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Review on Nutritional Malpractices Gaps, Motivational Barriers and Consequences in pregnant Women. Evidences from Recent Literatures and Program Implication in Ethiopia

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Abstract

Maternal nutrition is very important for wellbeing of women during pregnancy, childbirth and postpartum period which are crucial for the well-being of a mother and new born baby. Despite the healthy eating recommendation, most of women in developing countries including Ethiopia practiced nutritional malpractices due to perceived tradition/beliefs such as taboos of good foods, craving of junked foods (sweet, fat and salty/spicy foods) and non food items (soil, coffee residue/grind/leaf, soft white stone and ash). Socio-economic status, health care/ facilities, social support, community, culture, norm, religion, residency, season and dietary practices are the most important barriers to nutritional malpractices. Food taboos are a strong disliking and removal of foods such as animal sources (yogurt, cheese, milk, eggs, fatty and organ meat); vegetables (cabbage, spinach, lettuce, banana, pepper, kale, broccoli, pumpkin and sugar cane), fruits and roots (mango, orange, avocado, pineapple, pimento, potatoes and sweet potato), and grains (linseed, porridge, wheat bread, wheat and groundnut). Furthermore, fearing related to birth difficulty, plastered on fetal head, discoloration of fetus, fatty baby, burns of fetus, abortion, prevent diseases (gastritis, diarrhea and typhoid) and inconveniences like abdominal cramp are the primary motivational drivers to taboos of healthy diets in Ethiopia. Additionally, personal interest, flavor and color items are important motivators to practice cravings that affect nutrient intake, absorption of iron and zinc and gastrointestinal morbidities (abdominal pain, constipation and diarrhea). Overall, these malpractices are highly causative predictors for macro and micro nutrients deficiencies that results in negative pregnancy outcomes (anaemia and intrauterine growth restriction) in women and (infection, preeclampsia, bleeding, premature birth, low birth weight, and poor cognitive development) in the infant. Therefore, working in the identified gaps could reduce the current burden of adverse health consequences and related negative outcomes among women in Ethiopia. Accordingly, measures and government actions to support healthy dietary habits can be improved by empowering health practitioners in providing effective nutrition education, counseling and awareness generation programs. Urgent implementation of health and nutrition education programs considering cognizance of popular beliefs regarding food during pregnancy and use innovative means to minimize their negative and maximize their positive nutritional effects designed by the government of Ethiopia could also serve as a long-term solution to the problem.

Keywords*:* Food Taboo, Food Craving, Pica, Health Effect, Pregnant Women, Ethiopia

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Introduction

According to United Nations Children's Fund (UNICEF), malnutrition is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems (UNICEF, 2010). Pre and postpartum maternal health care and adequate nutritional status of women are important for good health and increased work capacity of women themselves as well as for the health of their offspring (Black *et al*., 2008; Nian *et al*., 2009; UNICEF, 2009; Elneim, 2014). More than 3.5 million women and children under age of five in developing countries die each year because of the underlying cause of malnutrition (Black *et al*., 2008). Low dietary intakes, inequitable intra-household food distribution, recurrent infections and poor care in general are among the leading causes of under nutrition, but food taboos and misconceptions can also contribute significantly to the high levels of under nutrition (Ahmed *et al*., 2013; Desa *et al*., 2013). Nutritional malpractices among women have been identified as one of the factors contributing to maternal undernutrition

