



# TRAINING MANUAL FOR PARTICIPANTS MATERNAL, INFANT, YOUNG CHILD AND ADOLESCENT NUTRITION (MIYCAN)



Khyber Pakhtunkhwa – Human Capital Investment Project (KP-HCIP) Health Department

**Activity:** Maternal, Infant and Young Child Nutrition (MIYCAN)

**Project Name:** Khyber Pakhtunkhwa Human Capital Investment Project  
(KP-HCIP)

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**Implemented by:** Department of Health, Khyber Pakhtunkhwa, Pakistan

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## Acknowledgement:

This training manual for Maternal, Infant and Young Child Nutrition (MIYCAN) has been developed with the support of the Department of Health (DoH) and various implementing partners as part of the Human Capital Investment Project (HCIP) in Khyber Pakhtunkhwa (KP). The aim of this manual is to ensure the delivery of high-quality training for primary healthcare workers, enabling them to provide effective nutrition services at both community and healthcare facility levels.

We extend our gratitude to the World Bank for their financial and technical support in the development of this manual. We also appreciate the expertise provided by the technical teams, including the Nutrition department of KP (DoH) and the contributions of the HCIP Technical Working Group. We would like to acknowledge all the stakeholders, experts and organizations who, in various capacities, contributed to the creation of this training module. Their valuable insights have been crucial in ensuring the relevance and quality of the material. We apologize for any unintentional omissions and remain deeply appreciative of the collective effort that has gone into the creation of this valuable training resource for Khyber Pakhtunkhwa.



## Glossary:

- **Active encouragement:**  
Support provided to motivate a child to eat, such as talking to the child, helping with feeding, or making the process fun.
- **Alveoli:**  
Tiny milk-producing sacs in the breast
- **Antenatal preparation:**  
Preparations made by a mother before giving birth.
- **Antibodies:**  
Proteins found in blood and breast milk that help fight infections.
- **Areola:**  
The dark area of skin surrounding the nipple
- **Artificial feeding:**  
The practice of feeding an infant with breast-milk substitutes
- **Artificial feeds:**  
Any liquid or milk provided as an alternative to breastfeeding.
- **Attachment:**  
The way a baby latches onto the breast during feeding.
- **Bonding:**  
The emotional connection that develops between a mother and her baby
- **Breast-milk substitute:**  
Any product intended as a replacement for breast milk, regardless of whether it is suitable for the purpose.
- **Colostrum:**  
The first milk produced by a mother after childbirth, which is typically yellowish or clear in color
- **Complementary food:**  
Foods, either manufactured or homemade, given in addition to breast milk or breast-milk substitutes
- **Distraction (during feeding):**  
Situations where a baby is diverted from breastfeeding by external factors, like noise

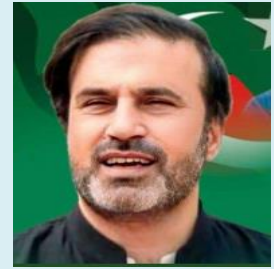
- **Exclusive breastfeeding:**  
The practice of feeding infant only breast milk, with no other liquids or solids, except for necessary supplements like vitamins or medicine.
- **Formula milks:**  
Man-made milk substitutes for babies, often in powder form, which are mixed with water and made from various ingredients like animal milk or vegetable oils.
- **Positioning:**  
The manner in which a mother holds her baby during breastfeeding, particularly in relation to the baby's body
- **Re-lactation:**  
The process of restarting breastfeeding after having previously stopped
- **Responsive feeding:**  
Feeding a baby in response to their hunger and fullness cues, either by direct feeding or helping older children feed themselves.
- **Hormones:**  
Chemical messengers in the body that regulate various functions
- **Lactation:**  
The production of breast milk
- **Lactation amenorrhea method:**  
Using the period of no menstruation after childbirth as a natural form of contraception
- **Nutrients:**  
Essential substances required by the body for growth, function and health, including carbohydrates, proteins, fats, minerals and vitamins.
- **Nutritional needs:**  
The specific amounts of nutrients required by the body to maintain health and support normal growth.
- **Oxytocin:**  
The hormone responsible for milk release from the breast
- **Prolactin:**  
The hormone responsible for stimulating milk production in the breasts

## Acronyms:

- ANC – Ante Natal Clinic
- BMI – Body Mass Index
- BMS – Breast Milk Substitute
- CMAM – Community-Based Management of Acute Malnutrition
- CF – Complementary Feeding
- DoH – Department of Health
- EBF – Exclusive Breastfeeding
- ENCU – Emergency Nutrition Coordination Unit
- GMP – Growth Monitoring and Promotion
- HCIP – Human Capital Investment Project
- IYCF – Infant and Young Child Feeding
- MIYCAN – Maternal, Infant and Young Child Nutrition
- M&E – Monitoring and Evaluation
- MOH – Ministry of Health
- NGO – Non-Governmental Organization
- ORS – Oral Rehydration Solution
- PHC – Primary Health Care
- UNICEF – United Nations Children’s Fund
- WHO – World Health Organization

## **Message from Health Minister, Khyber Pakhtunkhwa**

I am pleased to announce the launch of the Mother, Infant and Young Child Feeding (MIYCAN) module, developed for primary healthcare workers in Khyber Pakhtunkhwa under the World Bank-supported Khyber Pakhtunkhwa Human Capital Investment Project (KP-HCIP). This important resource reflects our continued commitment to improving the health and well-being of mothers, infants and young children and further strengthens our efforts to achieve Universal Health Coverage (UHC) in line with the Sustainable Development Goals (SDGs).



Breastfeeding and appropriate complementary feeding are important to ensure the healthy growth and development of children. This module will equip healthcare providers with the necessary knowledge and skills to promote optimal feeding practices and prevent malnutrition, which is one of the leading causes of childhood morbidity and mortality.

The MIYCAN module provides practical, evidence-based guidance for primary healthcare workers, emphasizing the critical role they play in delivering high-quality care and support to mothers and their children during the early years of life. It is designed to enhance caregivers' understanding of infant and young child nutrition and empower them to educate families on best practices for feeding during pregnancy, breastfeeding and complementary feeding.

I would like to extend my gratitude to the World Bank Pakistan for their invaluable support in the development of this module, as well as to the technical consultants and stakeholders who contributed to its creation. The collaborative efforts of all involved are a testament to our shared commitment to improving maternal and child health in Khyber Pakhtunkhwa. I encourage all primary healthcare workers, including clinicians, public health professionals and community health workers, to make full use of this module. Together, we can ensure that every mother and child in Khyber Pakhtunkhwa receives the care and support they need to thrive.

**Mr. Ihtisham Ali**

**Health Minister, Khyber Pakhtunkhwa, Pakistan**

## **Message from the Secretary of Health, Khyber Pakhtunkhwa**

As we continue our journey towards improving healthcare in Khyber Pakhtunkhwa through the Human Capital Investment Project (HCIP), it gives me great pleasure to introduce the Mother, Infant and Young Child Feeding (MIYCAN) module, developed for primary healthcare workers in our province under the World Bank's support.



This module represents a critical step in ensuring the health and well-being of our future generations. Proper nutrition during the first years of life is fundamental to a child's growth, development and long-term health. By focusing on promoting optimal feeding practices, including breastfeeding and complementary feeding, we aim to reduce child malnutrition, improve survival rates and foster better health outcomes for mothers and children.

The MIYCAN module provides essential knowledge and practical tools for healthcare providers to support families in making informed decisions about nutrition. It includes evidence-based strategies and guidelines that are designed to help healthcare workers educate and support mothers and caregivers in providing the best possible care for infants and young children.

I urge all primary healthcare workers to actively engage with this training material and apply it to your daily practice. Your role is vital in promoting these life-saving practices in our communities. With your commitment and expertise, we can ensure that every mother and child in Khyber Pakhtunkhwa receives the best start in life, laying the foundation for a healthier and more prosperous future.

Let us move forward with determination and a shared vision of creating a stronger, healthier Khyber Pakhtunkhwa. Together, we can make a lasting impact on the health and well-being of our people.

**Mr. Shahid Ullah**

**Secretary of Health, Khyber Pakhtunkhwa, Pakistan**

## Message from the Director General Health Services, Khyber Pakhtunkhwa

As we continue our efforts to achieve Universal Health Coverage (UHC) in Khyber Pakhtunkhwa, it is essential that we focus on strengthening the foundation of health for our future generations. One of the most crucial aspects of this effort is ensuring that mothers, infants and young children receive the best possible nutrition, which is fundamental to their growth, development and overall well-being.



In this regard, I am pleased to announce the development of the **Mother, Infant and Young Child Feeding (MIYCAN)** module, designed specifically for primary healthcare workers in Khyber Pakhtunkhwa under the World Bank's Human Capital Investment Project (HCIP). This module aims to provide healthcare professionals with the necessary knowledge and skills to promote optimal feeding practices, including breastfeeding and complementary feeding, ensuring that every child in our province has the best start in life. Through this resource, we aim to empower healthcare providers with the tools to educate and support families in improving nutrition, thereby preventing malnutrition and its long-term consequences.

We express our sincere gratitude to the World Bank Pakistan for their continued support in developing this important resource. We also acknowledge the efforts of the technical consultants and stakeholders from both public and private sectors who have contributed to its development. This collaborative effort will have a lasting impact on the health of mothers and children in Khyber Pakhtunkhwa.

I urge all primary healthcare workers to utilize this module to its fullest, ensuring that every mother and child in our province benefits from the highest standards of care and nutrition. By working together, we can achieve better health outcomes and build a healthier, more resilient Khyber Pakhtunkhwa.

**Dr. Muhammad Saleem Khan**

**Director General Health Services, Khyber Pakhtunkhwa, Pakistan**

## Message from Director Nutrition, Khyber Pakhtunkhwa

I am pleased to introduce the **Maternal, Infant and Young Child Nutrition (MIYCAN)** training module, developed under the World Bank's Human Capital Investment Project (KP-HCIP). This important resource is specifically designed to equip our primary healthcare workers with the necessary knowledge and skills to address the critical issue of nutrition in Khyber Pakhtunkhwa, particularly among mothers, infants and young children.



In our province, malnutrition continues to be a major challenge, with high rates of stunting and wasting among children. Recent statistics indicate that more than 40% of children under five are stunted and a significant proportion suffers from wasting. These conditions not only hinder the physical and cognitive development of children but also have long-term consequences on their health, academic performance and economic productivity. Stunting and wasting are preventable through timely, evidence-based interventions, especially in the critical early years of life.

The MIYCAN module emphasizes the importance of optimal nutrition during pregnancy, breastfeeding and the complementary feeding period. It provides comprehensive guidelines for healthcare workers to ensure that mothers and caregivers are equipped to provide the best possible nutrition for their children. By promoting exclusive breastfeeding during the first six months and appropriate complementary feeding after that, we can significantly reduce the risk of stunting and wasting, improving both immediate and long-term health outcomes.

This training module will not only enhance the capacity of healthcare providers but will also contribute to a broader effort to combat malnutrition in our province. We aim to empower healthcare workers to make a lasting impact on nutrition in Khyber Pakhtunkhwa. I extend my gratitude to the World Bank Pakistan for their continued support and to all stakeholders who have contributed to the development of this training module. Together, we can address the challenges of malnutrition and create a healthier, more prosperous future for the children of Khyber Pakhtunkhwa.

**Dr. Fazal Majeed**

**Director Nutrition, Khyber Pakhtunkhwa, Pakistan**

## Message from Project Director, (KP-HCIP)

As the Project Director of the Khyber Pakhtunkhwa Human Capital Investment Project (KP-HCIP), I am excited to share with you another key initiative aimed at transforming our healthcare system and improving health outcomes for mothers, infants and young children across the province. Through this project, we are committed to strengthening the foundational health services available to our communities, particularly through the Primary Health Care (PHC) system, which serves as the first point of entry for essential health services.

One of the most pressing issues we face in Khyber Pakhtunkhwa is malnutrition, which has far-reaching consequences on the growth, development and well-being of our children. In line with our ongoing efforts to tackle this challenge, I am pleased to introduce the **Mother, Infant and Young Child Feeding (MIYCAN)** training module, developed under the World Bank-supported KP-HCIP. This training resource is designed specifically for our primary healthcare workers, aiming to equip them with the knowledge and skills necessary to promote optimal nutrition during the critical early years of life.

The MIYCAN module focuses on promoting the importance of breastfeeding, appropriate complementary feeding and maternal nutrition, all of which are vital to reducing malnutrition and improving both immediate and long-term health outcomes. By enhancing the competencies of healthcare providers in these areas, we can ensure that mothers and caregivers receive the support and education they need to provide the best nutritional practices for their children.

I would like to express my sincere gratitude to the World Bank Pakistan for their continuous support and to all those who contributed to the development of this module. By working together, we can ensure that every mother and child in Khyber Pakhtunkhwa has access to the essential nutrition and care they need for a healthier and more prosperous future.

**Dr. Bilal**

**Project Director, KP-HCIP, Pakistan**



## MESSAGE FROM THE DEPUTY PROJECT DIRECTOR

The Khyber Pakhtunkhwa Human Capital Investment Project (KP-HCIP) is committed to advancing healthcare services across the region, ensuring equitable access to quality care for all, in alignment with the principles of Universal Health Coverage (UHC). This initiative is the result of a strong collaboration between the Khyber Pakhtunkhwa Government, the Health Department, development partners, UN agencies and dedicated representatives from various healthcare levels. Together, with the relentless efforts of the KP HCIP team, we are proud to introduce a key training resource aimed at enhancing the nutritional care provided to mothers, infants and young children.

It is with great pleasure that I present the **Mother, Infant and Young Child Feeding (MIYCAN)** training module, developed under the World Bank-supported KP-HCIP. This module is specifically designed to equip our primary healthcare workers with the essential knowledge and practical skills to ensure optimal nutrition practices for mothers and children in the critical stages of early development. The MIYCAN module addresses key aspects of maternal nutrition, breastfeeding and complementary feeding, all of which are pivotal in preventing malnutrition and ensuring healthy growth and development in young children.

This training resource directly supports the broader goals outlined in the Essential Health Services Package (EHSP) and complies with the Minimum Service Delivery Standards (MSDS) established by the Health Care Commission KP. It serves as a critical tool for enhancing the competencies of healthcare workers and ensuring that quality nutrition care is provided at the community level.

I would like to express my heartfelt gratitude to all stakeholders involved in the development and finalization of this MIYCAN module.

**Dr. Sumaira**

**Deputy Project Director, KP-HCIP, Pakistan**

## **Introduction to the Manual**

Maternal nutrition in Pakistan remains a critical public health concern, with significant implications for both maternal and child health. Despite efforts to improve nutrition, a large proportion of women in Pakistan face nutritional deficiencies that directly impact pregnancy outcomes and maternal health. The National Nutrition Survey (2018) highlighted that a substantial number of pregnant women suffer from anemia, iron deficiency and other micronutrient deficiencies, which contribute to complications such as low birth weight, preterm births and maternal mortality. Optimal nutrition during pregnancy, lactation and early childhood is crucial for ensuring proper growth and development, preventing malnutrition and reducing the risk of maternal and child morbidities.

The first 1,000 days—from conception to a child's second birthday—represent a critical window of opportunity to shape long-term health outcomes. Nutrition during this period affects cognitive development, immune function and physical growth and can have lasting effects on the child's health into adulthood. This manual aims to equip primary healthcare providers with the knowledge and tools to promote optimal maternal and child nutrition practices at every stage, from pregnancy to the early years of life. In Pakistan, where malnutrition remains a significant public health challenge, improving maternal and child nutrition is essential to reducing preventable infant and maternal deaths and addressing issues like stunting, anemia and poor growth.

This manual provides evidence-based information on the importance of proper nutrition for mothers and children. It also highlights the challenges faced in ensuring optimal practices and offers practical strategies for healthcare providers to improve care delivery. It includes guidelines on supporting exclusive breastfeeding, appropriate complementary feeding and maternal nutrition during pregnancy and lactation. By following these guidelines, healthcare providers can help improve the nutritional status of mothers and children, leading to healthier pregnancies, stronger immunities and better developmental outcomes.

