

Study Unit 2

Study Unit Outline.

The Maternal and child health unit will cover the following departments:

1. Overview of maternal and child health.
2. Maternal and health services.
3. Child health problems.

Study Unit Duration

This Study Unit requires 4 hours of formal study time. You may spend additional hours on revision.

Maternal, Reproductive, Neonatal and Child Health

Preamble

The Maternal and Child Health module will give students core knowledge about maternal and child health issues across the life cycle - from pre-conception, pregnancy, and infancy to childhood and adolescence.

Learning Outcomes of Study Unit 2

After completion of this unit, you will be able to

- 2.1 Describe Maternal and Child Health Care
- 2.2 Identify maternal and child health services that are available in your locality and the facilitating factors
- 2.3 Explain child health problems, the symptoms and considerations required towards diagnosis

2.1 MATERNAL AND CHILD HEALTH (MCH) CARE

Maternal and Child Health is a term used to describe health care for mothers and their children (MCH). Women between the ages of 15 and 49, as well as children, teens, and the school-age populations, concentrate on MCH programs. MCH care considered growing concern and area of interest across the world, particularly in underdeveloped nations. To provide mother and child health care, the world conference for children in 1991 increased commitment. This provided serious thought to and specified essential areas to be addressed in delivering these services. we are delivering these services (Addisse, 2012).

2.1.1 Importance of health care in MCH.

Among the essential factors and justifications are the following:

1. A large majority of the population is made up of mothers and children. Pregnant women make up 4.5 percent of the population, children under the age of 5 make up 18 percent, children under the age of 3 make up 12 percent, and newborns make up 4 percent, according to the WHO standard.
2. Many expectant mothers get little or insufficient prenatal care and give birth without the support of medical professionals..
3. Women's productivity, their families' well-being, and the nation's economic development are all harmed when mothers are in poor health..
4. Unwanted pregnancies that are mistimed have a high risk of disease and death, and significant social-economic expenses.
5. Pregnant women are more likely to contract infectious disorders such as malaria as opposed to non-pregnant women, which occurs most often during the first pregnancy.
6. Many women endure long-term pregnancy-related disorders such as uterine prolapse caused by marriage on early age, motherhood, and fertile.
7. It is estimated that up to 70% of pregnant women in underdeveloped nations are anemic throughout their pregnancy.

8. Ineffective labor and delivery management techniques, poor maternal health and nutritional conditions before to and during pregnancy are all caused by maternal problems.
9. There are a lot of babies that are born underweight. Because many women are malnourished, marry young, work long hours, and spend a considerable portion of their life pregnant or breastfeeding, they are at risk of chronic malnutrition and high energy expenditure. "
10. Women typically lack access to relevant information, professional providers and supplies, emergency transportation, and other important services. a.
11. Women's access to services is hindered by cultural attitudes and behaviors. (UNFPA, 2020).

Objectives of the MCH program:

1. In order to provide the most basic of health care services,
2. it is necessary to also promote the use of clean water, sanitation, and immunization, as well as educate the general population on these topics.
3. Rural areas should have access to integrated maternal and child health care.
4. Health and nutrition education may help prevent maternal and newborn malnutrition and infection.
5. Provide services within the country's financial, material, and human resources at an affordable price.
6. To originate, develop, and coordinate operational and other important research in MCH.

Factors Affecting Health Status of Mothers

1. Economic development has a substantial influence on morbidity and mortality in the state.
2. Mothers' health is strongly affected by the lack of food in their families, which is a direct result of poor agricultural development.
3. Unsanitary conditions, inadequate housing, hazardous and inadequate water, and an unfavourable social and physical environment.\
4. Healthcare access: A lack of access to current healthcare services has a significant influence on maternal mortality.
5. Educational opportunities. Women are under-educated in many nations, with women accounting for two-thirds of illiterate individuals.
6. A woman's reproductive and health behavior includes her age at when she becomes pregnant, whether or not she wants the pregnancy, and the sort of health care she seeks.
7. Control and access to income and resources
8. Women have a low social rank.

