

## Research Article

# A Systematic Review of Maternal Feeding Practice and its Outcome in Developing Countries

Zelalem Tafese\*, Afework Kebebu

Academic Center of Excellence for Human Nutrition, Hawassa University, Ethiopia

\*Corresponding author: Zelalem Tafese, Academic Center of Excellence for Human Nutrition, Hawassa University, Ethiopia. Tel: +251911479506; E-Mail: wudasiez@gmail.com

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### Abstract

Maternal nutrition is an important public health problem in low-income countries around the world and mothers from this setting are considered as a nutritionally vulnerable group. Due to the nursing process, mothers are subjected to nutritional stresses. Frequent pregnancies followed by lactation and poor feeding habits result with poor birth outcomes and increase morbidity and mortality risk of mothers and their children. The objective of this review is to identify systematically, appraise and synthesize the best available evidence on the maternal feeding practice and its outcome in developing countries. Electronic search of Medline, Pub Med, Health Inter-network access to Research Initiative (HINARI), and Google Scholar databases was conducted. Results of interest were maternal feeding practice and its outcome. Many studies concluded that the most frequent proximate causes of maternal malnutrition include inadequate food intake, poor nutritional quality of diets, frequent infections and short inter-pregnancy intervals. Majority of the reviewed articles also reported that in developing world women are more likely to suffer from nutritional deficiency than men. The feeding practices, dietary intakes and nutritional status of women in most developing countries were short of the national and international recommendations. The diets of women and mothers are often overlooked socio-economic conditions, cultural beliefs, taboos and misconceptions are the major determinant factors for poor maternal feeding practice, which increase not only women's chance of being malnourished but increases the chance of intrauterine growth retardation and childhood malnutrition. The effect of poor dietary habits and feeding practices of mothers do not end with poor birth outcomes and nutritional status of the newborn but may extend on influencing children eating behavior, which results with poor health and nutritional status of children. Dietary counseling in order to achieve optimal nutritional situation of women through behavioral change programs, when appropriate and a need for more comprehensive applied research studies as a means to find scientific solution are recommended.

**Keywords:** Beliefs; Culture; Diet; Malnutrition; Misconception; Mothers; Taboos

### Introduction

Good maternal nutrition is important for the health and reproductive performance of women and the health, survival, and development of their children. Malnutrition in women, including pregnant women, is not conspicuous and remains, to a large extent, uncounted and unreported; thus, insufficient attention has been given to the extent, causes, and consequences of malnutrition in women. Under nutrition and poor health from preventable causes disproportionately affect the well-being of millions of people in the developing world. In developing countries, the health and nu-

trition of females throughout their entire life is affected by complex and highly interrelated biological, social, cultural, and health service-related factors [1].

Maternal nutrition is an important public health problem in low-income countries around the world. It is particularly evident in Africa, South/Southeast Asia, Latin America, and the Caribbean [2]. Literature shows that many developing countries are focusing on creating policies in line with addressing maternal and child issues, implementing programmes and placing systems to reverse the situation; taking it as the main agenda on the fight against poverty. The lancet series, 2013 noted that "Nutrition is crucial to both individual and national development and a fundamental driver of a wide range of developmental goals". It was also one of the pri-

many objectives to be achieved in Millennium Development Goals (MDGs) [3,4].

Factors at individual, household and community level, or a combination of these factors, may contribute to poor nutrition and health status of women. Habits about eating are influenced by developmental considerations, gender, ethnicity and culture. Other factors include beliefs about food, personal preferences, religious practices, lifestyle, economics, medication and therapy, health, alcohol consumption, advertising, and psychologic factors. Healthy eating is important from the day of birth. Children, grow quite rapidly and this is due in part to the foods eaten. In particular, malnutrition among women is likely to have a major impact on their own health as well as their children's [5].

Dietary practices play a significant role in determining the long-term health status of both the expectant mother and the growing fetus. Along with the potential impacts of poor diets on women and their families; a better understanding of the relationship of women's diets to their feeding practice and patterns of food security in the home and family is needed [6].