### **Target audience:**

The target audience for the Maternal, Infant and Young Child Nutrition (MIYCAN) module primarily consists of primary healthcare workers, including Medical Officers, Lady Health Visitors (LHVs), Medical Technicians and Nutritionists. These professionals play a vital role in delivering essential nutrition services and promoting healthy practices within communities. Medical Officers are responsible for diagnosing and managing nutrition-related health issues, while LHVs and Medical Technicians provide front-line care, counseling and support to mothers and children. The role of these healthcare workers are important in improving maternal and child nutrition, addressing malnutrition and promoting healthy feeding practices in line with national guidelines and global standards.

### **Training Manual Contents:**

Each module in the manual is divided into sessions and activities, each with clear objectives to guide the learning process. Every session includes a defined aim, a list of necessary materials and equipment, an estimated time frame and step-by-step instructions for execution. Some activities may require preparatory work ahead of the training session. To enhance learning, the sessions are supported by handouts, PowerPoint presentations, case studies and classroom exercises, all of which are designed to facilitate engagement and reinforce key concepts.

### **Scope and Implementation of Guidelines:**

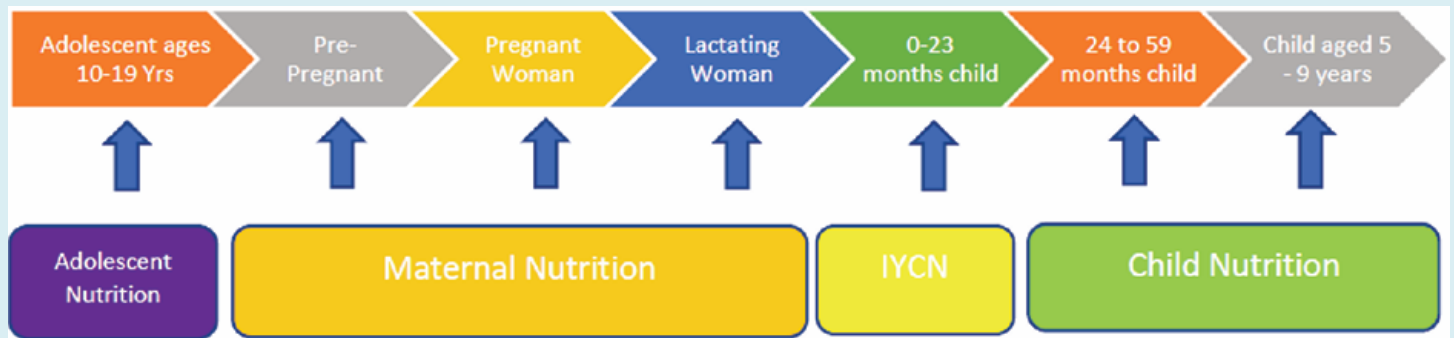
These guidelines support better nutrition and health for mothers, infants, young children, and adolescents in KP, Pakistan. They follow the **MIYCAN Action Plan** and are designed to improve care across the **entire life cycle**—from **adolescence to early childhood**.

### **Life Stages Covered by the Guidelines**

The guidelines are organized around the key stages of life as shown in following figure:

1. **Adolescents** – especially girls
2. **Pre-pregnancy period**
3. **Pregnancy and childbirth**

4. **Breastfeeding period**
5. **Children under five years of age**



Each stage is important for improving nutrition and overall health. These guidelines will be applied through **existing health services** at both **facility** and **community levels**:

### **Main Focus Areas of the MIYCAN Guidelines**

1. **The First 1,000 Days**
  - From conception to the child's second birthday
  - A critical window for brain and body development
2. **Adolescent Girls**
  - Focus on good nutrition before marriage and pregnancy
  - Important for their health and the health of future babies
3. **Pregnant and Breastfeeding Mothers**
  - Ensure proper nutrition and care during and after pregnancy
4. **Birth and Delivery**
  - Critical time for both mother and child's survival and long-term health
5. **Infant and Young Child Feeding**

## **Resources Needed for Implementation**

To successfully apply these guidelines, we need:

- **Human resources:** trained health workers and volunteers
- **Material resources:** tools, supplements, equipment
- **Organizational support:** strong coordination at local health facilities
- **Financial support:** budget from the government and partners

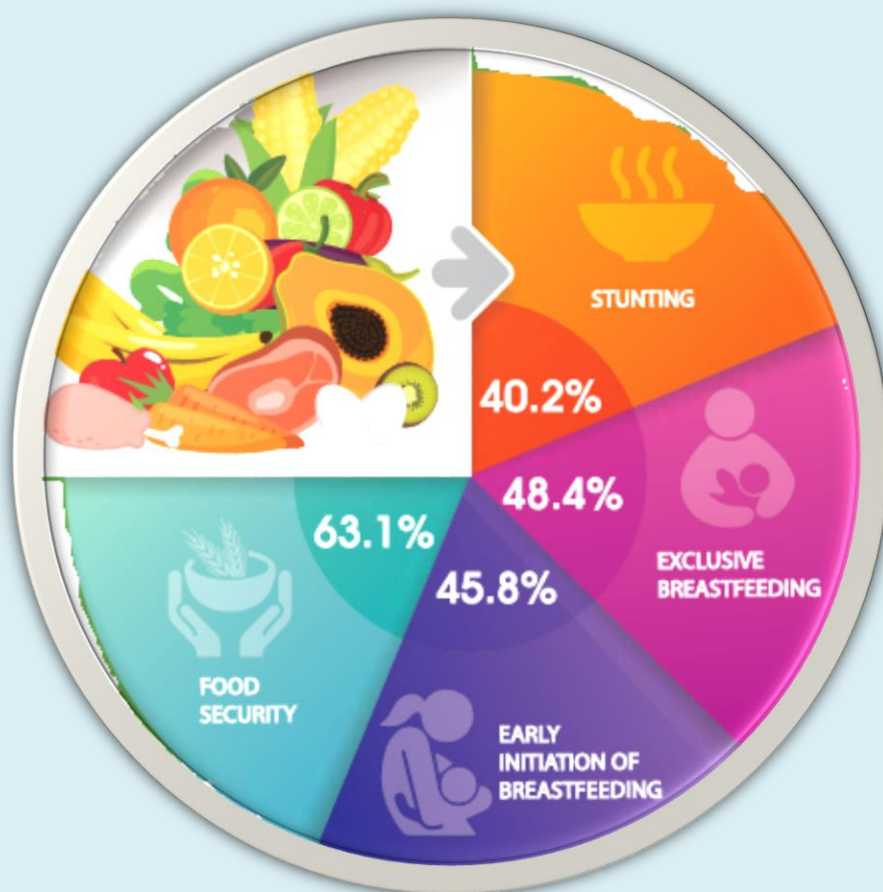
## **Support and Alignment with National Plans**

These guidelines support and align with key health and nutrition policies in Pakistan, including:

- National Health Vision of Pakistan
- Pakistan's Multi-sectoral Nutrition Strategy
- KP's health and nutrition policies
- WHO global targets for maternal, infant, and young child nutrition

### Session

## Overview of Maternal, Infant, Young Child and Adolescent Nutrition in Pakistan



## Situation Analysis:

### 1.1 Introduction to Maternal and Child Nutrition

Maternal and child nutrition is a critical component of public health, as it directly influences the health outcomes of both mothers and children. Good nutrition during pregnancy, lactation and early childhood is essential for optimal growth and development, reducing the risk of complications, preventing malnutrition and ensuring healthy long-term outcomes for both mother and child. In Pakistan, maternal and child nutrition remains a significant public health challenge, with high rates of malnutrition, micronutrient deficiencies and poor feeding practices.



## Session Objectives:

At the end of the session, the participants will be able to;

1. Understand the Current Maternal and Child Nutrition Status in Pakistan including malnutrition rates, breastfeeding practices and common nutritional deficiencies.
2. Identify the socio-economic, cultural and healthcare-related challenges that contribute to poor maternal and child nutrition outcomes in Pakistan, such as limited access to nutritious foods, lack of health education and cultural barriers.
3. Recognize and explain how inadequate maternal and child nutrition contributes to negative health outcomes, including increased maternal and child mortality, low birth weight, stunting and developmental delays.
4. Gain knowledge about Pakistan's national nutrition policies and key programs aimed at improving maternal and child nutrition.
5. Outline and discuss their role in improving maternal and child nutrition, including providing nutrition counseling, screening for malnutrition and promoting essential practices such as breastfeeding and appropriate complementary feeding.

## 1.2 Adolescent Girls, Maternal and Child Nutrition Status in Pakistan

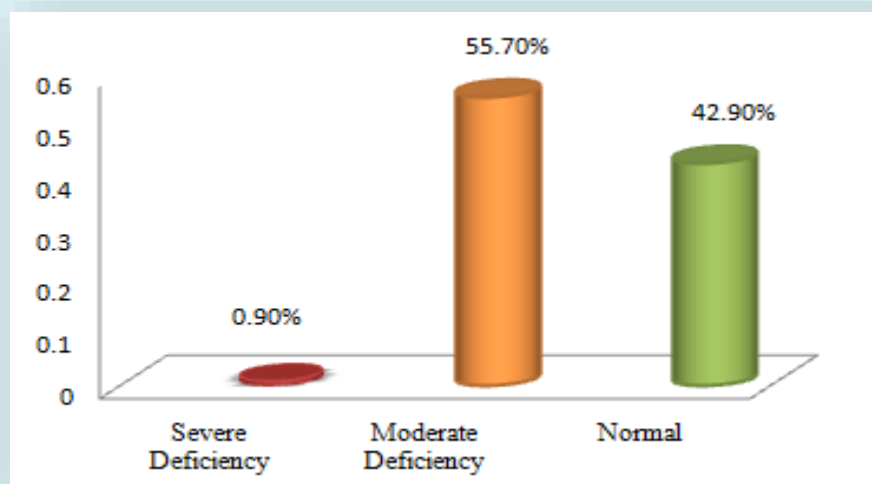
The nutritional status of mothers and children in Pakistan presents a concerning picture:

- **Adolescent Nutrition:**

- According to the National Nutritional Survey (NNS) 2018, nearly one in eight adolescent girls in Pakistan is underweight. Additionally, 11.4% of adolescent girls are overweight and 5.5% are affected by obesity.



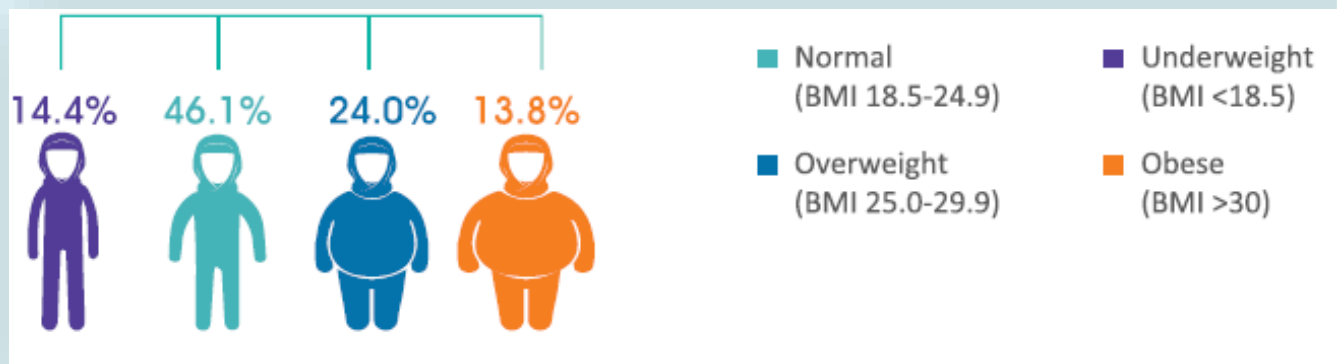
- More than half (56.6%) of adolescent girls in Pakistan have anaemia, although only 0.9% have severe anemia. Anaemia is more common in rural areas (58.1%) than in urban areas (54.2%).



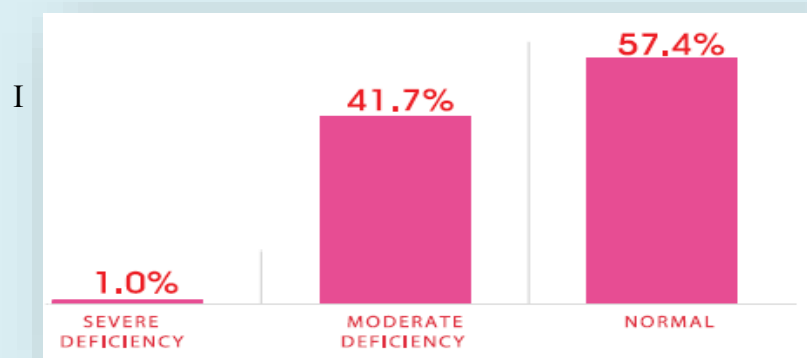


- **Maternal Nutrition:**

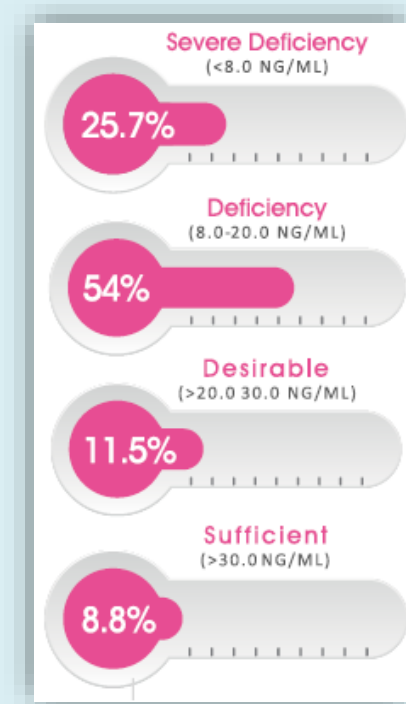
In Pakistan, women of reproductive age (15–49 years) face a double burden of malnutrition. Although the percentage of undernourished women has decreased from 18% in 2011 to 14.4%, the rates of overweight and obesity are on the rise. In 2011, 28% of women were overweight or obese, but this figure increased to 37.8% by 2018. There is a notable urban-rural divide: women in rural areas experience higher levels of under nutrition, while overweight and obesity are more prevalent among women in urban areas.



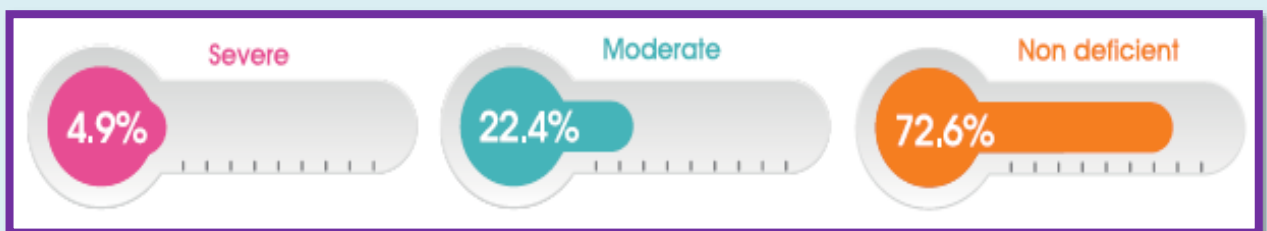
High rates of **iron deficiency anemia** (estimated 1% severe and 41.7% moderate deficiency among women of reproductive age) contribute to poor maternal health outcomes, including maternal mortality and low birth weight.



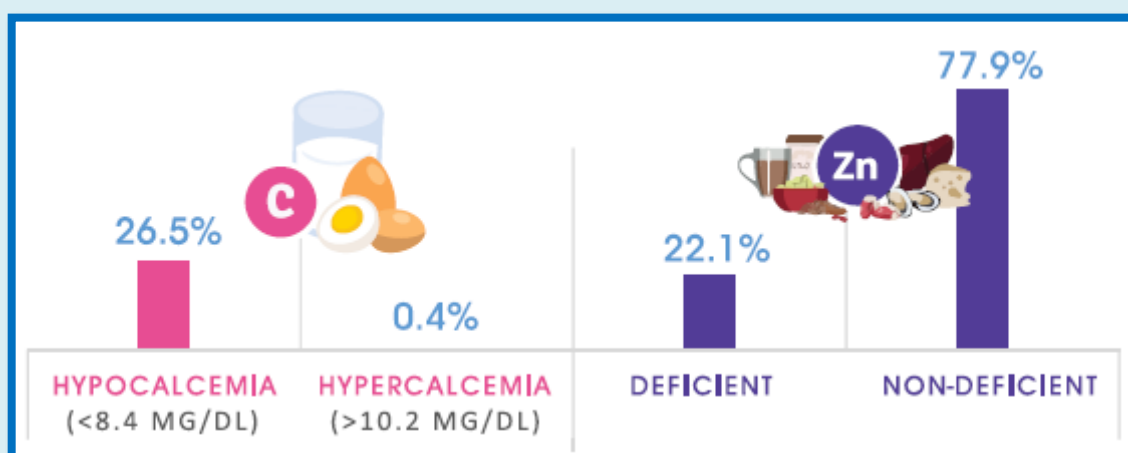
- Inadequate **calcium** and **vitamin D** intake leads to poor bone health and pregnancy complications. Most women of reproductive age (WRA), about 79.7%, suffer from vitamin D deficiency. Among them, 54.0% have moderate deficiency, while 25.7% experience severe deficiency. Vitamin D deficiency is more prevalent in urban areas (83.6%) compared to rural areas (77.1%).



