NUTRITIONAL COUNSELING IN LACTATING MOTHERS

Thesis

Submitted in Partial Fulfillment of M.Sc. Degree in
Public Health & Community Medicine

By

Suzan Sayed Ahmed Mohamed Sayed Ahmed Hagag
M.B.B.Ch.
Faculty of Medicine, Cairo University

Supervisors

Prof. Dr. **Ibrahim Soliman Hegazy**
Professor of Public Health
Faculty of Medicine- Cairo University

Dr. **Rehab Abdel Hai Ahmed**
Assistant Professor of Public Health
Faculty of Medicine- Cairo University

Dr. **Rania Ali Hegazy**
Assistant Professor of Pediatrics
Faculty of Medicine - Cairo University

Faculty of Medicine
Cairo University
2012

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

وَالْوَالِدَاتُ يُرْضِعْنَ أَوْلَادَهُنَّ حَوْلَيْنِ كَامِلَيْنِ لِمَنْ أَرَادَأَنْ يُتِمَّ الرَّضَاعَةَ

صدق الله العظيم

سورة البقرة الآية (233)

ACKNOWLEDGMENT

First and foremost thanks are due to **'Allah'**, the most beneficent and merciful.

I would like to express my deepest gratitude to Prof. Dr. **Ibrahim Soliman Hegazy**, Professor of Public Health, Cairo University, for his great assistance, continuous encouragement and generous advice.

I also wish to express my deep appreciation and indebtedness to Dr.**Rehab Abd Elhai Ahmed**, Assistant Professor of Public Health, Cairo University for her constant guidance, valuable criticism and encouragement throughout the work.

My thanks for Dr.**Rania Ali Hegazy**, Assistant Professor of Pediatric, Cairo University, for her kind supervision and constant support.

My deepest gratitude goes to all my family members for their constant love and support. I dedicate all of my work to them.

Last but not least, I wish to send my sincere greetings to all the mothers whose endless love and sacrifice build up our future generations.

ABSTRACT

Dietary practices of the lactating mothers have a significant effect on the wellbeing of both mothers and infants. **Methods:** This study is an interventional study that assesses the nutritional practices of the lactating mothers followed by nutritional counseling. A total of one hundred mothers were chosen from the clients of the breastfeeding clinic at the Center of Social & Preventive Medicine (CSPM). Personal interview was done fulfilling sociodemographic characteristics, nutritional practices by food frequency questionnaire and medical history. Additionally, physical examination was done, and weight and height were evaluated to calculate the BMI. The food guide pyramid was used for counseling followed 3 months later by assessment of food intake, anthropometric measures and physical examination. **Results:** Revealed that the main observed nutritional practices were high consumption rice, macaroni, butter, margarine, sugar, tea and cola. While low consumption of red meat, poultry, fish, liver, egg, milk, yogurt, split peas, dry beans, lentils, cooked vegetables, raw vegetables and fruits. The majority (85%) rarely exercised. Overweight and obesity were more prevalent (39% and 37%respectively) and 41% suffered from pallor while 56%from spongy gums. There was significant improvement in nutritional practices after counseling regarding poultry, fish, egg, milk, yogurt, raw vegetables and fruits, split peas, lentils consumption (all with significant P-values < 0.05). Furthermore macaroni and margarine showed significant decrease in consumption with P-value < 0.05. Overall BMI, changes showed significant improvement similar to improvement in physical activity, improved pallor and spongy gums.

Conclusion: This study shows that the nutrition counseling sessions have a positive effect on feeding practices and health of the lactating mothers.

Key words: **Nutrition-Counseling-Lactation-Breastfeeding-mother.**

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

BMI	Body Mass Index
CNS	Central Nervous System
CSPM	Center for Social and Preventive Medicine
DEXA	Dual Energy X ray Absorptiometry
DHA	Docosahexanic acid
EDHS	Egyptian Demographic Health Survey
FAO	Food Agriculture Organization
FFQ	Food Frequency Questionnaire
FGP	Food Guide Pyramid
IgA	Immunoglobulin A
IGF	Insulin like growth factor
IL	Interleukin L
WHO	World Health Organization
WHR	Waist Hip Ratio

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

Exclusive breastfeeding is recommended by all the international agencies for the first six months of life. Hence, the nutritional status of the breastfeeding mothers is considered to be important for the well being of both mothers and infants ***(Allen, 2005)***.

The levels of some nutrients such as thiamin, riboflavin, vitamin B-6, vitamin B-12, iodine, and selenium in breast milk are affected by the dietary intake of mothers. Other micronutrients (such as foliate, calcium, iron, copper, and zinc) remain at relatively high levels in breast milk even when the mother's reserves are low ***(Allen, 2005)***. Therefore, mothers should take a balanced daily diet to replenish her stores ***(U.S. Department of Health and Human Services and U.S. Department of Agriculture 2005).***

Women in developing countries often have several micronutrient deficiencies which may cause poor maternal-infant interaction and affect the mental status of the mothers during breastfeeding ***(Frith and Naved, 2009)***. The nutritional status of women in these countries is usually threatened by repeated un-spaced pregnancies which may lead to several nutrient deficiencies. Therefore it is justified to call for nutrition interventions for further improvement of health of lactating mothers and their infants ***(Haidar, et al., 2003).***

Hence, this study was conducted to assess the nutritional practices of lactating mothers and evaluate the impact of nutritional counseling on their nutritional practices.

