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Cultural Beliefs and Perceptions of Maternal Diet and Weight Gain during Pregnancy and Postpartum Family Planning in Egypt

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Abbreviations

AUC	American University in Cairo
BMI	Body Mass Index
CDA	Community Development Association
DHS	Demographic and Health Survey
IFA	Iron and Folic Acid
IUD	Intrauterine Device
IYCF	Infant and Young Child Feeding
LAM	Lactational Amenorrhea Method
MCHIP	Maternal and Child Health Integrated Program
MNCH	Maternal, Newborn, and Child Health
USAID	United States Agency for International Development
WHO	World Health Organization

Executive Summary

INTRODUCTION

Since 2005, Egypt has faced increased levels of food insecurity, combined with rising poverty rates and food prices, and successive crises, including the avian influenza epidemic (2006) and food, fuel, and financial crises (2007–2009) resulting in reduced household access to food and purchasing power. An increase in the prevalence of stunting between the 2005 and 2008 Egypt Demographic and Health Surveys (EDHS) coincided with the avian influenza outbreak in Lower Egypt. The purpose of this study, conducted by the Maternal and Child Health Integrated Program (MCHIP), was to address factors related to stunting, within the context of the rise in stunting in Lower Egypt in comparison to Upper Egypt, where little change in stunting has occurred. This study addressed factors related to stunting, focusing on cultural perceptions and beliefs about infant and young child feeding (IYCF) practices, while also examining perceptions of maternal dietary practices and how these perceptions can influence how mothers feed their children and families.

This operations research study addressed the following four objectives: 1) identify gaps and positive aspects of IYCF practices through the application of the Trials for Improved Practices (TIPs) methodology with Egyptian mothers; 2) understand cultural beliefs, perceptions, behaviors, and motivating factors that may facilitate or act as a barrier to optimal IYCF practices and how these factors may explain the rise in stunting in Lower Egypt, including perceptions related to maternal diet, weight gain, and birth spacing; 3) ascertain the role of grandmothers, fathers, and health care providers in IYCF; and 4) examine changes in growth perceived by mothers, other caretakers, and health care providers resulting from the avian influenza outbreak within the context of the rise in stunting in Lower Egypt during the previous 5–6 years.

This report will specifically address behaviors, perceptions, and cultural beliefs in relation to maternal dietary intake during pregnancy, lactation and non-lactation, weight gain during pregnancy, birth spacing and family planning, and how these beliefs may provide context for improving IYCF practices.

METHODS

The two study sites were composed of one district each in Upper Egypt (El-Maragha District, Qalibia governorate) and Lower Egypt (Kafr Shokr District, Sohag governorate), which allowed for comparisons between the region with the highest (Lower Egypt) and the lowest (Upper Egypt) levels of stunting.

To examine perceptions, cultural beliefs, and behaviors related to maternal dietary practices and weight gain during pregnancy, as well as diet during lactation and non-lactation, birth spacing and family planning, qualitative data were collected by in-depth interviews. Pregnant women and lactating and non-lactating mothers were selected using purposive sampling in Lower and Upper Egypt. A total of 120 in-depth interviews with pregnant women (N=40), lactating (N= 40) and non-lactating (N= 40) women were carried out in study areas, which provided context to IYCF practices collected using Trials for Improved Practices (TIPs). TIPs is a consultative research methodology that consists of three household visits to the mother to identify barriers and facilitating factors to optimal IYCF practices and work together with the mother to identify and agree on feasible solution(s). As part of TIPs, qualitative data on cultural beliefs, perceptions, and behaviors related to IYCF practices were collected by in-depth interviews with mothers 18 years and older with children 0–23 months of age (N=150) during the first TIPs visit. Dietary intake (i.e., food frequency questionnaires, 24-hour dietary recall)

was ascertained and measurement of nutritional status (i.e., weight, length) was collected during both the first and third TIPs visit in children 6–23 months of age (N=120).

Mothers' TIPs interviews were contextualized with information on perceptions and advice given by family members and health care providers on infant and young child feeding practices. Fathers, grandmothers, and health care providers were selected using purposive sampling, from the same communities as TIPs in Lower and Upper Egypt. In-depth interviews were conducted with fathers with children 0–23 months of age (N=40), grandmothers with grandchildren 0–23 months of age (N=40), and health care providers (N=40). The results of TIPs and in-depth interviews with fathers, grandmothers, and health care providers are presented in a separate report.

All questionnaires and oral consent forms were translated and administered in the local language of Arabic. Ethical approval was granted by The Egyptian Society for Healthcare Development, PATH Ethics committee, and the American University in Cairo (AUC) Social Research Center.

Preliminary analyses of in-depth interviews were conducted to develop thematic categories relating to maternal diet, weight gain during pregnancy, family planning, and birth spacing, which served as a coding structure and the basis of our qualitative analysis. This process allowed for the identification of dominant themes and descriptions that emerged within these categories.

KEY FINDINGS

Sources of Advice on Diet during Pregnancy and Lactation

Mothers most often reported valuing and trusting the advice from medical doctors, who provide routine antenatal care, on the “best” foods to eat and which foods to avoid during pregnancy. In addition to doctors' advice, mothers also expressed their regard and appreciation for advice from family and other members of their communities. During lactation, mothers consulted various community and family members (family, elderly women, neighbors and friends, media) as sources of information about which foods to eat during breastfeeding, particularly to increase breast milk quantity. Mothers received conflicting information to eat healthy foods, like vegetables, and also sugary foods or foods rich in fat and sugar (*Halawa*) from different sources, including health care providers and family members.

Maternal Diet during Pregnancy

Women relayed that during pregnancy, a diet high in proteins as well as essential vitamins and minerals is needed. Women stated that a pregnant woman's diet should contain “good” and “beneficial” foods such as meat, fish, lentils, chicken, eggs, and milk, as well as various fruits and vegetables. Pregnant women rarely mentioned grains (breads, rice, and pasta), yet viewed potatoes as essential foods for a healthy pregnancy. Carbohydrates, as a food group, were viewed as “not beneficial” for pregnancy and were perceived to cause “bloating for the mother” and excessive weight gain; therefore mothers believed they should restrict their intake and “[these foods] should not be consumed much.”

The actual consumption of “beneficial” foods during pregnancy is sometimes limited by personal preferences and affordability of foods. This can restrict the variety of foods consumed to milk, cheese, eggs, some meats (red meat and/or chicken), bean or lentils, and fried or boiled potatoes, with little consumption of fruits and vegetables. Junk food and caffeinated beverages as well as salty, pickled, and spicy foods are considered culturally taboo or “bad” during pregnancy. Intake of these foods is not always restricted, and their harm is generally misunderstood. Pregnant women said they recognize that junk foods (e.g., lunch meat, soda, prepackaged potato chips, biscuits, and locally made potato chips); salty foods; acidic foods (e.g., foods cooked with onions and tomatoes);

and caffeinated beverages (e.g., tea and coffee) may adversely affect the mother and/or the child, for example, contributing to *“high blood pressure”* and *“deformation of unborn children.”*

Mothers mainly had misinformation about the harmful effects of these taboo foods. These effects included: *“chips cause worms for the fetus,”* salty foods create *“a burning sensation when delivering the child,”* and junk foods *“cause cancer of the blood.”* Mothers were also selective about which junk foods were considered to be appropriate to eat during pregnancy. While dark (caffeinated) sodas are frowned upon, light-colored sodas and store-bought juices were perceived to be acceptable for consumption. Mothers learned of the harmful effects of these foods from family members and health workers, as well as media sources (e.g., TV and the Internet), which are viewed as trusted sources of information on health.

Weight Gain during Pregnancy

Some women associate healthy weight gain and fetal growth with good nutrition and the amount of food consumed; many misunderstand the connection between nutrition and weight gain. Weight gain is viewed as carrying an “additional person.”

Pregnant women have little to no knowledge of optimal weight gain during pregnancy, likely due to lack of counseling by health care providers.

Iron and Folic Acid Supplementation during Pregnancy

Women routinely receive iron and folic acid (IFA) supplementation during antenatal care. Mothers do not always understand why health care providers have prescribed iron-folic acid pills for anemia, nor are they given appropriate counseling on how to deal with temporary side effects of IFA supplements. Seeking health care services from different health care providers who provide different pills of varying color added to the confusion about IFA supplements. The lack of both consistent and correct guidance and information on IFA contributed to the lack of adherence to IFA among pregnant women.

Maternal Diet during the first two years following the birth of the child

Overall, women indicated that they generally consume more foods during lactation than they usually do, including during pregnancy. The quantity of foods consumed is perceived to be associated with the amount of milk produced.

Mothers associated nutritious foods with sufficient milk production, improved milk quality, and the well-being of both mother and child. Some foods are considered taboo to consume during lactation, and are restricted from the diet of lactating mothers. This includes traditional foods that are *“pickled,” “very salty,”* and *“very spicy;” “heavy”* or *“simmered”* foods (these include stewed vegetables and meats); as well as non-traditional foods (junk foods). Taboo foods are restricted primarily because they are seen to decrease milk production. These foods are also avoided because they are perceived to directly affect the health of the child (e.g., cause colic and gas), or because they are known to have an ill effect on the mother, which is believed to be transmitted to the child. Non-lactating mothers believe that they are free from all food restrictions, and can eat what they whatever they want, including junk foods, as long as they are not breastfeeding. Some non-lactating mothers also indicate that they had stopped breastfeeding because they had become pregnant, emphasizing the need for improving both maternal diet and family planning practices among women with children under the age of 2 years.

Birth Spacing and Family Planning

Mothers recognized that prevention of pregnancy for at least 2 years is better for both the mother’s and the child’s health. Within the context of the effect of birth spacing on the child’s health, mothers view the continuation of breastfeeding as a motivation for birth spacing, as they

believe that breastfeeding during pregnancy is “*bad*” for both the growth of their fetus and the psychological well-being of their breastfeeding child and must be discontinued.

Both lactating and non-lactating mothers discussed natural lactation: “*when the woman gets her period, and if she doesn’t use a birth control method, she conceives.*” This was contrasted with “*clean*” lactation, which is “*breastfeeding without getting a period, and this way the woman doesn’t conceive.*” Some mothers relayed the concept of “clean lactation,” or lactation with no return of their menstrual bleeding, which is the only component of the Lactational Amenorrhea Method* (LAM) that mothers were aware of. Mothers did not know about LAM and its three criteria for use. These mothers also did not state that breastfeeding needed to be exclusive for “breastfeeding for family planning” to be effective.

