



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Shendi University



Faculty of Post Graduate Studies and Scientific Research

**Assessment of Mothers Knowledge
Regarding Relationship between Early
Weaning and Malnutrition**

*Athesis Submitted in requirements to fulfill master degree in Pediatric
nursing.*

By

Nagia mohmed shems eldeen

Supervisor

Dr: Marim Mohammed Elnageeb

B Sc .MSc .PhD Pediatric nursing

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الآية

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى:

﴿مُحَمَّدٌ رَسُولُ اللَّهِ وَالَّذِينَ مَعَهُ أَشِدَّاءُ عَلَى الْكُفَّارِ رُحَمَاءُ بَيْنَهُمْ
تَرَاهُمْ رُكَّعًا سُجَّدًا يَبْتَغُونَ فَضْلًا مِّنَ اللَّهِ وَرِضْوَانًا سِيمَاهُمْ فِي
وُجُوهِهِمْ مِّنْ أَثَرِ السُّجُودِ ذَلِكَ مَثَلُهُمْ فِي التَّوْرَةِ وَمَثَلُهُمْ فِي الْإِنْجِيلِ
كَزَّرَعٍ أُخْرِجَ شِطَّاهُ فَأَازَرَهُ فَاسْتَغْلَظَ فَاسْتَوَىٰ عَلَىٰ سُوْقِهِ يُعْجِبُ
الزَّرَّاعَ لِيغِيظَ بِهِمُ الْكُفَّارَ وَعَدَّ اللَّهُ الَّذِينَ آمَنُوا وَعَمِلُوا الصَّالِحَاتِ
مِنْهُمْ مَّغْفِرَةً وَأَجْرًا عَظِيمًا﴾

صدق الله العظيم

سورة الفتح - الآية (29)



Dedication
To those

*Who give me the best of life without payment
Happily, I would like to dedicate this simple attempt
to,,,,,*

*The one who have taught me how to be a valuable member
of the community*

'MY FATHER'

To essence of life and meaning of humanity

'MY MOTHER'

*To who share with me all moments of happiness and sadness
and made me happy at time of sadness*

' My lovely family ''

To who gave me sense of everlasting warmth and beauty

'My best friends''

*I thank my all friends and colleagues those who make me
feel friendship and share with me the all burden of carrying
out this research.*

Especial thanks:

"My lover (samia)"

Acknowledgment

All thanks to Allah from the start to the end... ..

And pray for Prophet Mohammed peace be upon him

I would like to acknowledge the contribution of my

Supervisor:

Dr: Mariam Al- Nageeb

*Who guide me throughout my way and helped me to make this
research as accurate and useful as possible.*

*And I'm grateful to my friends and all those who contributed
their time and helped me.*

My thanks also extend to my college and my teachers.

List of abbreviation

Abbreviation	Term
NICU	Neonates Intensive Care Unit
CMS	Centers for Medicare and Medicaid Services
MDROs,	multidrug-resistant organisms
VRE	vancomycin-resistant enter
BSI	possible bloodstream infection
PPE	personal protective equipment
CPAP	continuous positive airway pressure

ملخص الدراسة

أجريت هذه الدراسة الوصفية في وحدة العناية المكثفة لحديثي الولادة بمستشفى المك نمى الجامعي في مدينة شندي في الفترة من سبتمبر إلى نوفمبر 2014م بهدف تقييم معرفة تقنيي التمريض عن كيفية التحكم في انتشار العدوى في وحدة العناية المكثفة لحديثي الولادة. تم اختيار جميع تقنيي التمريض العاملين بوحدة الأطفال أثناء فترة الدراسة.

وقد أثبتت الدراسة أن أقل من نصف تقنيي التمريض (46%) لديهم معرفة بالعدوى، كما أن أقل من النصف (40%) منهم يعرفون طرق الحماية من العدوى، وأكثر من النصف (65%) لديهم خبرة عن الاحتياطات القياسية لمنع انتشار العدوى وأيضاً أثبتت الدراسة أن أقل من النصف (46%) منهم ملمين بمعرفة المعدات اللازمة للسيطرة على العدوى.

وأوصت الدراسة بقيام دورات تعليمية عن طرق الحماية من العدوى وكذلك أوصت بتوفير جميع المعدات اللازمة للحماية من العدوى، كما أوصت تقنيي التمريض بمعرفة مسببات العدوى وطرق الوقاية منها والعناية التمريضية اليومية للرضيع.

Abstract

This was descriptive cross sectional study conducted at Elmek Nimer NICU to assess the knowledge of nurses about infection control in NICU at the period extended from September to November.

The result showed that less than half (46%) of nurses knowledgeable about the infection control, less than half of nurses (40%) knowledgeable about methods used to prevent infection and control strategies, two third half (65%) of them knowledgeable about standard precaution, and lees than half (46%) of nurses knowledgeable about the equipment used to prevent infection.

The study recommended that hospital must develop training course regarding infection control in NICU, infection control equipment should be provide in NICU. The nurses should be knowledgeable about the micro organism developing in NICU, how to prevent from infection, and daily nursing care of infant.

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى:

﴿ وَمَا أُوتِيتُمْ مِنَ الْعِلْمِ إِلَّا قَلِيلًا ﴾

صدق الله العظيم

سورة الإسراء : الآية: (85)



الإهداء

إلي من غمرني بالحب والحنان وأتمني لهم روضة الجنان

إلي أمي وأبي

إلي من ساندني وقف بجانبني

زوجي

إلي من أرشدوني ولم يبخلوا علي بشي

إلي إخواني وأخواتي

إلي رفقا الدرب

زملائي وزميلاتي

إلي كل من علمني حرفا وزرع حروفا من النور لتضيء طريقي

أساتذتي الأجلاء

شكروم وعرفان

قبل لله رب

الشكر من بعد ومن

العالمين

أتقدم باسمي آيات الشكر والعرفان والتقدير

للدكتورة مريم النجيب

التي ساهمت في إنجاز هذا البحث بجهدھا المعنوي

والعلمي. كما أخص بالشكر كل أساتذة بكلية علوم

التمريض

ملخص البحث:

هذه الدراسة أجريت في السودان ولاية نهر النيل مدينة شندي في مستشفى الملك نمر الجامعي لتقييم معرفة الامهات بخصوص العلاقة بين الفطام المبكر وامراض سوء التغذية.

استخدم في هذه الدراسة استبانة وهي تتكون من 25 سؤال وزعت ل70 ام مرافقة لطفلها المريض في المستشفى أثناء فترة الدراسة.

وقد حلت المعلومات باستخدام طريقه التحليل الاحصائي و عرضت النتائج في صورة جداول, وأوضحت نتائج الدراسة أن معظم الامهات ليس لديهم

المعرفة الكافية عن الفطام المبكر وامراض سوءالتغذية واكثر من نصف الامهات تعتبر ان الفطام المبكر ليس له علاقة مع امراض سوء التغذية. وأخيرا أوصت هذه الدراسة بزيادة معرفة الامهات باستمرارو التعلم بصورة منتظمة حتى يزيد من المعرفة

Abstract:

This study was done in Sudan river Nile state in Shendi town, at Elmek Nimer university hospital to assess the mother's knowledge regarding the relationship between early weaning and malnutrition.

Standard closed questionnaire composed from 25 questions was used; it had been distributed among 70 mothers whom admitted with their children in Elmek Nimer university hospital during time of study.

Then the data was analyzed by SPSS (statically package of social science) program method and results presented in form of tables. The result showed that knowledge of mothers in study group about weaning and malnutrition was inadequate and more than half of the woman's consider that early weaning has no relationship with malnutrition disease.

Finally the study recommended that to Establish continuous health education program in hospitals.

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Introduction:

Nutritional status of the child plays vital role in the physical and mental development of the children. Timely balanced feeding makes babies healthy. Healthy babies are future wealth of nation. Inadequate and imbalance diet led to malnutrition which may cause various types of infections. Generally nutritional status depends on food habits, socio-economic conditions, tradition, culture and knowledge of the family .The knowledge about nutrition of the family directly affects nutritional condition of family. Malnutrition makes a child susceptible to infections and delays recovery, thus increasing mortality and morbidity. Every time an innocent child suffers the curse of malnutrition, the responsibility goes to the mother , family and to the community due to their faulty or no knowledge regarding the harmful effects of prelacteal feeding, benefits of exclusive breast feeding and initiation of proper weaning at the correct time.

Weaning is a process of gradual and progressive transfer of the baby from breast milk to the what family diet. It does not mean discontinuing to breast feeding. Weaning begins from the moment supplementary food is started and continues till the child is taken off the breast completely. Breast milk alone is not able to provide sufficient amounts of all the nutrients needed to maintain growth after the first six months. Increasing need of calories and protein of growing children cannot be met by the diminishing output of mother's milk. Milk is also a poor source of vitamin C and supplementation with fruit juice is essential. Iron stores in liver of the infant would last only up to 4-6 months. Hence iron-rich foods should be given at least from six months onwards. Milk is also deficient in vitamin D. If the baby is to maintain the expected rate of growth and remain healthy and well nourished,

supplementary feeding has to be resorted to round about the 6th month of life.⁽¹⁾

weaning is not the cessation of breastfeeding but rather the addition of new foods. Brylin Highton: Weaning as a natural process⁽²⁾

In the strictest sense of the word, weaning means getting a baby used to drinking milk from a cup instead of sucking milk from the breast or bottle; in the broader sense, it also means getting the baby used to taking food by biting and chewing instead of only by sucking; Weaning is now discarded in favor of the phrase complementary feeding. To make weaning an easy adjustment for a baby, it should be done gradually step by step.

A malnutrition is one of the most widespread conditions affecting child health. The 'germ' of malnutrition 'infects' a foetus in the intra-uterine life due to lack of sufficient antenatal care on part of the mother. The condition deteriorates further when after birth the infant is deprived of exclusive breast feeding or initiation of weaning is delayed. Weaning should be started after the age of 6 months and should contain energy rich semi solid food⁽³⁾

Over 6 million deaths (55% of the 12 million children under 5 years of age) each year in developing countries from infectious diseases, can be attributed to malnutrition.

In 2011, the WHO estimated that malnourished children numbered 181.9 million (32%) in developing countries. In addition, an estimated 149.6 million children younger than 5 years are malnourished when measured in terms of weight for age. In south central Asia and eastern Africa, about half the children have growth retardation due to protein-energy malnutrition. This figure is 5 times the prevalence in the western world.

In Sudan the prevalence of chronic malnutrition (stunting) in male was 6.2 and 17.43% for severe and moderate stunting and in females was 3.03 and 12.85% for severe and moderate stunting, respectively. The prevalence of acute malnutrition in both males and females according to the BMI-for-age body mass index (BMI) was 6.99 and 19.19% for severe and moderate acute malnutrition. The prevalence of acute malnutrition (wasting) in males was 6.66 and 19.66% for severe and moderate acute malnutrition and in female was 6.95 and 18.93% for severe and moderate acute malnutrition⁽⁵⁾

Infant and young child nutrition has been engaging the attention of scientists and planner since long for the very simple reason that growth rate in the life of human beings is maximum during the first year of life and infant feeding practices comprising of both the breast feeding as well as complementary feeding have major role in determining the nutritional status of the child. The link between malnutrition and infant feeding has been well established. Recent scientific evidence reveals that malnutrition has been responsible directly or indirectly for 60% of all deaths among children under five years annually .over2/3 of these deaths are often associated with inappropriate feeding practices and occur during the first year of life .only 35% of infants world-wide are exclusively breast feeding during the first four months of life and complementary feeding begins either too early or too late with foods which are often nutritionally inadequate and unsafe.

Poor feeding practices in infancy and early childhood resulting in malnutrition contribute to impaired cognitive and social development, poor school performance and reduced productivity in later life. Poor feeding practices are therefore, a major threat to social and economic development as

they are among the most serious obstacles to attaining and maintaining health of this important age group⁽⁶⁾

Justification and Rationale

Malnutrition and early weaning problem is one of the main health problems facing children in under five age group in developing countries. The prevalence of malnutrition imposes significant costs on the Sudan economy as well as society.

Also assessment of the mothers knowledge is essential to ensure that the growth and development is proceeding successfully and. will lead to improved well being of child a decreased incidence of early weaning complications.

Because of importance of good knowledge of mother about early weaning and how it complete nutrition I did is research.

