















mothers afraid from vaccination significantly affected the immunization status.

Water, Sanitation and Hygiene (WASH) play a fundamental role in improving nutritional outcomes. Hygiene behaviors were measured using a spot check approach, whereby field workers were trained to observe and grade a list of predetermined hygiene-related aspects of the caregiver/mother, index child, house and compound in which they lived. Poor food-hygiene practices, i.e. mother's hand washing before preparing food and feeding the child, child's hand washing before eating a meal and after defecating/urinating, food preparation, cleanliness of utensils, water source and safe drinking water, habits of buying cooked food, child's bottle feeding hygiene and housing and environmental condition are the main sources of diarrhea which can affect the health status of children under five years.

Safe water sources play particularly important; children from households, who use safe water sources, are less likely to be underweight and wasted and more likely to be normal in weight for age z- score and weight for height z-score. Malnutrition and diarrhea are common in developing countries, so, it is interesting to note the source of water to the households. According to the survey of Tadiwos and Degnet that conducted in Kombolcha District of Eastern Harerghe Zone, Ethiopia, about 41% of the households were using water from safe source. Safe water sources play particularly important role in determining child nutritional status. Specifically, the estimation result of Tadiwos and Degnet showed that children from households, who use safe water sources, are less likely to be underweight and wasted and more likely to be normal in weight for age z-score and weight for height z-score. Another study on Nigeria posts that the policy to reduce child malnutrition should target women education program and public health programs to provide clean drinking water in rural areas.

#### **Other important socio-demographics cause of undernutrition in Children**

Globally under nutrition is a leading cause of childhood morbidity and mortality. According to the study conducted in South Africa (2013) Innocent Declaration on Infant and Young Child Feeding recognizes that inappropriate young child feeding practices; sub-optimal or inadequate complementary feeding, are significant threats to child health. While economic and contextual factors are strong determinants of child nutritional status, immediate causes such as feeding practices are associated with nutritional outcomes, particularly stunting, independent of socio-economic determinants. Even with optimum complementary feeding, children are at risk of being stunted if adequate quantity and quality of complementary food is not given beginning at 6 months of age. Recognizing this, in 2001 the World Health Organization (WHO) released global recommendations for child feeding practices. WHO

recommends that children should take nutritionally appropriate and safe complementary foods after six months.

Residence, education of parents, economic status of the household, number of antenatal care visit for the mother, age, birth order and birth interval of the child were found to be determinants of child nutritional status [23]. Mother's age at the time of first birth is an important determinant of the children health. It is hypothesized that a young mother has a high probability of a child to be malnourished. The child's mother's age and child's own age were both significant at 1%, but was surprising negative signs. Better nutritional profile of under-three year children of educated mothers indicates that the right to have education and to achieve good literacy will help in promoting the nutritional status of children. Educated mothers are more aware about the health services and can easily introduce new feeding practices scientifically, which helps to improve the nutritional status of their children. Another study in this country showed that unlike the education of mothers, the education of fathers independently influenced the nutritional status of children and they deduced that a one-year increase in schooling of the father can reduce 11% of stunting in children [49].

The study conducted in the rural communities of Arba Minch Zuria woreda also revealed that about one-fourth of children were underweighted which significantly associated with lack of maternal and paternal education and low dietary diversity score. According to the finding of Ifeanyi et al, the child's mother's position among women married was had a negative sign significant only at 5% with child nutritional status than the male household head. A study in Nepal shows that household economic status, occupation of the household-head, number of children under five in a household, availability of public health services in the community and mothers' health's are important determinants for child nutrition status. Evidence in Bangladesh showed that there is a strong relationship between household wealth status and stunting and it recommend that to improve the health and nutritional status of children by giving due consideration to household wealth is crucial [50].

The demographic variables such as age, birth order and preceding birth interval of the child were significantly associated with child nutritional status. Significant association was observed between birth weight and malnutrition. Majority of malnourished children had birth weight less than 2500 gm which is low birth weight. In Pakistan malnutrition is significantly higher among girls than boys, indicating child level gender issues to be crucial. It also depends on family income and breastfeeding practices. According to the survey of Tadiwos and Degnet the prevalence of underweight and wasting were higher in female children in the age group of 24-59 months. However, stunting was lower in female children in the same age group. According to the survey conducted by Jeannot and his colleagues, preschool girls are more likely to be overweight

or obese at a young age than boys. This observation shown a greater increase in weight for girls than boys, compared to the data used to establish the BMI norms in 10 years ago study. According to the hypothesis that was considered, going from hormonally induced early puberty to a potentially stronger influence of environmental factors such as food, exercise, and diets in girls compared to boys.