In Lower Egypt, most breastfeeding mothers were in the first year postpartum and using a method of family planning. Mothers participating in the study reported using intrauterine devices (IUDs) and oral contraception pills. In contrast, in Upper Egypt, the majority of lactating mothers were not using any method. About half of non-breastfeeding mothers, primarily in the second year following childbirth, were using family planning methods, including injectables and oral contraception pills, as well as IUDs. Overall, study participants who chose not to use family planning methods after childbirth indicated that they did not need them because they wanted to become pregnant again, or their husbands worked abroad, or they had recently given birth and were 40 days postpartum.

DISCUSSION AND RECOMMENDATIONS

Overall, maternal diet was limited to foods that were perceived to be appropriate for the life stage (pregnant, lactating, non-lactating), affordable, and favored. Counseling mothers on appropriate weight gain during pregnancy and incorporating a wide range of foods, including animal source food, lentils, fruits and vegetables, and grains is needed to support healthy pregnancy outcomes and overall maternal health. Health care providers and community-level strategies should also aim at discussing limiting the consumption of non-nutritive foods like junk foods, soda, and teas among mothers, which also serves as an opportunity to address feeding problems among infants and young children, who also consume junk food. Mothers should be counseled to eat nutritious and diverse foods during and after pregnancy, and these foods are also appropriate for their families, even young children who are 6–23 months. Study findings from this operations research demonstrate the limited variety, quantity, and frequency of meals given to children 6–23 months of age in Lower and Upper Egypt, and the overconsumption of junk foods among these children.

Counseling on anemia and its consequences and on why and how mothers should take IFA supplements should be strengthened in health facilities and at the community level, taking into account the barriers to IFA adherence identified in this study. Mothers will be encouraged and motivated to prevent anemia during pregnancy with adequate counseling, including how to manage temporary side effects. There is a need to develop guidance on how to address breastfeeding during pregnancy, within the context of the commonly held belief that breastfeeding and pregnancy are incompatible. Mothers need to be counseled that optimal birth spacing of at least 2 years can also help to reduce stunting in their communities and poor pregnancy outcomes. Teaching mothers that LAM provides effective protection against pregnancy in the first 6 months can reinforce exclusive breastfeeding practices; encouraging mothers to get another family planning method at 6 months, when mothers initiate complementary feeding, is also needed.

*The Lactational Amenorrhea Method (LAM) is a temporary contraceptive method based on natural infertility resulting from certain patterns of breastfeeding. LAM integrates postpartum family planning and nutrition because it promotes exclusive breastfeeding, which reduces malnutrition and mortality in infants in their first 6 months and extends birth intervals which, in turn, promotes maternal and child survival.

CONCLUSION

Strengthening health care provider counseling and community-level strategies to address maternal health, including nutrition, birth spacing, and family planning, requires an integrated approach. Counseling provided during antenatal care and the postpartum period should encompass culturally tailored messages that address barriers and misperceptions related to maternal nutrition (e.g., diet, anemia), weight gain during pregnancy, infant and young child feeding (IYCF), birth spacing, and LAM, as part of family planning.

Introduction

The period from pregnancy to 24 months of age, the first 1,000 days of life, is “the window of opportunity to prevent malnutrition,” such as stunting or chronic malnutrition.¹ Poor growth in height can lead to chronic malnutrition or stunting; a process reflecting inadequate dietary intake and recurrent/frequent infections, that can begin in the womb and then continue through the first 2 years of life.^{1,2} A child is defined as stunted when his height-for-age is below -2 S.D. (standard deviation) of the World Health Organization (WHO) child growth standard.³ Stunted children are likely to be stunted adults.⁴ Long-term impacts of stunting that affect adulthood include: decreased adult height; decreased work capacity and productivity; increased risk for obesity and related illnesses; and poor outcomes of reproductive health.^{5,6}

Maternal undernutrition, maternal stunting, and infection restrict growth in utero.⁵ This highlights the importance of maternal nutrition to achieve adequate child height. Adequate maternal nutrition and weight gain during pregnancy are the cornerstone of health for women and their children, affecting pregnancy outcomes as well as the growth and development of children.

Maternal obesity is on the rise in many countries, including Egypt.⁷ Overweight among women exceeds underweight in most countries, and nearly 75% of adult Egyptian women are overweight.⁸ Recent findings from Australia indicated that consumption of junk food (i.e. non-nutritive processed foods that are high in sugar and/or fat) during pregnancy in women who were overweight and obese pre-pregnancy predicted high infant birth weight, over 4 kg, in comparison to mothers who did not consume these foods.⁹ Carrying too much weight during pregnancy may have adverse effects on the fetus, setting the stage for increased risk for obesity over the child’s lifetime.^{8,10} A recent study found excessive pregnancy weight gain to be associated with higher body weight in childhood, which was only partially explained by birth weight, suggesting an effect of a child’s weight on later adult weight, including overweight and obesity.⁵ Evidence also reveals that if a mother has poor dietary intake of energy, protein, and micronutrients during pregnancy, her child has increased risk of adult obesity.¹⁰ Evidence also reveals that if a mother has poor dietary intake of energy, protein, and micronutrients during pregnancy, her child has increased risk of adult obesity.⁸

Improving maternal nutrition can reduce the risk of poor pregnancy outcomes such as fetal growth restriction and small-for-gestational age births, and prevention of micronutrient deficiencies can have a role in whether a child develops obesity.¹¹ A recent study in Norway (N=66,000) demonstrated that pregnant women who followed a diet rich in vegetables, fruits, oils, and whole grains significantly reduced their risk of preterm delivery, compared to other women, including women who consumed salty and sweet snacks, white bread, and processed meats.¹²

During the first 2 years following the birth of a child, maternal diet, birth spacing, and postpartum family planning are necessary to ensure that women have adequate nutrient stores to support subsequent pregnancies and prevent or reduce existing nutrient deficiencies and anemia, and allow women to maintain a healthy weight for better birth, growth, and health outcomes. A study of Demographic and Health Survey (DHS) data from 52 developing countries also found that the likelihood of a child becoming stunted or chronically undernourished increases substantially with decreasing birth intervals.¹³

Since 2005, Egypt has faced increased levels of food insecurity, combined with rising poverty rates, food prices, and successive crises, including the avian influenza epidemic (2006) and food, fuel, and financial crises (2007–2009) resulting in reduced household access to food and purchasing power.¹⁴ In Egypt, the 2008 DHS revealed diets of mothers of young children, specifically the foods and liquids consumed and recalled 24 hours prior to the survey:¹⁵

- 90% of mothers consumed foods made from grains

- 86% of mothers ate meat; fish, including shellfish; and poultry
- 60% ate legumes and nuts
- About half ate fruits and vegetables with vitamin A or other fruits/vegetables
- About 70% consumed cheese, yogurt, and other milk products and half consumed milk
- 80% drank coffee or tea
- 16% ate sugary foods and 84% ate food made with oil, fat, or butter

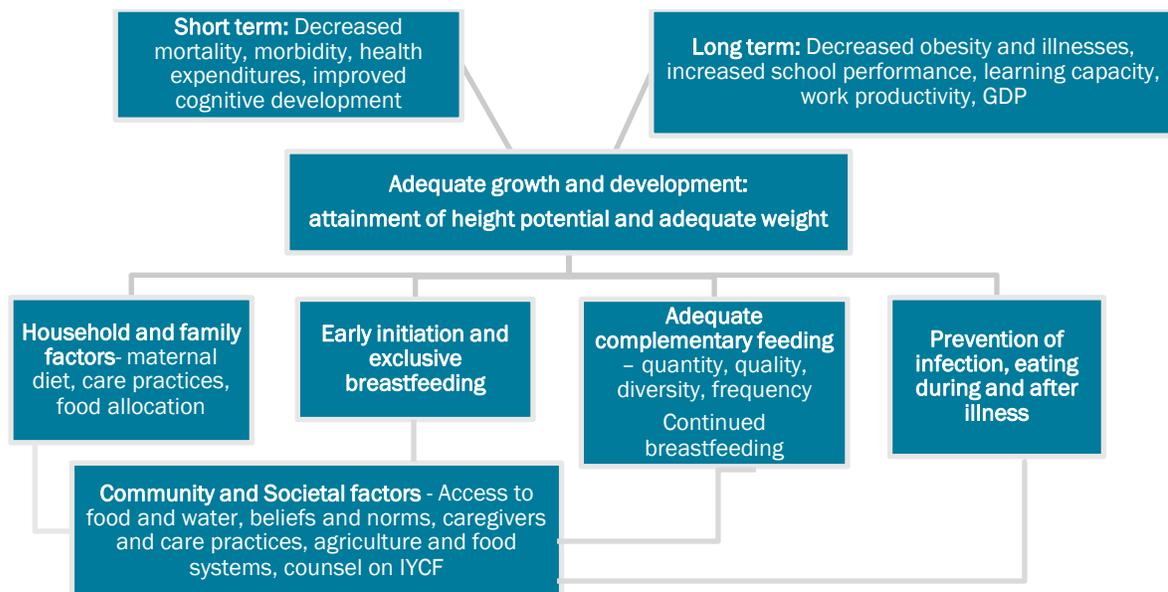
These data showed that mothers had high consumption of grains, meat, and milk, and moderate consumption of legumes, which are staples in the Egyptian diet. Yet fruits and vegetables were consumed by only half of mothers, while foods made with oil, fat, and butter were consumed by the majority of mothers. Junk foods are part of mothers' diets.

An examination of perceptions and cultural beliefs about maternal diet and weight gain during pregnancy as well as maternal diet, birth spacing, and family planning within the first 2 years following the birth of the child can help identify recommendations to improve dietary intake for mothers within the context of feeding practices to prevent stunting in young children.

METHODS

The study was conceptualized using the World Health Organization (WHO) Framework on Childhood Stunting, which emphasizes the importance of maternal diet and care practices, alongside breastfeeding practice (exclusive breastfeeding in the first 6 months postpartum and continued breastfeeding until 2 years of age), and complementary feeding practices to ensure a child reaches his/her height potential and adequate weight.¹⁶ We adapted the WHO model to provide for a structured contextual approach to explore behaviors, perceptions, and cultural beliefs of maternal diet, weight gain during pregnancy, birth spacing, and family planning, including the Lactational Amenorrhea Method* (LAM) (see Figure 1).

Figure 1. Adapted WHO framework of factors associated with stunting



*The Lactational Amenorrhea Method (LAM) is a temporary contraceptive method based on natural infertility resulting from certain patterns of breastfeeding. LAM integrates postpartum family planning and nutrition because it promotes exclusive breastfeeding, which reduces malnutrition and mortality in infants in their first 6 months and extends birth intervals which, in turn, promotes maternal and child survival.