2.1.2 MATERNAL DEATH.

When a pregnant woman dies during or within 42 days following the termination of her pregnancy, she is considered to have died as a result of maternal mortality, regardless of where or how long she was pregnant or how she was treated throughout her pregnancy.

In underdeveloped countries, maternal mortality is the leading cause of death for women. Despite this, it receives the least attention; good management may virtually eliminate all human misery and death(Organization, 2007).

Key reasons of Maternal Mortality

Following are key reasons why mother die

1. Excessive bleeding
2. Infection

3. Pregnancy hypertive
4. Prolang labour
5. Miscarriage

1. Bleeding.

When it comes to the postpartum phase, it may occur at any time during or after the birth of a child.

In pregnancy it could be

- Three months (1st trimestery) because of miscarriage.
- The second three months (2nd trimester) are attributable to placental location and preterm labour.
- Last three months (3rd trimester) Placental anomaly, early placental dissection, and preterm delivery are all causes of premature birth.

In delivery

- Uterine rapture a or placental reteienment
- Trauma in uterus and placent.

After delivery

- Lack of uteterus construction.

Bleeding is more common among women age on 34 years and above.

- abortions that are not properly disinfected
- antepartum heommarage
- Obstucted labor

Caused of antepartum bleeding.

- Placenta Abruptio or previa
- Common in multiparities six children or more.
- Aged 34 or above
- Damaged uterus

Causes of abruption placenta

- High blood pressure during pregnancy.
- Damage or traumatic.
- Injury in the abdomen
- Difficult work
- Emotional trauma

Caused of postpartum bleeding.

- Unaccented uterus
- Previous History of bleeding.
- Multiple parties.
- Increase with number of pregnancies
- Severe Anaemia
- Obstructed labour
- Traumatic events.

2. Infection

Diseases such as anemia, malnutrition and goiter are common among the poor, and these factors increase the risk of infection. Maternal infection is quite severe because of the vicious loop of inadequate calorie intake, a heavy workload, and illness.(Addisse, 2012)

a. Infection

Puerperal infection is more likely in complex and protracted deliveries, and it is rare in spontaneous births without complications.

Factors that increase the risk of infection are as follows:

1. The most of women give birth at home, exposing them to unsanitary conditions.
2. Untrained person's assistance during delivery
3. The number of vaginal examinations and vaginal inspections with dirty hands during birth.
4. Long-term labour (the more significant it lasts, the greater the risk)
5. Trauma
6. Caesarean section, especially if the uterus is ruptured.
7. Infections of the genital and reproductive tract.
8. Pelvic inflammatory disease (PID) is a condition in which the lining of
9. Infertility is the failure of a female to get pregnant for any reason.
10. Ectopic pregnancy is number ten.

Practical strategies to prevent sepsis include:

1. Increased hygienic standards throughout regular care.
2. Minimizing interventions and vaginal exams.
3. Ensure that all mothers have a "clear birth."
4. Antibiotics as a preventative measure after pre-labour membrane rupture (longer than 12 hours).
5. Transferring women who have been in labour for more than 12 hours to a referral institution.
6. Get rid of any remaining placental remnants as soon as possible.

b. Malaria

Malaria causes severe underweight during pregnancy, affecting 3 million African newborns. It's relatively frequent throughout the first trimester

During pregnancy, malaria can also cause.

- Severe anaemia
- Abortion.
- Obstructed delivery.
- Stillbirth
- Baby with Low-birth weight

Malaria can cause the following complications

- a. During childbearing, there is a risk.
- b. Haemorrhage tolerance is reduced (bleeding).
- c. Anaesthesia and operation delivery are both at risk.
- d. Pregnancy ended in a miscarriage.
- e. During birth, there is bleeding, sickness, and death.
- f. Stillbirth fetal growth problems
- g. Preterm labor

Hepatitis

Hepatitis A is linked to socioeconomic status, and low-income women are more likely to have unsanitary living situations. Pregnancy raises the risk of infection twofold, and one seriously ill and likely to die in pregnancy than in the absence of pregnancy.