Although researchers have raised concerns on maternal feeding practices and associated factors, previous review articles have not adequately addressed this issue in developing countries. The researchers are motivated to identify the dietary habits; feeding practices and associated factors among women in developing countries; aimed at providing important information in designing and initiating intervention programs to improve maternal nutrition. Hence an updated systematic review is essential to provide the basis for future research and for a discussion of policy implications. This manuscript examines the feeding habits of women, associated factors and outcomes in developing countries by reviewing published literature/articles.

## Methods

The published results from high-quality human observational and experimental studies which analyzed the prevalence and factors associated with maternal feeding practices were all included to this literature based analysis. Electronic search of Medline, Pub Med, Health Internetwork Access to Research Initiative (HINARI), and Google Scholar databases up to the end of 2014 was conducted. Search was done in keywords: ("maternal feeding practice" OR "maternal nutritional status" OR malnutrition AND ("Impacts" OR "factors associated" OR prevalence OR feeding practice) AND (Observational studies OR Randomized control trials in developing countries).

A function extracting related articles as well as reference lists from research, reviews and editorials was used during the search process. The full version of the English-language analyzed articles and abstracts of most found papers were available during the selection process. All literatures, including: observational studies, quasi-randomized trials and prospective Randomized Controlled

Trials (RCTs) evaluating the maternal feeding practice and nutritional status, published in English language, were included.

There were no limits on the age if the women were in their reproductive years. In the primary search 111 records were found. After exclusion of studies/reviews which did not examine the maternal feeding practice and nutritional status in developing countries duplicated and outdated which is published before 2000, 54 articles were selected. During the second selection 38 articles were evaluated as potentially relevant considering maternal feeding practices and their nutritional status in developing countries. Studies that failed to meet our criteria were not taken into consideration (Figure 1). This review defined a "maternal feeding practice" as overall feeding practice of mothers in reproductive age which is associated with good or bad outcomes on the nutritional status of mothers in developing countries.

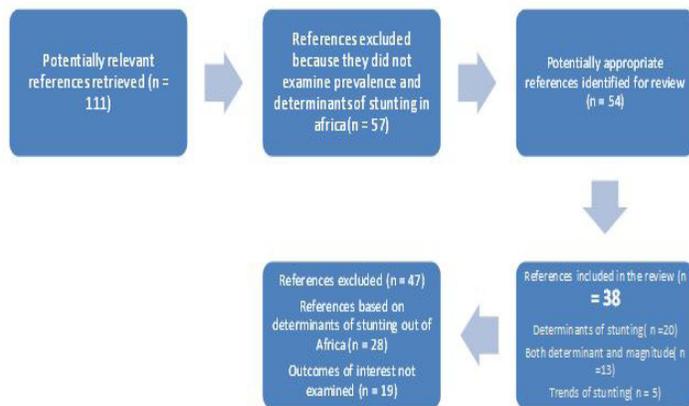


Figure 1: Selection of studies included in a systematic review of factors affecting maternal feeding practice and its outcome in developing countries.

## Results

Many studies unanimously concluded that women are more likely to suffer from nutritional deficiency than men for several reasons, including their reproductive biology, low social status, poverty and lack of education [5,7].

Other scholars identified in developing countries socio-cultural traditions and disparities in household, cultural norms, practices and socio-economic factors can increase women's chance of being malnourished [5,8,9]. In line with this is noted that preferential food allocation patterns, based on economic contribution; social value and other factors do play a role in limiting the intake of animal source foods for children and women in some settings [10]. Similarly, a study done in Nigeria reported occurrence of unequal food distribution within families and the acceptance of women to some discriminatory practices in food distribution still exists. The same study revealed that a woman is obliged to serve her husband's portion of food before her own and children and the best portion of food goes to the husband [11].

Another concern pointed out by DHS comparative report is the most frequent causes of maternal malnutrition include inadequate food intake, poor nutritional quality of diets, frequent infections, and short inter-pregnancy intervals [2]. These causes are recognized as stemming from wider contextual factors such as educational and socioeconomic status, ethnic and cultural beliefs, agricultural practices, national policies, and food insecurity. Furthermore, the study by Huffman et al., (1999) [12] mentioned income level as a determinant factor for women's malnutrition in low-income settings; that they consume inadequate number of micronutrients because of resource limitation; especially animal source foods, fruits and vegetables.

