

The Prevalence of Under Nutrition and Associated Factors among Adolescent Pregnant Women: A Narrative Review

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ABSTRACT

Background: Maternal under nutrition continues to place a heavy burden on low- and middle-income countries. Pregnancy puts adolescent women at increased risk of malnutrition through diverting nutrients from the mother to the fetus, pregnancy complications and poor pregnancy outcomes (including death). Early pregnancy contributes to the cycle of maternal malnutrition. The adolescent pregnant women constitute the most vulnerable segment of a population from the nutritional standpoint; in particular the conditions of pregnant women belonging to low income group are a matter of serious concern.

Objective: The aim of this senior seminar was to the prevalence review under nutrition and associated factors among adolescent pregnant women (age <20 years) in Ethiopian Somali region, Eastern Ethiopia.

Results: The prevalence of under nutrition was [35.9%; 95%CI (30.8%, 40.2%)]. Adolescent pregnant women who had changing to less meal frequency of eating than before the pregnancy time were 4.2 times more likely undernourished than women who do not change the frequency of eating [AOR=4.2; 95%CI (2.25, 7.79)]. Regarding, number of wives the husband had, women with husbands with two and more wives were 2.14 times more likely undernourished than women with husband only one wife [AOR=2.14; 95% CI (1.02, 4.26)]. Adolescent pregnant women from severely food insecure households were 7.9 times more likely under nutrition compared with those women from food secure households [AOR=7.9; 95%CI(3.20, 19.60)]. Moderately foods insecure were also 3.03 times more likely under nutrition compared to food secure household women [AOR=3.03; 95%CI (1.02, 7.90)].

Conclusion: There was high level of under nutrition among the adolescent pregnant women. The factors associated with under nutrition among adolescent pregnant were women with husband had two and more wives, moderately and severely household food insecure, changing to less meal frequency of eating than before pregnancy time. Most of Ethiopian Somali region health office should give emphasis on nutrition in life cycle approach and strengthening activities of the community on creation of job opportunity particularly in food-insecure households.

Keywords:-Adolescent, Household, Pregnant, Women, Ethiopian Somali region, Prevalence

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1. Introduction

1.1. Background

Nutrition is a key to unlocking the potential of investment in the health of women, children and adolescents. Ensuring the health and nutritional

status of women, in their own right, throughout all stages of life is fundamental to ensuring the health and nutrition of children. A mother's nutritional status at conception, during lactation, plays a key role in determining her health and well-being, as

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well as that of her child. The nutritional status of an individual is often the result of many inter-related factors (Inset et al., 2003). It is influenced by food intake, quantity & quality, & physical health. Malnutrition is a broad term commonly used to describe people who are malnourished due to the fact that their diet does not provide adequate calories, protein for growth and maintenance, and micronutrients; or they are unable to fully utilize the food they eat due to illness or lack of safe water (Fanzo, 2012).

Under nutrition and poor health from preventable causes disproportionately affect the well-being of millions of people in the developing world. One of the major long-term determinants of malnutrition is poverty, in both developed and developing countries factors at individual, household and community levels (WHO, 2009). Poor nutritional status could be due to inadequate diet, lack of availability of food or inadequate absorption of nutrients which leads to various deficiencies, lifestyle behaviors e.g. smoking, and alcohol consumption, cultural and traditional fads which lead to the elimination of certain food groups and thereby leads to poor nutritional status and further health implications (Abu-Saad and Fraser, 2010). In particular, under nutrition among women is likely to have a major impact on their own health as well as their children's health. For social and biological reasons, women of the reproductive age are amongst the most vulnerable to malnutrition. Increased perinatal and neonatal mortality, a higher risk of low birth weight babies, stillbirths, and miscarriage are some of the consequences of malnutrition in women (Bitew and Telake, 2010).