(Oni and Tukur, 2012). Cultural traditions tie into the availability of foods and preferences of food, and how daily life influences pregnancy and the chance of evolving food cravings. Physiological and psychological changes that occur during pregnancy also impact the possibility of exhibiting food cravings, aversions, nausea and vomiting (Myaruhucha, 2009). The relative contribution of this nutritional malpractices varies greatly by geographical location, season and dietary practices (Addis and Mohammed, 2014) and time, culture, norm and religion (Parmar and Khanpara, 2013; Liu, 2015). Increasing the production and accessibility of nutrient dense foods alone would not be enough to improve the nutritional status of the pregnant women in light of the identified food taboos and misconceptions (Zerfu *et al*., 2016). Different recent studies from different parts of Ethiopia are largely reported prohibited food items: fruits and vegetables, and cereals and salty *(*Hanlon *et al.,* 2010; Cherkos *et al.,* 2013; Nejimu, 2015; Wollelaw *et al*., 2018; Mohammed *et al*., 2019*);* dairy products like milk, yogurt and cheese *(*Nejimu, 2015; Zerfu *et al*., 2016; Hadush *et al*., 2017); Egg, fatty meat and honey *(*Nejimu, 2015; Hadush *et al*., 2017; Mohammed *et al*., 2019).

Food cravings are very common during pregnancy, along with food aversions in many instances, yet their underlying causes are not well understood (Hainutdzinava *et al*., 2017). Specifically, a food craving is defined as an intense desire to eat a specific food (Pelchat *et al*., 2004) and non food items (Brantsaeter *et al*., 2009; Al-Rmalli *et al.,* 2010; Halala, 2015; Ugwa, 2016). Numerous investigators throughout the world have studied the phenomenon over the past few decades, and find that food cravings are common during gestation, with estimates of some 60 to 85% of women reporting one or more when pregnant (Bayley *et al*., 2002). Food cravings are usually met with the consumption of the craved food, which generally include unhealthy foods such as sweet/fat and salty/spicy foods and may be a response to a nutritional deficiency (Hainutdzinava *et al*., 2017).

The merits and demerits of non-food cravings have been extensively studied, and a more curious form of craving is *pica*, consumption of nonfood substances, observed worldwide and posited to be somewhat biologically adaptive and culturally supported (Ngozi, 2008; Brantsaeter *et al*., 2009; Al-Rmalli *et al.,* 2010; Young *et al*., 2010; Placek and Hagen, 2016). Most of the identified food taboos, although their reasons are not scientifically supported, seem to have originated from the intention to prevent pregnancy complications (Halala, 2012; Kiday *et al*., 2013; USAID/ENGINE, 2014; Nejimu, 2015; Zerfu *et al*., 2016; Hadush *et al*., 2017; Duko *et al.,* 2018; Haileyesus *et al*., 2018; Wollelaw *et al*., 2018; Mohammed *et al*., 2019). Furthermore, the Bayley et al. (2002) funding concluded that, food cravings can also be formed by women's beliefs about what they should consume to ensure a healthy status for their baby. Often women eat certain foods believing that they are precautionary measures to satisfy nutritional needs of the unborn fetus. Practicing of pica substance may interfere with nutritious substance absorption and causes intestinal obstructions that lead to physiological disruptions (Ngozi, 2008; Brantsaeter *et al*., 2009). This nutritional malpractices results in deficiencies of calories, protein, minerals and vitamins and causes severe undernutrition, which could lead to permanent changes in structure and metabolism in the fetus, the imbalance or relative deficiency of nutrients, could impacting their health and the health of their babies (Fall *et al*., 2003; Cherkos *et al.,* 2013; Hadush *et al*., 2017). Accordingly, culturally mediated food taboos and carvings are contributing to the anemia and intrauterine growth restriction leading to greater maternal and infant morbidity and mortality (Myaruhucha, 2009; Cherkos *et al.,* 2013; Parisi *et al.,* 2014; Nejimu, 2015; Vasilevski and Carolan-Olah, 2016, Zerfu *et al*., 2016; Hadush *et al*., 2017; Mohammed *et al*., 2019), and reducing this burden has been a priority public health agenda in Ethiopia, too. However, contrary to what could be expected, the recent years have seen an increasing trend in the prevalence of maternal anemia in Ethiopia, rising from 17% in 2011 to 24% in 2016, even more marked among neonates and infants (EDHS, 2016). It may also lead to still birth (Abu-Ouf and Jan, 2015), premature birth (Levy *et al*., 2005), low birth weight (Banhidy *et al*., 2011; Alwan *et al.,* 2015), and poor cognitive development in the infant (Kalaivani, 2009; Black, 2012; Murray-Kolb, 2013).