AIM OF WORK

Promote healthy nutritional practices among lactating mothers.

Specific Objectives:

1- Assess the nutritional practices of lactating mothers.

2- Perform nutritional counseling for lactating mothers.

3- Evaluate the effect of nutritional counseling on maternal nutritional practices.

Chapter (1)

COMPOSITION OF HUMAN MILK

Human milk contains all the nutrients that an infant needs in the first six months of life. These nutrients include carbohydrates, fat, proteins, vitamins, minerals and water. It also contains bioactive factors that augment the immature immune system of the infant, thus providing protection for the infant against infection ***(Donovan, 2005).***

Stages of milk production

1) Colostrum:

It is a thick, yellowish or creamy colored fluid produced in the first few days up to a week after birth. Its yellowish color is due to its high beta carotene content. It has low fat, high protein content and is rich in immune protective components. It also contains a higher percentage of minerals and fat soluble vitamins (A, D and K) than those found in mature milk ***(Donovan, 2005; Wardlaw and Smith, 2009).***

2) Transitional milk:

It is secreted during the latter stages of colostrum secretion and persists between 10 days to 2 weeks. It is then replaced by mature milk. Fat and lactose content are more in transitional milk than in colostrum. It also contains water soluble vitamins and more calories than colostrum ***(American Pregnancy Association, 2011).***

3) Mature milk:

It follows the transitional milk and is composed of approximately 88 – 90 % water which is necessary to maintain hydration of the infant ***(American Pregnancy Association, 2011).*** The remaining 10% is composed of the following:

A) Carbohydrates

Lactose is the dominant carbohydrate in human milk. Small quantities of oligosaccharides, galactose and fructose are also present ***(Picciano, 2001)***.

B) Fats

Lipids provide up to 50% of calories in breast milk. The fat is secreted in small droplets and the amount increases as the feed progresses so the hindmilk at the end of the feed is richer in fat than the foremilk. Breast milk contains long chain polyunsaturated fatty acids including docosahexanic acid (DHA) and arachidonic acid which are considered to be important for the neurological development of the infant ***(Riordan, 2004).***

C) Proteins

Proteins in human milk are predominantly whey proteins including alpha lactalbumin, lactoferrin and various immuno-globulins. Alpha lactalbumin unfolds in the stomach into a different form and binds to oleic acid forming a complex which kills the tumor cells protecting the baby from cancer ***(Svanborg et al, 2003)***. Human milk contains other non-protein nitrogen compounds including urea, creatine, creatinine, amino acids and nucleotides ***(Thorell et al, 1996)***.

D) Fat soluble vitamins

i. Vitamin A

Vitamin A concentration in colostrum is approximately twice its concentration in mature milk and some of vitamin A is in the form of beta carotene. It is responsible for yellowish color of colostrums. Vitamin A concentration in mature milk is 75 microgram/dl or 280 IU/dl ***(National Research Council, 2001).***

Vitamin A is considered to be one of the vitamins of which their content in the human milk is influenced by maternal dietary intake ***(Donovan, 2005).***

ii. Vitamin D

Most of vitamin D in breast milk is in the form of 25-OH2 vitamin D and vitamin D3. The Level of vitamin D in human milk varies with maternal diet and sunshine exposure. It is found that maternal exposure to sunshine increases the level of vitamin D3 in milk by ten folds ***(Brown, 2008).***

Transfer of vitamin D in milk can be limited if maternal plasma levels of vitamin D decrease to critically low levels as in women who restrict intake of food rich in vitamin D or have inadequate sunshine exposure. Milk content is not very responsive to increased maternal intake, and at best, breast milk contains low amounts of vitamin D ***(Picciano and Mc Donald, 2006).*** Hence the American Academy of Pediatricians gave recommendations that all breast fed infants should take daily oral supplementation of 200 IU daily ***(Gartner and Greer, 2003).***

iii. Vitamin K

Vitamin K content in breast milk is not known to be influenced by maternal dietary intake. However some studies found that maternal vitamin K supplementation with pharmacologic doses (5 – 20 mg/day) can significantly increase its concentration in milk and improve vitamin K status of breastfed infants ***(Picciano, 2001).*** Human milk contains only 2.5 microgram/L of vitamin K in comparison to cow milk based formulae that contains twenty times this amount. Therefore breast fed infants should take vitamin K injection after birth to decrease risk of hemorrhagic disease ***(Greer, 2004).***

iv. Vitamin E

It is found that Colostrum is particularly rich in vitamin E (tocopherol). Both full term and preterm infants have similar levels of vitamin E (3IU/100KCAL) and carotenoids levels which are considered to be higher than those in bovine milk ***(Ostrea, 1986)*** or formula ***(Sommerburger, 2000)***. Vitamin E is an antioxidant that protects the cell membrane in retina and lungs from injury. Mothers who take food containing high levels of polyunsaturated fatty acids and fast foods add to oxidation stress and their requirement of vitamin E increase according ***(Riordan and Wambach, 2005).***

E) Water soluble vitamins

Water soluble vitamins include Ascorbic acid, Nicotinic acid, B12, Thiamin, Riboflavin and B6 (Pyridoxine) are influenced by maternal dietary intake. Supplementation of mother by these vitamins increase their level in breast milk then reaches a plateau level. However, there is no need for supplementation if the mothers' diet is balanced ***(Riordan and Wambach, 2005).***