Sexually Transmitted Diseases and Pelvic Infections

Infections of pelvic and sexually transmitted diseases have severe repercussions the child and his mother. That could cause:

Stimulated abortion (induced)

spontaneous abortion (Induced abortion,

spontaneous abortion,

stillbirth is all linked to poor obstetric and gynaecological procedures(Organization, 2018)

3. Hypertention during pregnancy (Toxemia of Pregnancy)

Only during the 20th week of pregnancy can pregnancy-induced hypotension set in and create eclampsia or pre-eclampsia.

Second and third trimester women are more likely to develop preeclampsia in its early stages, characterized by high blood pressure (hypertension), widespread oedema (swelling), and an excess of urine protein. Eclampsia is characterized by high blood pressure, convulsions, and the danger of a brain hemorrhage. Ensuring the health and safety of all pregnant women is an essential part of safe parenting.(Geibel, 2012).

The following are in a complete package of services for safe motherhood:

- Antenatal treatment and counselling during pregnancy.
- During Childbirth: Professional assistance during labour and delivery.
- After the Baby Is Born: Postpartum Care
- Family Planning Before and After Pregnancy
- Abortion-Related Care Throughout the Reproductive Life Span
- Reproductive health education and assistance throughout adolescence
- Community education for women and families.

Essential Obstetric Care

Health centre level.

- Prenatal and counselling while pregnant.
- During Childbirth: Assistance from a professional during labour and delivery
- Family Planning Before and After Pregnancy

- Abortion-Related Care Throughout the Reproductive Life Span After the Baby Is Born: Postpartum Care
- Community education for women and families • Reproductive health education and help during adolescence

At District Hospital Level/First referrals

- Operations
- Anaesthesia
- Blood transfusion

4. Obstructed Labor

During labor, obstructions arise when the current portion does not progress despite good uterine contractions. There is a high chance of teenage pregnancy, especially in the first pregnancy.

Vesicovaginal fistula (VVF), holes that grow between the vaginal and urinary systems, as well as the rectum are among the most serious complications of childbirth. Obstructed labor is the most prevalent cause of VVF in women.:

- Children and adolescents who are malnourished or uninfected during childhood and adolescence are more likely to be stunted.
- women to get pregnant for the first time before their pelvic growth

5. Abortion

When a pregnancy is terminated before the fetus is capable of living outside of the womb, it is known as an abortion. (Organization, 2018).

According to the cause as categorized as

1. Involuntary miscarriage (often referred to as miscarriage) is the uninvited end of pregnancy.

2. Abortion induced as a result of the purposeful intervention. It may be carried out in one of the following ways:

Outside the bounds of the law

3. Curative abortion is conducted only for health reasons, mainly when the risk to the mother's health is considerable if the pregnancy persists. Stimulated abortion is a significant public health issue in every region.

Types of abortion

- Urgent miscarriage care
- Selective abortion care

Unsafe abortion

- A pregnancy that terminated by uneducated and unskilled individuals have

The following factors cause unsafe abortion:

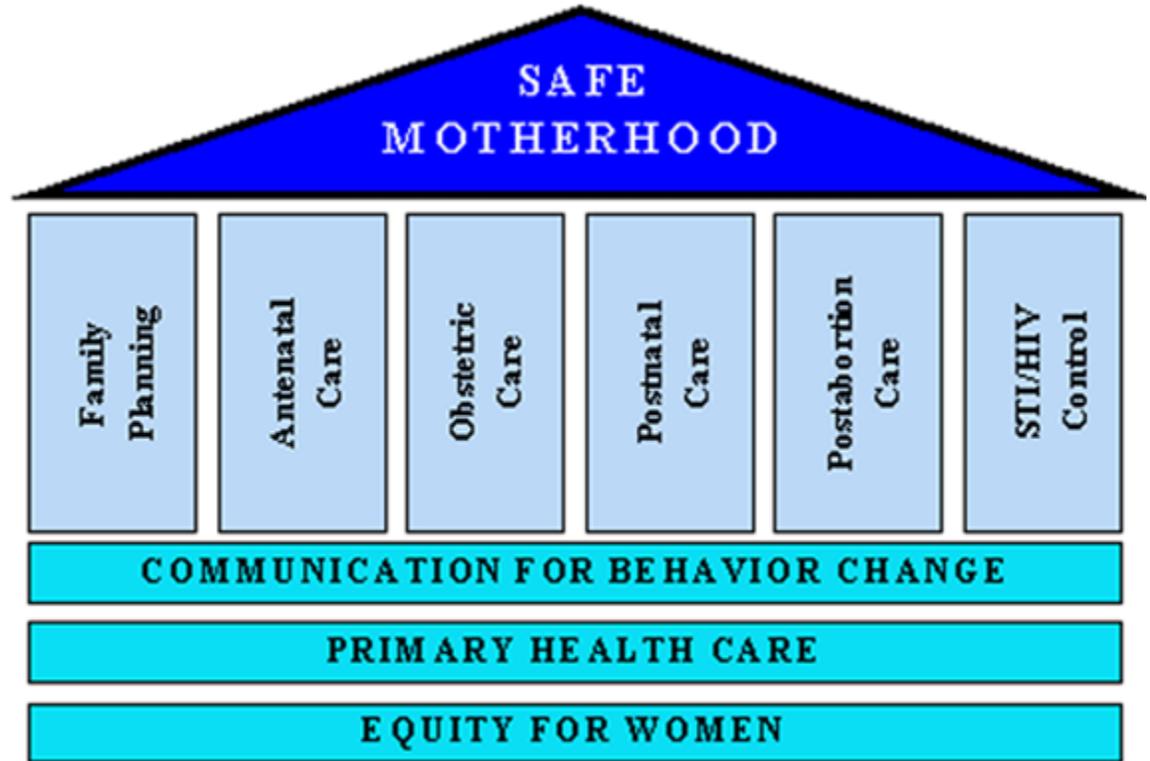
- Factors associated with demographic related risk
- Exceptional parity. This might be a result of economic difficulties.
- Socioeconomic and cultural determinants of risk
- Religion and Culture

The Best Ways to Prevent Abortion-Related Illness and Death

- Enhancing family planning and post abortion services;
- Educating and counselling individuals to assist them in avoiding having unwanted children.

2.2 MATERNAL HEALTH SERVICES

GENERAL CONSIDERATIONS.



Pillars of Safe Motherhood

Figure 1 Family Planning Services (AFRICA, 2018)

2.2.1 Services of FAMILY PLANNING

Maternal mortality may be reduced by Family Planning (FP) by minimizing the risk of pregnancy and delivery in the event of unintended babies.

Aims, Approaches and Service Modalities of FP.

- To spacing children appropriately; to decrease mother and child disease and mortality related to unintended births.
- To assist infertile couples in achieving pregnancy.
- To restrict the size of a family.
- **Eligibility**

Regardless of age and marriage status, every man or female who is capable of conceiving or causing conception is entitled to family planning services, including counselling and assistance

Why Family planning Services are essential.

- a. Lower fertility rates and growth of the population.
- b. Lower maternal mortality rates by spacing out or avoiding pregnancies. It is estimated that it will result in a 20% reduction in maternal fatalities.
- c. Avoid having too many pregnancies too soon, too late, or too close together.
- d. Lowering the likelihood of unplanned pregnancies and abortions.
- e. Improve the well-being of families
- f. Increase long-term growth while lowering the dependence ratio
- g. Assist an infertile couple

Nature methods

- Breastfeeding as a preventive of pregnancy.
- Self-restraint
- Isolation or withdrawal.

- Using calendar days.

Scientific methods

- Hormone-related methods (pills, injection, IUCDI and Implant)
- Mechanical methods

Permanent contraception

- Sterilization by female
- M sterilization by male

Important issues when discussing and selecting contraceptive methods include:

- Long-term success is measured in terms of effectiveness.
- Acceptability Others may disrupt 2. easiness of access Sexual activity.
- Availability: how simple to get and utilize for a long time
- difficulty and relevance of side effects
- Provided with appropriate - how easy it is to think up anything new (Reversibility).