Food taboos during pregnancy are influenced by different factors like dietary counseling, whether attending antenatal care clinic or not, younger age, less educational status, and multiparous and pregnant women (Oni and Tukur, 2012; Zerfu *et al*., 2016). Culture and belief also influence maternal eating pattern during pregnancy (Oni and Tukur, 2012). Accordingly, the health sector is better to increase its effort to enhance good nutritional practice through health education, treatment of extremely malnourished children, and provision of micronutrients to mother and children using enhanced outreach strategy with targeted supplementary food and transitioning into the health extension program, health facility nutrition service, community based nutrition, micronutrient intervention, and essential nutrition actions (CSA, 2014).

Basic Concept of Nutritional Practices

According to the essential nutrition action (2008) and USAID/ENGINE (2014) diet and nutritional practices such as meals from different food groups, changing meal frequency and amount, not skipping meals and taking at least two additional meals per day during lactation/pregnancy are recommended for women. There is a dearth of literature focusing on the nutrition habits and understanding of Ethiopian women. Lack of awareness about the consequences of poor diet during pregnancy was also a concern, with the vast majority of women not knowing that poor nutrition could affect the health of both mother and baby (Daba *et al.,* 2013). Basically, awareness about the need for increased nutritional intake during lactation period was reported by most of women West Arsi Zone, Oromia, Ethiopia (Duko *et al.,* 2018). This is an important lapse as maternal nutrition during pregnancy is critical in reducing pregnancy complications, maternal morbidity and infant morbidity and mortality. Nonetheless, to date, very little has been done to assess the general knowledge of Ethiopian women about nutrition during pregnancy (Cherkos *et al.* 2013; Daba *et al.* 2013). About 82.4% of women from Shashemene believe on importance of eating balanced diet during pregnancy, and age, educational status and previous ANC attendance of the women showed significant and positive association with belief on balanced diet (Nejimu, 2015).

Women have also reported that their serving sizes weren't adequate, that they were skipping meals due to poverty and poor education (Halala, 2015) and fasting involved not eating during the day at Ramadan for Muslim women and abstaining from animal products on Fridays and in the weeks prior to religious events, such as Easter and Christmas for Orthodox women (USAID/ENGINE, 2014; Nejimu, 2015). Daba et al. (2013) study found that knowledge about sources of specific nutrients, vitamins and minerals, such as protein, vitamin A and iron was even lower, with less than 30 percent of the sample reporting that they knew about vitamins or where to source these nutrients. It also reported more than half of Ethiopian pregnant women did not follow a balanced diet during pregnancy and over 70 percent did not know the main food groups. About 71.2% 68.6% and 39.3% of women were not taking additional meal during the time of lactation (Kiday *et al*., 2013; Halala, 2015; Duko *et al.,* 2018). This dietary behavior of pregnant and lactating women was also common and further supported by formative finding of USAID/ENGINE (2014). In other studies, only a small proportion of women (33.2%) made dietary changes during pregnancy include increasing feeding frequency (26.1%) and eating more carbohydrate (21%) (Nejimu, 2015). According to a study from northern part of Ethiopia, changing in food intake during lactation was not practiced by most of the lactating mother (Kiday *et al*., 2013; Zerfu *et al*., 2016) but, it is better in the Duko et al. (2018) study. During pregnancy there is tendency for some women to decrease their food intake over pre-pregnancy intake for two reasons: in the first trimester, they experience nausea and aversions to certain foods (USAID/ENGINE, 2014), and during the later stages of pregnancy, some women deliberately decrease their food intake in an effort to have a smaller fetus and an easier delivery which is known in the nutrition literature as 'eating down' (USAID/ENGINE, 2014; Hadush *et al*., 2017). The consumption of meat, fish, fruits, and some vegetables during pregnancy remained as low as the pre-pregnancy state (Zerfu *et al*., 2016). Regarding their own health and that of the embryo, food aversions may serve the purpose of helping the pregnant female to avoid foods that can carry pathogens or chemical toxins, hence the oft-reported aversions to meat and fish (McKerracher *et al*., 2015), as well as to alcoholic and caffeinated beverages (Hainutdzinava *et al*., 2017).