- Many women do not receive the recommended levels of **micronutrient supplementation** during pregnancy, contributing to inadequate maternal health and fetal development. More than a quarter of women of reproductive age (WRA), or 27.3%, are deficient in vitamin A, with 22.4% experiencing moderate deficiency and 4.9% severe deficiency. This deficiency is more common among women in rural areas (29.3%).

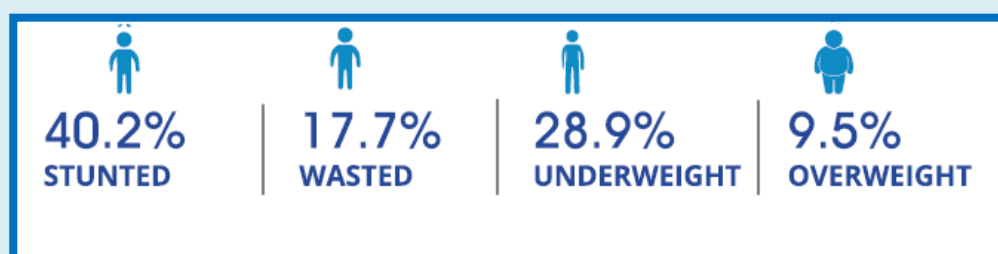


Approximately 26.5% of women of reproductive age (WRA) are hypocalcaemic, while only 0.4% are hypercalcaemic. Zinc deficiency affects 22.1% of WRA, with a higher prevalence in rural areas (24.3%) compared to urban areas (18.7%). Punjab has the highest proportion of women with zinc deficiency (24.1%), followed by Baluchistan (23.4%) and Sindh (21.4%), while Khyber Pakhtunkhwa (KP) has the lowest prevalence at 15.9%.

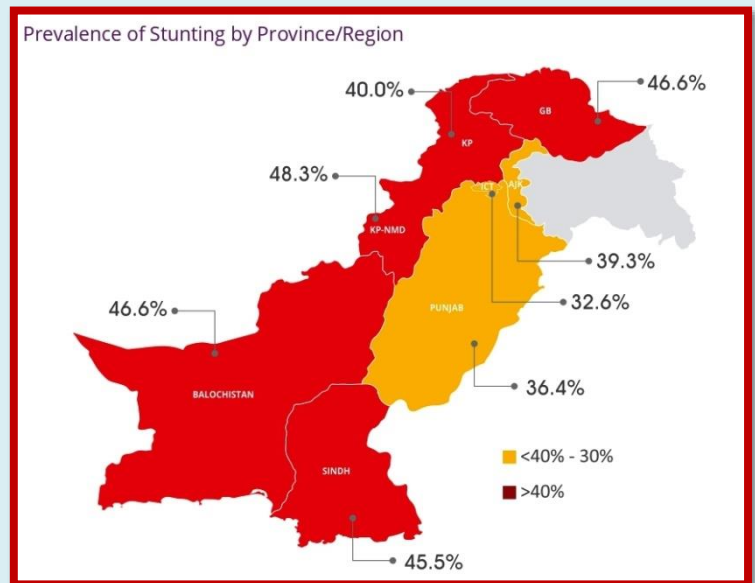


- **Child Nutrition:**

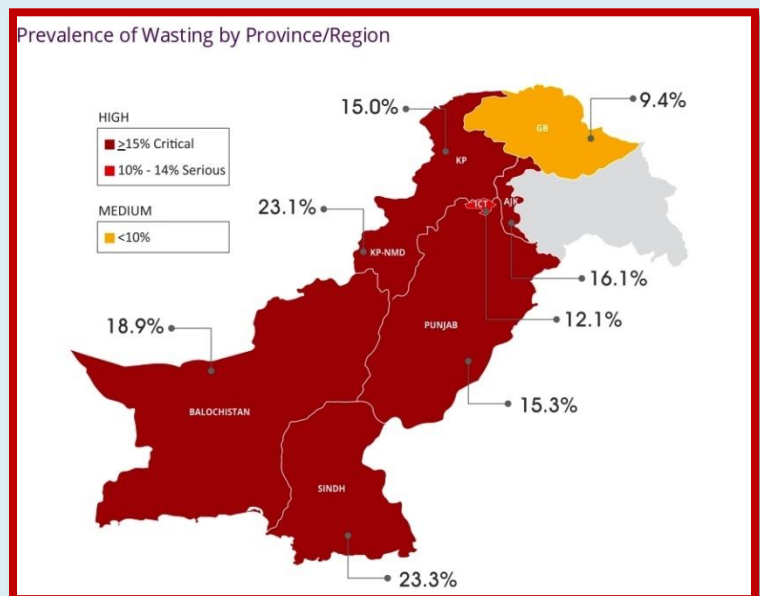
- In Pakistan, 40% of children under five years of age are stunted and 17.7% suffer from wasting. The double burden of malnutrition is becoming more evident, with nearly one in three children (28.9%) being underweight, alongside a rising prevalence of overweight (9.5%) in the same age group. The rate of overweight children under five has nearly doubled over seven years, increasing from 5% in 2011 to 9.5% in 2018.



Stunting is a significant issue in Pakistan, affecting 12 million children who are shorter than the expected height for their age. To prevent this form of malnutrition from undermining the nation's human capital and hindering its socioeconomic development, reducing stunting has become a top national priority.



Since 1997, the prevalence of low weight for height (wasting) among young children in Pakistan has been steadily increasing, rising from 8.6% in 1997 to 15.1% in 2011 and reaching 17.7% in 2018. Despite progress in other socioeconomic indicators, acute malnutrition remains a critical issue, with the country experiencing its highest rate of wasting in history.



- **Exclusive breastfeeding** rates are low (around 38% of infants under 6 months are exclusively breastfed), which impacts early childhood growth and development.
- Complementary feeding practices are often delayed and the introduction of appropriate, nutrient-rich foods after 6 months is inadequate.
- A high percentage of children suffer from **micronutrient deficiencies**, particularly **vitamin A**, **iron** and **zinc**, which can impair immune function and cognitive development.

### 1.3 Key Factors Affecting Maternal and Child Nutrition in Pakistan

Several interconnected factors contribute to the current nutritional status of mothers and children in Pakistan:

- **Socioeconomic Factors:**

- Poverty, food insecurity and limited access to quality healthcare services often hinder access to adequate nutrition. Many households cannot afford nutrient-rich foods and the cost of essential supplements is often a barrier for pregnant and lactating women.

- **Cultural Practices:**

- Traditional beliefs and practices surrounding food consumption can influence maternal and child nutrition. For example, some communities may undervalue breastfeeding or delay the introduction of complementary foods. Additionally, gender-based disparities in food allocation can affect women's nutrition, particularly in lower-income households.

- **Healthcare System:**

- The healthcare system in Pakistan faces challenges such as inadequate infrastructure, insufficient trained healthcare workers and limited access to maternal health services, especially in rural areas. This impacts the provision of maternal and child nutrition counseling, antenatal care and access to micronutrient supplementation.

- **Inadequate Infant and Young Child Feeding (IYCF) Practices:**

- Suboptimal IYCF practices, such as delayed initiation of breastfeeding, early introduction of solid foods and inadequate complementary feeding practices, contribute to high rates of malnutrition in children less than 5 years.

- **Environmental and Sanitation Issues:**

- Poor water, sanitation and hygiene (WASH) practices contribute to infections and diseases, which exacerbate malnutrition. Diarrheal diseases, especially in young children, are a major cause of malnutrition.

#### **1.4 Maternal and Child Nutrition Interventions in Pakistan**

The government of Pakistan, along with international organizations, has initiated several interventions to address maternal and child nutrition. Key initiatives include:

- **Micronutrient Supplementation:**

- The **Pakistan National Vitamin A Supplementation Program** aims to reduce the incidence of vitamin A deficiency in children.
- The **Iron and Folic Acid Supplementation Program** is designed to address iron deficiency anemia among pregnant women and adolescent girls.

- **Breastfeeding Promotion:**

- Pakistan has embraced the **Baby-Friendly Hospital Initiative (BFHI)**, which promotes exclusive breastfeeding for the first 6 months of life and supports continued breastfeeding for up to 2 years or more.
- The **Infant and Young Child Feeding (IYCF) policy** aims to provide guidelines for breastfeeding, complementary feeding and promoting proper feeding practices.

- **Community-Based Programs:**

- Lady health workers (LHWs) are actively engaged in educating communities about good nutrition practices, including proper maternal diet, breastfeeding and complementary feeding. Programs like the **Community Management of Acute Malnutrition (CMAM)** aim to identify and treat malnourished children in their communities.

- **Integrated Nutrition Programs:**

- Programs like the **Pakistan Integrated Nutrition Program (PINS)** have been implemented to address maternal and child malnutrition through a multi-sectoral approach that involves health, agriculture, education and social welfare sectors.

- **Food Fortification:**

- Efforts to fortify staple foods, such as wheat flour, with micronutrients like iron and folic acid, are underway to combat nutritional deficiencies at the population level.

### 1.5 Khyber Pakhtunkhwa Protection of Breast-Feeding and Child Nutrition Act, 2015:

The act aims to safeguard the health and nutrition of infants and young children by promoting and protecting breastfeeding across the province. Recognizing the vital role of breast milk in ensuring safe and adequate nutrition during early childhood, the Act also regulates the marketing and promotion of designated products such as breast milk substitutes, feeding bottles, teats, and related items.

This MIYCAN (Maternal, Infant, Young Child and Adolescent Nutrition) module introduces the key provisions of the Act to guide healthcare workers in supporting optimal infant feeding practices and preventing harmful promotional activities that could undermine breastfeeding.

#### A. Composition and Functions of Infant Feeding Bodies

Body	Composition	Key Functions
<b>Khyber Pakhtunkhwa Infant Feeding Board</b>	<ul style="list-style-type: none"><li>• Minister for Health (Chairman)</li><li>• Representatives from: Health, Home Depts, Pakistan Paediatric Association, Khyber Medical University, Provincial Health Services Academy, Food Safety Authority, Infant Food Industry</li><li>• Govt-nominated experts</li></ul>	<ul style="list-style-type: none"><li>✓ Receive and act on violation reports</li><li>✓ Educate and train health workers</li><li>✓ Advise govt on breastfeeding and child nutrition policies</li></ul>
<b>District Infant Feeding Committee</b>	<ul style="list-style-type: none"><li>• District Nazim (Chairman)</li><li>• Deputy Commissioner</li><li>• DHO (Secretary)</li><li>• Female Council Members</li><li>• Religious Leader</li><li>• Public Health Coordinator</li><li>• NGO reps and Social Workers</li></ul>	<ul style="list-style-type: none"><li>✓ Promote breastfeeding in communities</li><li>✓ Train health workers</li><li>✓ Report violations to the Board</li><li>✓ Perform additional duties from the Board</li></ul>



## B. Prohibited Practices under the Infant Feeding Act

Category	Prohibited Practice
Promotion	No advertising or promotional activities unless allowed by the Act
Misleading Claims	Cannot claim products are equal to or better than mother's milk
Gifts & Incentives	No benefits to health workers, families, or board/committee members
Donations	No donations of products/services to health facilities or associations
Instruction	Only independent health workers can advise on product use
Healthcare Facility Access	Manufacturers/distributors may not interact with the public in health facilities
Educational Material	Only factual, approved material allowed; no public distribution

## 1.6 Challenges in Maternal and Child Nutrition

Despite progress in some areas, several challenges remain:

- **Low Coverage of Nutrition Services:** Many pregnant women and children, especially in rural and remote areas, do not receive adequate nutrition services, such as antenatal care or micronutrient supplementation.
- **Gender Inequality:** It remains a significant barrier, as women often lack the decision-making power to influence their nutritional choices or healthcare access.
- **Lack of Awareness:** Limited awareness about the importance of maternal and child nutrition, especially in rural communities, often results in poor feeding practices and inadequate dietary intake.
- **Cultural Beliefs:** Societal norms and cultural practices, such as early weaning or restricting certain foods for women during pregnancy, can hinder effective nutrition practices.
- **Economic Constraints:** Affordability and availability of nutrient-rich foods remains a significant barrier, particularly in low-income households. The economic burden of buying fruits, vegetables and animal-source foods is often beyond the reach of many families.
- **Inadequate Data and Monitoring:** There is a lack of robust data on maternal and child nutrition indicators, making it difficult to track progress and evaluate the effectiveness of nutrition interventions.

These challenges call for multifaceted approaches to improve nutrition, focusing not only on food security but also on empowering women to make informed decisions about their health and care. Ensuring that women have access to nutritious diets and services is essential to breaking the cycle of malnutrition and poor health outcomes for both mothers and children. By addressing these barriers, we can improve maternal health, reduce the risk of birth complications and promote healthier childhood development, ultimately benefiting the whole community and society.

## 1.6 The Way Forward: Priorities for Maternal and Child Nutrition in Pakistan

To improve the nutritional status of mothers and children in Pakistan, the following strategies should be prioritized:

1. **Strengthening Health Systems:** Expanding access to quality maternal and child healthcare, improving the coverage of nutrition programs and training healthcare workers in effective counseling and service delivery.
2. **Community Engagement:** Enhancing community-level nutrition education and behavior change communication to promote healthy practices, such as exclusive breastfeeding and timely complementary feeding.
3. **Addressing Socioeconomic Barriers:** Developing policies and interventions to reduce food insecurity improve access to nutritious foods and address the root causes of poverty.
4. **Policy Support and Advocacy:** Advocating for the integration of nutrition-specific and nutrition-sensitive interventions into national and provincial policies, as well as ensuring sustained funding for nutrition programs.
5. **Improved Monitoring and Evaluation:** Strengthening data collection and monitoring systems to assess the impact of nutrition interventions and ensure that progress is tracked at national and provincial levels

## MODULE TWO:

### ADOLESCENT NUTRITION IN PAKISTAN



## Adolescent Nutrition in Pakistan:

**Adolescence**, as defined by the World Health Organization (WHO), is the stage of life between **10 and 19 years old**. During this time, young people go through **rapid physical and emotional changes**, and their bodies need **more nutrients** than usual to support this growth. This includes **macronutrients** like carbohydrates, proteins, and fats, as well as **micronutrients** such as vitamins and minerals. **Both boys and girls need these nutrients to grow properly**, and **girls may need extra nutrients** as they start menstruating or, in some cases, begin childbearing.<sup>1</sup>

**Ref:** 1 WHO (2018). Guideline: Implementing effective actions for improving adolescent nutrition. Geneva. Available at: <https://www.who.int/nutrition/publications/guidelines/effective-actions-improving-adolescent/en/>

By the end of this training session, participants will be able to:

### Session Objectives:

1. **Understand the nutritional needs of adolescents** and the importance of this stage for growth, development, and future health—especially in the context of Pakistan.
2. **Identify common forms of adolescent malnutrition** (undernutrition, micronutrient deficiencies, overweight, and obesity) and their causes, symptoms, and health impacts.
3. **Promote adolescent-friendly nutrition services** at health facilities and in communities, with a focus on counseling, growth monitoring, and referral.
4. **Educate adolescents and families** on healthy diets, physical activity, and the importance of delaying early pregnancies to improve maternal and child outcomes.
5. **Strengthen linkages between schools, communities, and health services** to create supportive environments for adolescent nutrition.
6. **Contribute to breaking the cycle of intergenerational malnutrition** by supporting healthy adolescent development as part of the broader MIYCAN strategy.