Other studies reported that women in developing countries are frequently malnourished and often have a poor pregnancy outcomes [13,14]. A number of studies also concluded that not only under nutrition but also over nutrition result with poor pregnancy and birth outcomes on a pregnant mother. During labour and delivery, maternal obesity was found associated with maternal death, hemorrhage, caesarean delivery, or infection [15,16,17]. Furthermore, another review reported that both obesity before pregnancy and inadequate weight gain during pregnancy have a negative effect on breastfeeding practices [18].

In most developing countries, women spend a larger proportion of their reproductive years pregnant, lactating, or pregnant and lactating. It is estimated that on average, women in Africa and Asia 30-48 percent of their life time between the ages of 15 and 45 were pregnant or lactating [8]. Furthermore, frequent pregnancies followed by lactation increase the health risk of mothers resulting in a high maternal mortality [19]. Thus, it was stressed in this study that under-nourished women who have closely spaced pregnancies and heavy workloads during pregnancy and lactation replicate the intergenerational life cycle of malnutrition.

One of the possible reasons for poor nutritional status of mothers mentioned above can be poor dietary habits and practices. In line with idea a study discussed that people may hold definite ideas about the kinds of foods, and amounts of food, appropriate for women during pregnancy, childbirth and the postpartum period but during pregnancy all women need more food, a varied diet, and micronutrient supplements [8]. Additionally, another cross-sectional study revealed that significant number of women reported that they did not eat vegetables and animal source foods during pregnancy because of cultural taboos and false beliefs [20]. On the other hand, a systematic review article indicated that food intake is consciously restricted during pregnancy because of the misconceptions of fear of delivery complications associated with having a large newborn [1].

The desire to avoid vegetables, an important source of nutrients like folic acid, may have negative consequence during pregnancy. A research finding shows that unsatisfactory maternal nutrition has been reported to result from inadequate dietary intakes during pregnancy, which have been attributed to ignorance

and superstitions [21]. Moreover, it is also reported that lactating mothers from low-income settings are considered as nutritionally vulnerable group [19] and the traditional postpartum food restrictions are commonly observed in urban Laos; the diet of lactating women is of low diversity and excessively based on glutinous rice, resulting in intakes below the standard recommendations for lipids, proteins and micronutrients [22].

Supporting the above idea, a study from Ethiopia concluded that feeding practices, dietary intakes and nutritional status of the lactating women in Ethiopia were short of the national and international recommendations [23,24], and were not adequate to support their increased energy and nutrient requirements [25]. Similar finding reported by other studies is a nutrient supplementation during pregnancy among women is a promising preventive approach for pre-eclampsia, impaired fetal growth and reduces the risk of low birth weight and other complications [26,27,28].

Inadequate dietary intake, especially micronutrient deficiency during pregnancy and lactation is common and the prevalence of goiter and chronic energy deficiency in India was higher [9]. It is of interest to note, however, the fact mentioned by the same study that both micronutrient deficiency and excess during pregnancy result with several crucial roles in fetal development. Congenital anomaly is one of the outcomes of micronutrient deficiency; in line with this idea the finding of a case control study suggests in normal weight mothers, a maternal dietary intake of vitamin A below the RDA may contribute to the risk for new born birth defect by [29].

Another community based cross sectional study reported moderate nutritional anemia in the form of iron deficiency anemia was a problem in Ethiopia and it is also reported high prevalence of iron deficiency anemia in women with childbearing age and dietary habit of subjects as one of the causative factors leading to iron deficiency anemia [30,31]. Other study from Ethiopia confers women's nutritional deficiency is aggravated by the high phytate content food consumption of the study participants such as cereal based foods and legumes[25].

