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Summary

Background

Maternal nutrition is a key determinant of maternal, new-born, and child health (MNCH) outcomes hence one of the major health concerns discussed by various agencies globally. Maternal nutrition is more critical during pregnancy because it lays the foundation for a successful outcome of pregnancy, lactation, survival and development of infants and children. Hence a malnourished pregnant woman will not only experience more complications during pregnancy and delivery including her own death, but is also likely to experience conditions such as still-birth, low birth weight (LBW) and pre-term delivery, neonatal mortality conditions and physically or mentally handicapped babies.

Due to multiple immediate and long-term, and inter-generational effects associated with maternal malnutrition, several interventions have been designed to improve the immediate (inadequate dietary intake as well as disease) and underlying (household food security, maternal and child care, health services and the environment) causes of malnutrition. *Nutrition education and counselling* is the most widely used strategy, and a cost effective intervention globally approved by the World Health Organization (WHO), to improve the nutritional status of women during pregnancy. The strategy focuses primarily on: promoting a healthy diet by increasing the diversity and amount of foods consumed; promoting adequate weight gain by keeping physical activity, maintaining sufficient and balanced protein and energy intake; and promoting the consistent and continued use of micronutrient supplements, food supplements or fortified foods. Studies have confirmed that with the effective implementation of, and compliance with, these interventions, maternal nutrition is improved.

However, despite the governments' high-level commitment to maternal health and nutrition, and the proven efficacy of the WHO-recommended interventions, the intended outcomes and associated health indicators have been less successful than hoped in most LMICs, including Kenya. This is a clear indication that these interventions are either barely effective or poorly provided. Studies have shown that effective interventions, regardless of the success achieved during a demonstration period, typically yield diminishing returns, due to the failure to adhere faithfully to implementation requirements. Other studies however, established that rigid adherence to the prescribed protocol might well lead to poorer outcomes and so suggested that practitioners need to have some level of flexibility and adaptability to meet local and individual needs depending on the population and different context. Adoption of new knowledge therefore depends on how easily it can be integrated into existing knowledge systems.

Pregnancy, food and nutrition are cultural concepts and could be perceived differently based on a population's socio-cultural context and their everyday life experiences, and this undoubtedly can influence women's interpretation of and response to innovations. Local

knowledge is therefore an important consideration especially in rural communities where cultural beliefs are strongly entrenched. The aim of this thesis is to assess implementation fidelity of maternal nutrition intervention strategies aimed at pregnant women in rural Kenya as well as to understand local knowledge regarding maternal nutrition and health and its influence on health-seeking behaviour.

Methodology

This thesis brings in the analytical and integrative perspectives of constructivists and memetic theories in understanding the cognitive basis of the different local explanatory models of maternal nutrition and health, and consequently adoption of interventions. These insights will inform recommendations to improve maternal nutrition intervention strategies. The regional focus of this thesis is rural Kenya. The Kalenjin community of Uasin Gishu County, Kenya was the case for this study although illustrations are drawn from other countries in Africa and beyond.

To achieve our main objective, the following research questions were formulated to provide guidance and direction in the research approach for this thesis:

1. What is the level of implementation fidelity of biomedical maternal nutrition interventions?
2. What are the challenges and motivations to implementation fidelity of biomedical nutrition intervention strategies?
3. How do emic cultures conceptualize adverse pregnancy outcomes associated with maternal malnutrition and how do these cultural conceptualizations influence the women's care-seeking behaviours?
4. How do emic cultures perceive ANC and how do these perceptions influence early and frequency of access to ANC services?
5. How do food beliefs and practices influence the nutritional behaviour intention of pregnant women? What local food stuffs are traditionally recommended or restricted for consumption by pregnant women?
6. What are the underlying reasons for food recommendations and restrictions during pregnancy?

To answer these research questions, two empirical studies were conducted and mixed research methods approach was employed in both studies, using questionnaires with closed and open questions and key informant interviews. Based on these studies, the findings of this thesis are presented into two parts: The first part of this study assessed the implementation fidelity of biomedical maternal nutrition interventions and the factors that constrain implementation fidelity in a specific context – a rural area in Kenya – Uasin Gishu County. The second part involved understanding ethno-medical maternal beliefs and practices, including how they influence maternal nutrition behaviour and access to biomedical care interventions in the same rural area in Kenya.