Factors improving Family Planning Programs:

1. Services should be accessible.
2. Services should be available in public or private health institutions and through community-based distribution systems.
3. Contraceptive variety is required to fulfil both women and men's diverse family planning requirements throughout their lives.
4. Counselling should be provided by health care practitioners who have been educated to respect the concerns and sensibilities of their clients.
5. Strategic planning must take into account demand for contraceptives, public and political support, infrastructure for service delivery, and logistics supply.
6. Collaborating with private institutions can help you reach a more significant number of individuals.
7. It is critical to have practical information, education, and communication.

2.2.2 Care during pregnancy ANC

Ante-Natal Care (ANC) is the care provided to pregnant women to ensure a healthy pregnancy and newborn. It also aids in the reduction of pregnancy, labor, postpartum, and neonatal problems.

Actions During the First ANC Visit:

1. Identify pregnancy by collecting a medical history
2. doing a physical examination.
3. Performing a laboratory test
4. Immunization
5. Treat anemia, syphilis, and other health issues as needed.

● **Second visit and subsequent of the ANC visits:**

- pressure in blood and symphysis fundal height measurements.
- TT vaccine and other investigations as necessary.

During ANC, health and nutrition education is provided focusing on:

- the fetal activity, especially in primigravida labor; and the frequent complications of pregnancy
- Extra eating, gaining weight, fasting, and rest are all examples of poor diet and nutrition (especially in the first trimester). Personal hygiene
- Preparation delivery
- Indication of labour.
- Exclusive Breastfeeding.
- Essential care of new born
- Pregnancy: fetal activity (significant for primigravida), labour, and frequent complications
- Nutrition: more food, weight growth, fasting, and resting.
- Avoid alcohol, cigarettes, and medications (particularly during the first trimester).
- Personal cleanliness
- Preparation delivery
- Indication of labour.

- Exclusive Breastfeeding.
- Essential care of newborn
- Provision of Family planning
- Attitudes and behaviours of the ancestors

Pregnancy weight gain

Both weight gained before pregnancy and pregnancy weight increase have a significant and cumulative impact on pregnancy outcomes.

During last six months of the pregnancy, a pregnant woman must have her weight measured twice a month. Growth of less than one kilogram per month is a red flag, with no gain or loss being much more severe and needing prompt treatment, such as direct food supplementation for the lady(e Conhecimento, 2020).

Maternal Care Using a Risk-Based Approach

At-risk patients are identified as early as possible and interventions are taken to reduce the risk. This research strategy was developed based on the assumption that all women of reproductive age are susceptible to sickness, death, and incapability. While all women are at risk, our technique helps identify individuals at a greater risk than others.(e Conhecimento, 2020).

Purpose.

- Making the most efficient use of already available resources for the benefit of the greatest number of people A minimal level of care is provided for everyone. Still, guidelines are provided for allocating scarce resources to those who need them most. So, to sum it up:
- Provide for everyone, but focus on the most vulnerable;
- Direct limited resources toward helping those who are most in need.

- A person's capacity to recognize and assess risk variables is a prerequisite for detecting them.
- This knowledge must be obtained by studying traits linked with bad outcomes.

Measures to identify high-risk women

A risk factor and its relationship to a bad consequence a physical, psychological, or social ailment

Anemia

In addition to raising a woman's risk of infection and bleeding, anemia also contributes to her death. Anemia can cause significant long-term health problems for women, including low birth weight if it is severe.

Infections during Pregnancy

- Due to the increased likelihood of sexual activity among pregnant women, these women are at greater risk of catching infections like HIV/AIDS. Prenatal care includes syphilis testing and treatment, which are both widely available and inexpensive.
- **Preventing HIV/AIDS through effective sexually transmitted disease prevention strategies**
- Promote risk behavior modification or elimination techniques via education.
- Ensure that patients have access to appropriate diagnostic and treatment options.
- Prevent problems by detecting them early and treating them appropriately.
- Use, safe delivery practices, to reduce infection risk during genital tract surgeries.
- Reduce infection risk by providing health information.
- Limiting the spread of infection by seeking counselling and referring a partner, and
- Promote the usage of condoms and increase the focus of family planning initiatives on males.