There is a need to address factors related to stunting, including IYCF practices and the avian influenza outbreak, which coincided with a rise in stunting in Lower Egypt. This was the focus and impetus for an operations research study conducted by the Maternal and Child Health Integrated Program (MCHIP), in collaboration with American University in Cairo (AUC) Social Research Center, and local nutritionists affiliated with the National Nutrition Institute. MCHIP is the United States Agency for International Development (USAID) flagship project on maternal, newborn, and child health, focused on accelerating the reduction of maternal, newborn, and child mortality by increasing the use of integrated maternal, newborn, and child health (MNCH) interventions to address underlying causes of mortality, including malnutrition. MCHIP implemented the SMART Project in Lower and Upper Egypt to improve health service delivery through private sector community development association (CDA) clinics and community health workers to carry out community-based strategies to improve nutritional status and newborn health.

This study examined the following household and family factors, as well as community and societal factors in relation to stunting in Lower and Upper Egypt: cultural beliefs, perceptions, facilitating factors and barriers to maternal nutrition, weight gain during pregnancy, and birth spacing. In this mixed methods study, qualitative data collection methods (i.e., in-depth interviews) were used to gather detailed information from mothers on maternal nutrition, weight gain during pregnancy, birth spacing/family planning, and LAM, and cultural beliefs and perceptions that influence these practices. Details of the study are documented elsewhere.¹⁷

In collaboration with local researchers, questionnaires were piloted in communities in Lower and Upper Egypt, and then adapted to the local cultural context. All questionnaires were translated and administered in the local language of Arabic. Oral consent forms were translated into Arabic. These Arabic consent forms were then back-translated into English to confirm accuracy. Ethical approval was granted by The Egyptian Society for Healthcare Development, PATH Ethics committee, and the AUC Social Research Center.

The two study sites were composed of one district each in Upper Egypt (El-Maragha District, Qaliobia governorate) and Lower Egypt (Kafr Shokr District, Sohag governorate). Both regions of Egypt are primarily Muslim. Qaliobia, Lower Egypt (population 4.2 million, 11% poor), is a semi-urban area, north of Cairo in the Egypt Delta (also known as “greater Cairo”) and is a the top producer of chicken and eggs, as well as maize, wheat, cotton, fruits, animal husbandry.¹⁸ Upper Egypt, Sohag governorate, is an agricultural rural area, producing sugar cane, grains, and clover for animal husbandry, and nearly half of the population (3.7 million) is considered poor.¹⁸ These districts reflect two of six SMART Project governorates and allowed for comparisons of infant feeding practices between regions with the highest (Lower Egypt) and the lowest (Upper Egypt) levels of stunting, according to the DHS.¹⁵

Data collection was carried out in five villages (Shundaweel, Naga Abo Awad, Shorania, El Gherizat, and Nahed Amer) in El-Maragha District, Sohag governorate, in Upper Egypt and in three villages (Kafr Kordy, Kafr Tesfa, and Tesfa) in Kafr Shokr District, Qaliobia governorate, in Lower Egypt. Pregnant women and lactating and non-lactating mothers were selected using purposive sampling in Lower and Upper Egypt. We conducted 40 in-depth interviews with pregnant women to ascertain perceptions regarding maternal diet, micronutrient supplementation (i.e., iron and folic acid supplementation), and weight gain during pregnancy. We interviewed 80 women with children less than 2 years of age, including lactating (breastfeeding) mothers (N=40) and non-lactating mothers (N=40). Women were asked to discuss cultural norms related to foods eaten during lactation or non-lactation, weight gain during pregnancy, family planning including LAM, and perceptions of breastfeeding, as well as reasons for breastfeeding cessation among non-lactating women (see Appendix 1 for interview guides).

All 120 in-depth interviews with pregnant, lactating, and non-lactating women were audio-recorded and transcribed verbatim by trained transcribers into Arabic. Locally trained researchers from AUC listened to all of the recordings after the transcription process to confirm Arabic transcriptions. Trained interpreters translated transcripts from Arabic into English. Researchers from MCHIP and AUC jointly read the English transcripts, which were checked against Arabic transcripts. All transcripts were triangulated with field data collection forms and informal observations conducted during fieldwork. The team conducted preliminary analyses of in-depth interviews to develop thematic categories relating to maternal diet, weight gain during pregnancy, and postpartum family planning and birth spacing to be used as a preliminary coding structure. Issued as a statement by WHO, postpartum family planning (PPFP) is the prevention of unintended and closely spaced pregnancies through the first 12 months following childbirth.* This definition of PPFP is used in this report.

The coding process allowed for the identification of dominant themes and descriptions that emerged during interviews. Two researchers verified dominant themes in a subset of transcripts. Qualitative analyses of transcripts were carried out using NVivo version 10.0 analytic program.¹⁹ Two separate coders coded the interviews in Arabic and English to confirm reliability.

*WHO and MCHIP Statement for Collective Action for Postpartum Family Planning
http://www.who.int/reproductivehealth/topics/family_planning/Statement_Collective_Action.pdf

Results

CHARACTERISTICS OF STUDY PARTICIPANTS

One hundred and twenty women were interviewed for the study (see Tables 1 and 2). Overall, maternal characteristics within the study samples showed a similar distribution between Upper and Lower Egypt.[†] Mother's ages ranged between 18 and 42 years. Very few mothers were illiterate (14 women), as the majority were educated, and the level of education they received varied from primary school to post-secondary education. Almost all mothers were not working.

Table 1. Characteristics of pregnant mother study participants in Upper and Lower Egypt

PREGNANT WOMEN	AGE			PREGNANCY TRIMESTER			EDUCATION*				EMPLOYMENT		
	<=19	20-39	>=40	1 st	2 nd	3 rd	Illiterate	Primary	Secondary	Post-Secondary	Not Working	Unskilled Labor	Professional
Lower Egypt (N=20)	10%	90%	-	10%	60%	30%	5%	10%	50%	35%	90%	-	10%
Upper Egypt (N=20)	15%	85%	-	5%	65%	30%	30%	10%	50%	10%	100%	-	-
Total (N=40)	12%	88%	-	7%	63%	30%	17%	10%	50%	23%	95%	-	5%

*Note that categories of primary and secondary education indicate participation in these levels of education and do not necessarily indicate completion.

Table 2. Characteristics of study participants with children under age two in Upper and Lower Egypt

WOMEN WITH CHILDREN UNDER 2 YEARS	AGE			CHILD AGE			EDUCATION*				EMPLOYMENT		
	<=19	20-39	>=40	0-11.99 months	12-23.99 months	Unknown	Illiterate	Primary	Secondary	Post-Secondary	Not Working	Unskilled Labor	Professional
Lactating Mothers													
Lower Egypt (N=20)	5%	95%	-	65%	20%	15%	10%	20%	50%	20%	85%	10%	5%
Upper Egypt (N=20)	5%	90%	5%	75%	15%	10%	10%	10%	65%	15%	80%	10%	10%
Total (N=40)	5%	93%	2%	70%	18%	12%	10%	15%	58%	17%	83%	10%	7%
Non-Lactating Mothers													
Lower Egypt (N=20)	5%	95%	-	0	95%	5%	-	10%	70%	20%	80%	10%	10%
Upper Egypt (N=20)	-	95%	5%	45%	55%	0	15%	15%	65%	5%	75%	20%	5%
Total (N=40)	2.5%	95%	2.5%	23%	75%	2%	7%	12%	68%	13%	78%	15%	7%

[†]A greater proportion of women were illiterate in Upper Egypt than Lower Egypt in the pregnant and non-lactating sample of women. *Note that categories of primary and secondary education indicate participation in these levels of education and do not necessarily indicate completion.

In the study sample of pregnant women (N=40), 62% of pregnant women were in the second trimester and 30% in the third trimester. For women with children under the age of two (N=80), the majority of lactating women (70%) had children who were 0–11.99 months old (less than a year old), while the majority of non-lactating women (75%) had children between 12 and 23.99 months.

Though non-lactating mothers were defined as mothers who were not currently breastfeeding at the time of the interview, almost all of these mothers had breastfed for some duration of time, as only five women breastfed for less than 6 months, and most had weaned their children after 12 months.

This section describes the dominant themes emerging from the in-depth interviews with pregnant, lactating, and non-lactating mothers in both Upper and Lower Egypt. Themes are organized under the thematic categories that the research team developed, which include: Advice on Nutrition and Diet during Pregnancy and Lactation; Maternal Diet during Pregnancy; Iron and Folic Acid Supplementation during Pregnancy; Cultural Perceptions of Foods Mothers Should Consume during Lactation; Cultural Perceptions of Appropriate Foods for Non-lactating Women; Knowledge and Use of the Lactational Amenorrhea Method; Optimal Birth Spacing and Perceived Effects of Poorly Spaced Birth. In this study sample, there was little variation, as most women were educated and not working. The stratification of the data across educational level and occupation did not yield any thematic differences. In some of the themes, differences were observed between Upper and Lower Egypt, and those were discussed accordingly.

“The doctor’s role during pregnancy is important, since he gives me the best advice on nutrition, and the best types of food and drink. It is usually members of my household who then continue to advise me when I am pregnant, in addition to the doctor of course. It is mostly my mother and mother-in-law.”

~Lactating mother, Lower Egypt

The dominant themes identified under each of the thematic categories are presented in **bold text**. Each theme is followed by a detailed description, and includes quotes from the interviews. All text presented with quotation marks represents the direct quote or language that the study participants used.

ADVICE ON NUTRITION AND DIET DURING PREGNANCY AND LACTATION

During pregnancy, women received advice from various sources in the community. Pregnant women trust and value the advice of physicians the most, while also considering the advice from family and community members.

Sources of advice on which foods to eat during pregnancy came from health care providers, husbands, mothers-in-law, friends, and neighbors, as well as the Internet and television, which mothers acknowledged as affecting choices of foods eaten during the antenatal period. Mothers most often reported valuing and trusting the advice from medical doctors, who provide routine antenatal care, on the “best” foods to eat and which foods to avoid during pregnancy. In addition to doctors’ advice, mothers also expressed their regard and appreciation for advice from family and other members of their communities.

“The doctor’s role during pregnancy is important, since he gives me the best advice on nutrition, and the best types of food and drink. It is usually members of my household who then continue to advise me when I am pregnant, in addition to the doctor of course. It is mostly my mother and mother-in-law.” Lactating mother, second year after birth of the baby, Lower Egypt

“Lactating woman usually eats vegetables like arugula and drinks milk to increase the breast milk. The family is the one who usually advises the lactating woman about eating during breastfeeding.”