Adolescence is the age between 10-19 years old, and it is the transition from dependent childhood to independent adulthood, that comprises 20% of the global population, and with approximately 80% of them live in developing countries (WHO, 2005). Adolescence is the only time in life besides the critical window of the first 1,000 days (-9 to 24 months) when the velocity of growth actually increases. Nearly 45% of maximum skeletal mass and 15% of adult height are gained during adolescence (SCUK, 2015). Children in the developing world also undergo the same changes, although many enter adolescence thin and stunted through malnutrition and infections during infancy and childhood, which may delay or extend the period of pubertal changes, thus enabling more time for growth to catch up. However, for many girls the opportunity to benefit from the altered physiological

state is curtailed by early pregnancy(Thurnham, 2013).

In low and middle income countries, over 30% of girls marry before they are 18 years of age; around 14% before the age of 15 (WHO, 2014). Nutrition during this period of life is crucial, because adolescents are a nutritionally vulnerable group for a number of specific reasons, including their high requirements for growth, their eating patterns and lifestyles, their risk-taking behaviors and their susceptibility to environmental influences (WHO, 2006).

Pregnancy puts adolescent women at increased risk of malnutrition (diverting nutrients from the mother to the fetus), pregnancy complications and poor pregnancy outcomes (including death). Early pregnancy contributes to the cycle of maternal malnutrition in two ways: Indirectly, through the premature cessation of the mother's growth. Directly, through the increased risk of delivering a low birth weight baby (LINKAGES, 2000). Compounded with growth, adolescent pregnancy exposes both mother and child to adverse health and socioeconomic consequences, particularly if the mother is stunted or undernourished. Hard physical work, as commonly observed in low-income countries, may impose additional physiological stress and nutritional requirements in adolescence (WHO, 2014).

Issue of nutrition is becoming increasingly important as the evidence base grows, illustrating the links between early nutrition (including during adolescence) and the risks of chronic disease in adulthood. There is also greater evidence on the critical role of adolescent mothers' nutritional status in determining fetal health and development, reinforcing the intergenerational cycle of under nutrition(Anand and Anuradha 2015; SCUK, 2015). Anthropometric measurements provide an excellent indication of the nutritional status of vulnerable groups and individuals. They are usually the central component of the nutritional surveillance systems that have evolved over the past several years (WHO, 2006). Therefore, this article is aimed to see the prevalence of under nutrition and associated factors among adolescent pregnant women.

2. Literature Review

2.1. Prevalence of under nutrition among adolescent pregnant women.

Across the globe, under nutrition takes a grave toll on women, infants, and children. More than 10

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percent of adult women in Africa and Asia are underweight. (Naik and Smith, 2015; Imdad and Bhutta, 2011). State food security and nutrition survey in Bangladesh in 2013 nationally, 29% of adolescent girls were short for their ages and there was little difference between urban and rural areas. Adolescents under 18 years with children fewer than five years of age are shorter than women in that age group without children. Additionally, almost 15% of adult women were at increased risk during delivery due to short stature. Moreover, 12% of adolescent girls had a moderately or severely low mass index for their age and nearly one quarter of women were chronically energy deficient (CED), indicating a medium severity public health problem (FSNSP, 2013). The 7th national nutrition survey of Philippines in 2008 showed that 26.5% of pregnant women were undernourished (FNRI-DOST, 2008).

A cross sectional study on the anthropometric assessment of nutritional status among college women of Midnapore, West Bengal, India the overall age combined prevalence of CED was 28.3%. Out of these, 4.9%, 6.9% and 16.5% belonged to CED III, CED II and CED I categories, respectively. There was a significant negative age trend in the prevalence of CED. The highest rate was observed at age 18 years (32.7%) while the lowest rate (21.1%) was present at age 20 years (MANDAL, KUMAR SINHA et al., 2011). Other study done on the assessment of nutritional status of adolescent girls in rural area of district Varanasi India shows that out of 650 adolescent girls, more than 50% were having BMI between 18.5-24.9, and 27% were below 18.5. Nutritional status of adolescent girls was found significantly ($p < 0.05$) associated with their caste BMI between 18.5-24.9, and 27% were below 18.5 (Singh et al., 2012).