Magnitude and Motivational Drivers to Nutritional Malpractices among Women

Pregnant and lactating women in various parts of the world are avoided nutritious and beneficial foods (Hartini *et al*., 2005; Ankita *et al*., 2013). In various studies, it was seen that women in various parts of the Ethiopia are forced to abstain from nutritious foods as a part of their traditional food habits and means of protecting the health of women and their babies (Halala, 2012; Kiday *et al*., 2013; USAID/ENGINE, 2014; Nejimu, 2015; Zerfu *et al*., 2016; Hadush *et al*., 2017; Duko *et al.,* 2018; Haileyesus *et al*., 2018; Wollelaw *et al*., 2018; Mohammed *et al*., 2019) However, it is quite obvious that the extensive food restrictions are more likely to put the health of both mother and baby at risk. Pregnant women avoid certain foods for a range of reasons associated with pregnancy outcome, birthing process and to avoid undesirable visual features in the baby.

A study from Awabel District Ethiopia reported that twenty-seven percent of pregnant mother encountered food taboos. Accordingly, pregnant women believed that the reason for the taboo is that when they consumed banana (35.7%), something is attached to the head of the fetus; pimento (32%) burns the fetus; cabbage (24.3%) disturbs

the fetus; and sugarcane (44.3%) increases the seminal fluids. Furthermore, the study participants avoid pumpkin and ground nut because they assumed that these foods increase the weight of the fetus, making it difficult to deliver, linseed causes loss strength of the fetus, and nug changes the color of the fetus and makes it black. Coffee (19%), tea (18.7%), coca (16.3%), and porridge (34%) also were restricted due to burning the fetus and causing abnormality and coca drink causes abortion (Wollelaw *et al*., 2018). In a study by Nejimu (2015), the most frequently reported taboos during pregnancy included restrictions on the consumption of linseed, honey, milk and nuts from fear of; birthing a "fatty baby", having a baby with discolored skin, abortion and stillbirth. The food items most avoided were green chili pepper, organ meat, and dark green leafy vegetables, which were avoided by 16.7%, 15.7% and 13.0% of the participants, respectively (Mohammed *et al*., 2019). Fruits such as mango, orange, avocado, pineapples are not eaten (Nejimu, 2015) and this are so the baby doesn't contract worms, malaria and diarrhea during childhood (Assefa *et al.,* 2005). Many vegetables are also taboo (Nejimu, 2015), particularly those that are green in color as it is thought that these cause the baby to be bald and are associated with bad odors in both baby and mother. Eating eggs and fruits together, as well as a combination of meat with cheese was also reported to be harmful for the fetus as well as the mother (Nejimu, 2015). Cultural exclusion of dairy products consumption like milk, yogurt, and cheese during pregnancy is considered in Zerfu and his colleagues study (2016). In addition to these foods, other studies have reported avoidance of potatoes, sweet potato (Cherkos *et al.,* 2013), and sugar cane (Hanlon *et al.,* 2010) so the baby won't grow too big and lead to a difficult labor (Tsegaye *et al.,* 1998; Cherkos *et al,* 2013; Nejimu, 2015). Furthermore, food items that are white in colour (milk, fatty meat, porridge, potato and banana) are not consumed (Tsegaye *et al.,* 1998; Assefa *et al.,* 2005) so that the baby is not "plastered" on the head with white patches (Nejimu, 2015; Hadush *et al*., 2017). Moreover, other studies also revealed, good foods (meat, milk and milk products) were tabooed and associated with the size of the fetus and the difficulty in delivering it (Tsegaye *et al.,* 1998; Nejimu, 2015; Hadush *et al*., 2017). The community believes that solid foods, particularly different forms of bread, cause severe bleeding during labour and delivery (Hadush *et al*., 2017). In addition to the myth of eating down and abstain from eating good foods, solid foods (bread forms) and cool foods (milk, yoghurt, cheese, water and meat) were tabooed for pregnant and lactating women (Raven *et al*., 2007; Levay *et al*., 2013; Hadush *et al*., 2017). Previous studies done in Ethiopia (Vasilevski and Carolan-Olah, 2016; Zerfu *et al*., 2016) as well as other developing countries (Riang *et al*., 2017; Kavle and Landry, 2018) also reported a high avoidance of meat and vegetables by pregnant and lactating women due to taboo.