## Importance of Adolescent Nutrition

Adolescents make up **20.57% of Pakistan's total population (Figure 2.1)**, yet their specific health and nutritional needs remain largely overlooked in national health planning and policy frameworks. This neglect persists despite the fact that adolescence is a **critical period for growth, development, and long-term health outcomes**. It is during this stage that individuals experience rapid physical, emotional, and cognitive changes that lay the foundation for their adult life.

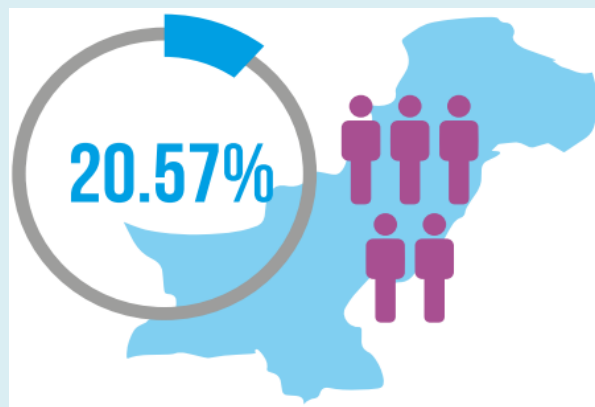


Figure 2.1: Adolescent Population in Pakistan

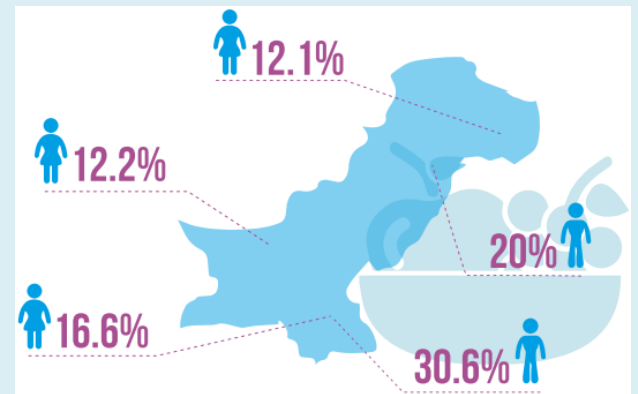
Investing in adolescent nutrition presents a **unique opportunity** to improve not only individual health outcomes but also the **future health of families and communities**. Proper nutrition during adolescence contributes to better educational outcomes, increased economic productivity, and a lower risk of chronic diseases in adulthood. The NNS 2018 provides valuable insights into the nutritional status of adolescents across Pakistan. The findings highlight a serious concern, especially regarding undernutrition among adolescent boys and girls:

## Underweight Among Adolescents

- According to NNS 2018, **1 in 8 adolescent girls** and **1 in 5 adolescent boys** are underweight.
- **Boys are more affected** (21.1%) than girls (11.8%), in both urban and rural areas.

## Regional Comparison – Underweight Adolescents

- **Underweight Girls:**
  - Sindh: 16.6%
  - Balochistan: 12.2%
  - Azad Jammu and Kashmir: 12.1%
- **Underweight Boys:**
  - Sindh: 30.6%
  - Islamabad Capital Territory (ICT): 20%



## Anaemia in Adolescent Girls

- **Over half (56.6%)** of adolescent girls in Pakistan are **anemic**.
- **Severe Anaemia** is less common, affecting only **0.9%** of girls.

## Overnutrition Trend

- In addition to undernutrition, **30.6% of adolescents** are either overweight or obese, signaling the growing threat of **overnutrition** due to poor dietary habits and sedentary lifestyles.

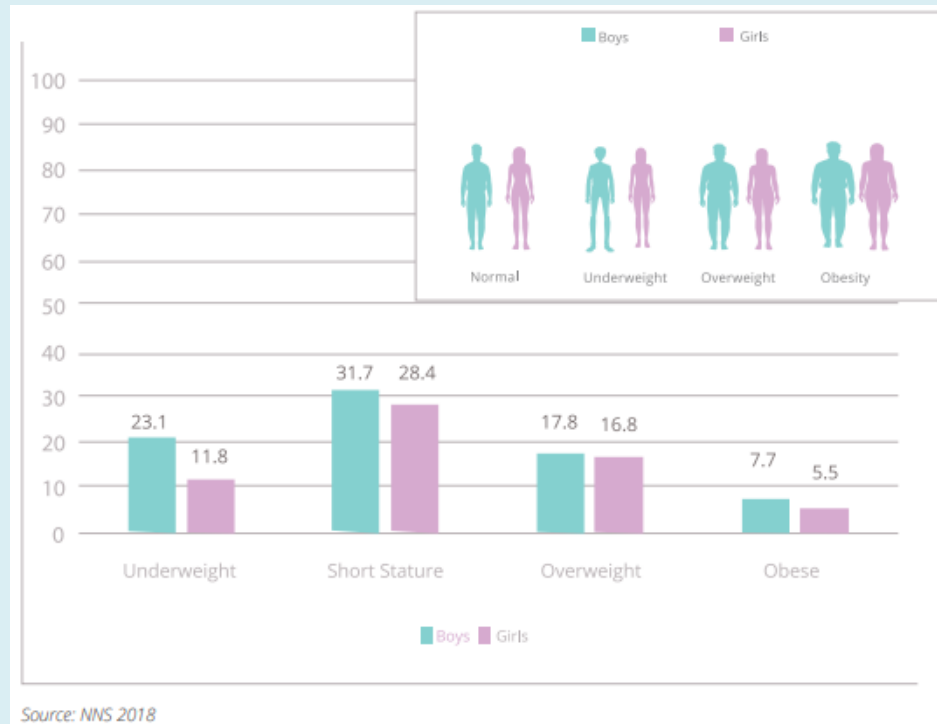


Figure: Underweight, short stature, overweight and obesity in adolescent boys and girls

## Types of Adolescent Malnutrition

### A. Stunting

- **Stunting** happens due to long-term undernutrition and poor health.
- It is often linked to **poverty and lack of proper nutrition** during childhood and adolescence.
- Adolescents with higher **height-for-age Z-scores (HAZ)** are more likely to:
  - Attend school regularly
  - Have better self-confidence, motivation, and future goals
- Lower HAZ scores are linked to:
  - **Poor thinking skills and lower academic performance**
- **Stunted adolescent girls** who become mothers are more likely to face:
  - Complications during childbirth
  - Babies who are underweight, stunted, or at risk of dying



## **B. Thinness (Underweight):**

- Indicates **acute lack of macronutrients** (like carbohydrates, proteins, and fats)
- Linked to **poor school performance** in adolescents
- **Low BMI in pregnant adolescent girls** increases the risk of:
  - Babies being **small for their age at birth**
  - **Stillbirth, infant death, and cerebral palsy**

## **C. Obesity (Overweight):**

- Increases the risk of **diet-related non-communicable diseases**, such as:
  - High blood pressure (hypertension)
  - Insulin resistance and metabolic syndrome
  - Hardening of arteries (atherosclerosis)
  - Non-alcoholic fatty liver disease
- **Obesity in childhood and adolescence** often leads to:
  - **Obesity in adulthood**, which is linked to:
    - **Heart disease**
    - **Type 2 diabetes**
    - **Certain types of cancer**

## Causes of Adolescent Malnutrition

### 1. Limited Access to Healthy Food

- Lack of safe, affordable, and nutritious food options
- Poor food quality and availability in many areas

### 2. Socioeconomic Factors

- **Low income and poverty** can limit access to proper nutrition
- **Neglect or lack of family support** can also contribute

### 3. Cultural Norms and Beliefs

- Traditional food practices or gender-based food distribution
- Misconceptions about food and body image

### 4. Personal Food Choices

- Adolescents may choose **unhealthy or unbalanced diets** due to:
  - Peer pressure
  - Lack of knowledge
  - Taste preferences

## Consequences of Adolescent Malnutrition:

Adolescent malnutrition—whether due to not eating enough or eating too much unhealthy food—can seriously affect a young person’s health, growth, learning, and future well-being.

### 1. Effects of Poor Diet

When adolescents eat poorly, they may get **too little** or **too much** of:

- **Protein**
- **Fats**
- **Energy (calories)**
- **Micronutrients** (like iron, iodine, vitamin A)

This can lead to:

- **Micronutrient deficiencies**
- **High blood sugar levels**
- **High blood pressure**
- **Poor nutritional status before pregnancy** (especially in teenage girls)

### 2. Double Burden of Malnutrition

Adolescents in Pakistan can suffer from both **undernutrition** and **overnutrition**. This is called the “**double burden**” of malnutrition.

Type	Common Problems
Undernutrition	<ul style="list-style-type: none"> <li>- Wasting or thinness (very low weight)</li> <li>- Underweight</li> <li>- Stunting (short for age)</li> </ul>
Micronutrient Deficiency	<ul style="list-style-type: none"> <li>- Iron deficiency (anaemia)</li> <li>- Iodine deficiency</li> <li>- Vitamin A deficiency</li> </ul>
Overnutrition	<ul style="list-style-type: none"> <li>- Overweight and obesity</li> <li>- Too much sugar, fat, and salt in the diet</li> </ul>

### 3. Long-Term Health Risks

Malnourished adolescents are at higher risk of:

- **Frequent illness**
- **Poor maternal health** if they become pregnant too early
- **Poor infant and young child feeding (IYCF) practices** in the future
- **Non-communicable diseases (NCDs)** like:
  - Heart disease
  - Diabetes
  - Stroke
  - Some types of cancer

### 4. Impact on Mental and Physical Development

- **Iron deficiency anaemia** is a major cause of:
  - Fatigue and low energy
  - Poor concentration
  - Disability (especially in ages 10–14)
- In older adolescents (15–19 years), poor nutrition is linked to:
  - **Mental health issues** (depression, anxiety)

- **Maternal health complications**
- **Self-harm risks**

## 5. Broader Impact on Society

- Malnourished adolescents may:
  - Struggle in school and drop out early
  - Be unable to bear healthy children later
  - Miss out on job opportunities and economic participation
- This leads to **loss of human capital** and **reduced national productivity**

## 6. Why Investing in Adolescent Nutrition Matters

- ✓ **Healthy adolescents = Stronger future generation**
- ✓ **Well-nourished youth = Better education, productivity, and health**
- ✓ **Fewer health costs and greater economic growth**

👉 Investing in adolescent nutrition is not just about health—it's about building a **stronger Pakistan**.

## Nutrition in Adolescent Girls and Its Impact on Motherhood and Child Health

Good nutrition **before pregnancy** is very important for the health of both the **mother** and the **baby**. Poor nutrition in adolescent girls can cause serious problems during pregnancy and childbirth, and affect the baby's growth and survival.

## Health Risks Based on Nutrition Status Before Pregnancy

Nutrition Problem in Girls	Possible Health Risks for Mother and Baby
Overweight/Obesity	<ul style="list-style-type: none"><li>- High blood pressure and preeclampsia</li><li>- Gestational diabetes</li><li>- Delivery by C-section</li><li>- Heavy bleeding during birth</li><li>- Stillbirth</li><li>- Infant death</li></ul>
Underweight & Micronutrient Deficiency	<ul style="list-style-type: none"><li>- Preterm birth</li><li>- Baby born too small (small for gestational age)</li></ul>
Short Stature (Stunted Growth)	<ul style="list-style-type: none"><li>- Obstructed labour</li><li>- Higher risk of mother and baby dying during delivery</li></ul>
Low BMI or Stunting	<ul style="list-style-type: none"><li>- Poor baby growth during pregnancy (foetal growth restriction)</li></ul>
Micronutrient Deficiencies (e.g., Iron, Vitamin A, Iodine)	<ul style="list-style-type: none"><li>- Babies more likely to be born underweight or small for gestational age</li></ul>

## The Two Key Windows of Opportunity for Nutrition

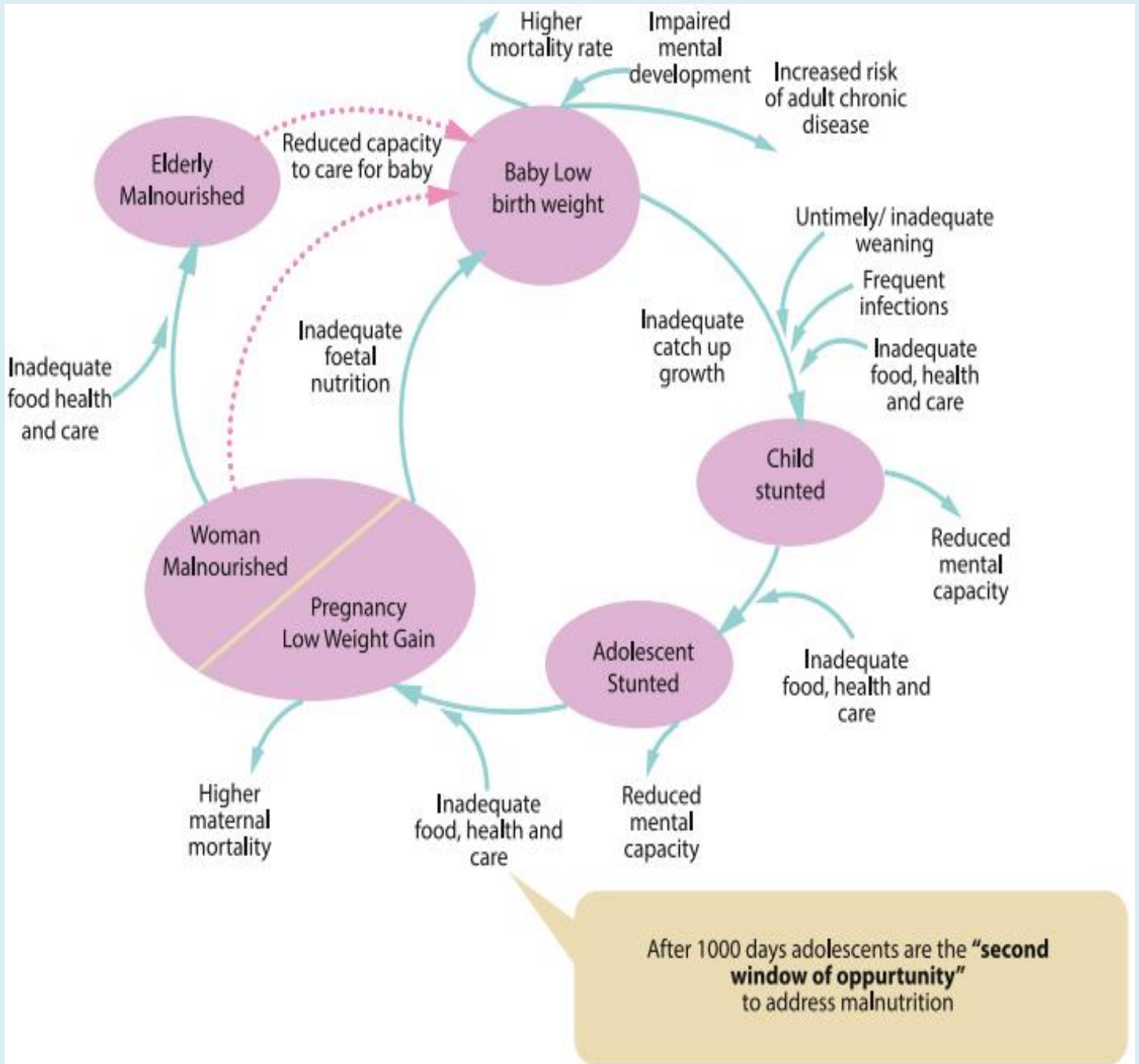
### 1. First 1,000 Days (From Conception to 2 Years of Age)

- This is the **most important period** for a child's development.
- Good nutrition during this time supports **brain development, growth, and immunity**.

### 2. Adolescence (Second Window of Opportunity)

- The teenage years are a **second critical chance** to:
  - Improve nutrition
  - Prevent long-term health problems
  - Break the cycle of malnutrition, disease, and poverty

- Prepare girls for **healthy motherhood** in the future



## Key Message for Health Workers

- ✓ Support adolescent girls with **good nutrition and health education**
- ✓ Identify and address **underweight, overweight, and stunting** early
- ✓ Provide counselling to **delay early pregnancies**
- ✓ Involve schools, families, and communities to improve adolescent health
- ✓ Use every contact point to **educate and screen** adolescent girls

## Recommended Actions to Promote and Support Optimal Nutrition among Adolescents:

### 1. Promoting Healthy Diet:

Adolescence is a time of **rapid physical growth and development** as young people move from childhood to adulthood. During this stage, the body needs **more nutrients** to support healthy growth.