~ Lactating mother, first year postpartum,
Upper Egypt

“It is the doctor who advises the pregnant woman on the right type of foods. Additionally, there is also SMART Project that has specialized people to spread awareness amongst us, there is a lady called Ronda. She comes on monthly basis and advises us of the nutritious types of food to eat. They teach us to eat well, take care of our babies’ health, and advise us to follow up with the doctor for the sake of the mother and the baby.” Non-lactating mother, second year after birth of the baby, Upper Egypt

Mothers received advice on what foods to eat during breastfeeding from various sources.

During lactation, mothers consulted various community and family members (family, elderly women, neighbors and friends, media) as sources of information regarding which foods to eat during breastfeeding, particularly to increase breast milk quantity. Mothers received conflicting information from vegetables to *Halawa* and sugary foods.

“I eat everything, people advised me to eat – Halawa and sugary food, but my doctor told me it is better to eat green vegetables.”

~ Lactating mother, first year postpartum,
Lower Egypt

“Lactating woman usually eats vegetables like arugula and drinks milk to increase the breast milk. The family is the one who usually advises the lactating woman about eating during breastfeeding.” Lactating mother, first year postpartum, Upper Egypt

Health care providers may also advise mothers on the types of foods to consume during breastfeeding.

MATERNAL DIET DURING PREGNANCY

Pregnant women believe that a diet low in carbohydrates and high in proteins, essential vitamins, and minerals is necessary for a healthy pregnancy.

When asked about their knowledge of foods that are good to eat during pregnancy, women described a prenatal diet that is high in proteins as well as essential vitamins and minerals, and recommend “good” and “beneficial” foods such as meat, fish, lentils, chicken, eggs, and milk, as well as various fruits and vegetables. As discussed by two women, from Lower and Upper Egypt:

“Milk, meat because of the vitamins and calcium they are rich in, also fruits and fish; all are nutritive. The protein in meat is good for the baby.” Pregnant woman, 5 months, Lower Egypt

“Useful food for pregnant woman is chicken, eggs, meat, milk, lentil, and also home food. Pregnant woman should eat fruits (guava). These foods are important because it strengthen the child’s body.” Pregnant woman, 5 months, Upper Egypt

Pregnant women rarely mentioned grains (breads, rice, and pasta) and potatoes as essential foods for a healthy pregnancy. Carbohydrates, as a food group, were viewed as “not beneficial” for pregnancy and were perceived to cause “bloating for the mother” and excessive weight gain; therefore mothers believed they should restrict their intake and “[these foods] should not be consumed much.”

“Carbohydrates are not useful for pregnant woman because it contains oils. Sugar also is not good because it might cause pregnancy diabetes and obesity. I take small amounts of carbohydrates ... I eat less bread (balady bread).” Pregnant woman, 6 months, Upper Egypt

“Carbohydrates are not good, example macaroni; the pregnant should eat less of it because it increases the weight but is not nourishing.” Pregnant woman, 4 months, Lower Egypt

Consumption of identified “beneficial” foods during pregnancy is sometimes restricted due to personal preferences, food affordability, and limited income. Diet during pregnancy is generally limited to dairy products, meats, eggs, beans, and potatoes

When asked about food consumption during pregnancy, pregnant women said that they did not always consume foods known to be beneficial and rich in nutrients. Only some pregnant women indicated actually consuming foods they had identified as beneficial for pregnancy. Women may have developed aversions to these foods during pregnancy.

“Sometimes I don’t have appetite for food like lentils and beans.” Pregnant woman, 7 months, Upper Egypt

Poor economic conditions impacted the ability to afford food and restrict consumption, regardless of the food’s nutritional value.

“I do not eat much meat or fish because I do not have enough money to buy either of them.” Pregnant woman, 5 months, Upper Egypt

For the majority of women, diet during pregnancy was limited to the consumption of milk, cheese, eggs, some meats (either red meat or chicken), as well as fried or boiled potatoes; even though this was perceived to be “not beneficial.” Women do not consistently indicate including vegetables or fruits in their diet.

“Usually I eat fried potatoes, white cheese, and I drink milk. I used to like marmalade but now I don’t like it. I stopped eating fish and meat.” Pregnant woman, 4 months, Lower Egypt

“I usually eat food that is available in the house like beans, cheese, and fried or boiled potatoes. Because our income is limited.” Pregnant woman, 3 months, Upper Egypt

Junk food and caffeinated beverages as well as salty, pickled, and spicy foods are considered culturally taboo or “bad” to eat during pregnancy, but their consumption is not always restricted, and their harm is generally misunderstood.

When asked about foods that are harmful to consume during pregnancy, pregnant women said they recognize that junk foods (lunch meat, soda, prepackaged potato chips, biscuits, and locally made potato chips sold by street vendors); salty foods; acidic foods (e.g., foods cooked with onions and tomatoes); and caffeinated beverages (tea and coffee) cause great harm during pregnancy for both mothers and their babies. They cited perceived adverse effects, e.g., “*high blood pressure*,” which could result from increased salt intake, and “*deformation of unborn children*,” which reflects their misunderstanding of these effects.

“Pregnant woman must avoid eating salty or spicy food like hot pepper, salty cheese and pickles, because it may cause allergy to the child.” Lactating mother, first year postpartum, Lower Egypt

However, they indicated that they are inconsistent in putting this knowledge to practice and sometimes chose to consume these foods regardless. As one pregnant woman explained:

“Things I like to eat are creamy, spicy and salty food. The salty food cause deformation of the child and gives the pregnant woman allergies I think sodas and lemon are not good for pregnant women. But I like these things and eat them. I have beans and tamaiya [falafel – patties made of fava beans] for breakfast with pickles and salty cheese (mish).” Pregnant woman, 3 months, Lower Egypt

The perceived harms caused by junk foods were not well-understood by mothers. For example, while foods that were perceived to contain preservatives as well as dark (caffeinated) sodas were frowned upon, light-colored sodas and store-bought juices were perceived to be acceptable for consumption in large amounts.

“Some foods the pregnant woman should not eat are all the dark sodas (cola), light colors [sodas] are okay and sardines because it contains large amounts of salts which is dangerous.” Pregnant woman, 6 months, Lower Egypt

“Foods which contain preservative are bad, example potato chips, cheese and luncheon meat. These types have no benefit for the pregnant woman. My mother told me that. I have to drink soda daily. I also drink juices that I buy from the store about two to three times a week.” Pregnant woman, 4 months, Lower Egypt

Mothers mainly had misinformation about the harmful effects of these taboo foods, including such effects as “chips cause worms for the fetus,” salty foods create “a burning sensation when delivering the child,” and junk food “causes cancer of the blood.” On the other hand, some mothers were correct in saying caffeine can be stimulating. Table 3 lists the perceived harms of taboo foods during pregnancy.

Mothers learned of the harmful effects of these foods from family members and health workers, as well as media sources (e.g., TV and the Internet), which were viewed as trusted sources of information on health.

Table 3. Perceived harms of taboo foods during pregnancy, according to currently pregnant, lactating, and non-lactating Egyptian women in Upper Egypt (N=60) and Lower Egypt (N=60)

TABOO FOODS DURING PREGNANCY	PERCEIVED HARM	MOTHER	CHILD	REPETITIONS (NUMBER OF TIMES MENTIONED)	
				Upper Egypt (N=60)	Lower Egypt (N=60)
Junk Food	▪ “Causes cancer in the blood”	✓	✓	3	63
	▪ “Makes the bones fragile”	✓	✓		
	▪ “Causes miscarriage”	✓			
Caffeinated Beverages	▪ Cause “malformation”		✓	18	47
	▪ “Destroy iron” and “cause anemia	✓	✓		
	▪ Act as a “stimulant”	✓	✓		

TABOO FOODS DURING PREGNANCY	PERCEIVED HARM	MOTHER	CHILD	REPETITIONS (NUMBER OF TIMES MENTIONED)	
				Upper Egypt (N=60)	Lower Egypt (N=60)
Salty Foods	▪ “Increase albumin in the blood”	✓	✓	68	67
	▪ Contribute to the “malformation of the child”		✓		
	▪ Create “swelling” and “edema”	✓	✓		
	▪ Cause “burning of the chest”	✓			
	▪ Cause “poisoning”	✓			
	▪ Cause “allergies”	✓			
	▪ “Form salty stones in the body”	✓			
	▪ Create a “burning sensation when delivering the child”	✓			
Acidic/Spicy Food	• “Causes colic”	✓	✓	60	55
	• “Causes hemorrhoids”	✓	✓		
	• “Causes constipation”	✓	✓		
	• Is “not nutritious”	✓	✓		
	• “Causes heartburn”	✓			
	• Affects “the head”		✓		
	• “Makes the baby kick his mother’s womb”	✓			

WEIGHT GAIN DURING PREGNANCY

All pregnant women perceive weight gain to be a natural and essential part of pregnancy related to carrying the fetus. They often do not associate weight gain with nutrition, food consumption, health status, or activity patterns.

All women indicated that when pregnant it is inevitable that they will gain weight due to the presence and growth of the infant.

“A pregnant woman should gain weight during her pregnancy, but how much weight I don’t know but the weight increases by itself because of there is a baby inside. This baby is eating and growing. There is no reason for a pregnant woman not to gain weight, whether she likes it or not, her weight will increase because of the child.” Pregnant woman, 6 months, Lower Egypt

While some women associated healthy weight gain and fetal growth with good nutrition and the amount of food consumed, many misunderstood the connection between nutrition and weight gain. As one woman indicated:

“A pregnant woman gains extra weight because extra weight is being formed around him, the baby. She will gain weight because the baby will increase her weight, he is gaining weight so it will add on to her weight, it has nothing to do with her health or her nutrition, so there is no reason to keep the pregnant woman from gaining weight.” Pregnant woman, 4 months, Lower Egypt

Here, the concept of weight gain as a consequence of carrying an “additional person” emerges as this quote from a pregnant woman from Lower Egypt illustrates:

“A pregnant woman should gain weight to be 70–80 kilos since they are two persons. Originally she was 50–60 kilos.” Pregnant woman, 4 months, Lower Egypt

Pregnant women have little to no knowledge of optimal weight gain during pregnancy, likely due to lack of counseling by health care providers.

When asked about the appropriate amount of weight to gain during pregnancy, women relayed that they do not receive counseling on weight gain during pregnancy by health care providers. As a result, the majority of women indicated little to no knowledge of the amount of weight to gain during pregnancy, and when asked to estimate the amount of healthy weight gain, they based their estimates on their experiences with previous pregnancies. Those who claimed to have some knowledge of weight gain had an incorrect understanding of appropriate weight gain and stated that excessive weight gain in some cases was acceptable. Responses regarding the optimal amount of weight to gain during pregnancy varied widely, ranging from 2 kg to 50 kg during the course of pregnancy.