A study done on nutritional status of pregnant women in south-west region of Bangladesh showed that, 35.50% of pregnant women were BMI level < 18 which indicates underweight, 40.25% of pregnant women were BMI level 19-24 indicates normal weight, 21.25% were BMI level 24-29 while only three percent were BMI level > 29 indicates overweight (Rahman et al., 2013). The Landscape report on adolescent and maternal nutrition in Indonesia in 2014 showed that, MUAC < 23.5 cm is considered a sign of under nutrition and a risk factor during pregnancy. Overall in Indonesia, % low MUAC is 24.2% among pregnant women and 20.8% among non-pregnant women (29.8% and

21.8%, respectively, in East Java (Landscape report, 2014).

A cross sectional study conducted in Sri Lanka among 15-19 year old out of school girls selected using a two stage random sampling method from an urban district (Colombo, $N=307$) and a rural district (Kalutara, $N=306$). Weight, height, waist circumference and skin fold thickness were measured. Of them, 33.2% were underweight, and 6% were overweight (De Lanerolle et al., 2010).

Nigerian demographic health survey of 2013 shows that 11% of women of reproductive age are thin or undernourished (BMI less than 18.5 kg/m^2). The proportions of mild thinness ($17.0-18.4 \text{ kg/m}^2$) and moderate and severe thinness (less than 17 kg/m^2) are 8 percent and 4 percent, respectively. Twenty-three percent of women age 15-19 are thin, as compared with 7 percent of women age 30-39 and 6 percent of women age 40-49. Women in Gombe and Bauchi (23 percent each) are more likely to be thin than women in other states (NDHS and ICF, 2013). Other study done on the anthropometric indices of 720 pregnant women accessing antenatal care at selected rural and urban health centers in Ogun state of Nigeria most rural participants (78.4%) had normal MUAC readings. More than 17% of rural participants and 9.2% of urban participants had MUAC readings had indicative of mild to moderate malnutrition. An equal proportion of (4.4%) respondents were severely malnourished in both urban and rural groups of women (Jeminusi et al., 2015).

A cross sectional study on dietary diversity, nutrient intake and nutritional status among pregnant women in Laikipia county, Kenya based on mid-upper arm circumference, 19.3% of the study participants were found to be undernourished (MUAC < 23 cm). Other cross sectional study West Pokot County is one of the counties in Rift Valley Province in Kenya under nutrition < 21 cm in ages 19-24 was 28.2% (Keumunto, 2010). Association between dietary diversity and respondent nutritional status were also established (Willy et al., 2016). Other study done on the assessment of Nutritional Status using Anthropometric Measurements in Relation to Pregnancy outcome among southern Sudanese pregnant women in Juba city showed that, the average total mean of mid upper arm circumference (MUAC) among the studied group was 25.11 ± 2.81 cm. It is concluded that the prevalence of undernourished women are high (28%) which had MUAC less than 23.5 cm. (Gritly and Bahafizalla, 2013).

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EDHS survey of 2011 showed 3% percent of Ethiopian women are below 145 cm in height. Adolescent women, age 15-19 years, are most likely to be below 145 cm. Women of short stature are most likely to reside in the Amhara region, and to have no education or primary education. The mean BMI for Ethiopian women age 15-49 is 20 kg/m². Sixty-seven percent of Ethiopian women have a normal BMI (between 18.5 and 24.9 kg/m²), while 27 percent of women are thin or undernourished (BMI less than 18.5 kg/m²) (CSA, 2011).

A cross sectional study done among Pregnant Women in Wondo Genet District, Southern Ethiopia the mean height of the study participants was 158.2 ± 5.8 cm and majority (98%) of the respondents had a height greater than or equal to 145 cm., 9.2% was undernourished (MUAC < 21) and almost all nutrient intakes of pregnant women were below the recommended level (Kuche et al., 2015). A study done on Nutritional Status of Adolescent Girls Living in Southwest of Ethiopia According to their mid upper arm circumference (MUAC) only one (0.47%) was severe acute malnourished by having MUAC less than 18cm. Forty five (21.32%) were moderate acute malnourished (MUAC between 18-21cm) and hundred sixty five (78.2%) were normal (MUAC greater than 21 cm) (Wolde et al., 2014).