Food cravings are a strong desire and intense desire to obtain foods which are very interesting to the individual. It is generally described as a distinct state characterized by an intense urge to obtain a food substance (Tsegaye *et al*., 1998; Cherkos *et al.,* 2013; Halala, 2015). Meat, egg and vegetable are the most common food items craved by women because of their flavor and color (Halala, 2015). Other study also acknowledged that most commonly craved foods during pregnancy are chocolate, chips, citrus fruits, pickles and ice cream (Kaiser and Allen, 2008). The most demanded foods were sweets, especially ice cream, and fruits and vegetables, though watermelon and tropical fruits were named more frequently than were citrus fruits (Hainutdzinava *et al*., 2017). Bayley and colleagues (2002) noted that fruit, fruit juices, and sweets as most craved, while OrloffK and Hormes (2014) study indicated sweets (chocolate), carbohydrates (pizza), and animal protein (steak) at the top of their list. It is important to follow a healthy diet during pregnancy in order to promote healthy outcomes for both mother and infant, but with the consumption of unhealthy craved foods a healthy diet may be difficult to maintain (Hainutdzinava *et al*., 2017).

Different studies show that cravings for high-energy/low-nutrient dense foods like sweets may be explained by the lower cost of these foods, their wide availability, and marketing campaigns (George *et al.,* 2005). Hence, the craving of fruits and vegetables by nearly as many women, despite more expense and less promotion, is a positive finding. One hypothesis may be that sweets are higher in calories, so that cravers might achieve a satiety level more quickly, while the fruits and vegetables group of cravers did not feel full as rapidly after eating fruits and vegetables. Therefore, fruits and vegetables cravers may have looked for additional sources of oral gratification, and in this sample, by primarily chewing on ice (Hainutdzinava *et al*., 2017). This study also explains, the spike in gestational hormones in mid-pregnancy that regulate the flow of glucose to the developing fetus has been proposed as a triggering mechanism for craving sweets. Although pica behavior is practicing and a deliberate desire for substances that are largely nonnutritive substance such as paper, clay, metal, chalk, soil, glass, or sand. It is prevalent among pregnant women across Sub-Saharan African countries, such as Ethiopia, Kenya, Ghana, Rwanda, Nigeria, Tanzania, and South Africa (Al-Rmalli *et al.,* 2010; Halala, 2015; Ugwa, 2016). It is associated with medicinal treatment, spiritual and ceremonial behavior as well as chronic hunger, folk medicine, traditional cultural activities and social customs (Ugwa, 2016).