“A pregnant woman should gain weight. I was 50 kilos before pregnancy and now I am 59 kilos which is appropriate, so it is normal to gain a kilo per month. I might have heard that on TV or from someone, but the doctor did not tell me. He doesn’t weigh me unless I ask him.”

~Pregnant woman, 6 months, Lower Egypt

“A pregnant woman should gain weight. I was 50 kilos before pregnancy and now I am 59 kilos which is appropriate, so it is normal to gain a kilo per month. I might have heard that on TV or from someone, but the doctor did not tell me. He doesn’t weigh me unless I ask him.” Pregnant woman, 6 months, Lower Egypt

“I don’t know how much the pregnant woman should gain, nobody told me. The woman should gain ½ a kilo per week all over the 9 months. Weight gain can be very high if the pregnant woman increases 4 to 5 kg per week.” Pregnant woman, 6 months, Lower Egypt

IRON AND FOLIC ACID SUPPLEMENTATION DURING PREGNANCY

Women routinely receive iron and folic acid (IFA) supplementation during antenatal care; however, some mothers said they do not know why IFA is important or the reasons for taking IFA, which makes adherence problematic.

The majority of women were prescribed IFA supplements at the point when they receive antenatal care, which can sometimes surpass the ideal point of supplementation, as some women report starting these supplements at their third, fourth, or fifth month of pregnancy.

Our data showed that women are provided a combined IFA supplement, are given either iron or folic acid, or are given iron separately (usually in the second trimester) once a folic acid supplementation is initially completed (usually during the first trimester). As one woman explains:

“I was given the folic pills only but not the iron. I took the pills that prevent the deformation of the fetus. At the health clinic they told me that when I am in the 4th month of pregnancy I will be given the iron pills.” Pregnant woman, 3 months, Lower Egypt

“I took the iron and folic pills, the doctor gave them to me when I saw him after the fourth month and told me they were good for the baby I have been taking them for about 2 months.” Pregnant woman, 5 months, Lower Egypt

In Lower Egypt, IFA supplements are exclusively prescribed by private health care providers, and women who had not taken IFA supplements indicated that they were not following up with a health care provider. In Upper Egypt, however, these supplements are either prescribed by private health care providers, clinic health care providers (SMART Project), or both providers simultaneously. This can sometimes create confusion among women about their supplements, given that each woman sees more than one provider and receives IFA pills of various formulations and colors. As one woman relayed:

“They give us iron and folic acid [combined] tablets here at this clinic, the packet is green and contains colored pills. I was told not to take any other type of pills beyond that. I took the brown one, from another doctor, not the one in this clinic, for a month, it was in the third month I think. I took it for 1 month once per day after lunch. The other pills they gave me, the one on the green box, I took from the 4th month. I continue to take those pills, from the 4th until now.” Pregnant woman, 6 months, Upper Egypt

The data also indicated that health care provider counseling on IFA supplements was inadequate because some women did not understand that IFA supplements are for anemia, the reasons why they need to take IFA, how to handle side effects—due to lack of counseling; only one woman indicated receiving any counseling about IFA side effects. For example, some women talked about how the doctor had informed them that by taking these pills *“it would be good for both me and the baby,”* that the woman would not *“bleed or require blood transfusion”* or ever feel *“dizzy,”* and that the IFA pills would *“increase the blood volume.”* One woman said she was given the pills *“to control her weight and benefit the baby,”* while another just *“does not know what the iron pills do.”* Another stated, *“I don’t know why I had to take them, the doctor is the one that prescribed these pills”* Pregnant woman, 8 months, Lower Egypt

“I stopped taking the iron pills the doctor gave me. I threw them away, they made me weak and I was uncomfortable taking them. The doctor had told me to take them twice a day because of my weakness. But I stopped taking them, I think it causes me to faint.”

~Pregnant woman, 3 months, Lower Egypt

While the majority of women indicated that they have taken IFA supplements at some point (83%), less than half of these women (48%) consistently adhered to IFA supplementation and some women had even stopped them all together.

“I stopped taking the iron pills the doctor gave me. I threw them away, they made me weak and I was uncomfortable taking them. The doctor had told me to take them twice a day because of my weakness. But I stopped taking them, I think it causes me to faint.” Pregnant woman, 3 months, Lower Egypt

“I took the pills when I was sick ... but as soon as I got better, I stopped them even though my doctor asked me to take it consistently because I am underweight.” Pregnant woman, 4 months, Lower Egypt

The lack of adherence despite some indication of the benefits of IFA supplements was largely due to the following:

- Side effects, such as nausea:

“For the iron, I was not consistent with it, I would skip a day or two, I didn’t finish the box within 2 months. I still have about two strips left (10 pill/strip). The pills make me want to vomit and gives me stomach aches.” Pregnant woman, 5 months, Lower Egypt

- Lack of motivation to improve adherence:

“I didn’t take all the pills, I took around 10 tablets altogether. I don’t remember exactly. I am just not good about adhering to medication in general. I don’t like taking medication. I used to take them after the meals. These pills were to give me strength until the end of pregnancy, to prevent bleeding at the time of delivery, and to prevent deformation of the child.” Pregnant woman, 9 months, Lower Egypt

- Conflicting information from external sources and misinterpretation of IFA benefits:

“They say that these things like pills and vitamins, they make the baby’s head big, so when I went to the doctor and she gave me these pills, I only took one strip of each pill, but I was advised by people not to take any more. This was during my fourth month, I would take a pill 1 day, then forget to take them for 2 days, then I stopped because of what people said about the baby’s head becoming big and this will make a woman have a C-Section when delivering. Everyone around me was saying that. The doctor gave it to me, but I decided to stop it, and I didn’t ask the doctor first.” Pregnant woman, 5 months, Upper Egypt

Another woman explained reasons for starting and stopping IFA supplements:

“I took two boxes of iron pills, each box has about two strips of 10 pills because I was not eating well in my second, third and about fourth month. I stopped taking it because iron increases the blood volume, and I will need that in about my ninth month, so I will start taking it again in my after my seventh month.” Pregnant woman, 6 months, Upper Egypt

A breakdown of iron and/or folic supplements taken by pregnant women is described in Table 4.

Table 4. Iron, folic acid, and iron and folic acid supplements prescribed to women during antenatal care, Upper and Lower Egypt

IRON AND/OR FOLIC ACID PRESCRIBED	UPPER EGYPT (N=20)	LOWER EGYPT (N=20)
Folic acid supplements followed by iron supplements	20%	35%
Only folic acid	0	10%
Only iron	15%	0
Combined iron and folic acid supplement	45%	40%

CULTURAL PERCEPTIONS OF FOODS MOTHERS SHOULD CONSUME DURING LACTATION

Women increase their food consumption during lactation, more so than in other periods, which include pregnancy, in order to increase milk production.

Overall, women indicated that they generally consume more foods during lactation than they usually do, including during pregnancy. The quantity of foods consumed was perceived to be associated with the amount of milk produced. As one woman explains, *“The more I eat, the more milk I have. I eat more now that I breastfeed than I used to eat when I was pregnant.”* Again here, when comparing their food consumption patterns with pregnancy, women did not regularly associate food consumption with fetal growth as they associated it with milk production. As one woman explained, *“There is a difference in diet between a pregnant woman and a lactating one. The latter eats more because she produces the milk for the child/breastfeeding him”* Pregnant woman, 4 months, Lower Egypt

“If I forget to eat or if I eat only one meal, then the [breast] milk is not sufficient for the child and he cries until I feed him, but if I eat a lot then the milk is plenty and the child is satisfied and sleeps.” Lactating mother, first year postpartum, Lower Egypt

“Eating is very important during this period because if the woman does not eat well, the milk will be less.” Lactating mother, first year postpartum, Lower Egypt

Mothers associate nutritious foods with sufficient milk production, improved milk quality, and the well-being of both mother and child.

Mothers consciously tried to improve their diet during lactation and favored foods that increased the quality and quantity of breast milk. This process involved eating foods that were considered “good” to “*increase the breast milk*” and improve its “*heaviness*.” Typical foods indicated for this purpose were milk, eggs, radishes, leafy greens (e.g., arugula, spinach, *molokhaia*, Jew’s mallow), and protein sources (e.g., legumes, fish, chicken, and meats). Some traditional foods were also seen as a means to increase milk production, such as *Halawa*, a sweet dish made of sesame paste, butter, and sugar, as well as fenugreek tea.

“I usually eat food such as Halawa, fish, and vegetables like arugula or radish to increase my breast milk.” Lactating mother, first year postpartum, Upper Egypt

Mothers also viewed these foods as “*strength*” and “*energy giving*” to the mother while benefiting the child’s health simultaneously. One mother commented, “*Eggs and milk are good for lactating woman because it provides the child with calcium.*” Lactating mother, first year postpartum, Upper Egypt

Another mother indicated, “*Breastfeeding women eat meat, milk, eggs, lentils and beans. Meat, fish, eggs and honey are good for breastfeeding mothers. These types of food give breastfeeding women energy and iron.*” Lactating mother, first year postpartum, Upper Egypt

During lactation, mothers restrict their consumption of foods that are considered “taboo” and “harmful” to both milk production as well as the overall health of the mother and child.

Some foods are traditionally taboo to consume during lactation, as they are seen to decrease milk production. This includes foods that are “*pickled*,” “*very salty*,” and “*very spicy*.” Mothers explained that “*lactating women must avoid eating salty food because it decreases the breast milk.*” and “*Chili pepper and salty cheese are bad for breastfeeding women because they affect the milk.*”

Some foods are traditionally taboo because of their perceived ill effects on the child’s general health. For example, “*Pickles and spicy food are bad for lactating women because they make the child colicky, ... and cauliflower, molokhaia, (Jew’s mallow), and mango [are bad] because they cause diarrhea to the child. Also heavy food (stewed foods) causes diarrhea.*” Lactating mother, first year postpartum, Lower Egypt

Moreover, there were also some restrictions on traditional foods, such as those that are salty, spicy, pickled, and “*heavy*” or “*simmered*” (stewed), as well as non-traditional foods (junk foods) that stem from knowledge of the ill effects of these foods on the health of the mother, which are believed to be transmitted to the child.

“The baby is affected by this food since the mother is nursing.” Lactating mother, first year postpartum, Lower Egypt

“What is bad for lactating women are potato chips, soda, and fast food. Sodas affect the bones, chips is not nutritive and fast food is greasy. All this is transmitted through the milk to the child and harms the child in the same way.” Lactating mother, second year following the birth of the child, Lower Egypt

CULTURAL PERCEPTIONS OF APPROPRIATE FOODS FOR NON-LACTATING WOMEN

Non-lactating mothers have no dietary restrictions, and can eat any foods they desire during lactation, including junk food.