Risk factor survey by Nutrition Causal Analysis in maize livelihood belt of Aleta Chucko and Aleta Wondo Woredas, Sidama Zone, SNNPR Ethiopia found that 38.8 per cent of mothers were currently moderately malnourished as defined by having a MUAC <23cm. Furthermore only 20.8 per cent of mothers reported to eat more during their last pregnancy (ACF INTERNATIONAL, 2014). Other community based study on under nutrition and associated factors among adolescent pregnant women in Shashemenne District, West Arsi Zone, Ethiopia the mean MUAC (± SD) of the study participants was 22.0cm (±2.8). Among 424 women interviewed, 144 (34.0%, 95%CI: 29.5%, 38.4%) were undernourished (MUAC<22 cm(Belete et al., 2015)).

2.2. Factors associated with under nutrition among adolescent pregnant women.

The National Family Health Survey (NFHS-3), India, 2005-06 showed that, percentage of women who are underweight decreases sharply throughout the wealth distribution. Total malnutrition decreases with wealth status in the first four wealth quintile groups but increases in the highest wealth quintile because of a huge increase in the percentage of

women who are overweight or obese in that group (Arnold et al., 2009).

A cross sectional study on socio-economic correlates of malnutrition among married women in Bangladesh 2007, wealth index and women's education were the most important determinants of underweight. The multivariate logistic regression analysis revealed that the risk of being underweight was almost seven times higher among women with no formal education as compared to those with higher education and the likelihood of underweight was significantly 5.2 times in the poorest as compared to their richest counterparts (Kamal and Aynul, 2010). Other study on mother's nutritional status evidence from rural Bangladesh DHS in 2004 survey showed that, women whose husbands had a lower status job were suffering more from acutely malnutrition. It was also found that women with lower household assets index have the highest rates of malnutrition. The other main contributing factors likely to affect nutritional status of women were respondent's education, husband's education (Rahman and Nasrin, 2008).

A study done on nutritional status of adolescents Comparison of severe thinness status of a low-income family's adolescents between urban and rural Bangladesh, revealed that economic status had a significant effect on nutritional status. Nutritional status of low-income families' adolescent was low both in urban and rural adolescents, but severe thinness rate according to the WHO of urban (22.4%) adolescents was much higher than rural (10.3%) adolescents and was also higher at an earlier age of their life. In food intake distribution and food consumption status, the same results were seen. The percentage of never eat meat and fish of low-income families adolescent girls were (29.7%, 11.4%) in urban group and (24.4%, 6.8%) in rural group (Akhter and Sondhya, 2013).

A study done on dietary intake patterns and nutritional status of women of reproductive age in Nepal findings from a health survey from September 2011 to August 2012, women of age 15 to 24 years were about three times more likely to be malnourished than women of 35 to 49 years' age (the unemployed women had nearly two times more chances of being malnourished than women doing manual work. The women who did not get nutrition education from any organizations were 1.1 times more likely to be malnourished than those women who got (Bhandari et al., 2016). A survey done in 2012 from four rural districts of Prey Veng, Cambodia on Household food insecurity and dietary

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diversity showed that, women of living in moderately and severely food insecure households were approximately 1.5 and 2.0 times more likely to be thin relative to women living in food secure households (McDonald et al., 2015).

A study done influence of family size, household food security status, and child care practices on the nutritional status of under-five children in Nigeria showed that, overall prevalence of household food insecurity and household food security were 65% and 35% respectively. Household food security status was significantly associated with children's nutritional status. Mothers who ate less than they desired because of insufficient finances were significantly more likely than the mothers who ate as desired to have stunted children (Ajao et al, 2010). A cross sectional study on dietary diversity, nutrient intake and nutritional status among pregnant women in Ethiopian countries, Kenya showed that, a positive linear relationship between dietary diversity and the pregnant women nutritional statuses were noted based on MUAC. Those with inadequate nutritional status had a lower dietary diversity score as compared to those who had satisfactory nutritional status (Willy et al., 2016).