Implementation fidelity of Biomedical Maternal Nutrition Intervention Programmes, and challenges and motivations to implementation fidelity

Despite the proven efficacy of biomedical interventions in improving maternal nutrition and pregnancy outcomes, and the fact that these interventions are widely in place throughout the globe, coverage targets set for these interventions are reportedly low in some settings and thus malnutrition remains a major challenge. As a result, our first study, which is presented in part one aimed at addressing the following research questions:

- a) *What is the level of implementation fidelity of biomedical maternal nutrition interventions?*
- b) *What are the challenges to implementation fidelity of biomedical nutrition intervention strategies?*

The findings of these two research questions are presented in chapters 4, 5 and 6.

The Maternal Infant and Young Child Nutrition (MIYCN) intervention programme was selected as the case for our study, because its coverage targets all pregnant women in the country irrespective of their nutritional status and is offered free of charge in all government health facilities. Implementation fidelity of MYICN was measured using indicators such as coverage, content, frequency and quality of delivery. Barriers to implementation fidelity were also investigated during the study.

The MYICN programme is implemented as an ANC integrated programme in all government health facilities with an assumption that all pregnant women will turn up for the services. However, as it is presented in **chapter 4**, the findings of the study indicated that even if coverage of maternal nutrition interventions is widespread (99%), a large percentage of women (90%) did not seek interventions within their first trimester as is recommended and this strongly affects frequency fidelity and effectiveness of interventions. It was also established that the content of the MYICN programme is not exhaustively offered to those women who turn up for ANC. Partial provision was reported in all the intervention components. For those respondents who received the supplements (74% in the case of iron and 47% in the case of folic acid), only 18% and 15% of the respondents received 90 or more iron and folic acid pills respectively during their entire pregnancy, of which only 80% and 48% respectively understood the usefulness of the supplements. Despite the relatively low number of nutritional supplement pills distributed, not more than two-thirds of our respondents reported having completed taking the supplements that were issued to them. The side-effects of the pills were the main reason reported for low compliance with nutritional supplements. On the other hand, only 28% of our study population reported receiving counselling on general diet. Only 16% of the respondents reported relying on nutritional knowledge acquired at the health facility. Most women (37%) reported relying on own knowledge on appropriate nutrition or knowledge acquired from older women relations or learned in school, while others combine the knowledge acquired from the multiple sources.

Ethno-medical conceptualization of pregnancy and implications on access to interventions

Late initial and low frequency of access to ANC services were established as one of the major factors affecting implementation fidelity of the MYICN intervention programme. For this reason, we investigated the factors attributed to this late trend of initial access to ANC. In regard to this, it was necessary to establish the factors that cripple access to health facilities for interventions. Hence our fourth research question therefore was:

How do local cultures perceive ANC and how do these perceptions influence early and frequency of access to ANC services?

From our study, it was established that how pregnancy is viewed and how it is valued is heavily dependent on the cultural and social context. As presented in **Chapter 5** for instance, the Kalenjin community perceived pregnancy as a normal natural condition rather than a pathological one requiring medical care. Almost half (42%) of the respondents who seek biomedical interventions were motivated by unpleasant symptoms and those who did not seek earlier ANC did not see the need for care because they were not feeling unwell. We also found that, according to many respondents, not all observed symptoms and complications require biomedical care; a number of women believed they could detect some of their abnormalities based on their own subjective physical experiences and sensations such as numbness of the leg, without necessarily requiring biomedical examinations. Based on these subjective assessments, some symptoms were thought to require TBA care only or both TBA and biomedical care – 44% of the respondents reported having sought TBA services, including herbal medicine, intercession remedies, confirmation of foetal presentation and massage of the uterus. The majority of the respondents without symptoms and complications and who use TBA services wanted to confirm the foetal presentation in the uterus. Breach or transverse presentation was of great concern to these women because they believe it may lead to a complicated delivery. The TBA was known to be able to manipulate the foetus into the head-down presentation by external version; a service they felt that is not provided by the nurses at the health facilities during ANC. It was noted that some women (13%) delay starting ANC because they feared or felt ashamed to disclose their pregnancy when they conceive unexpectedly.

Further, as presented in **Chapter 6**, it was also established that a culture's conceptualization of birth helps community members make sense of pregnancy-related illnesses and adverse outcomes which in turn influence their remedy- and health-seeking behaviours that might be in line with or contrary to the expectations of biomedical interventions. This was established when we were trying to answer our third research study:

How do emic cultures conceptualize adverse pregnancy outcomes associated with maternal malnutrition and how do these cultural conceptualizations influence the women's health and nutritional care seeking behaviours

A broad frame of traditional explanatory models of pregnancy complications emerged which influence women's care-seeking behaviours. Pregnant women are considered vulnerable to external attacks that can emanate from either man, nature or supernatural powers hence must be protected from harm using medicinal herbs, observing certain food and behavioural taboos, and performing certain rituals in order to preserve their pregnant state and give birth to healthy infants. Thus, any complications or misfortunes associated with birth are often perceived to be a result of the woman's own behaviour, possibly because she has acted against a custom. Perceiving pregnancy complications as emanating from causes other than nutrition made women fail to take biomedical interventions seriously and instead seek remedies such as medicinal herbs.