The prevalence of practicing pica varies across from different areas of studies and 68%, 45.6%, 30.6%, 27% and 59% were reported (Ngozi, 2008; Brantsaeter *et al*., 2009; Halala, 2015; Ugwa, 2016; Hainutdzinava *et al*., 2017) respectively. Soil (clay, sand, wall mud), coffee residue/grind, soft white stone, ash, old dried animal like oxen, cow and skin and green coffee leaf eating has been reported among pregnant women in various parts of Ethiopia at least once a day due to personal interest and smell of substance (Halala, 2015). The extent of these dieting malpractices, as well as the specific food items avoided, varies from one community to another community. However, food taboo is generally more common among rural and less educated communities than among urban and more educated communities (Meyer-Rochow, 2009; Vasilevski and Carolan-Olah, 2016). Food taboos were found to be dominant among remote rural residents with little access to nutrition and health services, older, and uneducated women (Obse *et al*., 2013; Quiroz and van Andel, 2015; Ekwochi *et al*., 2016; Zerfu *et al*., 2016). In such circumstances, cultural believes, whether right or wrong, tend to shape behaviors. Food restrictions were significantly associated with Ethnicity; Oromo ethnic groups were shown to have much food taboos than Wolyta ethnic groups (Nejimu, 2015).

The Ethiopians most likely to follow these taboos are young, poorly educated women who come from low socioeconomic backgrounds (Tsegaye *et al.,* 1998). The pregnant mothers from not educated husbands were more likely to avoid food than those whose husbands were educated. This might be because educated husbands can give good support for pregnant mother not to avoid or dislike nutritious food. Growing sweet potato, potato and coffee were significantly associated with food aversion of pregnant women (Halala, 2015). Age of the mother, and previous antenatal care were significantly associated with food taboo (Wollelaw *et al*., 2018). A number of studies have shown that age, education level and socioeconomic status are associated with awareness about the importance of balanced diet during pregnancy (Tsegaye *et al,* 1998; Gebremedhin and Enquselassie, 2011; Daba *et al.* 2013; Nejimu, 2015). Alarmingly, this level of food restriction eliminates entire food groups, where Ethiopian pregnant women have little diversity in their diets. As a consequence, the majority of foods consumed are limited to, teff injera (sourdough flat bread), shiro wot (chickpea flour stew), wheat bread and kocho (fermented enset flatbread), which are generally high in carbohydrates (Tsegaye *et al.,* 1998) and devoid of other key nutrients such as proteins, fats, vitamins and minerals which are vital for optimal body function, and fetal growth and development during pregnancy. Having additional meal during pregnancy was statistically associated with food aversion. Pregnant mothers who were having additional meal were 1.62 times more likely avoiding food than those who were not having additional meal. This might be that pregnant mother who have additional meal can avoid the food that they dislike. Growing sweet potato, coffee was more likely avoiding food than those who were not growing these agricultural products. This might be that women who have access to these agricultural products can get alternative food from the market by selling these products. For this reason they may avoid what they dislike and they may receive what they desired (Halala, 2015).

Potential Health Consequences of Nutritional Malpractices

Malnutrition is a significant health problem affecting many women in Ethiopia and has serious consequences for pregnancy and birth outcomes (Nejimu, 2015). Pregnancy, in its own, makes pregnant women vulnerable to malnutrition due to the physiological rise in nutrient demand, which may not be adequately met by dietary intake. Thus, further restricting eating due to pregnancy-related food taboos and myths may seriously affect the health of the mother as well as the fetus (Vasilevski and Carolan-Olah, 2016; Kavle and Landry, 2018). Food taboos are therefore inextricably linked to the nutrition status of Ethiopian pregnant women, impacting their health and the health of their babies (Cherkos *et al.,* 2013). Poor nutrition in reproductive age women affects chances of woman's survive as well as her child's health (UNICEF, 2009). Ethiopian women who follow traditional food taboos during pregnancy have an increased likelihood of developing a range of negative pregnancy outcomes. The vast restriction of food substantially impacts upon the intake of vital nutrients required for optimal maternal health and fetal development (Nejimu, 2015). Evidence shows higher rates of taboo prohibiting the consumption of iron-rich food items, like meat, legumes, or dark green vegetables, might result in anemia in pregnant as well as non-pregnant women (Camaschella, 2015). This culturally transmitted traditions and misconceptions result in poor dietary quality and diversity, which may subsequently lead to developing deficiencies in a range of micro and macro nutrients (Daba *et al*., 2013; Szostak, 2014; Zerfu *et al*., 2016; Kavle and Landry, 2018). These deficiencies have been associated with a number of adverse pregnancy and developmental outcomes such as anaemia and intrauterine growth restriction (IUGR) leading to greater maternal and infant morbidity and mortality (Daba *et al*., 2013; Parisi *et al.,* 2014; Nejimu, 2015; Zerfu *et al*., 2016; Kavle and Landry, 2018). Previous studies done in Ethiopia reported the existence of pervasive food taboos, which may be contributing to the burden of maternal anemia (Cherkos *et al.,* 2013; Camaschella, 2015;