Objectives

General objective:

Assessment of Mothers knowledge regarding the relationship between early weaning and malnutrition.

Specific objectives:

- To identify the knowledge about importance of lactation.
- To assess mothers knowledge about effect of early weaning on baby health.
- To assess mothers knowledge about concept of malnutrition
- To assess mothers concept and attitude regarding weaning.
- To assess mothers knowledge about the common complications of poor nutrition and early weaning.

Literature Review:

Important of lactation:

Breastfeeding is universally endorsed by the world's health and scientific organizations as the best way of feeding infants. 1–3 Years of research have shed light on the vast array of benefits not only for children but also for mothers and society. For children, breastfeeding supports optimal development and protects against acute and chronic illness. For mothers, breastfeeding helps with recovery from pregnancy and childbirth and provides lifelong health advantages. For society, breastfeeding provides a range of economic and environmental rewards.

Benefits for Children:

Breastfeeding offers advantages for children that cannot be duplicated by any other form of feeding. The benefits of breastfeeding begin from the first moments after childbirth and last for many years after breastfeeding ends. Compared with formula-fed children, those who are breastfed are

healthier and have fewer symptoms and shorter illnesses when they do get sick.

Breastfed children:

- Score higher on cognitive and IQ tests at school age, and also on tests of visual acuity^{4–6}
 - Have a lower incidence of sudden infant death syndrome (SIDS)
 - Are less likely to suffer from infectious illnesses and their symptoms (e.g., diarrhea,⁷ ear infections,^{7,8} respiratory tract infections, meningitis⁷)
 - Have a lower risk of the two most common inflammatory bowel diseases (Crohn's disease, ulcerative colitis).
 - suffer less often from some forms of cancer (e.g., Hodgkin's disease,¹⁰ childhood leukemia)
 - have a lower risk of juvenile onset diabetes, if they have a family history of the disease and are breastfed exclusively for at least 4
 - are significantly protected against asthma and eczema, if at risk for
 - allergic disorders and exclusively breastfed for at least 4 months^{11,12}
 - may have a lower risk of obesity in childhood and in adolescence^{13,14}
 - Have fewer cavities and are less likely to require braces
- Breastfeeding provides benefits not just for full-term infants but also for premature and low birth weight infants. Compared with premature infants who receive human milk, those who receive formula have future IQs that are 8–15 points lower.

For premature infants, human milk:

- Significantly shortens length of hospital stay
- Reduces hospital costs
- Hastens brainstem maturation
- Reduces the risk of life-threatening disease of the gastrointestinal system and other infectious diseases.

Benefits for Mothers:

Breastfeeding offers a range of benefits for mothers as well as their children. Women who have breastfed are less likely to develop ovarian and premenopausal breast cancers.^{16,17} The more months a woman has spent breastfeeding, the greater the beneficial effect. Breastfeeding reduces osteoporosis.

Breastfeeding mothers enjoy a quicker recovery after childbirth, with reduced risk of postpartum bleeding.¹⁶ Mothers who breastfeed are more likely to return to their prepregnancy weight than mothers who formula feed.¹⁶ Breastfeeding reduces the risk for long-term obesity.

Exclusive breastfeeding may reduce the risk of anemia by delaying the return of the menstrual cycle for 20 to 30 weeks.¹⁷ Exclusive breastfeeding for the first 6 months postpartum, in the absence of menses, is 98 percent effective in preventing pregnancy.¹⁷ Breastfeeding mothers are reported to be more confident and less anxious than bottle-feeding mothers.¹⁸ Breastfeeding contributes to feelings of attachment between a mother and her child.

Benefits for Society:

Breastfeeding offers society not only improved health of children and mothers but also economic and environmental benefits. Breastfeeding reduces the need for costly health services that must be paid for by insurers, government agencies, or families. Breastfeeding reduces the number of sick days that families must use to care for their sick children. The estimated cost of artificial feeding (up to \$1,200 per year for powdered formula) is four times that of breastfeeding (approximately \$300 per year for increased food for a lactating woman). Concentrated and ready-to-feed formulas are even more expensive than powdered formula. The cost of artificial feeding has increased steadily over the last 10 years. Electricity or fuels are consumed in the preparation of infant formula. Breastfeeding requires no packaging, and its production does not harm the environment⁽⁷⁾

What is weaning:

The word “wean” means a passage from one relationship to another - not a loss or detachment from a relationship⁽²¹⁾

The weaning process begins the first time your baby takes food from a source other than your breast – whether it’s formula from a bottle or mashed banana from a spoon. Weaning is the gradual replacement of breastfeeding with other foods and ways of nurturing⁽⁸⁾

From a strictly medical point-of-view, the younger the baby the more important it is for him to receive breast milk. For the premature baby, the benefits of breast milk may be even more important than for the term baby.

The more immature the baby, the greater the need for the protective features of breast milk. The American Academy of Pediatrics recommends

that for ideal nutrition, your baby should be exclusively breastfed for the first six months, and that nursing should continue after the introduction of solids for at least 12 months and longer if mother and baby wish. The World Health Organization recommends that babies be exclusively breastfed for the first 6 months, and that breastfeeding be continued for up to two years of age or beyond. Read more here about the advantages of breastfeeding.

It's a myth that the benefits of breast milk stop at a certain point. Instead, they continue and are more significant and longer-lasting for both you and your child the longer breastfeeding continues. In fact, the antibodies in human milk are more concentrated the lesser the frequency of breastfeeding is (say with a toddler or older child). If you nurse on into your child's toddler years he won't even need cow's milk as long as he receives other foods rich in protein, calcium, and fats, and nurses at least a couple of times a day. Read more here about the benefits of nursing past a year.

All children reach an age of being ready to wean at different times. While one may be ready – or at least more willing – at 18 months, another may not be ready until closer to 2, 3 or 4 years of age. The word “wean” means a passage from one relationship to another – not a loss or detachment from a relationship.

In ancient writings, the word “wean” meant “to ripen” — like a fruit nourished to readiness, its time to leave the vine... Weaning was a joyous occasion because a weaned child was valued as a fulfilled child; a child was so filled with the basic tools of the earlier stages of development that she graduated to take on the next stage of development more independently. It's important to be realistic about your expectations for weaning. Stopping breastfeeding does not make mothering any easier or force your child to grow

up any faster. Your baby will still demand lots of your attention; supplying this in ways other than nursing can be challenging. Breastfeeding can be a real work saver when you can count on it as a surefire way of getting a baby to quiet down or sleep. Often there are ways other than total weaning to cope with mothers' feelings of restlessness or being tied down.

If you choose to do so, there are many benefits to continuing to breastfeed as your baby grows into toddlerhood. This is the most natural path to follow. Babies who are allowed to wean at their own pace usually continue to nurse well past their first birthday (though this does not mean that you would be unable to wean later on if that is what you wish). As your baby learns to eat other foods and to drink from a cup, breastfeeding becomes more important for comfort and reassurance than for nourishment. When allowed to do so, children wean gradually, at their own developmental rate and when they are truly ready⁽²¹⁾

When to start weaning:

At about six months babies are ready to be moved onto a mixed diet.

Try giving solid foods when your baby: can sit up wants to chew and is putting toys and other objects in their mouth reaches and grabs accurately.

It is normal for babies aged three to five months to begin waking in the night when they have previously slept through. It is not necessarily a sign of hunger and starting solids will not make your baby more likely to sleep through the night again.

When to start Health experts agree that around six months is the best age for introducing solids. Before this, your baby's digestive system is still

developing and weaning too soon may increase the risk of infections and allergies. Weaning is also easier at six months. If your baby seems hungrier at any time before six months, they may be having a growth spurt, and extra breast or formula milk will be enough to meet their needs⁽³⁾

How to start weaning:

Start by offering a small amount of mashed vegetable, fruit or cereal mixed with milk after a milk feed or in the middle of one, if this works better. If the food is hot, allow it to cool, stir it and test it before giving it to your baby.

Some babies take time to learn to eat new foods. Your baby will be finding out about different tastes and textures and learning that food doesn't come in a continuous flow. Be patient, let your baby touch the food if they want to, and be prepared for some mess. Start by offering just a few teaspoons of food, once a day.

Use a little of your baby's usual milk (breast or formula) to mix the food to the desired consistency. Allow your baby to feed themselves, using their fingers, as soon as they show an interest. Give your baby a range of foods and textures to taste.

Doesn't force feed your baby? If your baby doesn't seem to want it, wait and try again later. If you are using a spoon, wait for your baby to open their mouth when the food is offered. Let your baby touch the food in the dish or on the spoon. If you are bottle feeding, don't add any foods (including rusks, cereal or sugar) to the milk⁽⁹⁾

First foods:

You could try: cereals such as baby rice mixed with milk mashed cooked vegetables such as parsnip, potato, yam, sweet potato or carrot mashed banana, avocado, cooked apple or pear pieces of soft fruit or vegetables small enough for your baby to pick up. Use mashed-up family food when you can. It's best to cook your own food for your baby. This way, you'll know the ingredients of the food and you'll be getting your baby used to eating what you eat. Don't add salt or sugar to food for your baby. ⁽²¹⁾

More foods to try:

Once your baby is used to eating vegetables and fruit you should add other foods, such as: puréed or mashed-up meat, fish and chicken mashed rice, noodles or pasta lentils (dhal) or pulses full-fat dairy products, such as yoghurt, from age frais or custard. Choose lower sugar varieties. See how your baby responds to the different flavors and textures. Offer your baby finger foods such as small pieces of fruit and vegetables or toast. How much your baby takes is less important than getting used to the idea of food other than milk.

Finger foods encourage your baby to chew, even if they don't have teeth, by giving finger foods. For example, cooked and cooled green beans or carrot sticks, cubes of cheese, toast, bread, pitta bread or chapatti, peeled apple and banana. Some babies prefer food they can hold to mashed foods, so offer your baby finger foods from the beginning. Finger foods provide chewing practice and encourage babies to feed themselves. Avoid sweet

biscuits and rusks so that your baby does not get into the habit of expecting sweet snacks.

Cup: If you are bottle feeding, comfort sucking on a bottle can become a habit that's hard to break. Introduce a cup from six months and aim to have your baby off the bottle by their first birthday. Using an open cup, or a free-flow cup without a valve, will help your baby learn to sip and is better for your baby's teeth⁽⁹⁾

How much and how often:

When you are both ready, you can start to increase the amount of solid food you give. Try to react to your baby's appetite, so if your baby is still hungry, you can give a little more. Your baby is the best guide to how much solid food you need to give. Progress from offering solid food once a day to solid food at two and then three feeds. Offer different foods at each of the three meals to give more variety.

Begin to add different foods and different tastes. You'll be able to use lots of the foods you already cook for yourself. Just mash a small amount cooked with no added salt or sugar and give it a try⁽³⁾

Food groups:

Starchy – such as potatoes, yams, rice or bread fruit and vegetables
protein – meat, fish, eggs, tofu or pulses such as beans and lentils. Red meat (beef, lamb and pork) is an excellent source of iron. Eggs are a quick and nutritious source of protein, but make sure they are thoroughly cooked until both the white and yolk are solid

Solid foods and milk:

You will find that as your baby eats more solid foods, the amount of milk your baby wants will start to reduce. Once your baby is eating plenty of solids several times a day, you can drop a milk feed but continue to breastfeed or give 500–600ml (about a pint) of infant formula a day until at least 12 months of age. Breastfeeding will continue to benefit you and your baby for as long as you choose to carry on. Cow's milk is not suitable as a drink until your baby is 12 months old but can be used in cooking.

From about nine months:

From about nine months, offer your baby: three to four servings of starchy food each day, such as potato, bread and rice three to four servings of fruit and vegetables. Vitamin C in fruit and vegetables helps to absorb iron, so give fruit and vegetables at mealtime's two servings of meat, fish, eggs, dhal or other pulses. By now your baby should be learning to fit in with the family by eating three minced or chopped meals a day as well as milk. Your baby may also like healthy snacks such as fruit or toast in between meals. From about nine months if your baby is on the move, you may need to increase the amount of food you give. Babies have small tummies, and they need energy for growth, so make sure you give them full-fat dairy products, such as yoghurt, from age frais and cheese. Cutting back on fat is sensible for adults but not for babies. If you have decided not to give your baby meat or fish, make sure that you give two servings a day of pulses (dhal, split peas, and hummus), tofu, TVP or eggs.