In contrast to their pregnancy and lactating periods, non-lactating mothers stated that *“there is no food that a non-lactating woman shouldn’t eat,” “nobody tells her what to eat,” and “she can eat anything she wants.”* Once she has stopped lactation, she is free to return to her “normal” diet as one mother explains:

“The women who breastfeed their infants eat more during their period of breastfeeding than their period of pregnancy because of the nutrition of their embryo. During my period of breastfeeding I didn’t eat any kind of beans as I was afraid to affect the health of [my child] Nour but after weaning her I began to eat the beans again. The woman who doesn’t breastfeed eats her normal meal, the same quantity of food that she usually eats. The woman who doesn’t breastfeed eats from the same food her family eats at home like the simmered food which is called in our village the red cooked food; we put the potatoes, the kidney beans, the vegetable marrow, the peas, the carrots together and cooked them with the tomato sauce.” Non-lactating mother, first year postpartum, Upper Egypt

For the non-lactating mother, there were no rules or restrictions on food intake, and she could even indulge in eating junk food. As one mother explained, *“I like the potato chips very much but my husband prevented me from eating it during the period of my pregnancy in order to protect me and protect the embryo from the preservatives that can affect our health, but now after giving birth to my infant I feel free to eat anything, even the chips.”* Lactating mother, second year following the birth of the baby, Lower Egypt

“What is bad for lactating women are chips, soda, and fast food. Sodas affect the bones, potato chips are not nutritive and fast food is greasy. All this is transmitted through the milk to the child and harms the child in the same way.”

~Lactating mother, Lower Egypt

However, some women were of the opinion that non-lactating women should eat foods that would build their nutrient stores for the next pregnancy, and mothers talked about foods rich in iron and calcium:

“She [non-lactating woman] must eat food rich with iron and calcium like vegetables to provide her with well nutrition and to be able to become pregnant again in good health. Non-lactating woman can eat any kinds of food and there is no bad food for her.” Non-lactating mother, first year postpartum, Upper Egypt

Early Weaning

Most non-lactating mothers breastfed their infants for at least 6 months, and tended to wean their children after their first year. Mothers weaned before completing the recommended 2 years of breastfeeding because they believed that their children

“I like the potato chips very much but my husband prevented me from eating it during the period of my pregnancy in order to protect me and protect the embryo from the preservatives that can affect our health, but now after giving birth to my infant I feel free to eat anything, even the chips.”

~Lactating mother, second year following the birth of the baby, Lower Egypt

were now “*grown up*” and “*old enough to eat,*” and weaning would improve the child’s appetite by decreasing his/her dependency on breast milk. As explained by one of the mothers: “*I nursed him for 1 year and 7 months (19 months). The reason I stopped lactating him is that I was advised to do so, as I did with his older brother. My mother-in-law was the one that recommended that based on the belief that this way the child would eat better.*” Non-lactating mother, second year following the birth of the baby, Lower Egypt

Women also tended to wean children once they discovered that they were pregnant, based on the belief that this “*will cause the baby to lose weight.*” Mothers who became pregnant were also advised by their doctors to stop breastfeeding.

“*I breastfed him for 1 year and 2 months but now I weaned him because I am pregnant.*” Non-lactating mother, second year following the birth of the baby, Lower Egypt

“*I nursed Malak 13 or 14 months. I stopped lactating when I found out that I got pregnant and went to the hospital where they told me to stop nursing the child. The doctor told me that it is wrong to nurse the child while being pregnant because the milk will harm the child stomach.*” Non-lactating mother, second year following the birth of the baby, Lower Egypt

KNOWLEDGE AND USE OF LAM FOR WOMEN IN THE FIRST 6 MONTHS POSTPARTUM

Mothers see “clean” lactation and not “natural” lactation as a form of contraception, and are not aware of LAM and the three criteria for its use.*

When asked about the possibility of getting pregnant while lactating, mothers agreed that it was possible if they are “naturally” lactating. Here, “*Natural lactation is when the woman gets her period, and if she doesn’t use a family planning method, she conceives.*” The concept of natural lactation is contrasted with “clean” lactation, which is “*breastfeeding without getting a period, and this way the woman doesn’t conceive.*”

Some mothers relayed the concept of “*clean lactation,*” or lactation with no return of their menstrual bleeding, which is the only component of LAM that mothers were aware of. Mothers did not know about LAM and its three criteria for use. These mothers also did not state that breastfeeding needed to be exclusive (or close to exclusive) for “*breastfeeding for family planning*” to be effective. Other mothers said that “*LAM and breastfeeding is the same thing*” or that “*LAM is longer and healthier for the baby than breastfeeding.*” Some mothers thought LAM meant giving formula to the child instead of breastfeeding. As a woman explained, “*I think LAM is giving the child baby milk or baby formula but breastfeeding is better.*” Lactating mother, second year following the birth of the baby, Upper Egypt

Mothers who viewed breastfeeding as a means to prevent pregnancy also did not understand how this process works. For example, some women attributed the contraception process to type and quantity of breast milk. As one mother explained, “*A woman can get pregnant after 6 months of her delivery because the milk in her breasts prevents the pregnancy during these 6 months because the quantity at that time is great but after 6 months the milk decreases*” Lactating mother, first year postpartum, Lower Egypt

“*I hear that some women have milk that would prevent pregnancy even after they wean the child, this milk remains until they get rid of it.*” Lactating mother, first year postpartum, Lower Egypt
In addition to breast milk, mothers also cited God’s will and hormones as reasons for how lactation can prevent pregnancy:

*For postpartum women to use LAM as a family planning method, they must fall under the following criteria: 1) menstrual bleeding has not resumed; AND 2) the infant is fully or nearly fully breastfed frequently, day and night; AND 3) the infant is under 6 months of age.

“Whether a nursing mother gets pregnant during nursing varies among mothers. I think the main reason is due to hormones. Some doctors say that mother’s milk prevents any conception. In some cases, a mother’s hormones are decreased, and pregnancy does not take place. This all goes back to God’s will, but we have to take our precautions anyway.” Lactating mother, first year postpartum, Lower Egypt

“I have been lactating for 3 months and have not gotten pregnant. And I’m not using any family planning method. Also my aunt and my mother got pregnant while lactating. This is from God, I don’t know the reason.” Lactating mother, first year postpartum Lower Egypt

Optimal Birth Spacing and Perceived Effects of Poorly Spaced Births

Mothers recognize prevention of pregnancy for at least 2 years is better for both the mother and the child’s health, and believe that breastfeeding during pregnancy is “bad” for the child and must be discontinued.

Mothers indicated that birth spacing for at least 2 years was necessary because becoming pregnant before the child reaches his/her second year was detrimental to their own health and to the child’s health. This would require a mother to discontinue breastfeeding. Here cultural beliefs specify that the milk produced during a state of pregnancy is “bad,” “poisonous,” “polluted,” and “not enough”; therefore, “she must stop breastfeeding.”

“If the woman gets pregnant while breastfeeding she has to stop breastfeeding her child because her milk will be poisoned and can harm him.” Lactating mother, second year following the birth of the baby, Lower Egypt

“If the woman gets pregnant she shouldn’t continue breastfeeding her infant already born as her milk will become polluted. Consequently it can affect the health of the infant who breastfeeds. My mother is the person who told me that.” Non-lactating mother, first year postpartum, Upper Egypt

Traditionally, the effect on the breastfed child was perceived to be not only physical but also “psychological.” A pregnancy can be sensed by the breastfed child, which “will create jealousy between the siblings, and you will find the older child being negatively affected” as it “makes him lose his appetite” and “feel neglected.” This was echoed in various explanations, such as:

“Lactating woman must wean her child at the age of 5 months old if she becomes pregnant again because the taste of breast milk will be different and the child will feel jealous. If a woman becomes pregnant before 2 years after having a baby, she will be sick and she will suffer from iron deficiency. This may affect the breastfeeding baby because he will stop breastfeeding and he may have a weak immune system.” Lactating mother, first year postpartum, Upper Egypt

“I do not think women should continue breastfeeding during pregnancy because the child can get jealous and lose weight.” Lactating mother, first year postpartum, Upper Egypt

The health of the mother and fetus was also a major concern. As one mother explained:

“If I get pregnant before 3 years I will become weak and unhealthy. I feel tired and dizzy all the time and I can’t do my house work properly. Also the fetus will be affected because he will not have enough food to take from me. Also I won’t be able to look well after my child and to nourish him properly.” Non-lactating mother, second year following the birth of the baby, Lower Egypt

The minimum 2-year period between pregnancies was viewed as the time when the mother “regains her strength” and “rests after giving birth and breastfeeding her child” and it “enables the mother to look well after her children.” As one mother explains:

“If the woman gets pregnant before 2 years of giving birth to the infant she will become weak as breastfeeding and pregnancy at the same time can affect the health of the woman. In addition to that she will be unable to take care of her children (their food, their cleanliness, playing with them), she will pay attention to her embryo more than them.” Non-lactating mother, first year postpartum, Upper Egypt

USE OF OTHER FAMILY PLANNING METHODS IN THE EXTENDED POSTPARTUM PERIOD AND IN THE 2 YEARS FOLLOWING CHILDBIRTH

In Lower Egypt, most breastfeeding mothers were in the first year postpartum and using a method of family planning. Mothers participating in the study reported using intrauterine devices (IUDs) and oral contraception pills. In contrast, in Upper Egypt, the majority of lactating mothers were not using any method. About half of non-breastfeeding mothers, primarily in the second year following childbirth, were using family planning methods, including injectables, oral contraception pills, as well as IUDs. Overall, study participants who chose not to use family planning methods after childbirth indicated that they did not need them because they wanted to become pregnant again, or their husbands worked abroad, or they had recently given birth and were 40 days postpartum.

If the woman gets pregnant she shouldn't continue breastfeeding her infant already born as her milk will become polluted. Consequently it can affect the health of the infant who breastfeeds. My mother is the person who told me that.”