A Traditional Birth Attendant's (TTBA's) Function

Most pregnant women find skilled traditional birth attendants to be quite useful in terms of advice and referrals. Because TTBA's are capable of quickly identifying issues such:

1. adolescent prim gravid
2. Previous pregnancy complications
3. Short height (depending on local risk norms)
4. Bleeding prior to or during birth

2.2.5 DELIVERY CARE SERVICES

The three c's are the most fundamental concept in labour and delivery care.

- Hand washing.
- Cleaning of the delivery equipment.
- Cutting cord with clean or sterile equipment.

All the time talk about with Trained TBAs:

- To prepare prior to the of delivery time.
- To avoid massaging.
- Don't perform vaginal inspection
- Concerning cord cutting.
- Concerning newborn care
- Concerning referral
- Concerning recording. Trained TBAs and other healthcare professionals of all levels are required to keep records.
- Conduct supervision to the Trained TBAs is critical and compulsory.

Various traditional practices of TBAs are sound and helpful:

- Relatives should attend.
- Promoting the practice of walking when delivering, it is important to provide for a free position
- The practice of breastfeeding a newborn before the umbilical chord has been severed

2.2.6 PNC SERVICES

- (PNC) Post Natal Care is postpartum care that lasts for up to six weeks for new mothers. Assumed to be the least important and commonly ignored
- PNC – day one after delivery
 - PNC – starting 6th week after delivery.

Aim of the PNC:

- Examine physical condition
- Consult and encourage Breastfeeding
- Inform and support family planning
- Encourage emotionally.
- Weaning and meal preparation health education

An overview of the main causes of maternal death and the services that should be provided

1. Reducing the fertility rate and preventing unwanted pregnancies and unsafe abortions via family planning may help decrease maternal death from all causes.
2. Regular screening and treatment of sexually transmitted diseases, urinary tract infections, and regionally widespread viral and parasitic disorders may improve the health of pregnant women and their babies. In locations where anemia is widespread and may be discovered by screening,

3. Iron and folate preventive supplements are recommended.
4. Prenatal health education may increase a woman's knowledge of potential risk factors for her baby.
5. Based on a patient's medical history and height, obstructed labour may be anticipated far in advance of the actual labor, allowing for optimal labor care and access to an operative delivery. When oxytocic medicines are used on a regular basis to manage the third stage of labor, hemorrhage may be prevented.
6. Sepsis may be prevented during delivery by minimizing vaginal checks and using clean delivery procedures.

2.3 CHILDREN'S HEALTH PROBLEMS

2.3.1 GENERAL CONSIDERATION

Child is defined as "any human being under the age of eighteen years, save if the child acquires majority earlier under relevant law". Growth and development occur naturally in a healthy environment. Growth and development are crucial at certain points in time (such as throughout adolescence and the reproductive years), as well as specific features (like pregnancy and reproduction).

Certain conditions increase the risk of illness, disability, and death (the 3 D's) for these groups. As a person grows, each stage builds on the previous one and impacts the next. There must be a balance between the physical and psychological requirements at each stage. Damage may be hard to reverse, and the body's ability to adapt becomes less effective as time goes on.e).(Addisse, 2012)

2.3.2 CAUSES THAT IMPACT THE HEALTH OF CHILDREN

One issue that has an impact on children's health is

- Healthy and appropriate food
- Lack of hygiene and home cleanliness
- Lack of clean water.
- Inadequate sanitation
- High-level of fertility
- Rapid growth in the population.
- Obstetric treatment that falls short Education for mothers The poor status of women
- Hungar

Mortality During Pregnancy (PM)

It is defined as the frequency of stillbirths (fetal deaths after the seventh day of gestation) and early neonatal deaths before the seventh day per 1,000 live births by the Centers for Disease Control and Prevention (CDC). Preventable causes kill almost 13 million children under the age of five every year in developing countries; three million of these deaths occur in the first week of birth. As many as 4 million stillbirths or late fetal deaths take happen each year.(Addisse, 2012).