Vitamins:

Vitamin D is naturally present in only a few foods such as fortified margarines, eggs and fatty fish. It is also made naturally in the skin when it is exposed to gentle sunlight. It is sensible to give all children vitamin drops

with vitamins A, C and D from the age of one to five years old. Breastfed babies and babies drinking less than 500ml of infant formula milk per day, should begin vitamin drops at six months, or earlier if advised by your health visitor or doctor. Ask your health visitor about Healthy Start children's vitamin drops.

Offer a wide variety of foods that you and your family usually eat, as this might help avoid fussiness later on ⁽⁹⁾

Starting good habits early eatin:

Starting good habits early eating as a family it's important to start good eating habits early as it can be much harder to change things once your baby is older. Setting good habits now can help your baby to grow up into a healthy child and adult. Up to 12 months, babies are usually willing to try new foods, so use the opportunity to introduce a wide variety of foods, with different tastes and textures. Try to offer family foods as often as possible. Get your baby used to eating a variety of fruit and vegetables, meat, fish or alternatives, and starchy foods, and offer sweet foods only occasionally or not at all. Eating as a family encourages your baby to get into good habits from a young age. If your baby is used to eating a variety of the foods the rest of the family eats – although they may need to be cut up a bit smaller – then they are less likely to be a fussy eater as they get older.

Sit your baby in a highchair at the table and smile and talk to your baby to make them feel included. Give your baby the same food as the rest of

the family – even if it has to be mashed up first. But remember to leave out the salt. Encourage babies and young children to feed themselves with finger foods, and let them decide when they've had enough. Don't worry if feeding your baby is messy! It's natural for babies to want to touch or play with their food when they're beginning to feed themselves – it's all part of learning. A plastic tablecloth, newspapers or an old sheet or towel on the floor will make it easier to clean up afterwards⁽³⁾

Coping with fussy eaters:

Some ideas for healthy and nutritious snacks include: toast, pitta or chapatti fingers, bread sticks, and rice cakes. Choose low-salt or salt-free versions whenever possible pieces of chopped fruit or vegetable sticks small cubes of cheese. If your baby is a fussy eater, here are some things you can do to help. Praise your baby when they eat well and don't get frustrated or angry if your baby doesn't eat. Don't worry if your baby doesn't like certain foods – simply leave it for now and try them again in a week or so. Babies like familiar foods and sometimes you need to offer a food more than 10 times before your baby will try it. Set a good example and let your baby see you eating and enjoying a variety of foods. Don't worry if your baby doesn't eat much one day. Appetites vary and what your baby eats over the course of a week is more important.

Allergies:

Babies are more likely to develop allergies if there is a family history of eczema, asthma or hay fever. For these families, exclusive breastfeeding is particularly recommended for the first six months. Introduce the foods that commonly cause allergies (milk, eggs, wheat, nuts, seeds, fish and shellfish) one at a time so that you can spot any reaction, but don't introduce any of

these foods before six months. Avoid giving peanuts and foods containing peanut products, e.g. peanut butter or groundnut oil, until your child is three years old. Soya-based infant formulas should only be used on the advice of your GP. Some babies who are allergic to cow's milk may also be allergic to soya. Infant formulas based on goat's milk protein have not been approved for use in Europe. ⁽⁸⁾

Foods to avoid:

SALT (which contains sodium) Do not add any salt to foods for babies. Do not use stock cubes or gravy in your baby's food as they are often high in salt. When you are cooking for the family, do not add salt, so your baby can share the family foods.

SUGAR:

Sugar can encourage a sweet tooth and lead to tooth decay when first teeth start to come through. Try mashed banana, breast or formula milk to sweeten food if necessary.

HONEY:

Don't give honey until your baby is one year old. Very occasionally, it can contain a type of bacteria, which can produce toxins in the baby's intestines and can cause a very serious illness (infant botulism). Remember that honey is also a sugar and can lead to tooth decay.

NUTS:

Whole nuts, including peanuts, should not be given to children under five years in case of choking.

LOW-FAT FOODS:

Low-fat foods, whether yoghurt, fromage frais, cheese or fat spreads are not suitable for babies or children under two. Fat is an important source of calories and some vitamins which they need.

Ready-prepared baby foods:

It can be useful to have a few jars, tins or packets of baby food in the cupboard, but don't let them replace family food altogether. Your baby needs to learn to eat family foods. If you buy baby foods: Check the 'use by' and 'best before' dates. Check that the seals on cans and jars haven't been broken. Choose 'sugar free' foods, or foods which do not contain added sugars or sweeteners. Some baby foods may say 'suitable from four months' on the label but health experts agree that around six months is the best age to start solid foods.

Remember to check the label of any food product you use to make family meals. Many of the food products we buy such as sauces, soups, breakfast cereals and ready prepared meals are high in salt and sugars. Try to check the labels for healthier versions⁽²¹⁾

Safety and hygiene:

Ensure your baby is not at risk from germs as a result of food preparation and serving. Always wash your hands well before preparing your baby's food.

Check that your baby's hands are clean before feeding. Keep surfaces clean and prevent pets from coming near food or surfaces where food is prepared.

- Keep chopping boards thoroughly clean.

- Keep cooked and raw meats covered and away from each other and from other foods in the fridge.
- Thoroughly wash all bowls and spoons for feeding in hot soapy water.
- Don't save and re-use foods that your baby has half eaten. It may result in a tummy upset.
- Cooked food should not be reheated more than once.
- Cook all food thoroughly and cool it to a lukewarm temperature before giving it to your baby.
- Wash and peel fruit and vegetables, such as apples and carrots.
- Avoid raw eggs and raw shellfish.

Storing and reheating food:

Cool food as quickly as possible (ideally within one to two hours) and place it in the fridge or freezer. Food placed in the fridge should be eaten within two days.

Make sure that frozen food is thoroughly defrosted before reheating. The safest way to do this is in the fridge overnight or using the defrost setting on a microwave. Reheat food thoroughly so it is piping hot all the way through. Allow it to cool before offering it to your baby. To cool food quickly, place the food in an airtight container and hold it under a cold running tap, stirring the contents from time to time to allow cooling throughout⁽⁸⁾

Principles of weaning:

1. DO offer your baby the chance to participate whenever anyone else in the family is eating. You can begin to do this as soon as he shows an interest in

watching you, although he is unlikely to be ready to put food in his mouth until he is about six months old.

2. DO ensure that your baby is supported in an upright position while he is experimenting with food. In the early days you can sit him on your lap, facing the table. Once he is beginning to show skill at picking food up he will almost certainly be mature enough to sit, with minimal support, in a high chair.

3. DO start by offering foods that are baby-fist-sized, preferably chip-shaped (i.e., with a 'handle'). As far as possible, and provided they are suitable, offer him **the** same foods that you are eating, so that he feels part of what is going on.

4. DO offer a variety of foods. There is no need to limit your baby's experience with food any more than you do with toys.

5. DON'T hurry your baby. Allow him to direct the pace of what he is doing. In particular, don't be tempted to 'help' him by putting things in his mouth for him.

6. DON' expect your baby to eat any food on the first few occasions. Once he has discovered that these new toys taste nice, he will begin to chew and, later, to swallow.

7. DON'T expect a young baby to eat all of each piece of food at first – remember that he won't yet have developed the ability to get at food which is inside his fist.

8. DOtry rejected foods again later – babies often change their minds and later accept foods they originally turned down.

9. DON'T leave your baby on his own with food.

10. DON'T offer foods which present an obvious danger, such as peanuts.
11. DON'T offer 'fast' foods, ready meals or foods that have added salt or sugar.
12. DO offer water from a cup but don't worry if your baby shows no interest in it. A breastfed baby, in particular, is likely to continue for some time to get all the drinks he needs from the breast.
13. Do be prepared for the mess! A clean plastic sheet on the floor under the highchair will protect your carpet and make clearing up easier. It will also enable you to give back foods that have been dropped, so that less is wasted. (You will be pleasantly surprised at how quickly your baby learns to eat with very little mess!)
14. DO continue to allow your baby to breastfeed whenever he wants, for as long as he wants. Expect his feeding pattern to change as he starts to eat more solid foods.
15. If you have a family history of food intolerance, allergy or digestive problems, DO discuss this method of weaning with your health advisers before embarking on it.
16. Finally, DO enjoy watching your baby learn about food – and develop his skills with his hands and mouth in the process, but implies weaning at any time after 21 days of age. As with any management practice involving a sudden change in social structure (separation of ewe and lambs) or changes of diet and environment, this period will be stressful, and is a critical point for good health and general management practices⁽⁹⁾

Early weaning problems:

The evidence shows that young babies do not have the stomach enzymes to process the foods, and in fact, this sort of situation causes damage to the intestinal linings. When the babies are very young, their immune systems are in hyper-drive, but are not very good at their jobs. One of the biggest problems with too early solids is that these children later develop food allergies. Also, early weaning IS associated with a number of childhood problems including constant illnesses. In fact, there are suggestions that a number of mental illnesses including Autism, ADHD, and others are related to improper digestion, esp in infancy. There are several well-founded famous cases where some kids' Autism or ADHD was unexpectedly reversed due to drastic diet change. When you study pre-cursors to mental illness, one thing that studies have shown repeatedly is early feeding problems. In fact in adults with mental illness, one of the physical correlations is a variety of stomach/digestive problems. That is; mentally ill people have a much higher rate of stomach probs. Just like; they don't know exactly why smoking during pregnancy increases likelihood of ADHD by about 50-75%, but it does. I think you should perhaps just suggest to your friend that she discuss this with the babies' pediatrician. There are entirely too many other factors that come into play to have anything other than theories. A 7 week old should not be getting the rice yet. It will cause irritation to the digestive track⁽¹²⁾

The early introduction of mixed feedings began in early 19th-century Western society. Prominent contemporary physicians such as American Pediatric Society founders Dr. Luther Emmett Holt and Dr. Job Lewis Smith recommended that weaning begin at around nine to 12 months of age or when the canine teeth appeared. Smith recommended against weaning during the summer months because of the risk of “weanling diarrhea”. As weaning was

recommended earlier and earlier, infant mortality increased. Introduction of weaning foods was an important cause of infant mortality in the 19th century. In the early 20th century, mothers were encouraged by the medical community to raise their children scientifically or “by the book”. In the 1920s, the United States government published *Infant Care*, referred to at the time as the “good book” and read by women from all socioeconomic groups. It recommended cod liver oil, orange juice and artificial feeding.

In 2008, according to the Public Health Agency of Canada, 87% of children were breastfed for some period of time while only 16.4% were exclusively breastfed for six months. Still, this figure represents a steady increase in breastfeeding rates over the previous five years. Breastfeeding duration varies depending on maternal age. Only 11% of infants of mothers aged 25 to 29 years continue to breastfeed exclusively for six months, compared with 20% of infants of mothers 35 years or older. The most common reason mothers give for weaning is a perceived insufficiency in milk supply. Women who breastfeed for longer than three months most often cite return to work as their reason for weaning. Canadian breastfeeding practices may continue to improve because many mothers receiving employment insurance can delay their return to work for 12 months postpartum.⁽¹⁰⁾

Nutritional and developmental issues

At around four to six months of age, most infants are developmentally ready to handle puréed foods. They are developing the oral motor coordination necessary to accept different food textures. However, they are at risk for choking on chunky food pieces such as nuts, whole grapes and hot dog wheels that require advanced oral motor coordination not achieved before three years of age.

Sucking and chewing are complex behaviours with reflex and learned components. The learned component is conditioned by oral stimulation. If a stimulus is not applied while neural development is occurring, an infant may become a poor eater. There is a relationship between prolonged sucking without solids and poor eating.

While it is ideal for infants to be exclusively breastfed for six months, it is also true that after a certain age, human milk alone cannot supply all of an infant's nutritional requirements. Individual circumstances may make it appropriate for some infants to start complementary feedings as early as four months of age.

Age-appropriate intake of calories and micronutrients is important for growth, motor and mental development. Delaying the introduction of nutritional solid foods much beyond six months of age puts an infant at risk for iron deficiency anemia and other micronutrient deficiencies. Picciano et al followed older weaning infants (12 to 18 months of age) by collecting data on dietary intake and growth. Many of the study children were ingesting less than the recommended levels of fat (less than 30% of total calories), iron and zinc. Grains, whole milk, dairy products and meats were identified as important sources of iron, vitamin E and zinc.