~Non-lactating mother, Upper Egypt

Discussion

MATERNAL DIET

Pregnancy and lactation are critical stages for maintaining adequate nutrition. Women require a varied diet in order to meet the increased nutrient and energy requirements of pregnancy and support adequate weight gain (See Table 5). These study findings indicate that there is a gap between mothers' knowledge about nutritious and harmful foods for pregnant women and the types and amounts of foods actually consumed during pregnancy. Pregnant mothers restrict the consumption of some of the foods they know to be beneficial due to certain preferences and food affordability. For the majority of women, diet during pregnancy was restricted to the consumption of milk, cheese, eggs, some meats (either red meat or chicken), as well as fried or boiled potatoes. Mothers conveyed junk food, caffeinated beverages, and salty, pickled, and spicy foods as culturally taboo during pregnancy. Some mothers recognized that junk foods contain preservatives and are not “*healthy/nutritious*” foods, yet still chose to consume these foods while pregnant. Sodas and drinks that were perceived to be free of caffeine were also seen as suitable to consume freely during pregnancy. Rapid weight gain during pregnancy can result from the consumption of highly processed non-nutritive foods and beverages such as junk foods and sugary drinks.²⁰

Prevention of nutrient deficiencies during lactation requires mothers to have adequate stores of energy and nutrients that need to be maintained through a diversified diet and adequate energy intake. Lactation also increases the mother's need for water; as such, it is essential for women to drink enough liquids. Lactating mothers indicated that they eat more during lactation than pregnancy, though they tend to rely on foods that are thought to increase milk production, like *Halawa* (a traditional food that is high in fat and sugar), while others focus on consuming specific nutritious foods, such as green leafy vegetables, eggs, milk, and fish. In addition, lactating mothers do not consume foods that are thought to negatively affect both milk supply and the child's health. Both of these practices can potentially limit the variety of foods eaten.

While pregnant and lactating mothers restrict dietary intake to foods that are considered appropriate for their specific life stage, non-lactating mothers believe that they are free from any restrictions, and can eat whatever they want, including junk foods, as long as they are not breastfeeding. Overweight and obesity can result from the consumption of highly processed non-nutritive foods and beverages such as junk foods and sugary drinks. Some non-lactating women also indicated that they had stopped breastfeeding their children sometime after their children were a year old because they were indeed pregnant once again.

Whether lactating or not, the first 2 years following the birth of a child present an opportunity for women to maintain good nutritional status and a healthy weight that will allow them to avoid deficiencies and be well-prepared for their next possible pregnancy. Pregnant, lactating, and non-lactating mothers should be counseled during antenatal, postpartum, and child health visits to address the specific nutritional needs and problems that are associated within each of these stages (see Table 5). All mothers should be encouraged to incorporate adequate amounts of diverse foods in their diets, including animal-source food, lentils, fruits and vegetables, and grains in order to support a healthy maternal diet and optimal pregnancy and child growth outcomes²⁰ (see Table 5).

To avoid the restriction of beneficial foods, health care providers and community-level strategies should also emphasize moderation, educate mothers on the correct benefits and harms of specific foods, and provide counseling on how to maintain a balanced diet in the event of economic constraints and pregnancy-induced food aversions or nausea. Counseling efforts should also discuss limiting non-nutritive foods like junk foods, as well as sugary drinks and

teas, which inhibit iron absorption, and ensure that women maintain a healthy weight during and following pregnancy.²⁰ Counseling on maternal diet also serves as an opportunity to address feeding problems among infants and young children.¹⁷ Mothers should also be counseled that the nutritious and diverse foods they should be eating are also appropriate for their families, including children who are 6–23 months old. The study findings from this operations research demonstrate the limited variety, quantity, and frequency of meals given to children 6–23 months of age in Lower and Upper Egypt, and the overconsumption of junk foods among these children.

Mothers need the right types of foods, taking into consideration variety and quantity, to provide the nutrients needed for the mother and the baby during pregnancy and following pregnancy.

Table 5. Counseling messages for maternal diet during pregnancy, lactation, and non-lactation ^{14,20,21}

MESSAGES FOR HEALTHY DIET DURING PREGNANCY
<ul style="list-style-type: none"> ▪ You do not have to “eat for two”, or double the amount food you eat. From about the third month of pregnancy, you need an extra 240 kcal per day, and after your sixth month, you need an extra 452 kcal per day. <ul style="list-style-type: none"> – First trimester: no additional calories per day (no additional meal per day) – Second trimester: 240 additional calories per day (1 additional meal per day) – Third trimester: add 452 calories per day (1½ additional meals per day) ▪ It is important to eat lots of vegetables, fruits, bread, potatoes, pasta, cereals, beans and lentils; some milk, cheeses, and yogurts; and fish, lean red meats, and poultry. ▪ Make sure to eat at least five portions of fruits and vegetables per day (e.g., a tomato, 1 cup of spinach). ▪ Pregnant women need an extra 25 grams of protein during pregnancy. Make sure to eat at least two portions of meat, poultry, fish, or beans; meats are also great sources of iron. If meats/chicken/fish are not available or are too expensive, make sure to eat other, less expensive animal protein sources such as milk, eggs, and cheese, as well as plant protein sources such as peas, beans, and lentils. ▪ For nausea and vomiting, eat small but frequent meals (with about 2-hour intervals); avoid smells and foods that make your sickness worse; eat nutritious carbohydrate foods: try dry toasts, breakfast cereals, fruits, and vegetable salads at any time during the day; eat less fatty and sugary foods: consume spicy foods in moderation. ▪ Try to avoid junk foods, sugary drinks, sweet desserts and pastries, and caffeinated beverages (such as tea, coffee, and colas); junk foods, sweets, and sugary drinks are not nutritious, they are high in fat and/or sugars, and caffeine can interfere with the absorption of iron; if you do consume these foods, make sure to do so in moderation.
MESSAGES FOR HEALTHY DIET DURING LACTATION
<ul style="list-style-type: none"> ▪ Breast milk alone is the best food and drink for an infant for the first 6 months of life. After 6 months, infants need other nutritious foods, in addition to breastfeeding up to 2 years and beyond, to meet their growth and development needs. Feeding your baby solid food, along with breast milk, protects your baby from malnutrition. ▪ Breast milk production takes a lot of energy; during the first 6 months of breastfeeding, mothers need about 500 kcal more than when they are not breastfeeding or pregnant; breastfeeding also increases the mother’s need for fluids. ▪ During breastfeeding, eat a wide variety of vegetables, fruits, bread, potatoes, pasta, cereals, beans and lentils, milk, cheeses, and yogurts; meat (fish, red meat, and poultry, like chicken). ▪ Take three or more servings of milk products daily, like a cup of milk, or a piece of cheese. ▪ Make a greater effort to eat vitamin-A-rich vegetables or fruit often. Examples of vitamin-A-rich foods include carrots, spinach, or other cooked greens, sweet potatoes, and cantaloupe. ▪ Be sure to drink when you are thirsty. You will need more fluid than usual. Drink plenty of water, milk, and soups. ▪ Try to avoid junk foods, sugary drinks, sweet desserts and pastries, and caffeinated beverages (such as tea, coffee, and sodas); junk foods, sweets, and sugary drinks are not nutritious and are high in fat and/or sugars. ▪ Caffeine can interfere with the absorption of iron and can pass to the infant through breast milk; avoid tea, coffee, and sodas. If you do consume these foods, make sure to stop drink drinking these, or limit to 1–2 cups a day.
HEALTHY DIET WHEN NOT BREASTFEEDING
<ul style="list-style-type: none"> ▪ It is always important to eat a varied diet that includes lots of vegetables, fruits, bread, potatoes, pasta, cereals, beans and lentils, and some milk, cheeses, and yogurts, fish, lean red meats, and poultry. This will help you stay healthy and avoid deficiencies. ▪ Do not eat junk foods, sugary drinks, sweet desserts and pastries, and caffeinated beverages (such as tea, coffee, and colas); junk foods, sweets, and sugary drinks are not nutritious, they are high in fat and/or sugars, and caffeine can interfere with the absorption of iron. If you do consume these foods, make sure to do so in moderation.

IRON-FOLIC ACID SUPPLEMENTATION DURING ANTENATAL CARE

It is difficult to meet the increased need for iron and folic acid to support a healthy pregnancy from diet alone, and as such, IFA supplementation is recommended during pregnancy.²²⁻²⁴ WHO recommendations for IFA supplementation are 30–60 mg elemental iron plus folic acid 400 mg daily for 6 months (180 days) during pregnancy to prevent low birth weight, iron deficiency, and maternal anemia, though 60 mg of iron is preferred where anemia is a public health problem (prevalence of 40% or higher)^{23,25} Although the SMART project provided messages on anemia, the pregnant mothers in this study did not always understand why health care providers had prescribed iron-folic acid pills for anemia, nor were they given appropriate counseling on how to deal with possible side effects of these supplements. Seeking health care services from different providers who give different pills of varying colors added to the confusion about IFA supplements among pregnant women. Gaps in consistent and/or correct guidance and information on IFA can support women to adhere to IFA during pregnancy and should be investigated in future activities, through private clinics, CDAs, public clinics and pharmacies. Counseling on anemia and its consequences, as well as why and how mothers should take iron-folic acid supplements, should be strengthened in health facilities and at the community level, taking into account these factors. Mothers will be encouraged and motivated to prevent anemia during pregnancy with adequate counseling, (see Table 6),²⁶ which could be adapted to the cultural context.

Table 6. Counseling messages for anemia and iron-folic acid supplementation during pregnancy

When and how to take supplements
<ul style="list-style-type: none"> Take one iron-folic acid supplement per day between meals or before going to bed with a little juice or water or fruit for 180 days.
How to store supplements
<ul style="list-style-type: none"> Keep tablets in a cool storage place out of the reach of small children.
Where to return for more tablets
<ul style="list-style-type: none"> Return for more tablets at the health center, store, or other usual supplier.
The importance of taking all supplements
<ul style="list-style-type: none"> Take all supplements to ensure the health of the baby and the health and strength of the mother.
Side effects
<ul style="list-style-type: none"> They may occur as dark or black stools, gastric upset, nausea, diarrhea, or constipation. They are not serious and should subside in a few days.
Managing side effects
<ul style="list-style-type: none"> Take supplements with meals (instead of between meals or before bed). Don't take with tea or coffee because they reduce the advantage of the iron. Split scored tablets in half and take each half at a different time of day.
No negative effects
<ul style="list-style-type: none"> Iron is not a medicine and will not harm an unborn baby if taken as directed. Iron does not increase the baby's birth weight (i.e., it does not cause "large babies"). Iron does not increase the amount of blood or cause high blood pressure.

WEIGHT GAIN DURING PREGNANCY

Mothers do not understand how much weight they need to gain during pregnancy and are not counseled on weight gain in relation to their pre-pregnancy weight. Health care providers should provide counseling on adequate weight gain during pregnancy, and relay the message that¹⁷ mothers need to gain enough weight to have a healthy pregnancy and to support breastfeeding (see Table 7).