However, many adolescents—especially girls—may develop **unhealthy eating habits**, such as:

- Following **food fads**
- Being **picky or selective** about what they eat
- Skipping meals or **eating too little or too much** of certain foods

These behaviors can lead to **nutrient deficiencies** or **malnutrition**, affecting overall health and development.

### Key Strategy: Promote Healthy Eating Habits

The best way to prevent malnutrition in adolescents is to **encourage a healthy, balanced diet and active lifestyle**. Healthcare workers, families, schools, and communities should work together to:

- Educate adolescents about **nutritional needs**
- Promote **regular and balanced meals**
- Discourage harmful eating habits and food myths



### Recommended Action

Counsel and support adolescent girls and boys on healthy eating behaviors (eating a variety of nutrient rich foods, avoiding foods high in salt, sugar, and fats)

Successful implementation will involve the following to prevent overweight and obesity, undernutrition and micronutrient deficiencies among adolescent girls and boys:

Area of Focus	Recommended Action
Healthy Eating Education	Educate adolescents to eat a <b>variety of foods</b> and to <b>avoid foods high in sugar, fat, and salt</b> , like soft drinks, fast food, and salty/sweet snacks.
Fortified and Biofortified Foods	Encourage the <b>use of fortified foods</b> (e.g. fortified wheat flour) and <b>biofortified crops</b> at home and in schools.
Iron & Folic Acid Supplementation	Provide <b>weekly iron and folic acid tablets</b> to <b>menstruating adolescent girls</b> to help prevent anaemia.
Iodine Intake	Promote the <b>use of iodized salt</b> at home to prevent <b>iodine deficiency disorders</b> .
Deworming	Provide <b>deworming medicine every 6 months</b> for adolescents aged <b>10–14 years</b> to prevent worm-related anaemia.
Physical Activity & Nutrition Integration	Include <b>nutrition and exercise topics</b> in school sessions, youth clubs, and seminars to promote <b>healthy lifestyles</b> among adolescents.

## 2. Promoting Physical Activity in Adolescents

Adolescents are typically energetic and active, but in recent years, there has been a **shift towards more sedentary lifestyles**. Many young people now spend more time playing **indoor video games or using screens** and less time doing **outdoor physical activities**. This has led to an increase in **overweight, obesity, and other health problems** linked to inactivity.

### Recommended Action

Promote physical activity/exercises among adolescent boys and girls.

To improve adolescent health, it is important to **promote regular physical activity** as part of daily life—at home, in school, and in the community. This should follow **global guidelines** and **national health policies**.

## Key Recommendations for Physical Activity in Adolescents

Focus Area	Recommended Action
Daily Activity	Encourage adolescents to do <b>at least 60 minutes of physical activity every day</b> . Most of this should be <b>moderate to vigorous intensity</b> and aerobic.
Muscle & Bone Strengthening	Include <b>vigorous activities</b> that build <b>muscles and bones</b> at least <b>3 times a week</b> .
Activity Types	Promote fun and accessible activities like: - <b>Walking or cycling</b> - <b>Playing sports or games</b> - <b>Recreational activities</b>
Involvement in Daily Life	Encourage participation in <b>family, school, and community-based activities</b> that involve movement and exercise.
Counselling and Support	Provide regular <b>counselling to adolescents</b> and their caregivers on the <b>importance of physical activity</b> for overall health and development.

### Key Message for Health Workers:

- ✓ Make physical activity a part of daily routines
- ✓ Link physical activity with fun, social connection, and health
- ✓ Collaborate with schools and communities to create active spaces

### 3. Prevention of Sexually Transmitted Diseases (STDs) in Adolescents

Sexually Transmitted Diseases (STDs) and other infections that affect **adolescent sexual and reproductive health** can also harm their **nutritional status**.

This is often due to:

- The **stigma and shame** linked to these infections, which can prevent young people from seeking help
- **Limited access to youth-friendly health services**, making it difficult for adolescents to receive proper care and treatment

#### Recommended Action

Educate and counsel adolescents on prevention of sexually transmitted diseases and other infections.

Table: Successful implementation will involve the following:

Implementation Area	Activities
Counselling on prevention of STIs including HIV	- Provide individual and group counselling sessions- Distribute educational materials- Promote condom use- Encourage HIV testing and partner notification
Prevention of malaria and other infestations	- Distribute insecticide-treated nets (ITNs)- Conduct health talks on malaria prevention- Deworming programs for hookworm- Environmental sanitation campaigns
Early and timely management of STDs and infections	- Routine screening for STDs- Prompt treatment and referral- Training healthcare workers in syndromic management- Community outreach services

#### 4. Prevention of Early Pregnancies:

Preventing early pregnancies is essential to safeguard the health of adolescent girls, whose bodies are still developing and are at higher risk of nutritional deficiencies and complications during pregnancy. Pregnant adolescents often suffer from conditions such as iron deficiency anemia and their babies face increased risks of prematurity and mortality. To reduce these risks, adolescents should be educated and supported to delay their first pregnancy until at least 18 years of age. This involves improving access to education, promoting family planning, and enforcing legal protections against child marriage.

##### Recommended Action

Educate and counsel adolescents on delaying first pregnancy

#### Key Activities for Prevention of Early Pregnancies

Implementation Area	Key Activities
Adolescent education and empowerment	<ul style="list-style-type: none"><li>- Encourage adolescents to stay in school longer</li><li>- Promote access to formal and non-formal educational opportunities</li></ul>
Counselling on family planning and pregnancy prevention	<ul style="list-style-type: none"><li>- Provide adolescent-friendly sexual and reproductive health services</li><li>- Educate on benefits of delaying pregnancy till age 18</li></ul>
Policy enforcement and community engagement	<ul style="list-style-type: none"><li>- Advocate for enforcement of laws prohibiting child marriage</li><li>- Engage political, community, and religious leaders in awareness</li></ul>
Legal framework awareness	<ul style="list-style-type: none"><li>- Disseminate information on the Penal Code Act and Uganda's Constitution regarding legal age for marriage and sexual consent</li></ul>

## 5. Adolescent-Friendly Nutrition Services

Adolescent-friendly nutrition services aim to ensure that all adolescents receive equitable, respectful, and accessible nutrition care within health facilities, schools, and communities. These services should be inclusive and non-discriminatory, integrated into the broader healthcare and education systems. The goal is to assess and address the nutritional needs of adolescents, prevent malnutrition in all its forms, and promote healthy practices through both counselling and education.

### Recommended Action

Integrate nutrition services in adolescent-friendly platforms at the health facility, community, and school levels.

### Key Activities for Adolescent-Friendly Nutrition Services

Implementation Area	Key Activities
Nutrition assessment and monitoring	- Regularly assess the nutrition status of adolescent girls and boys
Nutrition counselling	- Provide targeted counselling on preventing and managing undernutrition, overweight, and micronutrient deficiencies
Integration with reproductive health services	- Offer nutrition counselling during sexual and reproductive health visits
School-based nutrition education	- Include nutrition education in school curricula - Promote school-based nutrition clubs
Water, Sanitation and Hygiene (WASH) promotion	- Ensure availability of clean water and sanitation facilities in schools and communities - Promote good hygiene habits

## MATERNAL NUTRITION



## MATERNAL NUTRITION

Women have unique nutritional needs at various stages of their lives, particularly before and during pregnancy and while breastfeeding. These are periods of increased vulnerability, where proper nutrition is essential for both the mother's health and the well-being of her child. Ensuring that women have access to nutritious food, healthcare services and appropriate care is critical to reducing maternal and infant mortality and promoting healthy growth and development.

However, in many regions of the world, women's nutritional status remains unacceptably low. This is especially true for adolescents and women at nutritional risk, who often do not receive the necessary services or support to meet their dietary needs. A lack of access to adequate nutrition services severely affects both maternal and child health, with consequences lasting long into childhood.

### Session 3.1: Importance of Maternal Nutrition

**Before Pregnancy:** It is essential for women to maintain a nutritious and balanced diet to establish sufficient reserves for the demands of pregnancy. Proper nutrition helps ensure that women are physically prepared for the challenges of pregnancy and supports optimal reproductive health.



**During Pregnancy and Breastfeeding:** During pregnancy and lactation, a woman's nutritional needs increase significantly. The growing fetus, the physical changes in the mother's body and the increased metabolic demands necessitate higher energy, vitamins and minerals intake. Adequate nutrition is crucial not only for the health of the mother but also for the proper development of the baby.



Poor nutrition during this time can result in a range of adverse outcomes such as maternal anemia, pre-eclampsia, low birth weight, preterm births and developmental delays in infants. During pregnancy and lactation, the nutritional requirements of the mother and her baby are



interdependent. A mother's diet directly influences the growth and development of her baby, both in utero and during the early stages of life.

### **Session 3.2 Key Nutrients for Pregnant and Lactating Women**

#### **Multiple Micronutrients Supplementation:**

Multiple Micronutrient Supplementation (MMS) refers to a prenatal supplement that contains a combination of essential vitamins and minerals, typically including 15 key nutrients such as iron, folic acid, iodine, calcium, zinc and vitamins A, C, D, E and B12. MMS is specifically designed for pregnant women to address common nutritional deficiencies during pregnancy. Its primary aim is to prevent anemia, improve maternal health and reduce the risk of complications such as low birth weight, preterm birth and developmental delays in the baby.



Iron and folic acid, two of the most critical components, play significant roles in preventing anemia and ensuring the proper development of the fetus, particularly the neural tube. The inclusion of other nutrients like iodine and calcium further supports the health of both the mother and the child. Iodine is essential for proper thyroid function, which is vital for fetal brain development, while calcium contributes to the development of the baby's bones and teeth.

MMS is especially recommended for women with inadequate diets or those at high risk of micronutrient deficiencies, such as women in low-income or rural areas. By providing a broad spectrum of nutrients, MMS helps ensure that pregnant women meet their increased nutritional needs, ultimately contributing to healthier pregnancies and better birth outcomes.

### *Nutritional Needs during Pregnancy:*

During pregnancy, a woman's nutritional needs increase significantly to support both her own health and the development of the fetus. The body undergoes numerous physiological changes and adequate nutrition is critical to meet these demands.

Trimester	Estimated Energy Requirements (Cal/day)	
1 <sup>st</sup> trimester	-	<div>1 snack (e.g. 1 cup of milk &amp; a handful of peanuts)</div> <div>1 small meal (e.g. 1 chapatti, 1 small plate of kofta curry &amp; 1 small bowl of vegetable salad)</div>
2 <sup>nd</sup> trimester	+ 340	
3 <sup>rd</sup> trimester	+ 452	

RDA *	Non-pregnant		Pregnant	
	Adolescent girls (14-18 years)	Women (19-50 years)	Adolescent girls (14-18 years)	Women (19-50 years)
Iron (mg/day)	15	18	27	27
Folate (µg/day)	400	400	600	600
Vitamin A (µg RAE/day) **	700	700	750	770
Vitamin D (µg/day)	5	5	5	5
Vitamin E (mg/day)	15	15	15	15
Vitamin C (mg/day)	65	75	80	85
Vitamin B6 (mg/day)	1.2	1.3	1.9	1.9
Vitamin B12 (µg/day)	2.4	2.4	2.6	2.6
Zinc (mg/day)	9	8	12	11
Vitamin B1 (mg/day)	1.0	1.1	1.4	1.4
Vitamin B2 (mg/day)	1.0	1.1	1.4	1.4
Niacin (mg/day)	14	14	18	18
Copper (µg/day)	890	900	1000	1000
Selenium (µg/day)	55	55	60	60
Iodine (µg/day)	150	150	220	220
Calcium (mg/day)	1300	1000	1300	1000

The increased nutritional requirements serve several key purposes:

- **Meet Physiological Requirements:** Pregnancy places additional demands on the body, such as the need for increased blood volume, tissue growth and the formation of the placenta. Nutrients like iron, folic acid and protein are essential to meet these physiological demands and maintain the health of the mother.
- **Sustain Fetal Growth and Development:** The fetus requires a steady supply of nutrients to grow and develop properly. This includes essential vitamins and minerals like calcium, iodine and folic acid, which support the development of the baby's bones, brain and neural structures. Adequate nutrition helps ensure proper fetal growth, reducing the risks of complications like low birth weight or preterm birth.
- **Protect the Health of the Mother and Prepare for Breastfeeding:** Proper nutrition during pregnancy is essential to safeguard the mother's health and ensure she has adequate reserves for breastfeeding. Nutrients like calcium, magnesium and vitamin D are important for bone health, while protein and fats support overall energy levels. Additionally, good nutrition helps prepare the mother's body for postpartum recovery and successful breastfeeding, which demands extra caloric and nutrient intake.

In sum, meeting the increased nutritional needs during pregnancy is vital not only for the health of the mother but also for the proper growth and development of the baby, ensuring a healthy pregnancy and promoting optimal outcomes in childbirth and breastfeeding.

## Minimum Dietary Diversity for Women (MDD-W)

The *Minimum Dietary Diversity for Women* (MDD-W) is a key indicator developed by the Food and Agriculture Organization (FAO) to assess the dietary quality of women of reproductive age (15-49 years). It is an important measure used to understand the diversity of food groups consumed by women, which is linked to better nutritional outcomes and overall health.

The MDD-W indicator is based on the consumption of 10 specific food groups over a 24-hour period. Women who consume at least 5 of these 10 food groups in a given day are considered to have met the minimum dietary diversity threshold, which is a proxy for the quality of their diet and a sign of good nutritional practices. The MDD-W indicator is particularly useful in monitoring the progress of nutrition interventions, assessing food security, and promoting improved dietary patterns among women, especially in contexts of malnutrition or food insecurity.

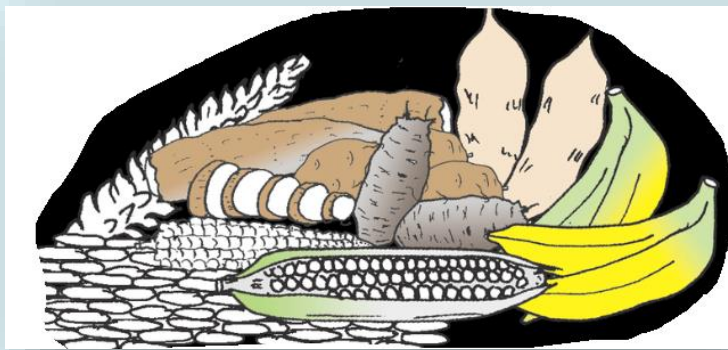
This indicator is a foundational tool for the *MIYCAN (Maternal, Infant, Young Child and Adolescent Nutrition)* program, where promoting the dietary diversity of women plays a crucial role in improving maternal health and, consequently, child health and development.

These food groups include:

- |   |  |
|---|--|
| <b>1. Grains, white roots and tubers, and plantains</b> | <b>6. Eggs</b>                                       |
| <b>2. Pulses (beans, peas and lentils)</b>              | <b>7. Dark green leafy vegetables</b>                |
| <b>3. Nuts and seeds</b>                                | <b>8. Other vitamin A-rich fruits and vegetables</b> |
| <b>4. Milk and milk products</b>                        | <b>9. Other vegetables</b>                           |
| <b>5. Meat, poultry and fish</b>                        | <b>10. Other fruits</b>                              |

### Group 1: Grains, white roots, tubers and plantains:

This food group is an essential part of the diet, providing a significant source of energy, carbohydrates, and essential nutrients. It includes grains (such as rice, wheat, and maize), white roots and tubers (such as potatoes, sweet potatoes, and yams), and plantains (a type of banana used for cooking). These foods are a staple in the diet across Pakistan and play an important role in meeting the daily energy requirements, especially for women and children.



### Nutritional Value

- **Carbohydrates:** The primary nutrient found in this food group is carbohydrates, which are the body's main source of energy. This energy is crucial for women and children, especially during pregnancy and lactation when energy needs are higher.
- **Dietary Fiber:** Foods in this group also provide fiber, which is important for maintaining a healthy digestive system. Fiber helps prevent constipation and aids in the absorption of other nutrients.
- **Vitamins and Minerals:** While not as rich in micronutrients as other food groups, some varieties of tubers, roots, and grains can provide essential vitamins such as Vitamin A (in sweet potatoes) and some B vitamins (like thiamine and niacin). They also contain minerals like potassium and magnesium, which are vital for muscle function and overall health.
- **Protein:** While not a primary source of protein, some grains like maize can contribute small amounts of protein.