By four to six months of age, iron stores from birth are diminishing, necessitating the introduction of iron-containing foods at six months of age for all infants. Iron supplementation after the first weeks of life or at four months of age for the exclusively breastfed infant has been recommended by some groups. When there is a delay in introduction of iron fortified foods, oral iron supplementation needs to be considered.

- ♦ Iron from meat has the best bioavailability and can be readily absorbed from the gastrointestinal tract. After six months of age, when breast milk alone cannot provide enough protein, additional protein sources (such as meat, fish, egg yolk, tofu, lentils and cheese) are needed. Roughage should also be introduced to the diet, although it is not clear when adding fibre becomes necessary. There is no conclusive evidence that delaying the introduction of eggs, fish and nuts (including peanuts) beyond four to six months of age helps to avoid food allergies. As a greater variety of solids and liquids are introduced to a baby's diet, weaning will progress.(11)
- ♦ **Causes of Early Weaning:** Bottle-feeding is perceived as the norm. People in the USA and many western cultures simply live in a bottle-feeding culture. It is very unusual to see a breastfeeding mother, and even more unusual to see a mother nursing a toddler or an older child - yet even World Health Organization recommends breastfeeding for at least two years. Television, books, and media usually show a baby with a bottle, not a baby at its mother's breast. Little girls grow up perceiving formula-feeding as the norm.

Mother thinks breastfeeding is yucky or indecent, or has 'hangups' about her own breasts. Breasts are to feed babies - if that was not so, why do breasts start making after mother gives birth (or tiny amounts even before)? There is nothing indecent about feeding your baby. Think about a cat mother feeding her kitties, or a dog feeding her puppies. Everybody just thinks that is cute and natural - the same is true for humans feeding their babies.

Mother's past sexual abuse. One out of every five American women has been sexually abused during childhood, and it is estimated about 20% of those

show significant symptoms as adults. There are wide reactions to past sexual abuse: some women who have been sexually abused cannot tolerate the thought of breastfeeding while others find breastfeeding as a healing experience. Especially difficult situations include: the early postpartum period with its high demands; night-time feedings since the night remind the mother of earlier abuse; and feeding an older infant who plays with the breast and smiles at it. These mothers may benefit from extra support of those around her or from mental health professionals, from partial pumping/bottle-feeding, and from extra reassurance to know what is normal behavior by the baby and how to redirect baby's behavior. On the other hand, breastfeeding can actually reduce child abuse and abandonment by mothers./p>

Husband or partner's negative opinions. Unfortunately many men think woman's breasts are sexual organs, so they can become jealous over the nursing mom's breasts, or start thinking that the baby is doing something indecent and pervert when it feeds. Breastfeeding is NOT a sexual act but simply a feeding act. It can be pleasurable to the mother (though also painful!), but it is not sensual pleasure, just a good feeling of being close to your baby.

Unsupportive friends or family members. Since bottle feeding was the norm in the near past, often a new mom's own mother and other relatives know very little about breastfeeding or even have negative experiences, and cannot support her. In fact, she might hear all kinds of undermining comments from ignorant people who don't understand the breastfeeding process. If that happens, you can try to explain to them in a nice way what the facts are.

Lack of knowledge of medical care personnel. Some doctors know very little about breastfeeding or know nothing about the dangers of infant formula, so won't really encourage the woman to breastfeed, or simply won't influence the mother in any direction.

While there are many pediatricians and obstetricians who do strongly support and speak for breastfeeding, you cannot count your doctor being that way unless you choose who is going to be your doctor.

- ♦ A majority of pediatricians believe that breastfeeding and formula-feeding are equally acceptable methods for feeding infants.
- ♦ Physicians and nurses in the U.S. routinely receive gifts, office supplies, meals, a year's supply of free infant formula for themselves or a relative and even pricey vacations from the infant-formula marketing representatives who haunt their offices⁽¹⁰⁾

Problems in breastfeeding. These include sore nipples, milk supply problems, thrush, infections, etc. By far most of the breastfeeding problems are solvable with adequate information and support. One of the usual initial problems is sore nipples, or simply pain while nursing. That is very common, and usually subsides after about one month. Just hang in there, make sure the positioning is right and baby has a good latch, and find support from someone or from internet message boards. It will get easier later and you'll be glad for your decision.

Medical conditions. Certain medications that the mother may have to take are not compatible with breastfeeding. However, many medications are fine.

Mismanagement of breastfeeding. Breastfeeding works best when baby is put to the breast very soon after birth, and is allowed to feed as frequently as

she wants - which is called 'cue feeding' or 'demand feeding'. Mother's milk supply is built up by the frequent feeding (which may mean every 30 minutes to every two hours), and this is important especially in the beginning. But wrong ideas about 'nursing schedules' still persist, based on bottle-fed babies' needs. Not feeding frequently can lead to low milk supply.

Another pitfall is that many women don't understand the danger of supplemental formula in regards to the "demand=supply" principle of milk production. The more formula you give to your baby in addition to breast milk, the less milk your breasts produce. Formula companies know this, and that is why they are so eager to give you free samples from every direction.

Difficulties with public breastfeeding. Even though breastfeeding in public is perfectly legal in the US in any place where the mother and baby would otherwise be allowed, women have had to leave swimming pools, supermarkets, restaurants, malls etc., or they have been told to nurse in the bathroom. Since breasts are perceived as 'sexual', it is often hard for women to be brave enough to breastfeed in public because they fear other people's attitudes about exposing their breasts.

Because of the general attitudes American society has about breastfeeding and of breasts, many women won't feel totally free and at ease when nursing in public, but in reality most mothers, when they get over the initial fears, find that the general public doesn't pay that much attention to the act, for the most part. People can almost seem to avoid watching the nursing mother in order to not make her feel uncomfortable. In fact, if someone appears to be watching, it may very well be that the person is just plain curious to see this precious moment of mother nurturing her child.

Misconceptions about weaning. Many people in US think that breastfeeding is only for the first couple of months of an infant's life, or mostly up to year. Experts don't agree with this. World Health Organization (WHO) recommends breastfeeding to 2 years of age, and American Academy of Pediatrics clearly states in their policy statement Breastfeeding and the Use of Human Milk, "Exclusive breastfeeding is ideal nutrition and sufficient to support optimal growth and development for approximately the first 6 months after birth." "It is recommended that breastfeeding continue for at least 12 months, and thereafter for as long as mutually desired."

In many other cultures worldwide and in most of the history children weaned even much later. Comparing humans to our closest animal relatives, Katherine Dettwyler has estimated that the natural age of weaning in humans would be between 2.3 and 7 years. Many women in the world and even in today's America do let children self-wean, and those allowed doing so, usually weaning between 2 and 5 years of age. The benefits of breastfeeding don't stop at any age. Many people think little children need to drink cow's milk - how much better it is when toddlers can get human milk with just the right nutrients for humans!

Working. American society does not give mothers a long maternity leave or otherwise encourage mothers to stay at home so breastfeeding would be easier. Nor is it common to find facilities at the workplace for pumping, though this seems to be on the increase.

So even though the best solution would of course be if women could stay home longer, you can still pump breast milk while at work, and continue normal nursing when at home, or possibly arrange your baby to be brought to

you at certain hours, if that is feasible. Breastfeeding doesn't have to end just because you return to work after maternity leave.

One of the most influential reasons why women fail to breastfeed is because **infant formula companies**. use the most aggressive and insinuating forms of advertising. Also, about half of all the infant formula used in the United States is purchased for poor women through the federal Special Supplemental Nutrition Program for Women, Infants and Children (WIC).

- ◆ From early pregnancy, mothers are bombarded by "friendly" formula companies who send free coupons and samples to expectant and new mothers. When signing up for baby clubs, mothers who are planning to breastfeed are placed on the target list of infant formula companies. Carefully mailed formula encouragers arrive before Baby's birth, in the take-home bag from the hospital and again when the baby is around 6 weeks old.
- ◆ In fact, formula manufacturers have no idea exactly how close their product is to breast milk because new ingredients and properties of breast milk are discovered every year. And even among those elements of human milk of which science is already aware, today's infant formula still doesn't measure up. Breast milk contains hundreds of known ingredients and elements which have not been -- or cannot be -- added to infant formula at this time.
- ◆ Virtually all hospitals in the United States offering maternity services - as well as the majority of individual obstetricians and pediatricians - continue to provide massive free advertising from the huge pharmaceutical companies that produce and market formula in the United States. Such promotional material comes in the form of formula

giveaways, patient "educational literature" produced by the formula companies and even free baby equipment such as diaper bags¹²⁾

Common weaning problems:

Weaning your baby is a really exciting time, but you're bound to experience a few problems along the way. Switching from breast milk or infant formula to solids is a big change for your baby's palate as he's learning to adapt to new tastes and textures. But if fussy eating is becoming a real problem, here are some tactics for you to try at mealtime.

1 Your baby's a very slow eater:

First of all, try to work out why your baby is eating slowly, says Naia Edwards, author of *Weaning and Coping With Feeding Problems* (Vermilion). Is it because he's not really hungry, or is he being distracted by something else? If you find it's the latter, then try to remove the distraction. Big brothers and sisters are a common one, so try to encourage toddlers to play while you're feeding.

"If he's eating slowly because he's not hungry, try feeding him a bit later and don't give him too many snacks between meals," says Naia. Don't forget though, eating reasonably slowly can be a good habit to have because it's encouraging your baby to enjoy his food and it also prevents overeating as his tummy has time to tell his brain that he's full.

2 Your baby gets food everywhere but his mouth:

"Exploring the feel and texture of food with his fingers is just as much a part of the weaning experience as tasting," says Naia. But obviously your baby needs to be getting some of it into his stomach as well as having fun with it.

For babies older than 7 months, finger foods and dips combine playing with eating. Your baby may well enjoy dropping food on the floor but don't worry, it's a phase he'll grow out of - and there are ways to take the stress out of messy eating.

If you keep picking up or wiping dropped food, your baby will think it's a game and keep doing it. Put a mess mat down to ease the damage and invest in a suction bowl to stop that ending up on the floor, too. If all else fails, Naia says, "Take the plate away and try again a bit later."

3 Your baby gags on any food with a bit of texture:

Gagging is a normal reflex that prevents your baby from choking, so the first thing is not to panic. It might also be worth checking that you're not putting too much food on his spoon or putting it too far into his mouth. Sometimes babies hate the transition from smooth to lumpy, says Naia. "It's very common for babies to find lumps in food quite difficult at first and to gag," she says. "It may take some time for your baby to learn how to allow lumpier food at the back of his tongue to enter his food passage."

If your baby does gag, try not to overreact and don't lift him out of the highchair. Instead, provide lots of reassuring words and comforting body language. Try mixing a smooth puréed cube of baby food with a cube of food that has more texture to help him get used to the lumpier food.

4 Your baby won't eat enough veg:

Try not to get stressed if your baby keeps refusing vegetable-based purees, as your reaction will only make feeding time harder. Just leave it a few days and try again. Yes, it can be soul destroying to keep cooking up

tasty feasts only for him to turn his nose up at them, but perseverance really is the key here.

If this isn't working, go back to the basics – use vegetables that don't have too strong a flavor and also try the sweeter ones, such as parsnips or carrots, to tempt those taste buds. “If your baby doesn't like the sweeter vegetable purées, then try fruit and veg combinations – apple with a bit of parsnip or pear with a bit of courgette are good,” suggests Naia. “Gradually increase the amount of vegetable you include until there's very little fruit in the mix.”

5 Your baby won't try anything new:

“If your baby refuses a new food, don't force it because a battle over food will only teach him mealtimes are unhappy,” says Naia. “Instead, let him eat foods he likes but don't give up offering new things. Studies have shown that babies and toddlers need to be exposed to a food between 15 and 21 times before they develop a true like or dislike for that food,” she adds.