Ethno-medical conceptualization of maternal nutrition during pregnancy: implications for nutritional behaviour of pregnant women

While answering study question three, it was found that among other reasons, pregnancy complications were thought to be caused by the wrong diet during pregnancy. Some foods were considered to jeopardize a pregnancy if consumed in excess, while others can endanger pregnancy if they are not eaten in sufficient quantity, while others should not be consumed at all. Thus, a pregnant woman is required to eat sparingly and selectively. Our fifth research question, which is answered in detail in **Chapters 7** and **Chapter 8**, were:

How do food beliefs and practices influence nutritional behaviour intention of pregnant women?

What local foodstuffs are traditionally recommended or restricted for consumption by pregnant women and questions six,

What are the underlying reasons for food recommendations and restrictions during pregnancy?

In both studies, women acknowledged that eating habits during pregnancy affect the health of the foetus and pregnancy outcome. To achieve a positive outcome, it is important to abide by certain food taboos and recommendations during pregnancy. Women adhered to the nutritional precautions as a concern for healthy pregnancy and birth outcome.

One of the most important nutritional recommendations adopted by the local women in our study aimed at keeping the foetus small. It is believed that large foetuses are difficult to deliver, resulting in episiotomy, prolonged and obstructed labour and possibly caesarean section (CS), increasing the chances of death of the mother or child. Eggs, oily food, meat, fresh milk, *Moboriet* and cooked potatoes during pregnancy are believed to make the foetus grow excessively big, hence these foods are restricted. Prescription of herbs was also mentioned as a remedy for regulating the size of the baby and to accelerate contractions during labour. Another factor that is ethno-medically believed to facilitate easy labour and birth is to have "sufficient blood". It is believed that fewer blood reserves make a woman

weak. A woman with less blood is also believed to bleed excessively during labour, birth or after birth, which may necessitate a blood transfusion or cause death if she cannot access a health facility in time and get a willing blood donor. According to many respondents, the prominent way of ensuring enough blood is consuming plenty of traditional vegetables, liver, animal blood, fruits, milk, beans, red soil/stones and fish during the pregnancy period.

It was also established that easy labour and birth are also determined by the strength of the woman. They consider that a weak woman cannot push out the baby easily and that she can even faint or die in the process. Such a woman can only be helped by CS which is, as mentioned above, believed to be a risky endeavour. For a woman to have enough energy during birth, she is expected to consume food believed to give strength during her pregnancy. Such food includes *ugali* and porridge made from finger millet mixed with sorghum, and traditional vegetables, milk, traditional herbs and meat. Evil spirits or supreme powers are also believed to interfere with good health outcomes by causing misfortune and complications during pregnancy and labour. The death of an animal is sometimes believed to be caused by evil spirits, which are transferable to humans. Therefore, if a woman eats the meat of a dead animal killed by evil spirits, these spirits can cause a similar death or misfortune to the mother or child. Some food was restricted because it is believed to cause sickness to the mother or to the child after birth including: neonatal death, skin rashes, colic pain, and nasal blockage or breathing difficulties in the infant and nausea feelings, vomiting, miscarriage, preterm birth and maternal death. Food believed to cause these illnesses to the child include those that are oily, sugary and salty. Eating soil, stones, mutton, sheep's head and vegetables grown on burned soil, oily food and salt are some of the food restrictions under this category.

Main findings and conclusion

The study findings indicated that even if coverage of biomedical maternal nutrition interventions is widespread, implementation fidelity is generally weak. Partial provision was reported in all the intervention components. Late initial bookings to antenatal care for interventions due to cultural misconception of maternal care and causes of pregnancy complications, drug stock shortage, staff shortage and long queues, anticipated or experienced side effects of the supplements were established to be the main challenges to implementation fidelity. In contrast to the limited reach to biomedical nutrition interventions, there is extensive use and reliance on ethno-medical care and remedies by pregnant women. Very few respondents (16%) reported to rely on nutritional knowledge acquired at the health facility. Most women (37%) reported relying on own knowledge on appropriate nutrition or knowledge acquired from older women relations or learned in school, while others combine the knowledge acquired from the multiple sources. Therefore, instead of paying little attention to or considering these ethno-medical practices to be inferior to the western medical system, or stereotyping them as “uncivilized irrational native superstitions”, this study recommends that intervention programmes should instead establish and enhance strategies that can mutually and fruitfully complement these two interventions to enhance maternal health.