Impacts of Perinatal Mortality

- Low-birth of weight
- Cord prolapses
- Lack of oxygiine Asphyxia
- Trouma during birth.
- Infection.
- Tetanus for Neonatal
- Labour with complication like prolong or obstructed.
- Poor management of labor
- Anoxia
- Age of the mother.
- Anamia
- Maternal health problems like, renal problem, diabetes, hypertensive disorders
- Maternal sypsis
- Multiple Parity
- Trouma uterus
- ANC services.
- Maternal educational level.

Low-Birth Weight

PNM is more likely to occur in children whose mothers were underweight at delivery. To put it another way, babies born to mothers who are underweight have a perinatal mortality rate five to thirty times higher than those born to mothers who are overweight.

Reasons of low-birth:

- Weight of pregnant before the birth.
- Lack of weight gain in pregnancy.
- Anaemia.
- Infection reproductive genitals.
- Infection in pregnancy.
- Antepartum haemorrhage.
- Eclampsia.
- Maternal death

Childhood Problems (Selected)

In industrialized nations, fatalities of children under five account for a negligible fraction of overall deaths. But the mortality of young infants is still a major problem in many underdeveloped nations.

The disparity in infant mortality rates between developed and developing nations demonstrates that most CHM causes are avoidable.

Diarrheal Diseases

The term "diarrhoea" refers to passing three and more loose or watery stools in 24 hours. Diarrhea that last longer than 14 days is referred to as constant diarrhoea.

Poor countries are particularly vulnerable to the devastation caused by diarrheal diseases, which impact a huge proportion of the population. Diarrheal infections kill more children

under the age of five than any other single cause in almost every developing nation. In many countries, the leading cause of death.

Children who survive diarrhea, in addition to the risk of death, are also more likely to suffer from malnutrition.(Addisse, 2012).

Causes to Prevention Diarrhea

- a. Adequate hydration during and following diarrhoea
- b. Breast milk, diluted formula, and conventional meals are provided to infants and youngsters.
- c. To demonstrate how to make and administer homemade fluids and to urge parents to do so.
- d. Advocacy for Breastfeeding because of its immunological benefits and the risk of exposure to hazardous chemicals.
- e. Enhancement of weaning methods
- f. Access to safe drinking tap water (though not completely secure or available)
- g. Appropriate food storage and sanitation of feeding utensils
- h. Proper sanitation in and around the house, especially crawling areas and playgrounds for children\
- i. Personal hygiene includes moms' practice of washing their hands after using the restroom.
- j. Immunization against diseases such as measles
- k. In order to encourage moms, health workers, and community leaders to adopt healthy lifestyles, health education initiatives depend on an understanding of cultural norms and traditions.

Malaria

Although malaria may affect people of all ages, pregnant women and children under the age of five are particularly vulnerable.

Certain sorts of therapy are required to decrease the impact of malaria on these high-risk individuals. In order to avoid the danger of a miscarriage or low birth weight, pregnant women should get preventive therapy with chloroquine. The "presumptive" treatment of young children in areas where malaria is prevalent is recommended, which is to treat all young children with drugs when it appears that the fever is due to malaria and that the child will respond to treatment with chloroquine (or other appropriate medications in the case of chloroquine-resistant areas)(Addisse, 2012).

Vitamin A Deficiency

Vitamin A insufficiency, on the other hand, has a broader influence than the visual symptoms. Xerophthalmia and low vitamin A levels have been associated to an heightened risk of death and morbidity related to respiratory and gastrointestinal disorders.

Xerophthalmia is a vitamin A deficiency-related eye condition that is the leading cause of blindness in developing countries.

Procedures to prevent vitamin A deficiency are usually grouped into the following:

- The creation and storage of vitamin A-rich foods, as well as an increase in food intake, are two ways to modify the diet.
- Breastfeeding must be protected and promoted.
- Foods may be enriched and augmented.
- Public health measures, such as those concentrating on primary health care components, are also included in this section.
-

Breastfeeding's role in avoiding a deficit in vitamin A

The advancement and protection of the human condition Vitamin A deficiency may be prevented by breastfeeding.

During the first few months of life, many babies rely only on breast milk as a source of vitamin A, and it often stays so until the age of two. Vitamin A levels in newborns can only be maintained for a few weeks without breast milk (Addisse, 2012).

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