Persevere with a taste. Try cooking and presenting it in a new way and don't overload your baby with new flavours. While it's important to keep introducing new tastes, too many at once can be overwhelming. It's a good idea to introduce new food at the mid-morning feed, as your baby will have more energy, and if he has a reaction, symptoms will have settled down by bedtime.⁽¹³⁾

Malnutrition :

Background:

The World Health Organization defines malnutrition as "the cellular imbalance between supply of nutrients and energy and the body's demand for

them to ensure growth, maintenance, and specific functions. Women and young children are the most adversely affected groups; one quarter to one half of women of child-bearing age in Africa and south Asia are underweight, which contributes to the number of low birth weight infants born annually

Malnutrition is globally the most important risk factor for illness and death, contributing to more than half of deaths in children worldwide; child malnutrition was associated with 54% of deaths in children in developing countries in 2001 Protein-energy malnutrition (PEM), first described in the 1920s, is observed most frequently in developing countries but has been described with increasing frequency in hospitalized and chronically ill children in the United States.- (15)

The effects of changing environmental conditions in increasing malnutrition is multifactorial. Poor environmental conditions may increase insect and protozoal infections and also contribute to environmental deficiencies in micronutrients. Overpopulation, more commonly seen in developing countries, can reduce food production, leading to inadequate food intake or intake of foods of poor nutritional quality. Conversely, the effects of malnutrition on individuals can create and maintain poverty, which can further hamper economic and social development.

Kwashiorkor and marasmus are 2 forms of PEM that have been described. The distinction between the 2 forms of PEM is based on the presence of edema (kwashiorkor) or absence of edema (marasmus). Marasmus involves inadequate intake of protein and calories, whereas a child with kwashiorkor has fair-to-normal calorie intake with inadequate protein intake. Although significant clinical differences between kwashiorkor and marasmus are noted, some studies suggest that marasmus represents an

adaptation to starvation whereas kwashiorkor represents a dysadaptation to starvation. See the image below.

This infant presented with symptoms indicative of Kwashiorkor, a dietary protein deficiency. Note the angular stomatitis indicative of an accompanying Vitamin B deficiency as well. Image courtesy of the Centers for Disease Control and Prevention.

In addition to PEM, children may be affected by micronutrient deficiencies, which also have a detrimental effect on growth and development. The most common and clinically significant micronutrient deficiencies in children and childbearing women throughout the world include deficiencies of iron, iodine, zinc, and vitamin A and are estimated to affect as many as two billion people. Although fortification programs have helped diminish deficiencies of iodine and vitamin A in individuals in the United States, these deficiencies remain a significant cause of morbidity in developing countries, whereas deficiencies of vitamin C, B, and D have improved in recent years. Micronutrient deficiencies and protein and calorie deficiencies must be addressed for optimal growth and development to be attained in these individuals(14)

Path physiology:

Malnutrition affects virtually every organ system. Dietary protein is needed to provide amino acids for synthesis of body proteins and other compounds that have various functional roles. Energy is essential for all biochemical and physiologic functions in the body. Furthermore, micronutrients are essential in many metabolic functions in the body as components and cofactors in enzymatic processes.

In addition to the impairment of physical growth and of cognitive and other physiologic functions, immune response changes occur early in the course of significant malnutrition in a child. These immune response changes correlate with poor outcomes and mimic the changes observed in children with acquired immune deficiency syndrome (AIDS). Loss of delayed hypersensitivity, fewer T lymphocytes, impaired lymphocyte response, impaired phagocytosis secondary to decreased complement and certain cytokines, and decreased secretory immunoglobulin A (IgA) are some changes that may occur. These immune changes predispose children to severe and chronic infections, most commonly, infectious diarrhea, which further compromises nutrition causing anorexia, decreased nutrient absorption, increased metabolic needs, and direct nutrient losses.

Early studies of malnourished children showed changes in the developing brain, including, a slowed rate of growth of the brain, lower brain weight, thinner cerebral cortex, decreased number of neurons, insufficient myelination, and changes in the dendritic spines. More recently, neuroimaging studies have found severe alterations in the dendritic spine apparatus of cortical neurons in infants with severe protein-calorie malnutrition. These changes are similar to those described in patients with mental retardation of different causes. There have not been definite studies to show that these changes are causal rather than coincidental. Other pathologic changes include fatty degeneration of the liver and heart, atrophy of the small bowel, and decreased intravascular volume leading to secondary hyperaldosteronism.⁽⁴⁾

Malnutrition is directly responsible for 300,000 deaths per year in children younger than 5 years in developing countries and contributes indirectly to over half the deaths in childhood worldwide.

The adverse effects of malnutrition include physical and developmental manifestations. Poor weight gain and slowing of linear growth occur. Impairment of immunologic functions in these children mimics those observed in children with AIDS, predisposing them to opportunistic and other typical childhood infections.

In developing countries, poor perinatal conditions account for 23% of deaths in children younger than five. Malnourished women are at high risk of giving birth to low birth weight infants. Many low birth weight infants (23.% of all births) face severe short-term and long-term health consequences, such as growth failure in infancy and childhood, which increases risk of morbidity and early death.(17)

Children who are chronically malnourished exhibit behavioral changes, including irritability, apathy and decreased social responsiveness, anxiety, and attention deficits. In addition, infants and young children who have malnutrition frequently demonstrate developmental delay in delayed achievement of motor skills, delayed mental development, and may have permanent cognitive deficits. The degree of delay and deficit depends on the severity and duration of nutritional compromise and the age at which malnutrition occurs. In general, nutritional insults at younger ages have worse outcomes. Dose-dependent relationships between impaired growth and poor school performance and decreased intellectual achievement have been shown. Although death from malnutrition in the United States is rare, in developing countries, more than 50% of the 10 million deaths each year are either

directly or indirectly secondary to malnutrition in children younger than 5 years.

Age;

Children are most vulnerable to the effects of malnutrition in infancy and early childhood. Premature infants have special nutritional needs that are not met with traditional feeding recommendations; they require fortified human milk or specially designed preterm formula until later in infancy. Children are susceptible to malnutrition for differing reasons. During adolescence, self-imposed dietary restrictions contribute to the incidence of nutritional deficiencies⁽⁴⁾

Malnutrition Clinical Presentation:

History:

Clinical signs and symptoms of protein-energy malnutrition (PEM) include the following:

- Poor weight gain
- Slowing of linear growth
- Behavioral changes - Irritability, apathy, decreased social responsiveness, anxiety, and attention deficits

Clinical signs and symptoms of micronutrient deficiencies: Some of the clinical signs and symptoms of specific micronutrient deficiencies may closely resemble those observed in PEM. Deficiencies of micronutrients, including vitamins, minerals, and trace elements have been well described. The most common and clinically significant deficiencies include the following:

- Iron - Fatigue, anemia, decreased cognitive function, headache, glossitis, and nail changes
- Iodine - Goiter, developmental delay, and mental retardation
- Vitamin D - Poor growth, rickets, and hypocalcaemia
- Vitamin A - Night blindness, xerophthalmia, poor growth, and hair changes
- Folate - Glossitis, anemia (megaloblastic), and neural tube defects (in fetuses of women without folate supplementation)
- Zinc Anemia, dwarfism, hepatosplenomegaly, hyperpigmentation and hypogonadism, acrodermatitis enteropathica, diminished immune response, poor wound healing(19)

Physical:

Physical findings that are associated with PEM include the following:

- ◆ Decreased subcutaneous tissue: Areas that are most affected are the legs, arms, buttocks, and face.
- ◆ Edema: Areas that are most affected are the distal extremities and anasarca (generalized edema). See the image below. This infant presented with symptoms indicative of a dietary protein deficiency, including edema and ridging of the toenails. Image courtesy of the Centers for Disease Control and Prevention.
- ◆ Oral changes
 - Cheilosis
 - Angular stomatitis

- Papillar atrophy
- ◆ Abdominal findings
 - Abdominal distension secondary to poor abdominal musculature
 - Hepatomegaly secondary to fatty infiltration
- ◆ Skin changes
 - Dry peeling skin with raw exposed areas
 - Hyperpigmented plaques over areas of trauma.
- ◆ Nail changes: Nails become fissured or ridged.
- ◆ Hair changes: Hair is thin, sparse, brittle, easily pulled out, and turns a dull brown or reddish color⁽¹⁴⁾

Causes:

- Inadequate food intake is the most common cause of malnutrition worldwide. In developing countries, inadequate food intake is secondary to insufficient or inappropriate food supplies or early cessation of breastfeeding. In some areas, cultural and religious food customs may play a role. Inadequate sanitation further endangers children by increasing the risk of infectious diseases that increase nutritional losses and alters metabolic demands.
- In developed countries, inadequate food intake is a less common cause of malnutrition. Instead, diseases and, in particular, chronic illnesses play an important role in the etiology of malnutrition. Children with chronic illness are at risk for nutritional problems for several reasons, including the following:

- Children with chronic illnesses frequently have anorexia, which leads to inadequate food intake.
- Increased inflammatory burden and increased metabolic demands can increase caloric need.
- Any chronic illness that involves the liver or small bowel affects nutrition adversely by impairing digestive and absorptive functions.

- Chronic illnesses that commonly are associated with nutritional deficiencies include the following:
 - Cystic fibrosis
 - Chronic renal failure
 - Childhood malignancies
 - Congenital heart disease
 - Neuromuscular diseases
 - Chronic inflammatory bowel diseases

- In addition, the following conditions place children at significant risk for the development of nutritional deficiencies:
 - Prematurity
 - Developmental delay
 - In utero toxin exposure (ie, fetal alcohol exposure)

- Children with multiple food allergies present a special nutritional challenge because of severe dietary restrictions. Patients with active allergic symptoms may have increased calorie and protein needs. ⁽¹⁶⁾

Laboratory Studies

- The most helpful laboratory studies in assessing malnutrition in a child are hematological studies and laboratory studies evaluating protein status.
 - Hematological studies should include a CBC count with RBC indices and a peripheral smear. This could also help exclude anemia's from nutritional deficiencies such as iron, folate, and vitamin B-12 deficiencies.
 - Measures of protein nutritional status include serum albumin, retinol-binding protein, prealbumin, transferrin, creatinine, and BUN levels. Retinol-binding protein, prealbumin, and transferrin determinations are much better short-term indicators of protein status than albumin. However, in the field, a better measure of long-term malnutrition is serum albumin because of its longer half-life. (20)

Additional diagnostic evaluation:

- In children who have a history of adequate food intake and signs/symptoms of malnutrition, focus on identifying the cause of malnutrition. Perform laboratory studies based on information from a complete history and physical examination.
- Initial diagnostic laboratory studies include a CBC count, sedimentation rate, serum electrolytes, and urinalysis and culture.

Stool specimens should be obtained if the child has a history of abnormal stools or stooling patterns or if the family uses an unreliable or questionable source of water.

- Additional studies may focus on thyroid functions or sweat chloride tests, particularly if height velocity is abnormal. Further diagnostic studies should be determined as dictated by the history and physical examination. For example, lab tests evaluating renal function, such as phosphorus and calcium, should be obtained in the presence of renal symptoms. Children with suspected liver disease should have triglyceride and vitamin levels obtained, while zinc levels should be obtained in patients with chronic diarrhea.
- Celiac serology is a useful screening test and should be considered, especially if there is a family history of celiac disease or if other autoimmune diseases, such as type I diabetes mellitus, are present.

Other Tests:

Practical nutritional assessment

- Complete history, including a detailed dietary history
- Growth measurements, including weight and length/height; head circumference in children younger than 3 years
- Complete physical examination(15)

Sensitive measures of nutritional status:

- Height-for-age or weight-for-height measurements greater than 2 standard deviations below the mean for age

- Height-for-age or weight-for-height measurements more than 2 standard deviations less than the mean for age
- Height-for-age measurements less than 95% of expected value
- Height-for-height measurements less than 90% of expected value
- Less than 5 cm/y of growth in children older than 2 years
- Body mass index (BMI), although this is not established by the Centers for Disease Control and Prevention (CDC) as a criteria for failure to thrive ⁽¹⁴⁾

Medical Care:

Following evaluation of the child's nutritional status and identification of the underlying etiology of the malnutrition, dietary intervention in collaboration with a dietitian or other nutritional professionals should be initiated. Children with edema must be assessed carefully for actual nutritional status because edema may mask the severity of malnutrition. Children with chronic malnutrition may require caloric intakes more than 120-150 kcal/kg/d to achieve appropriate weight gain. The formula for determining adequate caloric intake is:

$$\text{Kcal/kg} = (\text{RDA for age} \times \text{ideal weight}) / \text{actual weight}$$

Additionally, any micronutrient deficiencies must be corrected for the child to attain appropriate growth and development. Most children with mild malnutrition respond to increased oral caloric intake and supplementation with vitamin, iron, and folate supplements. The requirement for increased protein is met typically by increasing the food intake, which, in turn, increases both protein and caloric intake. Adequacy of intake is determined by monitoring weight gain.