Child with higher birth order may be neglected by the family and thus having higher chance to be malnourished. Children of first birth order were found to be at a significantly higher risk of stunting than children of higher birth. But, the highest level of stunting was also observed among children whose birth order was 4 or 5, followed by birth order 6 and more. This higher risk of stunting in first birth order children could be due to mothers' low level of experience at first delivery in the area of child care and feeding, which are important components of improved nutrition. The gap between two babies is also important for the nutrition of children. According to medical literature, birth gap less than 3 years may lead to some physical problem of mother as well as to children.

The Ethiopia Demographic and Health Surveys [9] indicated that prevalence of severe wasting was higher at younger ages and declined by 24 months while stunting prevalence peaks around 24 months and plateaus at a high level thereafter. The study had shown a strong correlation between the ethnicity of the children and the risk of overweight and obesity in which children of Kosovar origin have a higher risk of overweight and obesity than children from Kosovo who had brought attention to the importance of change in the environmental and strain induced by immigration on their parents. The explanations for these ethnic differences in overweight are linked to a number of factors including the family environment, nutritional habits, physical activity and television/screen viewing, can be strongly conditioned by culture.

## CONCLUSIONS AND RECOMMENDATIONS

Optimal nutrition during childhood is critical to ensuring optimal child health and development. A variety of factors have been reported to affect the nutritional status of children i.e., maternal characteristics, infant characteristics, and cultural practices. Maternal disempowerment and severe food insecurity were independently associated with undernutrition of children. The effects of these factors vary according to cultural context and related socioeconomic conditions. Household food insecurity, inadequate maternal and child care, and inadequate health services and health environment are the most important contributing barriers of undernutrition and they operate at household level. They influence the availability of food, the physical and economic access which an individual or household has to that food, the caregiver's knowledge of how to utilize available food and to properly care for the individual child, the caregiver's own health status, and the control the caregiver has over

resources within the household that might be used to improve the nutritional status of the child.

Additionally, the level of access to information and services for maintaining health, whether curative services are available, and the presence or absence of a healthy environment with clean water, adequate sanitation, and proper shelter all contribute to determining the nutritional status of an individual child. The less control a woman has over her own time and household resource, the less likely; To make a timely decision to treat her sick child after discovering an illness, to make use of health services and follow through with treatment recommendations, to have the child immunized, to obtain and prepare a special food for a child, and feed it to the child at an appropriate frequency and with the degree of patience required. Given the link between maternal empowerment with the underlying cause of malnutrition it can be affected by level of education, employment status, particularly employment for cash, and media exposure. Women who are educated, employed, and exposed to the media are likely to be better equipped with the information and the means needed to function effectively in the modern world. Contextual factors such as urbanization and socio-economic development foster the above factors in terms of availing opportunities to education, employment and media access. Local policy maker, health programmer and nongovernmental organization should enhance the nutritional status children using the possible interventions; Enhancing the household food security status; promoting mother to decide lonely or jointly with their husband on issue that affects their own self or child health, household resource allocation and freedom of mobility, improving the socioeconomic status and care practice of the household.

## ACKNOWLEDGMENTS

The author gratefully acknowledges the Wollega University Food and Nutritional Sciences department staffs for overall support by giving valuable comments.

## FUNDING

The author received no financial support for the review work, authorship and publication of this article.

## AVAILABILITY OF DATA AND MATERIALS

Data and materials are available upon request.

## AUTHOR CONTRIBUTIONS

GK contributed to analysis of theoretical framework and figure creation, literature search, writing up of all drafts of the paper, critical revision, reviewing and approval of final manuscript submission.

## CONFLICT OF INTEREST

The author declared no potential conflicts of interest with respect to the review work, authorship and publication of this article.

**CONSENT FOR PUBLICATION**

Not applicable.

**ETHICAL APPROVAL**

Not applicable.

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