## Examples of Foods in this Group in the Context of Pakistan:

### A. Grains:

- **Rice:** A common staple food in many regions of Pakistan, particularly in the southern and eastern provinces. It provides energy and is rich in carbohydrates.
- **Wheat:** Widely consumed in the form of *roti* (flatbread) or *paratha* (fried flatbread). Wheat is a key source of carbohydrates and some B vitamins, such as folate.
- **Maize (corn):** Commonly consumed in rural areas, maize is another important staple, often boiled or used in making *makai ki roti* (cornbread).

### B. White Roots and Tubers:

- **Potatoes:** Potatoes are one of the most commonly grown and consumed tubers in Pakistan. They provide energy, fiber, and vitamin C. They are versatile and used in various dishes, from curries to snacks.
- **Sweet Potatoes:** Although less common, sweet potatoes are grown in certain parts of Pakistan, especially in the northern regions. They are rich in Vitamin A, which is vital for eye health, and provide additional carbohydrates and fiber.

### C. Plantains:

- **Plantains** are less common in Pakistan but are available in some regions, especially those that have tropical climates. Plantains are higher in starch compared to regular bananas and are often cooked before being eaten. They provide a good source of carbohydrates and can be an alternative to potatoes in local dishes.

## Group 2: Pulses (Beans, Peas, and Lentils)

Pulses, which include beans, peas, and lentils, are an important food group in the context of nutrition, especially for women and children. In Pakistan, pulses are a key component of the diet, offering a rich source of plant-based protein, vitamins, and minerals. They are particularly beneficial in areas where animal-based proteins (such as meat, poultry, or fish) may be less accessible or affordable. Pulses also play a significant role in maintaining overall health and supporting the nutritional needs of mothers and young children.



### Nutritional Value

- **Protein:** Pulses are an excellent source of plant-based protein, which is crucial for growth, tissue repair, and immune function. For women, especially those who are pregnant or breastfeeding, adequate protein intake is vital for the health of both mother and child. Pulses provide a cost-effective alternative to animal protein and can be a primary protein source in vegetarian diets.
- **Fiber:** Pulses are high in dietary fiber, which supports digestive health and prevents constipation, a common issue during pregnancy. The fiber content also helps in maintaining healthy blood sugar levels, which is beneficial for women at risk of gestational diabetes.

- **Iron:** Pulses, particularly lentils and chickpeas, are rich in iron, an essential mineral needed for the production of hemoglobin. This is especially important for women and young children, as iron deficiency can lead to anemia. Iron from pulses is better absorbed when consumed with vitamin C-rich foods, such as citrus fruits or tomatoes.
- **Folate (Vitamin B9):** Lentils, beans, and peas are a good source of folate, a B-vitamin that is crucial during pregnancy for fetal development. Folate helps prevent neural tube defects in newborns and supports the overall health of the mother.
- **Micronutrients:** Pulses also provide important minerals such as potassium, magnesium, and zinc, which contribute to muscle function, bone health, and immune system support. These are essential for both maternal and child health.

### Examples of Pulses in Pakistan:

#### 1. Lentils (Masoor, Moong, and Urad):

- **Masoor (Red Lentils):** Red lentils are commonly consumed in Pakistan and are rich in protein, iron, and folate. They are quick to cook and are a staple in many households. Masoor dal (red lentil curry) is a popular dish that provides essential nutrients and is an easy way to include lentils in the diet.
- **Moong (Green Lentils):** Moong lentils are lighter and easier to digest, making them a common choice for soups and stews. They are rich in protein and provide a good amount of fiber and essential vitamins like folate.
- **Urad (Black Gram Lentils):** Urad lentils are commonly used in Pakistani cuisine to make dal or to prepare special dishes like *dal makhani* or *samosas*. They are a good source of protein and iron.



## 2. Beans (Lima Beans, Kidney Beans, Chickpeas):

- **Chickpeas (Chana):** Chickpeas are widely consumed in Pakistan, either in dishes like *chana masala* (spicy chickpeas) or used as a snack when roasted. Chickpeas are high in protein and iron, making them particularly valuable for women and children. They are also rich in folate and fiber.
- **Kidney Beans (Rajma):** Kidney beans are often used in curries or mixed with rice. They are a good source of protein, iron, and potassium, which supports heart health. Rajma chawal (kidney beans with rice) is a common comfort food in Pakistan.
- **Lima Beans (Val):** Lima beans are also consumed in some parts of Pakistan, providing a rich source of protein, fiber, and essential minerals.

## 3. Peas (Green Peas, Pigeon Peas):

- **Green Peas (Matar):** Green peas are frequently used in various dishes such as curries, biryanis, and soups. They provide protein, fiber, and essential vitamins like vitamin C and folate.
- **Pigeon Peas (Toor Dal):** This type of pulse is commonly used in Pakistani kitchens to make dals and stews. Pigeon peas are rich in protein and iron and provide a hearty, nutritious addition to any meal.

### Group 3: Nuts and Seeds

Nuts and seeds are a highly nutritious food group, offering a wealth of essential nutrients required for the growth and health of women and children. In Pakistan, while nuts and seeds may not be a daily staple in every household, they are commonly used in festive dishes, snacks, or incorporated into sweets and desserts. This food group is particularly valuable for providing healthy fats, proteins, vitamins, and minerals, all of which play a key role in maternal and child nutrition.



#### Nutritional Value

##### 1. Healthy Fats (Unsaturated Fats):

Nuts and seeds are rich in healthy fats, particularly unsaturated fats such as monounsaturated and polyunsaturated fats. These healthy fats are essential for brain development, particularly in infants and young children, and help to maintain heart health for women. Healthy fats also play a critical role in the absorption of fat-soluble vitamins (A, D, E, K), which are important for immune function and overall growth.

##### 2. Protein:

Nuts and seeds are a good source of plant-based protein, which is crucial for growth, tissue repair, and maintaining muscle mass. This is especially important for women during pregnancy and lactation, as well as for growing children who need protein for development. Although nuts and seeds alone may not provide all the essential amino acids, they are a good complement to other plant-based protein sources like legumes.

### 3. **Vitamins:**

- **Vitamin E:** Nuts like almonds and seeds like sunflower seeds are rich in Vitamin E, an antioxidant that helps protect cells from damage and supports immune health. It also plays a role in skin health, which is particularly important for pregnant women and young children.
- **B-Vitamins:** Nuts such as walnuts and seeds like sesame seeds contain B-vitamins, which are important for energy production and brain health.

### 4. **Minerals:**

- **Magnesium:** Nuts and seeds like almonds, cashews, and sunflower seeds are high in magnesium, a mineral that supports muscle and nerve function, bone health, and helps regulate blood pressure. Magnesium is particularly important during pregnancy and for children's bone growth.
- **Iron:** While nuts and seeds are not as high in iron as animal products, they still provide a significant amount of this important mineral. Iron is essential for preventing anemia in both women and children, particularly during pregnancy and early childhood.
- **Zinc:** Nuts and seeds like pumpkin seeds are also a good source of zinc, which is crucial for immune function, wound healing, and overall growth and development.

### 5. **Fiber:**

Nuts and seeds are an excellent source of dietary fiber, which promotes healthy digestion and can help prevent constipation. Fiber also helps in regulating blood sugar levels and maintaining healthy cholesterol levels, contributing to overall cardiovascular health.

## Examples of Nuts and Seeds in the Context of Pakistan

### 1. Nuts:

- **Almonds (Badam):** Almonds are widely consumed in Pakistan and are often added to desserts, sweets, and drinks like *badam milk*. Rich in healthy fats, protein, and Vitamin E, almonds support brain function, skin health, and immune health. They are also a good source of calcium, which is important for bone health.
- **Pistachios (Pista):** Pistachios are another popular nut in Pakistan, often eaten as a snack or used in traditional sweets like *mithai* (sweets). They are high in healthy fats, protein, and fiber, and provide essential minerals like potassium and magnesium.
- **Cashews (Kaju):** Cashews are commonly used in a variety of dishes, from curries to snacks, and are also found in sweets. They provide healthy fats, protein, and important micronutrients like magnesium and zinc.
- **Walnuts (Akhrot):** Walnuts are consumed in many parts of Pakistan and are often used in desserts or eaten as a snack. They are particularly rich in omega-3 fatty acids, which are important for brain health, and also provide protein and Vitamin E.

## 2. Seeds:

- **Sunflower Seeds:** These are a common snack in Pakistan and are rich in healthy fats, protein, and Vitamin E. Sunflower seeds are also a good source of magnesium and selenium, an antioxidant mineral that supports immune health.
- **Pumpkin Seeds (Kaddu ke Beej):** Pumpkin seeds are widely available in Pakistan, especially during the pumpkin harvest season. They are an excellent source of zinc, magnesium, and healthy fats. They can be eaten as a snack or added to salads, yogurt, or curries.
- **Sesame Seeds (Til):** Sesame seeds are used in a variety of dishes in Pakistan, including desserts like *til ke laddoo* (sesame seed sweets). They are rich in calcium, magnesium, and healthy fats, making them beneficial for bone health and overall growth, especially for women and children.
- **Flaxseeds (Alsi):** Flaxseeds are gaining popularity in Pakistan due to their high content of omega-3 fatty acids, fiber, and lignans (antioxidants). They are often added to smoothies, yogurt, or baked goods.

## Group 4: Milk and Milk Products – Nutritional Value for Women and Children

Milk and milk products are a highly valuable food group, providing essential nutrients that support the health and development of both women and children. In Pakistan, milk is a common part of the daily diet, often consumed as a beverage or used in cooking. This food group is particularly rich in calcium, protein, and other essential vitamins and minerals that are critical for bone health, growth, and overall development. Incorporating milk and its products into the diet can significantly improve maternal and child nutrition.



### Nutritional Value

#### 1. Calcium:

- One of the most significant nutrients found in milk and milk products is **calcium**. Calcium is essential for the development of strong bones and teeth, and it plays a vital role in muscle function, nerve signaling, and blood clotting. During pregnancy, lactation, and childhood, calcium is needed in higher amounts to support bone formation and growth.
- Women, particularly during pregnancy and breastfeeding, need adequate calcium to maintain their bone health and support fetal bone development. Inadequate calcium intake can lead to weakened bones and conditions like osteoporosis later in life.

#### 2. Protein:

- **Protein** is another important nutrient found in milk and milk products. Protein is essential for growth, tissue repair, and immune function. For pregnant and breastfeeding women, protein is especially important to support the growing fetus and ensure the health of the mother. Protein also plays a critical role in the development of muscle mass in children.

### 3. **Vitamin D:**

- **Vitamin D** is essential for calcium absorption, which makes it crucial for bone health. While vitamin D can be synthesized by the body through sunlight exposure, it is also found in fortified milk products. Adequate levels of vitamin D help prevent rickets in children and osteomalacia (softening of bones) in women, especially during pregnancy.

### 4. **Vitamin A:**

- **Vitamin A** is another important nutrient found in milk and milk products, especially in whole milk. Vitamin A supports eye health, immune function, and skin health. During pregnancy, adequate vitamin A intake is necessary to prevent vision problems and support fetal development.

### 5. **B-Vitamins:**

- Milk is also a good source of several B-vitamins, particularly **vitamin B12**, which is crucial for red blood cell production and nervous system function. Vitamin B2 (riboflavin) and vitamin B5 (pantothenic acid) also help in energy production, metabolism, and the formation of healthy skin, hair, and eyes.

### 6. **Phosphorus:**

- **Phosphorus** is another mineral present in milk that works alongside calcium to form strong bones and teeth. Phosphorus also plays a role in energy production and cell repair.

### 7. **Fat:**

- Milk fat provides energy, and the fat in milk contains fat-soluble vitamins (A, D, E, and K) that are essential for various bodily functions. However, the fat content varies depending on the type of milk (whole milk, skim milk, etc.).

## Examples of Milk and Milk Products in the Context of Pakistan

### 1. Milk:

- **Fresh Milk:** Fresh cow's milk is commonly consumed in Pakistan, particularly in rural areas. It is often consumed as a beverage (plain or with added sugar) or used in tea (chai). Milk is an important source of calcium, protein, and other essential nutrients.
- **Buffalo Milk:** In Pakistan, buffalo milk is also widely consumed, especially in rural regions. Buffalo milk is richer in fat and protein compared to cow's milk, making it a valuable source of energy and nutrition. It is used in a variety of traditional dishes, such as *lassi* (a yogurt drink) and *dahi* (yogurt).

### 2. Yogurt (Dahi):

- **Yogurt** is a staple in Pakistani diets, often consumed as a side dish with meals or in the form of *lassi* (a yogurt-based drink). It is rich in calcium, protein, and probiotics, which promote gut health and enhance the immune system. Yogurt is also an excellent source of Vitamin B12 and riboflavin.
- **Lassi:** A traditional yogurt-based drink that is popular in Pakistan, *lassi* can be either sweet or salty. *Lassi* provides hydration, protein, and probiotics that support digestion and immunity.

### 3. Cheese (Paneer and Other Varieties):

- **Paneer:** Paneer, or fresh cheese, is commonly used in Pakistani cuisine, particularly in vegetarian dishes. It is a good source of protein and calcium and is often used in curries or eaten in various snack forms. Paneer provides essential nutrients, including B-vitamins and phosphorus, supporting bone health and muscle development.
- **Other Cheeses:** Some other varieties of cheese, such as *cheddar* or *processed cheese*, are also available in urban areas and are used in snacks, sandwiches, or cooking.
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#### 4. **Butter (Makhan):**

- **Butter** is often used in cooking and is a common ingredient in many traditional dishes, such as *paratha* (flatbread) and desserts. While butter is high in fat, it is also a source of fat-soluble vitamins like Vitamin A and D, which are crucial for eye health, immune function, and bone health.

#### 5. **Ghee:**

- **Ghee** (clarified butter) is commonly used in Pakistani cooking. While ghee is rich in saturated fat, it is also a good source of energy and fat-soluble vitamins, including Vitamin A. Ghee is often used in traditional foods and sweets.

## Group 5: Meat, Poultry, and Fish

Meat, poultry, and fish are important food sources that provide high-quality protein, essential fatty acids, vitamins, and minerals necessary for the growth, development, and maintenance of health in both women and children. In Pakistan, meat and fish are commonly consumed, although they may be more prevalent in urban areas or among wealthier populations. This food group is particularly valuable for addressing protein and micronutrient deficiencies, especially in regions where plant-based proteins alone may not be sufficient to meet dietary needs.



### Nutritional Value

#### 1. High-Quality Protein:

- Meat, poultry, and fish provide **complete proteins**, which means they contain all the essential amino acids that the body cannot synthesize on its own. Protein is crucial for muscle growth, immune function, enzyme production, and tissue repair. For growing children, pregnant and lactating women, and the elderly, protein is vital for maintaining healthy body tissues, supporting immunity, and ensuring proper development.

## 2. Iron (Heme Iron):

- One of the most significant benefits of meat, poultry, and fish is their **iron content**, particularly **heme iron**, which is more easily absorbed by the body compared to non-heme iron from plant-based sources. Iron is essential for the production of hemoglobin, which carries oxygen in the blood. Iron deficiency can lead to anemia, a condition that is particularly common among women, especially pregnant women, and young children.
- In Pakistan, where iron deficiency anemia is widespread, the inclusion of meat, poultry, and fish in the diet can help combat this condition.

## 3. Omega-3 Fatty Acids:

- **Fish**, particularly fatty fish like **salmon, mackerel, and sardines**, are rich in **omega-3 fatty acids**. These essential fats play a crucial role in brain development, cognitive function, and eye health. Omega-3 fatty acids also have anti-inflammatory properties and contribute to heart health. For pregnant women, omega-3s are important for the development of the baby's brain and eyes.
- **Fish oil** from oily fish also contains **vitamin D**, which is important for bone health and the absorption of calcium.

## 4. B-Vitamins:

- Meat, poultry, and fish are rich in several **B-vitamins**, particularly **B12** (cobalamin), which is crucial for nerve function, red blood cell formation, and DNA synthesis. B12 is found exclusively in animal products, so it is particularly important for individuals who do not consume adequate animal-based foods.
- Other B-vitamins, such as **niacin** (B3), **riboflavin** (B2), and **pantothenic acid** (B5), are important for energy production, metabolism, and maintaining healthy skin, hair, and eyes.