A Cochrane Database of Systematic Reviews study noted that micronutrient powders (MNPs), which are single-dose packets containing multiple vitamins and minerals in powder form for sprinkling onto any semisolid food, can effectively reduce anemia and iron deficiency in children aged 6-23 months. While the benefits of this intervention as a survival strategy or on developmental outcomes are unclear, the use of MNP is possibly comparable to daily iron supplementation and better than placebo or no intervention.

In mild-to-moderate cases of malnutrition, initial assessment and nutritional intervention may be done in the outpatient setting. A patient with malnutrition may require hospitalization based on the severity and instability of the clinical situation. Hospitalization of patients with suspected malnutrition secondary to neglect allows observation of the interactions between parent/caregiver and child and documentation of actual intake and feeding difficulties. It may also be warranted in cases where dehydration and acidosis complicate the clinical picture. In moderate-to-severe cases of malnutrition, enteral supplementation via tube feedings may be necessary.

Diet

Dietary guidelines were released by the US Department of Health and Human Services and the US Department of Agriculture in 2005.

- Protein, energy, and other nutrient requirements vary with age, sex, and activity levels.

- Following careful assessment of the child's nutritional status, initiate nutritional intervention in collaboration with nutrition support personnel.
- Children with chronic malnutrition may require caloric intakes in excess of 120-150 kcal/kg/d to achieve appropriate weight gain. The diet must include adequate amounts of protein and other macronutrients.
- Monitor patients closely for growth and resolution of clinical signs and symptoms of malnutrition. Follow-up should be based on the severity of the illness, age of the patient, and the patient's initial response to intervention.
- Minimal intervals between visits should give the patient sufficient time to show a change in the measured parameter. For example, in infants beyond the newborn stage, the time needed to show an appreciable change in weight is 7 days. A 4-week interval is needed to document changes in length, and an 8-week interval is needed change in height.(16)
-

Management of acute complications:

Mortality of hospitalized children with marasmus is high, especially during the first few days of rehabilitation. Death is usually caused by infections (ie, diarrhea and dehydration, pneumonia, gram-negative sepsis, malaria, urinary infection) or other causes (ie, heart failure associated with anemia, excess of rehydration solution, or excess of proteins in the first days of treatment; hypothermia; hypoglycemia; hypokalemia; hypophosphatemia). Mortality rates can vary from less than 5% to more than 50% of children, depending on the quality of care.

- **Infectious complications:**

Every hospitalized child with marasmus should be considered as having a bacterial infection. Treatment of bacterial infections prevents the development of septic shock, improves the response to nutritional rehabilitation, and decreases mortality. If the child has no clinical sign of infection, the WHO recommends 5 days of oral cotrimoxazole therapy. If the child presents with clinical signs of infection, hypoglycemia, or hypothermia (that does not rapidly respond to the kangaroo position), he or she must be considered as seriously infected and treated with parenteral ampicillin and gentamicin. If the child does not improve rapidly, chloramphenicol should be added. Antimalaria treatment is also indicated in endemic areas, either orally, by injection, or intrarectal.

- **Other complications:**

- Severe and symptomatic anemia (< 4 g/100 mL) with signs of heart failure should be treated with a blood transfusion of packed red cells to a maximum of 10 mL/kg administered over at least 3 hours. Cardiovascular tolerance should be closely monitored. The benefit of blood transfusion must be balanced with the risks of cardiovascular failure and the risk of infection (eg, hepatitis, HIV) associated with blood transfusion.
- Practice guidelines for acute diarrhea have been established. Persistent and profuse diarrhea has 2 main causes.
- Infectious etiology (especially lamblia): This can be promptly treated with metronidazole if possible, after stool examination.

- Osmotic diarrhea: Sugar of the F75 solution should be replaced by cereal flour for 1-2 weeks.
- Vitamin A deficiency is always present and should be treated in the first few days. Vitamin A replacement facilitates recovery from diarrhea, measles, and respiratory diseases and decreases the risk of blindness.
- Lactose intolerance is unusual and often secondary to prolonged diarrhea. If, as dairy products are restarted, diarrhea persists despite antiparasitic treatment and nutritional rehabilitation, transient lactose intolerance is possible, especially if stools have a low pH and if the child presents with a perianal skin inflammation (diaper rash). In case of lactose intolerance, milk should be withheld and yogurt or a commercially available lactose-free formula can be used.
- An important consideration that has been known since World War II is the consequence of nutritional rehabilitation: the refeeding syndrome. This is most likely encountered in individuals with severe degrees of malnutrition. After refeeding is initiated in the severely compromised individual (including patients with anorexia nervosa), the metabolic needs that are required for anabolism may not be able to be met because of the depleted state. Characteristic features include hypophosphatemia (thus preventing synthesis of essential ATP), hypokalemia (leading to cardiac insufficiency), and various other required electrolyte and mineral deficiencies. A comprehensive article illustrates the syndrome and provides guidelines. Within the first

3 days of therapy, numerous issues must be monitored. Suggested supplementations include phosphate (0.5-0.8 mmol/kg/d), potassium 1-3 (mmol/kg/d), and magnesium 0.3-0.4 (mmol/kg/d); 100% DRI minerals and trace elements; and 200% DRI vitamins. Because beriberi may also coexist with marasmus, thiamine (200-300 g IV or PO) should be given daily.

- Extreme care must be given to following serum electrolytes (including phosphorus and magnesium) clinical features and EKG in any child with severe marasmus who is receiving nutritional repletion. .⁽¹⁶⁾

Specific medical treatment regimens:

- In certain clinical scenarios, specific clinical routines that should be observed.
- In malnourished children with developmental disabilities, a systematic approach that was applied in a specialized feeding disorder clinic has been described initially, specific deficits were identified. Diagnosis-specific treatment plans then resulted in significantly improved energy consumption and nutritional status. Consequently, the program decreased overall subsequent hospitalization rates and medical costs⁽²²⁾

Medication :

No practical guidelines have been established for the most frequently used medications in marasmus. However, significant changes occur in their pharmacokinetics, resulting in unpredictable responses to drug therapy.

Therefore, dosage adaptations are often necessary, and only the best-known medications and the absolutely necessary medications should be used.

Folic acid	5 mg PO on day 1, then 1 mg/d PO thereafter
Multivitamins	All diets should be fortified with water-soluble and fat-soluble vitamins by adding, for example, the WHO vitamin mix (thiamine 0.7 mg/L, riboflavin 2 mg/L, nicotinic acid 10 mg/L, pyridoxine 0.7 mg/L, cyanocobalamin 1 mcg/L, folic acid 0.35 mg/L, ascorbic acid 100 mg/L, pantothenic acid 3 mg/L, biotin 0.1 mg/L, retinol 1.5 mg/L, calciferol 30 mcg/L, alpha-tocopherol 22 mg/L, vitamin K 40 mcg/L)
Iron supplements	<p>Prophylaxis: 1-2 mg elemental iron/kg/d PO; not to exceed 15 mg/d</p> <p>Severe iron deficiency anemia: 4-6 mg elemental iron/kg/d PO divided tid</p> <p>Mild-to-moderate iron deficiency anemia: 3 mg elemental iron/kg/d PO qd or divided bid</p> <p>Precaution: GI irritation</p>
Zinc sulfate	Supplementation with ≥ 5 mg/d recommended for children aged 1 mo to 5 y with acute or persistent diarrhea (including dysentery)

Antimicrobial agents:

Empiric antimicrobial therapy must be comprehensive and should cover all likely pathogens in the context of the clinical setting. Penicillin and aminoglycosides are eliminated by the kidney and have an increased plasma half-life. A decrease by 25% of the usual dosage is recommended with an increased period between doses from 12-24 hours for aminoglycosides and from 6-8 hours for penicillin. Chloramphenicol is still used in low-income countries and recommended in some WHO management protocols. It should be replaced by less toxic drugs (eg, ceftriaxone). Antituberculosis medications, such as isoniazid and rifampicin, are metabolized by the liver.

To avoid serious liver failure, their dosage should be decreased by half and liver function should be monitored during treatment. Antimalarial drugs should be administered according to local guidelines; except for quinine, they are not mentioned in this article.

Antiprotozoal agents

Protozoal infections occur throughout the world and are a major cause of morbidity and mortality in some regions. Immunocompromised patients are especially at risk.

Antipyretic and analgesic agents:

These agents inhibit central synthesis and release of prostaglandins that mediate the effect of endogenous pyrogens in the hypothalamus; thus, they promote the return of the set-point temperature to normal. Acetaminophen (paracetamol) metabolism during malnutrition is well documented. Its half-life is increased with the impaired hepatic metabolism and renal excretion, requiring a dosage decrease. ⁽¹⁸⁾

Prevention:

- ◆ Prevention of malnutrition in children starts with an emphasis on prenatal nutrition and good prenatal care. Health care providers should emphasize the importance of breastfeeding in the first year of life. Promotion of breastfeeding is particularly crucial in developing countries where safe alternatives to human milk are unavailable. In addition to the promotion of breastfeeding, health care providers should counsel parents on the appropriate introduction of nutritious supplemental foods. Health care providers should continue to provide age-appropriate nutritional counseling at every opportunity.
- ◆ Programs addressing micronutrient supplementation and fortification have been successful at decreasing the incidence of specific micronutrient deficiencies (eg, iodine, vitamin D) in many countries, and supplementation in pregnant women has also been beneficial. These programs should be promoted more in developing countries. In addition, research demonstrates that zinc supplementation can help reduce the duration and severity of acute and persistent diarrheal illnesses in children in areas where diarrhea is a significant cause of mortality and is recommended by the World Health Organization and UNICEF. Additional fortification programs should be developed to address other common nutritional deficiencies such as iron deficiency, which continues to be significant problem throughout the world.
- ◆ Improvement in hygiene practices and sanitation reduces the incidence of infectious diseases, which decreases the incidence of malnutrition in developing countries.⁽¹⁹⁾

Prognosis:

- Children who have chronic malnutrition, especially those with intrauterine growth retardation and with onset at an early age, do not achieve their full growth potential or regain cognitive deficits. Although malnutrition is rare in the United States and other industrialized countries, over half of childhood mortality in developing countries is either directly or indirectly secondary to malnutrition. (22)

Material and Methodology

Study design:

The design used for this study was Descriptive cross sectional, hospital based study, to assess the mother's knowledge regarding the relationship between early weaning and malnutrition in El Meck Nimer University Hospital.

Study area:

The research was done in shendi town, it is a town in the River Nile State, which is located 174 Km north of the capital Khartoum the population is about 65 thousand living in more than 38 blocks , the town is considered a center of Galleen tribe as well other tribes like Mahasia, donglawia, Shaigia and Hassania. The majority of population profession is farming.

In shendi there are University of shendi it's with different faculties, three regional Hospitals - the teaching Hospital, the Military Hospital and Elmek Nimer University hospital. All these hospitals have different department.

Setting:

Elmek Nimer university hospital, established in 2002 , it is consist the following departments : medicine , surgery , ICU , CCU , obstetrics and gynecology , pediatric , NICU ,cardiac catheterization center, clinical refer for ENT , dental , ophthalmic , dressing room (out-patient) , psychiatric , pharmacy , laboratory , X-ray , Echo , ultrasound , renal unit , statistical administration , and endoscopy unit .

Study duration:

From September 2014 TO December 2014

Study population:

The study populations include all mothers with ill child at Elmek Nimer university hospital.

Samples:

All mother that admitted in pediatric ward in Elmek Nimer Hospital during period of study (convenient).

Sample Size: 70mothers

Materials:-

Data collection tool

Data was collected through a predesigned **questionnaire** and filled by the researcher.

Data analysis and storage

Data analyzed by using computer through SPSS (Stastical Package of social science) program.

Ethical consideration:

The study and way of conduction were explained to participants and verbal consent was taken.

