adish, S. A, Gulelat D. (2016). *Ethiopian pre-school children consuming a predominantly unrefined plant-based diet have low prevalence of iron-deficiency anaemia*. *Public Health Nutrition*, 19 (10): 1834-1841.
- [32] Ma'alin, A., Birhanu, D., Melaku, S. et al. (2016). *Magnitude and factors associated with malnutrition in children 6–59 months of age in Shinille Woreda, Ethiopian Somali regional state*. *BMC Nutr* 2: 44. <https://doi.org/10.1186/s40795-016-0079-1>
- [33] Ahmed A., Sakineh, Sh., Shahabeddin R, Kurosh. (2017). *Nutritional Status of Under Five Children in Ethiopia: Ethiop J. Health Sci*. 27 (2).
- [34] Beruk B., Christine L., Simon R., Tegene N., and Hans K. (2019). *Feeding Practices and Undernutrition in 6– 23-Month-Old Children of Orthodox Christian Mothers in Rural Tigray, Ethiopia: Longitudinal Study*. *Nutrients*, 11 (1), pp. 138.
- [35] Anware M., Muhdin M. B., Kanta K., Kaushik. (2016). *Socio-economic determinants of nutritional status of children in Ethiopia*. *International J. of Scientific and Research Publications*, 6 (3), ISSN 2250-3153.
- [36] Food and Agriculture Organization of the United Nations and United Nations Economic Commission for Africa (2018). *Regional Overview of Food Security and Nutrition. Addressing the threat from climate variability and extremes for food security and nutrition*. Accra. 116 pp.