Vasilevski and Carolan-Olah, 2016; Zerfu *et al*., 2016; Hadush *et al*., 2017; Mohammed *et al*., 2019). Anaemia during pregnancy has been associated with a range of adverse outcomes (Abu-Ouf and Jan, 2015) such as a greater risk of infection, preeclampsia, bleeding, intrauterine growth restriction, still birth (Abu-Ouf and Jan, 2015), premature birth (Levy *et al*., 2005), low birth weight (Banhidy *et al*., 2011; Alwan *et al.,* 2015), and poor cognitive development in the infant (Kalaivani, 2009; Black, 2012; Murray-Kolb, 2013). Geophagia was associated with iron depletion and absorption of essential nutrients (Geissler *et al*., 1998). Besides, a study conducted in Tanzania showed that differences in mean hemoglobin concentration by pica behavior in pregnancy were statistically significant. This study also confirmed that amylophagy and geophagy are types of pica substance which are strongly positively associated with iron deficiency, and some gastrointestinal morbidities such as abdominal pain, constipation and diarrhea (Young *et al*., 2010). Many of these negative pregnancy and birth outcomes can be improved by encouraging pregnant women to increase the diversity in their diets. In particular consuming animal products (Abebe *et al.,* 2008) and other protein sources such as beans and legumes (Roba *et al.,* 2015) can significantly impact the nutritional status of women. Beans and legumes are generally accessible and low cost and therefore present as a reasonable option for this group. Pica practice is significantly associated with nutritional status (undernutrition) of pregnant women (Halala, 2015).This might be the practicing of pica substance interferes with the absorption of important nutrients. The same study conducted in Kenya showed that practicing of pica substance may interfere with nutritious substance absorption and causes intestinal obstructions (Ngozi, 2008). Zinc deficiency is another problem for Ethiopian pregnant women (Abebe *et al.,* 2008). As for iron deficiency, high reliance on cereal based foods and low intakes of pulses and animal proteins are the main contributors to this problem (Roba *et al.,* 2015). Zinc deficiency during pregnancy has been associated with preterm birth and low birth weight (Cetin *et al.,* 2010). Seven percent of disability particularly sight loss and limb malformation is believed to be caused by broken food taboo. The major problem of food taboos is preventing pregnant women from accessing a well-balanced diet, resulting in high prevalence of low birth weight and harm to mother and baby (Delma-Paofa *et al.,* 2013). Many of these negative pregnancy and birth outcomes can be ameliorated by encouraging Ethiopian pregnant women to increase the diversity in their diets. In particular consuming animal products (Abebe *et al.* 2008) and other protein sources such as beans and legumes (Roba *et al.,* 2015) can significantly impact the nutritional status of Ethiopian women. Beans and legumes are generally accessible and low cost and therefore present as a reasonable option for this group. Even though the nutritional status of these women is largely unknown, women of African origin are more likely to be anemic and are at greater risk for infant morbidity and mortality (Carolan, 2010). Ethiopian women put on little weight during pregnancy, potentially for similar reasons (Salim *et al.,* 2012). These women have higher incidences of emergency caesareans and interventions during labour, preeclampsia, early post-partum hemorrhage, preterm and post-term birth, still birth and small for gestational age babies (Salim *et al.,* 2012; Merry *et al.,* 2013; Calderon-Margalit *et al.,* 2015). Ademuyiwa and his colleagues (2013) have suggested that a dietary pattern characterized by high intake of vegetables, plant foods, and vegetable oils decreases the risk of preeclampsia. Pregnancy complications in Ethiopian women are partially explained by socioeconomic disadvantage, poor education, poor prior health and prenatal care, but it is unknown what other factors contribute to these problems (Salim *et al*., 2012; Merry *et al.,* 2013).