#### 5. **Zinc:**

- Zinc is another essential mineral found in meat, poultry, and fish, particularly **red meat** and **shellfish**. Zinc plays a key role in immune function, wound healing, DNA synthesis, and cell division. It is also crucial for the growth and development of children.

#### 6. **Vitamin A (in certain meats):**

- **Liver** from animals such as cows and goats is a rich source of **vitamin A**, an essential fat-soluble vitamin that supports vision, immune health, and skin health. It also helps in fetal development and is vital during pregnancy.

#### 7. **Fat:**

- Meat and poultry, particularly **fatty cuts**, contain fat that provides energy. While some fat is necessary for maintaining body functions and absorbing fat-soluble vitamins, it is important to choose lean cuts of meat to avoid excessive saturated fat intake, which can contribute to heart disease.

### **Examples of Meat, Poultry, and Fish in the Context of Pakistan**

#### 1. **Meat (Beef, Mutton, and Goat):**

- **Beef:** Beef is widely consumed in urban areas of Pakistan and is often used in dishes like **karahi**, **nihari**, and **seekh kebabs**. It is a good source of protein, iron, zinc, and B-vitamins, particularly B12. Beef liver is an excellent source of vitamin A and iron.
- **Mutton (Goat Meat):** Mutton is a popular meat in many regions of Pakistan and is typically used in traditional dishes like **mutton curry** and **roast mutton**. It is rich in protein, iron, and zinc, making it beneficial for preventing iron-deficiency anemia and supporting overall growth and development.

- **Goat Meat:** Goat meat, particularly in rural areas, is commonly consumed. It is leaner than beef and mutton and is a good source of protein and iron, as well as essential fatty acids.

## 2. Poultry (Chicken, Turkey):

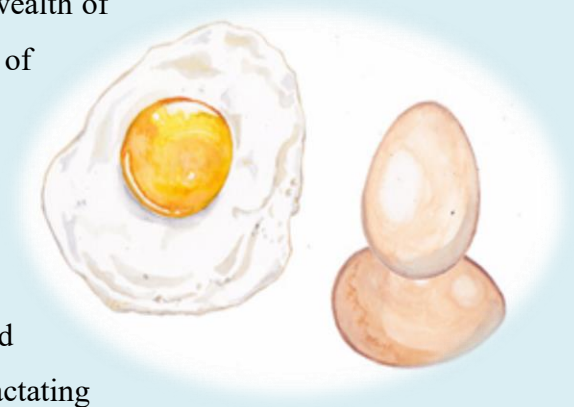
- **Chicken:** Chicken is a common source of protein and is consumed in various forms, such as **chicken curry**, **grilled chicken**, or **roast chicken**. It is lower in fat compared to red meats like beef and mutton but still provides high-quality protein, B-vitamins, and important minerals like phosphorus and zinc.
- **Turkey:** Though less common than chicken, turkey is consumed in some regions of Pakistan. It is similar to chicken in terms of nutritional value, providing lean protein and essential vitamins and minerals.

## 3. Fish (Freshwater and Saltwater Fish):

- **Freshwater Fish:** Fish like **rohu** (a popular variety of carp), **catla**, and **tilapia** are commonly found in Pakistan's rivers and are often consumed in rural and urban households. These fish provide good amounts of protein, omega-3 fatty acids, and essential vitamins and minerals.
- **Saltwater Fish:** Saltwater fish such as **pomfret**, **mackerel**, **sardines**, and **kingfish** (tuna) are widely consumed in coastal areas of Pakistan. Fatty fish like mackerel and sardines are particularly rich in omega-3 fatty acids, vitamin D, and protein, which are vital for heart health, brain development, and overall well-being.

## Group 6: Eggs – Nutritional Value for Women and Children

Eggs are an incredibly nutritious food that provides a wealth of essential nutrients required for the growth and health of women and children. In Pakistan, eggs are commonly available, affordable, and versatile, making them an important source of protein and other micronutrients in the diet. Eggs are highly recommended as part of a balanced diet due to their high nutritional density and numerous health benefits, especially for pregnant and lactating women, as well as growing children.



### Nutritional Value

#### 1. High-Quality Protein:

- Eggs are an excellent source of **high-quality protein**, containing all the essential amino acids needed by the body. Protein is vital for growth, tissue repair, immune function, and the formation of enzymes and hormones. For pregnant women, protein is essential for fetal development, while for children, it supports growth and development of muscles and organs.
- The protein in eggs is of high biological value, meaning the body can efficiently use it for various functions. This makes eggs an ideal source of protein for people with limited access to other animal-based protein sources.

## 2. Vitamins:

- **Vitamin A:** Eggs, especially the yolk, are rich in **vitamin A**, which is essential for maintaining healthy vision, immune function, and skin health. For pregnant women, adequate vitamin A intake is critical for fetal development, particularly for the development of the eyes and immune system.
- **B-Vitamins:** Eggs are an excellent source of several **B-vitamins**, including **B12**, **riboflavin** (B2), and **pantothenic acid** (B5). Vitamin B12 is essential for the production of red blood cells and nerve function. Riboflavin helps in energy production and maintaining healthy skin, while pantothenic acid is important for metabolic functions.
- **Folate (Vitamin B9):** Eggs are a good source of **folate**, which is crucial for DNA synthesis and cell division. Folate is particularly important during pregnancy to prevent neural tube defects in the developing fetus.
- **Vitamin D:** Eggs, particularly those from chickens exposed to sunlight, contain small amounts of **vitamin D**, which supports calcium absorption and bone health. Vitamin D is especially important for pregnant women and young children to support skeletal development.

## 3. Minerals:

- **Iron:** While eggs are not as rich in iron as meat, they still contain a small amount of **iron**, which is essential for the production of hemoglobin and prevention of iron deficiency anemia. This is particularly important for women during menstruation, pregnancy, and breastfeeding, as well as for children who are growing rapidly.

- **Zinc:** Eggs provide a modest amount of **zinc**, an essential mineral for immune function, wound healing, and cell division. Zinc is vital for the growth and development of children and supports the body's ability to fight infections.
- **Phosphorus:** **Phosphorus** in eggs plays an important role in the formation of bones and teeth and helps in energy production. It works closely with calcium for bone health.

#### 4. **Healthy Fats:**

- The **fat** content in eggs primarily comes from the yolk, which contains a mixture of **monounsaturated** and **polyunsaturated fats**, along with a small amount of **saturated fat**. These healthy fats are important for brain health, cell membrane structure, and the absorption of fat-soluble vitamins (A, D, E, and K).
- Eggs also contain **omega-3 fatty acids** (particularly in eggs from hens that are fed omega-3 enriched feed). Omega-3s are beneficial for brain function, eye health, and reducing inflammation in the body.

#### 5. **Choline:**

- Eggs are one of the best sources of **choline**, an essential nutrient that supports brain health and cognitive function. Choline is especially important during pregnancy for fetal brain development and can improve memory and cognitive function in adults.

**Chicken eggs** are the most widely consumed type of eggs in Pakistan. They are a staple in many households and are used in a variety of dishes. Common ways of preparing eggs in Pakistan include boiled eggs, fried eggs, scrambled eggs, or as an ingredient in **omelets**, **egg curry**, and **biryani** (a traditional rice dish). Chicken eggs are affordable and highly nutritious, making them a common choice for improving dietary quality.



## Group 7: Dark Green Leafy Vegetables – Nutritional Value for Women and Children

Dark green leafy vegetables (DGLVs) are among the most nutrient-dense foods, offering a wide array of vitamins, minerals, and fiber that are crucial for the health and well-being of both women and children. These vegetables are particularly important in the context of maternal and child nutrition, as they provide nutrients that help prevent common deficiencies and support overall growth and development. In Pakistan, DGLVs are commonly grown and consumed across various regions, making them an accessible and affordable source of essential nutrients.



### Nutritional Value

#### 1. Vitamins:

##### ○ Vitamin A (Beta-Carotene):

- Dark green leafy vegetables are rich in **vitamin A** in the form of **beta-carotene**, a powerful antioxidant that supports eye health, immune function, and skin integrity. Adequate vitamin A intake is particularly important for pregnant women, as it supports fetal development and reduces the risk of infections during pregnancy. For children, it helps with vision development and maintaining a healthy immune system.

- **Vitamin C:**

- DGLVs are also a good source of **vitamin C**, which is vital for the growth and repair of tissues, immune function, and the absorption of iron. Vitamin C enhances the body's ability to absorb non-heme iron from plant-based foods, which is particularly important for addressing iron deficiency anemia, a common issue in women and children in Pakistan.

- **Folate (Vitamin B9):**

- **Folate** is crucial for DNA synthesis and cell division, particularly in rapidly growing tissues. For pregnant women, folate is essential for preventing neural tube defects in the developing fetus. Dark green leafy vegetables are one of the best plant sources of folate. Ensuring adequate folate intake helps reduce the risk of birth defects and supports healthy fetal development.

## 2. Minerals:

- **Iron (Non-Heme Iron):**

- While the iron found in DGLVs is **non-heme iron** (less easily absorbed than heme iron from animal products), it still contributes to the overall iron intake. Iron is necessary for the production of hemoglobin, which transports oxygen in the blood. **Iron deficiency anemia** is common in women, especially during pregnancy, and in young children, making it essential to include iron-rich foods like DGLVs in the diet. Pairing these vegetables with a source of **vitamin C** (like citrus fruits or tomatoes) enhances the absorption of non-heme iron.

- **Calcium:**

- Some dark green leafy vegetables, such as **collard greens**, **mustard greens**, and **spinach**, contain a good amount of **calcium**, which is essential for strong bones and teeth. Calcium also plays a key role in nerve function, muscle contraction, and blood clotting. Ensuring adequate calcium intake is important for both pregnant women and growing children to support bone development and health.

### 3. **Fiber:**

- Dark green leafy vegetables are an excellent source of **dietary fiber**, which promotes digestive health and helps prevent constipation. Fiber also supports overall gut health, regulates blood sugar levels, and may contribute to maintaining a healthy weight. In young children, fiber helps with the development of a healthy digestive system, and in pregnant women, it can help alleviate constipation, a common issue during pregnancy.

### 4. **Antioxidants:**

- The dark green color of these vegetables is due to **chlorophyll**, which has antioxidant properties that help protect the body from oxidative stress and reduce the risk of chronic diseases. Antioxidants also support immune health and may play a role in reducing inflammation.

### 5. **Other Micronutrients:**

- DGLVs contain various other essential micronutrients, including **magnesium**, **potassium**, and **vitamin K**, which are important for muscle function, bone health, and blood clotting. These minerals work together to support overall health and well-being.

## Examples of Dark Green Leafy Vegetables in Pakistan

### 1. Spinach (Palak):

- **Spinach** is one of the most common and popular dark green leafy vegetables in Pakistan. It is widely consumed in various forms, such as **saag**, **spinach curry**, or **dal** (lentils) with spinach. Spinach is rich in iron, folate, and vitamin A, making it an excellent food for pregnant women and young children.

### 2. Mustard Greens (Sarson):

- **Mustard greens** are another commonly consumed leafy vegetable in Pakistan, particularly in the rural and farming communities. **Sarson ka saag** is a traditional dish made from mustard greens and is often enjoyed with **makki ki roti** (cornbread). Mustard greens are rich in calcium, vitamin A, and folate, making them an excellent food choice for both women and children.

### 3. Fenugreek Leaves (Methi):

- **Fenugreek leaves** are widely used in Pakistan, especially in curries and stews, and they have a slightly bitter taste. Methi is a good source of iron, calcium, and vitamins A and C. It is especially useful for improving iron levels in the body and can help combat anemia in women and children.

### 4. Coriander Leaves (Dhaniya):

- **Coriander leaves** are commonly used in Pakistani cooking, often as a garnish or in salads and chutneys. While not as rich in nutrients as other DGLVs, coriander still provides some vitamin C and fiber. It is also known for its digestive benefits.

## Group 8: Other Vitamin A-Rich Fruits and Vegetables – Nutritional Value for Women and Children

Fruits and vegetables rich in **vitamin A** are essential for good health, particularly for women and children. Vitamin A is a fat-soluble vitamin that plays a vital role in maintaining healthy vision, promoting immune function, supporting cell growth, and maintaining healthy skin. These fruits and vegetables, in addition to dark green leafy vegetables, provide another accessible and affordable source of this essential nutrient.



In Pakistan, several fruits and vegetables are rich in vitamin A, and they can be easily incorporated into local diets to improve overall nutritional status. The consumption of these vitamin A-rich foods is particularly important for pregnant and breastfeeding women, as well as young children, to prevent deficiencies and promote healthy development.

### Nutritional Value

#### 1. Vitamin A (Beta-Carotene):

- The primary nutrient provided by this group is **vitamin A**, mostly in the form of **beta-carotene**, which is converted by the body into active vitamin A. Vitamin A is critical for several biological functions:
  - **Eye Health:** Vitamin A plays a key role in maintaining good vision. It is essential for the production of **rhodopsin**, a pigment in the eyes that is required for night vision. A deficiency in vitamin A can lead to **night blindness** and other vision problems.

- **Immune Function:** Vitamin A is necessary for maintaining the health of the skin and mucosal membranes (like those in the eyes, respiratory tract, and digestive system). It plays a crucial role in immune response and helps the body fight infections.
- **Cell Growth and Development:** Vitamin A supports the growth of healthy cells and tissues, including during pregnancy, where it supports fetal development, especially the development of the eyes, heart, and other organs.
- **Skin Health:** Vitamin A helps maintain healthy skin and prevent conditions like **dry skin** and **keratosis pilaris**. It is also essential for wound healing.

## 2. Antioxidants:

- In addition to vitamin A, these fruits and vegetables contain **antioxidants** that protect the body from oxidative stress and inflammation. These antioxidants help to neutralize harmful free radicals, which can damage cells and increase the risk of chronic diseases such as heart disease and cancer.

## 3. Other Micronutrients:

- **Vitamin C:** Many vitamin A-rich fruits and vegetables, such as **papaya** and **carrots**, are also high in **vitamin C**, which supports immune health and the absorption of iron from plant-based foods. This is important in preventing **iron deficiency anemia**, a common issue in Pakistan.
- **Fiber:** Many of these fruits and vegetables are also rich in **dietary fiber**, which aids digestion and supports the gut health of both women and children. Fiber helps in regulating bowel movements, preventing constipation, and may also help in controlling blood sugar levels.

## Examples of Vitamin A-Rich Fruits and Vegetables in the Context of Pakistan

### 1. Carrots (Gajar):

- **Carrots** are one of the most widely available and popular sources of **beta-carotene** in Pakistan. They are consumed in various forms, such as in **salads**, **steamed** or **boiled** dishes, **vegetable curries**, or as a snack in raw form. Carrots are rich in vitamin A, and their high beta-carotene content makes them an excellent choice for promoting good vision and immune health.

### 2. Sweet Potatoes (Shakarkandi):

- **Sweet potatoes** are another excellent source of vitamin A in Pakistan. They are commonly eaten boiled, baked, or used in dishes such as **sweet potato curry**. Sweet potatoes are rich in beta-carotene, fiber, and other essential nutrients like potassium and vitamin C, making them a highly nutritious food for pregnant women, children, and the general population.

### 3. Pumpkin (Kaddu):

- **Pumpkin** is a popular vegetable in Pakistan and can be prepared in various ways, such as in **curries**, **soups**, and **stews**. It is rich in beta-carotene and other antioxidants that support eye health, immune function, and overall health. Pumpkin can be added to children's meals to support healthy growth and development.

### 4. Mangoes (Aam):

- **Mangoes**, which are grown abundantly in Pakistan, are a delicious source of **vitamin A**. Mangoes contain high levels of beta-carotene and are a good source of vitamin C as well. They are widely consumed as fresh fruit, juice, or in **desserts**. Mangoes help improve immunity, skin health, and vision, making them an excellent food choice for both women and children.

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#### 5. **Papaya (Papita):**

- **Papaya** is another tropical fruit that is rich in vitamin A. It is often consumed fresh in **salads**, **smoothies**, or as a snack. Papayas are not only rich in beta-carotene but also contain **vitamin C**, which aids in iron absorption and supports immune health.

#### 6. **Tomatoes (Tamatar):**

- **Tomatoes** are an essential part of many dishes in Pakistan, including **curries**, **soups**, and **salads**. Although they are known for their vitamin C content, tomatoes also contain a significant amount of **beta-carotene**, which is converted into vitamin A. Tomatoes are used extensively in cooking and are an important part of the diet, especially in rural areas.