Results:

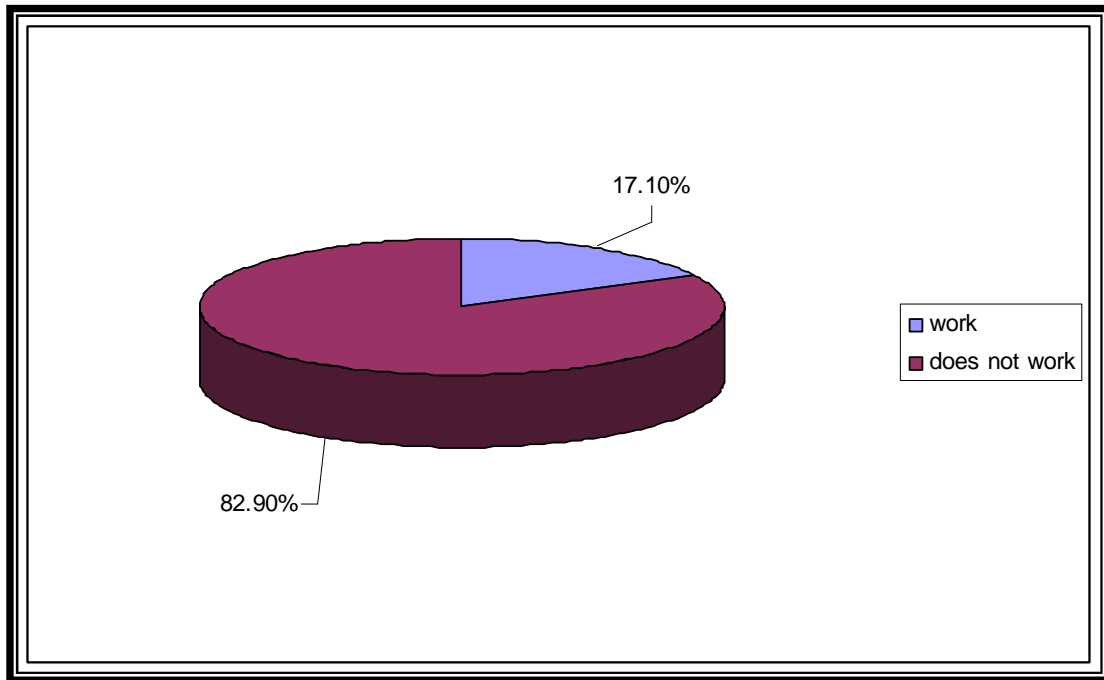
Data analysis

Table No (1): Distribution of study group according to the age:

Age	Frequency	Percent
20-30 years	39	55.7%
31-40 years	23	32.9%
More than 40	8	11.4%
Total	70	100 %

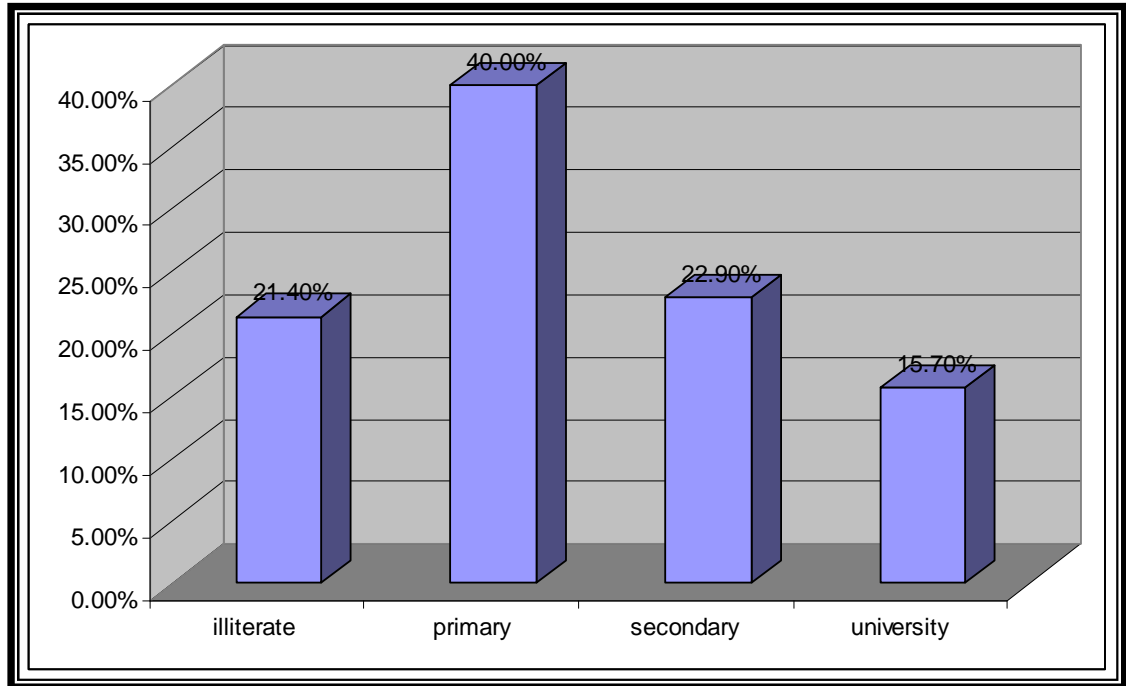
In above table the result showed that more than half (55.7%) of the woman's age range between 20-30 years, third (32.9%) of the them age between 31-40 and less than quarter (11.4%) of the them age more than 40.

Fig No (1): Distribution of study group according to the Occupation:



In above table the result showed that near majority (82.9%) of the woman's are not work and less than quarter (17.1%) of the them were worked.

Fig No (2): Distribution of study group according to the Education level:



In above table the result showed that near half(40%) of the women's are primary education level, near quarter(22.9%) of the them are secondary education level, near quarter(21.4%) of the them are illiterate education level and less than quarter(15.7%) of the them are university education level.

Table No (2): Distribution of study group according to the Monthly income:

Monthly income	Frequency	Percent
Enough	58	82.9%
Not enough	12	17.1%
Total	70	100 %

In above table the result showed that near majority (82.9%) of the woman's have enough income and less than quarter (17.1%) of the them are not enough income.

Table No (3): Distribution of study group according to the Children number in family:

Children number	Frequency	Percent
1-2	25	35.7%
3-4	23	32.9%
5-7	19	27.1%
More than 7	3	4.3%
Total	70	100 %

In above table the result showed that more than third (35.7%) of the woman's had 1-2 child , third(32.9%) of the woman's had 3-4child, more than quarter(27.1%) of the woman's had 5-7 child, less than quarter(4.3%) of the them had more than 7.

Table No (4): Distribution of study group according to the type of feeding used by the mothers:

Type of breastfeeding	Frequency	Percent
Brest feeding	62	88.6%
Formula feeding	1	1.4%
Both	7	10 %
Total	70	100 %

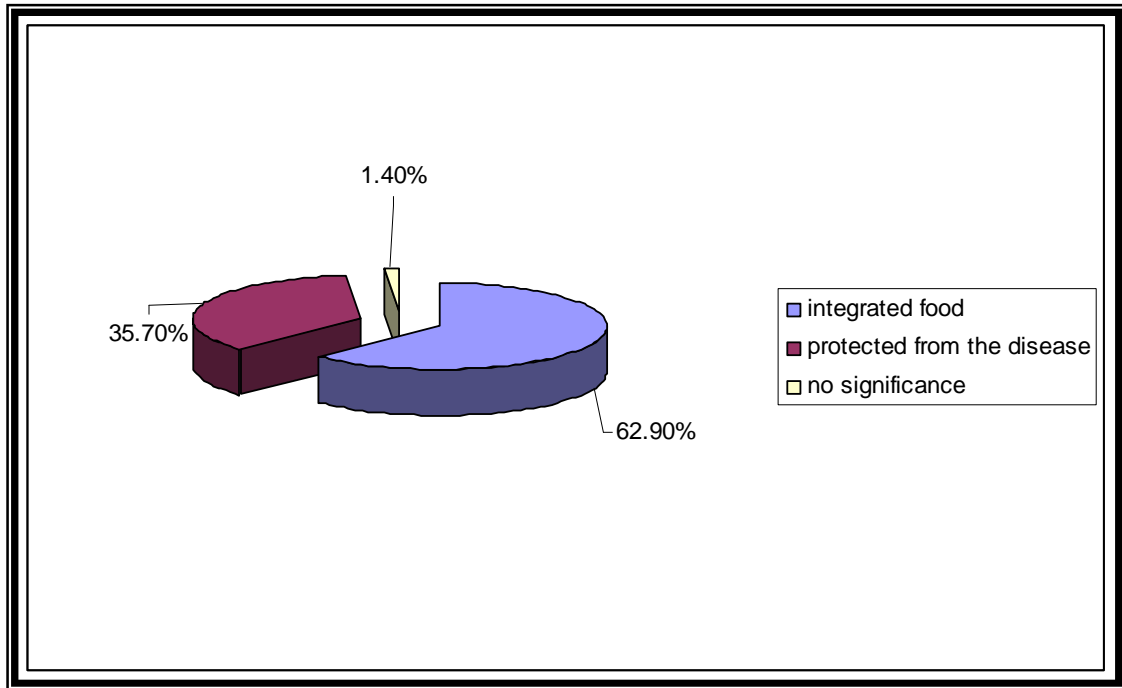
In above table the result showed that majority(88.6%) of the woman's depend on breast feeding only ,less than quarter(10 %) of the woman's depend on breast feeding and formula feeding, 1.4% of the woman's depend on formula feeding only.

Table No (5): Distribution of study group according to the adequacy of feeds:

Adequacy of feeds	Frequency	Percent
Enough	62	88.6%
Not Enough	8	11.4%
Total	70	100 %

In above table the result showed that majority(88.6%) of the woman's their number of campuses feeds are enough and less than quarter (11.4%) of the woman's their number of campuses feeds are not enough.

Fig No (3): Distribution of study group according to the importance of breastfeeding for the child:



In above table the result showed that more than half (62.9%) of the woman's consider that breast feeding) gust integrated food, more than third(35.7%) of the woman's consider that breast feeding protection from diseases,(1.4%) of the woman's consider that breast feeding no significance for the child.

Table No (6): Distribution of study group according to the concept of weaning:

Concept of weaning	Frequency	Percent
breastfeeding at a certain age	36	51.4%
Supplementary materials	16	22.9%
Reduce the number of feedings	18	25.7%
Total	70	100 %

In above table the result showed that half (51.4%) of the woman's had weaning concept was full stop breast feeding at a certain age ,quarter(25.7%) of the woman's had weaning concept was reduced the number of feeding, near quarter(22.9%) of the woman's had weaning concept was introduce solid diet.

Table No (7): Distribution of study group according to knowledge about time of starting weaning:

Starting of weaning	Frequency	Percent
At 6 month	2	2.9%
1-2 years	58	82.9%
More than 2 years	10	14.3%
Total	70	100 %

In above table the result showed that near majority(82.9%) of the woman's consider starting of weaning at 1-2 year, less than quarter(14.3%) of the them consider starting of weaning more than2 years, 2.9% of the them consider starting of weaning at 6 month.

Table No (8): Distribution of study group according to the maximum period of weaning their child:

The maximum period of time in which to be weaning your child	Frequency	Percent
From 6 months -1 year	12	17.1%
1-2 years	55	78.6%
More than 2 years	3	4.3%
Total	70	100 %

In above table the result showed that more than half(78.6%) of the woman's start weaning at 1-2 year, less than quarter(17.1%) of the woman's start weaning from 6 month to one years, 4.3% of the woman's start weaning more than 2 years.

Table No (9): Distribution of study group according to the concept of early weaning:

Concept of early weaning	Frequency	Percent
Supplementary materials before 6 month	15	21.4%
Supplementary materials after 6 month	55	78.6%
Total	70	100 %

In above table the result showed that more than half (78.6%) of the woman's consider early weaning is introduce solid food before 6 month, near quarter (21.4%) of the them consider early weaning is introduce solid food after 6 month.

Table No (10): Distribution of study group according to the reasons of early weaning:

The reasons of early weaning	Frequency	Percent
Mother causes	24	34.3%
Child causes	1	1.4%
Both	45	64.3%
Total	70	100 %

In above table the result showed that more than half(64.3%) of the woman's consider causes of early weaning due to mother and child causes, third(34.3%) of the woman's consider causes of early weaning due to mother causes,(1.4%) of the them consider causes of early weaning due to child causes.