Table 7. Recommended weight gain during pregnancy based on pre-pregnancy weight (Institute of Medicine, Updated Guidelines for Weight Gain during Pregnancy, 2009)

PRE-PREGNANCY WEIGHT	TOTAL WEIGHT GAIN	RATES OF WEIGHT GAIN IN 2 ND AND 3 RD TRIMESTERS
	Range in kilograms (kg)	Mean and the range of kilograms gained per week
Underweight (BMI* less than 18.5)	12.5–18 kg	0.51 (0.44–0.58) kg per week
Healthy weight (BMI 18.5 to 24.9)	11.5–16 kg	0.42 (0.35–0.50) kg per week
Overweight (BMI 25.0 to 29.9)	7–11.5 kg	0.28 (0.22–0.33) kg per week
Obese (BMI equal to or more than 30)	5–9 kg	0.22 (0.17–0.27) kg per week

*BMI = body mass index (weight in kg divided by height in meters squared, or kg/M²)

BIRTH SPACING AND FAMILY PLANNING

Mothers recognize that prevention of pregnancy for at least 2 years is better for both the mother’s and the child’s health. Short birth spacing interval will make the mother “*weak*,” and incapable of tending to the needs of additional children. Within the context of the effect of birth spacing on the child’s health, mothers view the continuation of breastfeeding as a motivation for birth spacing.

However, mothers also believe that breastfeeding during pregnancy is “*bad*” for both the growth of their fetus and the psychological well-being of their breastfeeding child and must be discontinued. This supports the previously discussed study finding that non-lactating women had stopped breastfeeding because they had indeed become pregnant. There is a need for guidance on how to address breastfeeding during pregnancy, within the context of the belief that breastfeeding and pregnancy are incompatible.²⁸ Mothers need to be counseled that birth spacing of at least 2 years can also help to reduce the risk of stunting in their communities and poor pregnancy outcomes.^{13,29,30}

LAM is not understood by mothers as a viable family planning method. Exclusive breastfeeding can be reinforced by teaching mothers about LAM, explaining that breastfeeding benefits not only the child but the mother as well. Teaching mothers that fulfilling the three criteria for LAM is effective protection against pregnancy in the first 6 months postpartum promotes exclusive breastfeeding. (The three criteria are: 1. Menstrual bleeding has not resumed; and 2. The infant is fully or nearly fully breastfed frequently, day and night; and 3. The infant is under 6 months of age.) Exclusive breastfeeding reduces malnutrition and mortality in infants in their first 6 months and extends birth intervals which, in turn, promotes maternal and child survival. Encouraging mothers to get another family planning method at 6 months, when mothers start complementary feeding, is also needed.

Conclusion

Women relayed their knowledge, cultural beliefs and perceptions about foods that should be eaten during pregnancy and lactation; food aversions; IFA supplementation and weight gain during pregnancy; birth spacing; and LAM. Junk food and caffeinated beverages, and salty, pickled, and spicy foods are considered culturally taboo or “bad” during pregnancy, but were still consumed by some mothers. Mothers primarily had misinformation about the harmful effects of these taboo foods and were also selective about which junk foods were considered to be appropriate to eat during pregnancy. During breastfeeding, mothers consume more foods than during pregnancy. The quantity of foods consumed is perceived to be associated with the amount of milk produced. Mothers also relate higher intake of nutritious foods with sufficient milk production, improved milk quality, and the well-being of both mother and child, but not fetal growth. Counseling mothers on incorporating a wide variety of food is needed to support healthy pregnancy, fetal growth, and adequate weight gain during pregnancy. Counseling on maternal diet also serves as an opportunity to address feeding problems among infants and young children. Mothers should also be counseled that the nutritious and diverse foods they should be eating are also appropriate for their families, including children who are 6–23 months old, and that these foods are appropriate for the child’s age and can be digested, supporting healthy growth and development. Junk foods should be limited not only for mothers and children, but for all family members. Health care providers and community-level strategies should also aim to discuss limiting the non-nutritive foods like junk foods, including sugary drinks, like soda and teas, which inhibit iron absorption.

Pregnant women have little to no knowledge of optimal weight gain during pregnancy and a limited understanding of the health benefits of birth spacing and LAM. Women also routinely receive IFA supplementation during antenatal care. Mothers do not always understand why health care providers have prescribed iron-folic acid pills for anemia, nor are they given appropriate counseling on how to deal with temporary side effects of IFA supplements. Future activities should include, as part of a comprehensive strategy, strengthening counseling by health care providers to address maternal diet, alongside infant and young child feeding practices, IFA supplementation, birth spacing, and LAM, at all health contacts with Egyptian mothers during antenatal and postnatal care.

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Appendix 1: Interview Guide for Pregnant, Lactating, and Non-Lactating Women

PREGNANT WOMEN INTERVIEW GUIDE

Pregnancy and Parity Status

How far are you in your current pregnancy? How many other children do you have?

Maternal Diet and Weight Status

How much did you weigh before you were pregnant (current pregnancy)?

What types of food do pregnant women usually eat? (Probes: What types of food are good for pregnant women to eat? What are the reasons these foods are good? What types are bad for pregnant women to eat? What are the reasons these foods are bad? What types of food do pregnant women avoid eating? What are the reasons they avoid these foods?)

Tell me about your diet now. (Probes: What types of food do you usually eat? Why? What types of food do you eat less often? Why?)

What quantity of food do you eat during pregnancy in relation to the quantity you usually eat when you are not pregnant or breastfeeding? (Probe: Same amount, more?) Was there a time in your pregnancy when you were eating less or more food? When was this time? Why do you think you were eating less or more during this period?

Who helps you decide what to eat during pregnancy? What is the role of this/these people in advising a mother what to eat during pregnancy?

How much weight are women supposed to gain during a pregnancy? Why do they need to gain weight? Is there a reason why women should not gain too much weight? How much is too much weight to gain in pregnancy?

Anemia and Treatments for Anemia (Iron Pills and Deworming)

Have you ever received iron and/or folic acid pills during your pregnancy? If yes, show the pill (i.e., brown, yellow), if possible. How many? Who did you receive these pills from? Of the total number of iron you received, how many did you take? Why did you take them all? Why didn't you take them all?

Did you receive deworming medicine? Did you take it?

Maternal Activity Pattern

Tell me about your activity patterns throughout the day. (Probes: What types of household work do you do? What types of agricultural or other work do you do? How much do you walk to obtain water/food/get to a workplace? Are you working the same amount of time per day as you did before you were pregnant? Are you working less time? Working more time? Are there certain activities you are not doing now that you are pregnant?)

Can you tell me how old your youngest child is? How many other children do you have?

LACTATING & NON-LACTATING WOMEN INTERVIEW GUIDE

Lactation Status

Are you breastfeeding your child? Yes = 1, No=2

If no, did you previously breastfeed your child and stop breastfeeding? Yes = 1 No = 2

How long did you breastfeed?

If you did previously breastfeed, why did you stop breastfeeding?

If you never breastfed your child, why did you choose not to breastfeed?

Section A. Maternal Diet and Weight Status during Pregnancy (If the mother already completed this during her in-depth interview during pregnancy, skip to Section B.)

First I'd like us to talk about nutrition and pregnancy.

What types of food do pregnant women usually eat? (Probes: What types of food are good for pregnant women to eat? What are the reasons these foods are good? What types are bad for pregnant women to eat? What are the reasons these foods are bad? What types of food do pregnant women avoid eating? What are the reasons they avoid these foods? Do you eat these foods (good and bad) for a certain amount of time?)

What quantity of food do you eat during pregnancy in relation to the quantity you usually eat when you are not pregnant or breastfeeding? More, less, the same amounts?

Who decides what a woman eats during pregnancy? What is the role of this/these people in advising a mother during pregnancy? Who advises pregnant women about what to eat? (Probe: People in the family? People outside the family?)

How much weight are women supposed to gain during a pregnancy? Why do they need to gain weight?

How did you feel about your weight early in your last pregnancy? What about later during the pregnancy? How much weight did you gain during the pregnancy? How did your weight change after delivery? What about while breastfeeding?

Section B. Maternal Diet and Weight Status during Breastfeeding

Now I'd like us to talk about your nutrition during breastfeeding.

Tell me about your diet now. (Probes: What types of food do you commonly eat now? What types of food do you eat less frequently than before you were breastfeeding? Why? What things determine the types of food you eat now while you are breastfeeding?)

How do you think your own diet influences your breastmilk? (Probes: the amount of breastmilk, quality, the way body produces breastmilk)

- What types of food, generally, do breastfeeding women usually eat? (Probes: What types of food are good for breastfeeding women to eat? What are the reasons these foods are good? What types of food are bad or should be avoided by breastfeeding women? What are the reasons these foods are bad or should be avoided?)
- What quantity of food do breastfeeding women eat in relation to the quantity they eat when they are pregnant?

- Who helps choose what foods breastfeeding women should eat? (Probes: Who advises breastfeeding women about what they should eat? People in the family? People outside the family?)

Now, I am going to ask you some questions about diet and non-breastfeeding women.

- What types of food generally, do non-breastfeeding women usually eat? (Probes: What types of food are good for breastfeeding women to eat? What are the reasons these foods are good? What types of food are bad or should be avoided by non-breastfeeding women? What are the reasons these foods are bad or should be avoided?)
- What quantity of food do non-breastfeeding women eat in relation to the quantity they eat when they are pregnant?
- Who decides what foods breastfeeding women should eat? (Probes: Who advises breastfeeding women about what they should eat?)

Now I would like to ask you some questions about breastfeeding, preventing pregnancy, and family planning.

Do you think a woman can get pregnant while she is breastfeeding her baby? Why or why not?

After having a baby, generally how soon do you think women can become pregnant again?

After having a baby, what is the amount of time that a woman should wait before becoming pregnant again?

If a woman becomes pregnant less than 24 months (2 years) after having a baby, how do you think it affects her health? Why? What about the health of the baby? Why?

Why do some women who are breastfeeding become pregnant and others don't?

Are LAM and breastfeeding the same thing or are they different? Yes = 1, No=2

If she says No—Probe: How, in what way? (Probe: ask if the mother knows the 3 criteria for using LAM as a contraceptive method (these criteria are: baby has to be <6 mos. and EBF and mother needs to be amenorrhic; don't tell the women these criteria, but see if she talks about any of these)

Should a woman continue to breastfeed if she becomes pregnant again? Why or why not?

Tell me, what family planning methods are you using now?

Maternal Activity Pattern

Tell me about your activity patterns throughout the day. (Probes: What types of household work do you do? What types of agricultural or other work do you do? How much do you walk to obtain water/food/get to a workplace? Who helps you with these activities?)