Conclusions and Recommendations

This review found evidences that nutritional malpractices have a significant influence on women nutritional status, maternal mortality and poor fetal outcomes. Maternal nutrition is very important for child bearing age women especially to make adjustments in maternal body composition, metabolism and function of various physiological systems. This should be further maintained through improved dietary intakes, intra-household food distribution, health/hygienic care and healthy nutritional habits as well as women empowerment. Despite, cultural misconceptions and traditions can greatly control behavior with actual foods consumption during pregnancy which ties into the availability of foods and preferences of food and the chance of evolving cravings and taboos. These nutritional malpractices are common among pregnant and lactating women means of protecting the health of women, fetus and their babies.

Food taboos are a strong aversion food items because of culturally transmitted background and fearing behavior of women like plastered on the fetal head, colors of fetus, burns of fetus, birth difficulty, fatty baby, fear of abortion and still birth. On other hand different food and non food items are caved by women due to their personal interest, flavor and color. Acknowledging that food cravings are real is important both for mothers and health professionals. While craving and consuming fruits and vegetables is beneficial for mother's health, sweets are to be consumed with caution since maintaining of healthy diets may be difficult with the consumption of

unhealthy craved foods. In other way, cravings to non food items (clay, sand, wall mud, coffee residue/grind, soft white stone, ash, old dried animal like oxen, cow and skin and green coffee leaf) interfere with the absorption of important nutrients (iron and zinc) that causes intestinal obstructions, negative pregnancy and birth outcomes.

The scope of these malpractices can varies greatly by time, community, culture, norm, religion, residency, season and dietary practices. Still, it can be associated with socio-economic status, nutrition information, health care/ facilities, social support and level of awareness. As a general rule, this literature review concludes that nutritional malpractices are strongly affecting the daily consumption of protein, energy, vitamins and minerals. Indeed, the deficiencies of those nutrients are associated with a number of adverse pregnancy and developmental outcomes such as anaemia and intrauterine growth restriction leading to greater maternal and infant morbidity and mortality. Additionally, poor dietary quality and diversity are significantly associated with a range of adverse outcomes such as a greater risk of infection, preeclampsia, bleeding, still birth, premature birth, low birth weight, and poor cognitive development in the infant. Therefore, there is a need for women who are pregnant or are of childbearing age to look for professional nutrition education, counseling and awareness generation programs to learn how to adopt healthy dietary habits. This can be improved by empowering health practitioner's (health extension workers, doctors, dietitians and others) in providing effective nutrition information that should be explored and given the overburdened public health system. Furthermore, this a need to put mechanisms that can routinely identify women observing nutritional malpractices, assess the reasons and provide appropriate nutrition education. Other governmental and nongovernmental organizations and various public associations such as women's Associations should also be actively concerned to make negligible extent of these culturally transmitted and harmful nutritional habits from different living environment. Women should be encouraged "eating up" during pregnancy and lactation and to provide supplementary food to poor women who cannot afford. In addition, the government of Ethiopia should design health and nutrition education programs that could capture the cognizance of the popular beliefs and misconceptions regarding food during pregnancy and use innovative means to minimize their negative and maximize their positive nutritional effects, a long-term solution to the problem.

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