A cross sectional study done in Samre Woreda, South Eastern Zone of Tigray, Ethiopia Socio-economic and demographic factors affecting the nutritional status of the participants were size of farm land, length of years of marriage, maize cultivation, frequency of ANC visit and age of breastfeeding child. Those who had a land size of 0.26-0.75 hectares were 5.1 times more likely to be malnourished (MUAC < 21 cm) than those who had a land size of greater than 0.75 hectares. Those who had a larger land size had an increased and diversified crop production as compared to those who had a smaller land size. Similarly, those whose years of marriage was between 11-20 years were 71% less likely to be malnourished (MUAC < 21 cm) than those whose years of marriage was less than or equal to 10 years (Hailesslassie et al., 2013).

A community-based cross-sectional study among women of reproductive age conducted in the Tahtay Adiyabo woreda, Northwest Tigray, Kunama population in 2014, age at first marriage, household food insecurity, inadequate dietary intake time to fetch water and meal frequency (were found to be independent predictors of under nutrition (Abraham et al., 2015). Other cross sectional study done on nutritional Status of Adolescent Girls from Rural Communities of Tigray, Northern Ethiopia showed that, lack of

latrine facilities (open air defecation) was significantly associated with stunting and thinness. The study showed age to be the strongest predictor of stunting and thinness. Lack of latrine facilities (open air defecation) was also a predictor of stunting and thinness in these adolescent girls (Mulugeta et al., 2009).

Across-sectional survey was conducted in Wondo Genet District, Southern Ethiopia on nutritional Status and associated Factors among Pregnant Women risk factors identified for under nutrition were only multiple pregnancies and no consumption of cereal-based foods. Multiple pregnancies and no consumption of cereal-based foods have a significant association on the nutritional status (mid upper arm circumference) of the pregnant women (Singh et al., 2012).

A cross sectional study on the nutritional Status and Associated Risk Factors Among Adolescent Girls in Agarfa High School, Bale Zone, Oromia Region, South East Ethiopia showed that, the chi square analysis showed that monthly income number of meals per day, meal skipping, diet diversity were the associated factors for nutritional status (Yasin and Benti, 2015). A study done among school going adolescent girls in Adama city of Ethiopia showed that, predictors of under-nutrition among adolescent girls were being born from uneducated parents (father and mother), their fathers' occupation of being a merchant, adolescents with low dietary diversity, monotonous diet and adolescents attending government schools (Roba et al., 2016). Other study done on factors associated with malnutrition among lactating women in subsistence farming households from dedo and seqa- chekorsa districts, jimma zone, 2014 showed that, dietary diversity score of women was found to be independently associated with underweight. Study participants who ate six or more food groups in the preceding 24 hour of interview were 39.6% less likely to be underweight as compared to those who ate three or less food groups (Alemayehu et al., 2015).

A community based study under nutrition and associated factors among adolescent pregnant women in Shashemenne District, West Arsi Zone, Ethiopia the mean MUAC (\pm SD) of the study participants was 22.0cm (\pm 2.8). Literate women were nine times less likely to be undernourished than those illiterate women. Women married before 15 years were sixteen times more likely to be undernourished than those married between 18-19 years and women who had exposure to mass media

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and live in urban were eight and five times less likely to be undernourished than their counterparts respectively. Women who get pregnant less than three times were nine times less likely to be undernourished than their counterparts. Women who desired their current pregnancy were eight times protected from under nutrition than women who did not desire their current pregnancy. Respondents those who avoid any foods during their pregnancy time were three times more likely to be undernourished than their counterparts. Women having literate partner and desired pregnancy by partner were less likely to be under nourished and respectively. In multivariate analysis, compared to respondents married between 18-19 years, those married before 15 years were about seven times more likely to be undernourished (Belete et al.,2015).