Table No (11): Distribution of study group according to the causes of early weaning:

	Mother causes	Frequency	Percent
Missing	Diseases	20	28.6%
	pregnancy	49	70 %
	Total	69	98.6%
	System	1	1.4%
Total		70	100 %

In above table the result showed that most (70 %) of the woman's consider mother causes of early weaning was pregnancy, near third(28.6%) of the woman's consider mother causes of early weaning was diseases.

Table No (12): Distribution of study group according to the child causes:

Child causes	Frequency	Percent
Congenital abnormalities	9	12.9%
Milk intolerance	27	38.6%
Others	10	14.3%
Total	46	65.7%
System	24	34.3%
Total	70	100 %

In above table the result showed that more than third (38.6%) of the woman's consider child causes of early weaning was milk intolerance, less than quarter (14.3%) of the woman's consider child causes of early weaning was congenital abnormalities, 12.9% of the them consider child causes of early weaning others causes.

Table No (13): Distribution of study group according to the Types of food used when start weaning:

Types of food when start weaning	Frequency	Percent
Liquid	38	54.3%
Semi liquid	22	31.4%
Solid	10	14.3%
Total	70	100 %

In above table the result showed that more than half (54.3%) of the woman's start weaning by liquid food, third(31.4%) of the them start weaning by semi liquid food, less than quarter(14.3%) of the them start weaning by solid food.

Table No (14): Distribution of study group according to the types of milk given during the period of weaning:

Types of milk given during the period of weaning	Frequency	Percent
Goats	43	61.4%
Cow	22	31.4%
both	4	5.7%
Alternative	1	1.4%
Total	70	100 %

In above table the result showed that more than half (61.4%) of the woman's given goats milk for child during the period of weaning, third(31.4%) of the woman's given cow milk for child during the period of weaning, 5.7% of the woman's given cow and goats milk for child during the period of weaning, 1.4% of the them given alternative milk for child during the period of weaning.

Table No (15): Distribution of study group according to the most important nutrients that given during the weaning period:

Important nutrients given to child	Frequency	Percent
Carbohydrate	28	40 %
Proteins	19	27.1%
Both	16	22.9%
Fats	7	10 %
Total	70	100 %

In above table the result showed that near half (40 %) of the woman's given carbohydrate for child during the period of weaning, near less than third(27.1%) of the woman's given proteins for their child during the period of weaning, near quarter (22.9%) of the them given carbohydrate and proteins for their child during the period of weaning,(10%) of the them given fats for their child during the period of weaning.

Table No (16): Distribution of study group according to the adequacy of the food given during the weaning period:

Adequacy of the food during the weaning period	Frequency	Percent
Enough	63	90 %
Not enough	7	10 %
Total	70	100 %

In above table the result showed that most (90 %) of the woman's that food given to their child during the period of weaning was enough, 10 % of the woman's that food given their child during the period of weaning was not enough.

Table No (17): Distribution of study group according to the complications of early weaning:

Complications of early weaning	Frequency	Percent
Malnutrition	15	21.4%
Weight loss	28	40 %
Affect child's growth	15	21.4%
No complication	12	17.1%
Total	70	100 %

In above table the result showed that near half (40 %) of the woman's consider early weaning complication is weight loss , 21.4% of the woman's consider early weaning complications was malnutrition, 21.4% of the woman's consider early weaning complications was affect of Childs growth, that17.1% of the woman's consider no complication during early weaning.

Table No (18): Distribution of study group according to the malnutrition concept:

malnutrition is a disease resulting from	Frequency	Percent
Protein deficiency	8	11.4%
Protein and calories deficiency	21	30 %
Don't know	41	58.6%
Total	70	100 %

In above table the result showed that more than half (58.6%) of the woman's unknown malnutrition, third(30 %) of them consider malnutrition was a disease resulting from protein and calories deficiency, 11.4% of the them consider malnutrition was a disease resulting from protein deficiency.

Table No (19): Distribution of study group according to the causes of malnutrition in your opinion:

causes of malnutrition in your opinion	Frequency	Percent
Economic	33	47.1%
Early weaning	25	35.7%
Bad habits in diet	12	17.1%
Total	70	100 %

In above table the result showed that near half (47.1%) of the woman's consider causes of malnutrition was economic factor ,more than third(35.7%) of the woman's consider causes of malnutrition resulting from early weaning , less than quarter (17.1%) of the woman's consider causes of malnutrition resulting from bad habits in diet .

Table No (20): Distribution of study group according to the symptoms of malnutrition in your opinion:

symptoms of malnutrition	Frequency	Percent
Chronic diarrhea	7	10 %
Weight loss	25	52.9%
Behaviors change	1	1.4%
All above	37	35.7%
Total	70	100 %

In above table the result showed that more than half (52.9%) of the woman's consider symptoms of malnutrition was chronic weight loss, more than third (35.7%) of the woman's consider symptoms of malnutrition was weight loss, 10 % of the woman's consider symptoms of malnutrition was all above, and 1.4% of the woman's consider symptoms of malnutrition was behaviors change.

Table No (21): Distribution of study group according to mother's attitude for ill child:

Attitude for ill child	Frequency	Percent
Traditional	15	21.4%
Go to health center	28	40%
Pediatrician	27	38.6%
Total	70	100 %

In above table the result showed that near half (40 %) of the woman's went to health center, more than third (38.6%) of the woman's went to pediatrician, less than quarter (21.4%) of the them used traditional treat ment.

Table No (22): Distribution of study group according to relation between early weaning and malnutrition:

relation between early weaning and malnutrition:	Frequency	Percent
Yes	32	45.7%
No	38	54. %
Total	70	100 %

In above table the result showed that more than half (54.3%) of the woman's consider that early weaning had no relationship with malnutrition diseases, near half(45.7%) of the woman's consider that early weaning had relationship with malnutrition diseases.

Discussion:

This study was conducted in pediatric ward in Elmek Nimer university hospital in the period between September to November 2014, to Assess mothers knowledge regarding relationship between early weaning and malnutrition. All mother admitted with ill child in pediatric ward.(70) mothers(were included).

The study showed that more than half(55.7%) of the woman's age between 20-30, ,and near half(40%) of the women's are primary education level and more than third (35.7%) of the them had 1-2 child. majority (82.9%) of the woman's had enough income Although (82.9%) of the woman's are not worked.

The study showed that majority(88.6%) of the woman's depend on breast feeding only , number of feeds are enough but more than half (62.9%) of the woman's consider that breast feeding must integrated food for the child that indicates they had poor information about breast feeding.

Regarding knowledge of mothers about weaning it was unsatisfactory as it was evidenced by their responses to the questionnaire because, only (22.9%) know the definition of weaning, 82.9% consider starting of weaning at 1-2 year most(78.6%) start weaning at 1-2 year for their child, most (78.6%) consider early weaning was introduce solid food before 6 month and most(70 %) consider causes of early weaning was pregnancy.

The study showed that of mothers about attitude during period of weaning it was poor as it is evidenced by their responses to the questionnaire because, more than half (54.3%) start weaning by liquid food, and near half (40 %) given carbohydrate for their child during the period of weaning.

The study showed more than half (58.6%) of the woman's unknown meaning of malnutrition, 47.1% of the woman's consider causes of malnutrition was economic factor and more than half (52.9%) of the them consider symptoms of malnutrition was weight loss just that inducted inadequate information about malnutrition.

Finally the study showed more than half (54.3%) of the woman's consider that early weaning has no relationship with malnutrition disease that indicate they had inadequate information about weaning and malnutrition due to most women's included in this study had low level education.

Conclusion

- The current study which was conducted in shendi city at Elmek Nimer university hospital about assessment the knowledge of mothers regarding relation ship between early weaning and mal nutrition .the study conducted that knowledge of mothers about weaning and malnutrition of study group was inadequate and more than half of the them consider that early weaning has no relationship with malnutrition disease.

Recommendations

To improve the knowledge of mothers about relationship between early weaning and malnutrition the study recommend the following:

- Establish continuous health education program in hospitals.
- Government attention and resource allocation to public health and nutrition.
- Improve infant and young child feeding through effective education and counseling services..
- Improve dietary diversity through promoting home production of a diversity of foods and market and infrastructure development.

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جامعة شندي
كلية علوم التمريض
إستبيان حول مفهوم الامهات عنالعلاقة بين الفطام المبكر وامراض سوء التغذية

العمر:

- 20-31-30 سنة ()
- 40 سنة ()
- اكثر من 40 سنة ()

1. المهنة :

- أ. تعمل ()
 - ب. لا تعمل ()
2. المستوى التعليمي:

- امي ()
- ابتدائي ()
- ثانوي ()
- جامعي ()

3. دخل الاسرة الشهري:

كافي ()

غير ()

عدد كافي ()

4.

الاطفال فى الاسرة:

1- ()

2 ()

3- ()

4 ()

5- ()

7 ()

اكثر ()

من 7 ()

ما 5.

نوع الرضاعة:

طبيع ()

ية ()

- صنا
- عية ()
- طبييع
- ية +صناعية ()
- عدد **.6**
- الرضعات:
- كافية
- ()
- غير
- كافية ()
- .7**
- اهمية الرضاعة الطبيعية بالنسبة للطفل:
- غذاء
- متكامل ()
- يحمي
- ه من الامراض ()
- ليس
- لها اهمية ()
- .8**
- مفهومك للفطام:
- التوق
- ف الكامل عن الرضاعة في عمر معين ()
- ادخا
- ل المواد التكميلية ()
- انقا
- ص عدد الرضعات ()
- 10. متي يبدأ الفطام :**
- سنة
- شهور ()
- من
- عام الي عمر عامين ()
- عاما
- ن فأكثر ()

11. اقصى فترة زمنية يتم فيها الفطام لطفلك:

من 6

شهور - سنة ()

سنة

- سنتين ()

سنة

ين فأكثر ()

12. ماهو مفهومك للفطام المبكر:

ادخا

ل المداد الغذائية قبل 6شهور ()

ادخا

ل المواد الغذائية بعد 6شهور ()

13. الأسباب التي تدفع الامهات للفطام المبكر

اسباب

ب تخص الام

اسباب

ب تخص الطفلج

الاثنا

ن معا

14. اسباب تخص الام:

مر

ضية()

حمل

()

تجميد

لية ()

15 . اسباب تخص الطفل

عيو

ب خلقية()

عدم

تحمل اللبن()

اخر

ى ()

16. ماهى نوعية المواد الغذائية التي تبدئ بها الفطام:

مواد

سائلة ()

شبه

سائلة ()

صلب

ة ()

17. ماهى نوعية الالبان التى تعطىها لطفلك اثناء فترة الفطام:

ماء

ز ()

ابقار

()

ماء

ز + ابقار ()

بديل

()

18. ماهى اهم المواد الغذائية التى تعطىها لطفلك اثناء فترة الفطام:

كارب

وهيدريئات ()

بروت

ين ()

كارب

وهيدريت + بروتين ()

دهو

ن ()

فيتام

ينات ()

19. هل المواد الغذائية التى تعطىها لطفلك اثناء فترة الفطام:

كافية

()

ب.غ

ير كافية ()

20. من مضاعفات الفطام المبكر :

امرا

ض سوء التغذية ()

فقدان

الوزن ()

يؤثر

على نمو الطفل ()

ليس

له مضاعفات ()

21. مفهوم سوء التغذية هي امراض ناتجة من:

نقص

البروتين ()

نقص

السرعات الحرارية ()

الاثنا

ن معا ()

لاء

رف ()

22. اسباب امراض سوء التغذية في نظرك:

الفقر

()

بع

ض العادات والتقاليد ()

القطا

م المبكر ()

اسباب

ب اخرى ()

23. ما هي اعراض سوء التغذية في نظرك:

اسها

ل مزمن ()

فقدان

الوزن ()

تغيرا

ت سلوكية ()

كل

هذه الاعراض ()

24. اذا تعرض الطفل لاحد الاعراض السابقة اثناء فترة الفطام ما هو العلاج الاول الذى تستخدمه:

- علا
- الذها
- اخت
- نعم)
- لا)
- ج بلدي ()
- ب الى مركز صحي ()
- صاصى اطفال ()
- 25.هل تعتقدن ان الفطام المبكر له علاقة بامراض سوء التغذية:
- (
- (

College of Nursing Science
Questionnaire about the assessment of mother