Another issue is cultural beliefs and practice which play very important role on the feeding practices of women. It is reported that the status of women can be described as low, as shown by the intra-household division of labour, the allocation of food and resources within the household, the opportunities for schooling, and other functions [32]. As is culturally typical in most areas in Ethiopia, men eat first at meal times and women eat last. Women also reported to sometimes not eat at all in times of scarcity and to prioritize other family members in terms of quality of food. Interestingly, it is reported that in times of food shortage men are prioritized and eat first, whereas in times when there are enough food available children are fed first and mothers reported eating in this way because of the belief that their husband is superior [33].

The effect of poor dietary habit and feeding practices of mothers do not end with poor birth outcome and nutritional status

of the newborns but may extend on influencing children eating behavior, resulting with poor health and nutritional status of children. This condition can be one factor to perpetuate the intergenerational cycle of malnutrition. Another study confirmed that the biological role of the mother and the effect of her nutritional status on infant feeding extend to postnatal infant feeding practices [34].

## Discussion

Based on the final review and analysis of this study adequate nutritional status of women is known to be important for good health and increased work capacity of women themselves as well as for the health of their offspring [35]. Women, especially mothers in most developing countries, are gatekeepers of the family diet, and have long been entrusted with the principal responsibility of selecting, preparing, and serving foods to support families and households. However, the diets of women and mothers are often overlooked [9]. Major factors associated with maternal feeding practices in these reviews are socioeconomic status, cultural beliefs, taboos and poor agricultural practices on cultivating fruits and vegetables for household consumption [2]. But perpetuating situations like frequent pregnancies followed by lactation, miscarriage, ignorance and superstition should not be overlooked. On the other hand, it is known fact that mothers consume inadequate number of micronutrients because of resource limitation; especially animal source foods, fruits and vegetables; which are appropriate for women during pregnancy, childbirth and the postpartum period [13]. It is agreed that women in developing countries are frequently malnourished and often have a poor pregnancy outcome and, the most important determinants of intra uterine growth retardation stem primarily from the mother's poor health and nutritional status [13,14].

The biological role of the mother and the effect of her nutritional status on the care and feeding of her infant obviously do not end with birth but due to the nursing process mothers are subjected to nutritional stresses [36]. Hence under-nourished women who have closely spaced pregnancies and lactation replicate the intergenerational life cycle of malnutrition. Even though there is short of data maternal over nutrition should not be overlooked since, it is associated with maternal deaths, hemorrhage, caesarean delivery, or infections. The effect of poor dietary habits and feeding practices of mothers do not end with poor birth outcome and nutritional status of the newborn but may extend on influencing children eating behavior, resulting with poor health and nutritional status.

Improving women's nutrition must start long before birth by solving economic and social problems that affect women. At different points in the life cycle of women, energy is needed for body maintenance and additional energy is needed to support adolescent growth, fetal growth during pregnancy, and milk production during lactation [37]. Energy demands are at a maximum level when an adolescent girl is pregnant and lactating; research findings report that it is the most important prerequisites to counteract low birth weight in developing countries [38].

## Conclusion

The review revealed that women in developing countries are more likely to suffer from nutritional deficiency than men; the socioeconomic and cultural conditions are the major determinants of their health and nutritional status. Additionally, the most frequent proximate causes of maternal malnutrition include inadequate food intake, poor nutritional quality of diets, frequent infections, and short inter-pregnancy intervals; cultural taboos and false beliefs increase women's chance of being malnourished. Gender issues are also associated with almost every aspect of diet and nutrition situations of women in developing countries.

The feeding practices and dietary intakes of the women especially pregnant and lactating in most developing countries are found short of the national and international recommendations. A food restriction by pregnant women needs to be addressed through behavioral change programs. All stakeholders are recommended to pay due attention on implementing short and long-term strategies to improve the feeding practice and habit of women to break the intergenerational cycle of malnutrition in developing countries.

Definitely, there is a need for more comprehensive applied research studies as a means of finding scientific solutions; taking the life-cycle and intergenerational effects of maternal malnutrition into account. Such approaches have the potential to further understand maternal dietary habit or practice and its influence on maternal health, birth outcome and to advance the effort to reduce the long-term impacts of poor maternal feeding practice.

## Authors' contributions

All authors made a substantial contribution to the conception and design of the review and have been involved in drafting the manuscript or revising it critically for important intellectual content.

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