A cross sectional study done on the effect of polygamous marriage on the reproductive health and nutritional status of currently married women in meskan and mareko district in 2002 (butajira), southern Ethiopia showed that, that 74 (33.7%) women in polygamous union and 120 (25.8%) women in monogamous union were observed to be malnourished (MUAC < 23.2cm). In assessing nutritional status taking mid-upper arm circumference (MUAC) measurement, women in polygamous union were 1.4 times more likely to be malnourished compared to those in monogamous union (Girma,2002).

A study on the Assessment of Nutritional Practices of Pregnant Women on Maternal Nutrition and Associated Factors in Guto Gida Woreda, East Wollega Zone, Ethiopia Out of 419 study participants responded to the questions assessing nutritional practices regarding avoidance of any food during pregnancy, only (35.8%) of the respondents had practiced avoiding food during their pregnancy. Out of those who avoided food during their pregnancy, (46.7%) reported makes the baby big, (36.0%) reported cultures, (14.7%) reported makes delivery difficult and (2.6%) reported religions as the reason for avoidance of the food respectively. their pregnancy respectively(Daba et al., 2013).

The prevalence under nutrition in women lies between 4%-40%. From the above literature review the nutritional status of pregnant women and associated factors had been reviewed. The major factors that might affect the nutritional status of adolescent pregnant women in general were

reviewed based on the concept of UNICEF maternal under nutrition causal model.

2.3. Conceptual framework for adolescent pregnant women under nutrition.

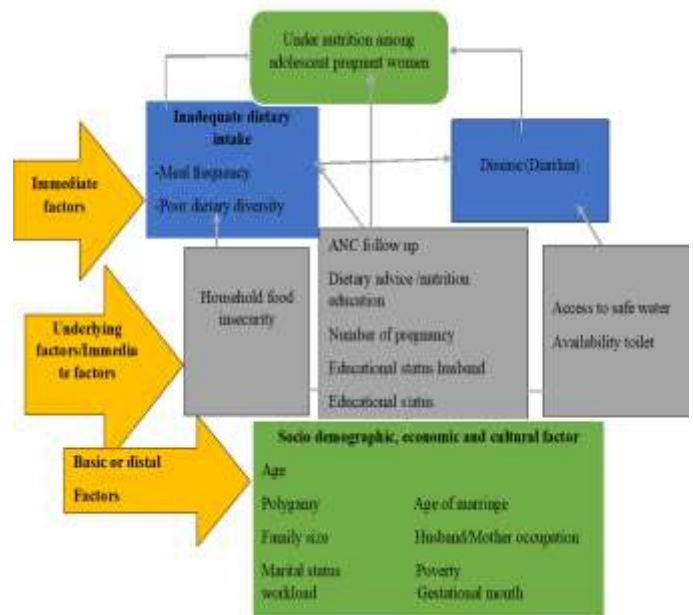


Figure 1; conceptual framework of adolescent pregnant women under nutrition

(Adapted from UNICEF conceptual frame work women under nutrition)

3. Conclusion and Recommendations

3.1. Conclusion

The Seminar revealed high level of under nutrition (MUAC <22CM) among the Adolescent pregnant women in the area 133(35.9%); CI (30.8, 40.2). The factors associated with under nutrition among adolescent pregnant women were women with husband who have two and more wives, moderately and severely household food insecure, changing less meal frequency than before pregnancy time. Thus, adolescent pregnant women in the Ethiopian Somali region are at higher risk of under nutrition which may affect the health of the growing mother and their fetus negatively.

3.2. Recommendations

This review suggests the following ecommendations were made:

1. Health extension workers in the district should give nutrition education by any opportunity of contact of the women about the risk of decreasing meal frequency during pregnancy time and the necessary of eating additional meal during pregnancy time.
2. Health institutions under the district health office should screen for under nutrition during

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any contacts with pregnant women in health facility for nutritional intervention.

3. Research is needed to identify more variables that may determine the under nutrition status of adolescent pregnant women in the study area.

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