#### 7. **Red Bell Peppers (Shimla Mirch):**

- **Red bell peppers**, though not as commonly grown in Pakistan as other vegetables, are an excellent source of **vitamin A**. They are rich in beta-carotene, as well as vitamin C. These peppers can be used in salads, stir-fries, and various dishes. Red bell peppers are especially important for supporting eye health and immune function.

#### 8. **Cantaloupe (Kharboza):**

- **Cantaloupe**, or **muskmelon**, is a widely available fruit in Pakistan and is a good source of beta-carotene and vitamin C. It can be eaten fresh as a snack or in **fruit salads**. Cantaloupe is hydrating, rich in antioxidants, and supports skin and eye health.



## Group 9: Other Vegetables

Vegetables from the **Other Vegetables** group play a vital role in providing essential vitamins, minerals, and fiber necessary for the overall health and well-being of both women and children. This diverse group includes a wide variety of vegetables that may not always be as nutrient-dense as the specific groups like **dark green leafy vegetables** or **vitamin A-rich fruits and vegetables**, but they still contribute significantly to the diet, helping to prevent deficiencies and supporting health.



In Pakistan, a wide array of vegetables is grown in different climates, and their availability varies depending on the season and region. These vegetables can be easily included in daily meals, improving dietary diversity and enhancing nutritional intake for maternal and child health.

### Nutritional Value

#### 1. Vitamins:

- **Vitamin C:** Many vegetables from this group, such as **tomatoes**, **cauliflower**, and **bell peppers**, are excellent sources of **vitamin C**. This vitamin is essential for immune function, the maintenance of skin and connective tissues, and the absorption of non-heme iron from plant-based foods. Since vitamin C is water-soluble and can be easily destroyed by cooking, consuming these vegetables raw or lightly cooked helps preserve the vitamin.
- **B Vitamins (including Folate):** Vegetables such as **cauliflower** and **cabbage** contain significant amounts of **folate (vitamin B9)**, which is crucial for the formation of red blood cells and the prevention of **neural tube defects** in developing babies. Folate is particularly important for women during pregnancy and for young children in their growth and development.

## 2. Minerals:

- **Potassium:** Vegetables like **potatoes**, **pumpkins**, and **tomatoes** are rich in **potassium**, an essential mineral that helps maintain proper fluid balance, supports muscle and nerve function, and aids in lowering blood pressure. Adequate potassium intake helps regulate blood pressure, which is particularly important for pregnant women.
- **Calcium:** Some vegetables, such as **broccoli** and **okra**, are good sources of **calcium**, an essential mineral for bone health, muscle function, and blood clotting. Since many individuals, particularly women and children in Pakistan, may not consume adequate dairy products, these vegetables can help fill the gap in calcium intake.

## 3. Fiber:

- Vegetables in this group are also high in **dietary fiber**, which supports digestive health, helps prevent constipation, and promotes healthy gut function. Fiber is important for both women and children, as it helps regulate bowel movements, manage blood sugar levels, and maintain a healthy weight.

## 4. Antioxidants:

- Many vegetables in this group are rich in antioxidants, which help neutralize harmful free radicals in the body. **Tomatoes**, for example, contain **lycopene**, a powerful antioxidant that has been linked to reduced risk of heart disease and cancer. Additionally, vegetables like **eggplants** and **peppers** are rich in compounds that have anti-inflammatory properties.

## 5. Phytochemicals:

- Various vegetables in this group contain **phytochemicals**—natural compounds that contribute to plant health and may offer additional health benefits for humans. For instance, **onions** and **garlic** contain **sulfur compounds**, which are known to have antimicrobial and immune-boosting properties.

## Examples of Other Vegetables in the Context of Pakistan

### 1. Tomatoes (Tamatar):

- **Tomatoes** are widely used in Pakistani cuisine and are an excellent source of vitamin C and antioxidants, especially **lycopene**. Tomatoes are used in **curries**, **salads**, **chutneys**, and **sauc**es, making them a versatile and nutrient-rich ingredient in everyday meals.

### 2. Cauliflower (Phool Gobhi):

- **Cauliflower** is a common vegetable in Pakistan, available in both rural and urban markets. It is high in vitamin C and folate, both of which are important for immune health and cell division. It can be used in **vegetable dishes**, **curries**, and **sabzis**.

### 3. Cabbage (Patta Gobhi):

- **Cabbage** is commonly used in various forms, such as in **salads**, **stir-fries**, and **cabbage rolls**. It is rich in vitamin C and folate, and it also contains fiber that aids in digestion. Cabbage is an excellent addition to the diet, especially for pregnant women to help prevent deficiencies.

### 4. Potatoes (Aloo):

- **Potatoes** are a staple food in Pakistan and are used in a wide variety of dishes, from **aloo ki tarkari** (potato curry) to **aloo ke parathay** (potato-stuffed flatbread). They are rich in potassium, an essential mineral that helps regulate blood pressure. Potatoes also provide a good amount of energy due to their carbohydrate content.

### 5. Pumpkin (Kaddu):

- **Pumpkin** is commonly consumed in the form of **curries** or **steamed dishes**. Rich in potassium and antioxidants, pumpkin helps maintain heart health, regulate

blood pressure, and strengthen the immune system. Its bright orange color indicates its high beta-carotene (vitamin A) content, benefiting both vision and immune function.

#### 6. **Okra (Bhindi):**

- **Okra**, also known as **ladyfinger**, is a popular vegetable in Pakistan. It is high in fiber, which aids digestion, and also provides vitamins A, C, and K. Okra is commonly used in **sabzis** (vegetable dishes), **curries**, or **stir-fries**. It is particularly beneficial for improving gut health and preventing constipation.

#### 7. **Eggplants (Baingan):**

- **Eggplants** are frequently used in Pakistani cooking and are a good source of antioxidants, fiber, and vitamins. They can be grilled, fried, or used in curries. The **anthocyanins** in eggplants have antioxidant properties that help reduce the risk of chronic diseases.

#### 8. **Onions (Pyaaaz):**

- **Onions** are a fundamental ingredient in Pakistani cooking, used in almost every savory dish. They are rich in antioxidants and sulfur compounds that have antimicrobial and anti-inflammatory properties. Onions help support immune function and digestive health.

#### 9. **Garlic (Lehsun):**

- **Garlic** is widely used in Pakistani cuisine for its flavor and health benefits. It contains **allicin**, a compound with strong antimicrobial properties. Garlic also supports heart health, improves digestion, and has immune-boosting effects.

## Group 10: Other Fruits

Fruits from the **Other Fruits** group are an essential part of a well-rounded, nutrient-dense diet. This group includes a variety of fruits that may not be as prominent in specific nutrient categories like vitamin A or vitamin C-rich fruits but still offer a wealth of essential vitamins, minerals, antioxidants, and fiber. These fruits play a significant role in the health and development of both women and children, especially in countries like Pakistan, where access to diverse fruits can contribute to better nutritional outcomes.



Fruits, in general, are packed with **natural sugars**, **vitamins**, **minerals**, and **fiber**. These nutrients are essential for maintaining energy levels, supporting immune function, promoting healthy digestion, and ensuring overall growth and development. The inclusion of fruits in daily meals is crucial for improving maternal and child nutrition.

### Examples of Other Fruits in the Context of Pakistan

#### 1. Bananas (Kela):

- **Bananas** are one of the most widely consumed fruits in Pakistan and are known for being an excellent source of **potassium**, **magnesium**, and **vitamin C**. They provide quick energy and are often used as a snack or added to **smoothies**, **fruit salads**, and **porridge**. The high fiber content in bananas also helps in preventing constipation, which is a common issue during pregnancy.

#### 2. Apples (Sev):

- **Apples** are popular in Pakistan, especially in northern areas where they are grown in abundance. They are rich in **fiber** (particularly **pectin**), which promotes digestion and helps lower cholesterol levels. Apples also contain **vitamin C**, which supports immune health, and their antioxidant content (especially **flavonoids**) helps protect the body from oxidative damage.

### 3. Oranges (Santara):

- **Oranges** and other citrus fruits are rich in **vitamin C**, which plays a key role in supporting the immune system, promoting skin health, and aiding in the absorption of **iron** from plant-based foods. **Oranges** are also a great source of **fiber** and **folate**, making them beneficial for both pregnant women and children.

### 4. Pomegranates (Anar):

- **Pomegranates** are widely available in Pakistan and are rich in **antioxidants** (especially **punicalagins**), **vitamin C**, and **potassium**. They have anti-inflammatory properties and help protect against cardiovascular diseases. The seeds are often used in salads, **fruit chaats**, and as a garnish for various dishes.

### 5. Papaya (Papita):

- **Papaya** is a tropical fruit that is abundant in Pakistan, especially during the summer months. It is a great source of **vitamin C**, **vitamin A**, and **folate**, which support immune function and cell growth. **Papaya** also aids digestion, making it an excellent fruit for promoting gut health and preventing constipation.

### 6. Guava (Amrood):

- **Guava** is another excellent source of **vitamin C** and **fiber**. It is also high in **folate** and **potassium**, making it a highly nutritious fruit for both pregnant women and children. Guava can be eaten raw, added to smoothies, or used to make fresh juices and jams.

### 7. Pears (Nashpati):

- **Pears** are a good source of **dietary fiber**, **vitamin C**, and **potassium**. The fiber content helps promote healthy digestion and prevent constipation, which is especially beneficial for pregnant women. Pears are also rich in antioxidants and anti-inflammatory compounds, which support overall immune health.

### 8. Apricots (Khubani):

- **Apricots** are rich in **vitamin A**, **vitamin C**, and **fiber**. They are especially beneficial for promoting good vision, skin health, and digestive health. In Pakistan, apricots are often used in desserts, jams, or eaten dried. They are also a good source of **potassium**, which helps maintain fluid balance and regulate blood pressure.

A healthy diet follows the same basic principles, but what makes up a healthy and diverse diet can vary depending on a person's needs, local food availability, and cultural habits. In Pakistan, especially in Khyber Pakhtunkhwa (KP), food choices can be different based on the region, climate, and what foods are locally grown. Each food group mentioned in this guide should be adapted to include foods that are easily available in the area. Since Pakistan has a wide range of agricultural products and different cultural practices, it's important that the diet meets the nutritional needs of the community while respecting local food traditions.

Maternal nutrition directly affects birth outcomes, influencing factors such as birth weight, gestational age and the likelihood of complications during pregnancy and delivery. Poor maternal nutrition can lead to a range of adverse outcomes for both the mother and the baby.

#### Impact on Maternal Health:

Maternal nutrition also has significant effects on the mother's health. Poor nutrition during pregnancy can increase the risk of complications such as:

- **Anemia:** Iron deficiency anemia is common in pregnant women and can lead to fatigue, weakness and increased risk of maternal mortality. It also increases the likelihood of preterm delivery and low birth weight.
- **Preeclampsia:** This condition, which is characterized by high blood pressure and protein in the urine, is more common in undernourished pregnant women and can lead to complications for both the mother and baby.
- **Postpartum Depression:** Nutritional deficiencies, particularly deficiencies in omega-3 fatty acids, folate and iron, have been linked to an increased risk of postpartum depression.

#### Impact on Birth Weight and Fetal Development:

- **Low Birth Weight (LBW):** One of the most common consequences of poor maternal nutrition is low birth weight (defined as a birth weight of less than 2500 grams). Maternal under nutrition, particularly during the early stages of pregnancy, can result in restricted

fetal growth, leading to LBW. Infants born with LBW are at a higher risk for neonatal morbidity, long-term developmental delays and even higher mortality rates.

- **Preterm Birth:** Malnutrition during pregnancy, especially deficiencies in key nutrients such as folic acid, iron and calcium, is associated with an increased risk of preterm birth. Preterm infants are more likely to face complications such as respiratory distress, infections and developmental delays.
- **Intrauterine Growth Restriction (IUGR):** Maternal under nutrition, particularly in the third trimester, can lead to IUGR, a condition where the fetus fails to grow to its full potential. IUGR is associated with higher rates of stillbirth, perinatal morbidity and long-term health issues in the child, such as cognitive delays and chronic diseases later in life.

## Conclusion

Maternal nutrition is fundamental for the health of both the mother and her baby. Proper nutrition during pregnancy and lactation provides the building blocks for healthy fetal development, reduces the risk of birth complications and promotes the well-being of the mother. Healthcare providers play a vital role in educating women about the importance of good nutrition, recommending appropriate dietary changes and ensuring access to essential micronutrient supplementation during pregnancy and breastfeeding. Improving maternal nutrition can have far-reaching effects, ensuring healthier pregnancies, reducing maternal and infant mortality and laying the foundation for a healthy, thriving population.

By emphasizing the importance of maternal nutrition, we can help achieve better birth outcomes, improve infant and maternal health and ultimately contribute to the well-being of future generations.



### Session 3.4 Antenatal Assessment of Maternal Nutritional Status

Nutrition plays an important role in ensuring the health and well-being of both the mother and the developing fetus during pregnancy. Adequate maternal nutrition is essential for fetal growth, preventing complications such as low birth weight, preterm birth and developmental delays. The World Health Organization (WHO) emphasizes the importance of regular nutritional assessments during antenatal visits as part of routine care to optimize maternal and fetal health. Following section aims to provide knowledge to primary healthcare providers on how to assess the nutritional status of pregnant women, identify risky pregnancies and deliver appropriate interventions during antenatal visits.

Pregnancy is a time of increased nutritional demand to support the growth and development of the fetus, as well as to maintain the health of the mother. The WHO recommends that nutritional assessment should be a routine part of antenatal care to prevent maternal and fetal complications by identifying nutritional deficiencies and risks early, allowing for timely intervention.

#### Components of Nutritional Assessment during Antenatal Visits

##### a. Anthropometric Measurements

Anthropometric measurements are essential in determining the nutritional status of the pregnant woman. The key measurements include:

- **Weight:** Regular monitoring of weight gain during pregnancy is a good indicator of nutritional status. According to WHO guidelines, weight gain should be assessed based on the woman's pre-pregnancy weight and BMI.
  - **Recommended Weight Gain:** The recommended weight gain during pregnancy varies by BMI:
    - Underweight (BMI < 18.5): 12.5–18 kg weight gain
    - Normal weight (BMI 18.5–24.9): 11.5–16 kg weight gain
    - Overweight (BMI 25–29.9): 7–11.5 kg weight gain
    - Obese (BMI > 30): 5–9 kg weight gain

- **Excessive weight gain** can lead to complications such as gestational diabetes and hypertension, while **insufficient weight gain** can result in low birth weight and developmental issues for the baby.
- **Mid-Upper Arm Circumference (MUAC):** MUAC is a simple yet effective indicator of nutritional status, particularly for identifying under nutrition. A MUAC less than 23.5 cm may indicate maternal under nutrition, requiring intervention.

#### **b. Screening for Micronutrient Deficiencies**

Micronutrient deficiencies are common during pregnancy and can have severe implications for both maternal and fetal health. WHO recommends screening for common micronutrient deficiencies during antenatal visits:

- **Iron Deficiency:** Iron is essential for the production of hemoglobin. Iron deficiency can lead to anemia, which increases the risk of maternal morbidity, preterm birth and low birth weight. Hemoglobin levels are commonly measured during antenatal visits to assess the risk of anemia. Hemoglobin levels below 11 g/dL in the first and third trimester and 10.5 g/dL in the second trimester are indicative of anemia.
- **Folate Deficiency:** Folate is vital for fetal neural tube development. Folate deficiency during pregnancy can lead to neural tube defects such as spina bifida and anencephaly. A maternal blood test may be used to measure folate levels and women should be advised to take folic acid supplements before conception and during pregnancy.
- **Vitamin D Deficiency:** Vitamin D is essential for calcium absorption and bone development. Deficiency may lead to maternal osteomalacia and poor fetal bone development. Serum vitamin D levels may be checked, especially in women with risk factors like limited sun exposure or low dietary intake.
- **Calcium Deficiency:** Calcium supports the development of the fetal skeletal system. Inadequate calcium intake can lead to maternal bone demineralization and preeclampsia. Supplementation may be recommended for pregnant women at risk.

### c. Dietary Assessment

A detailed dietary assessment provides insights into a woman's food intake patterns, helping healthcare providers identify potential nutrient gaps. The dietary assessment typically includes:

- **Dietary Recall or Food Frequency:** Ask the woman about her typical meals, snacks and any special food preferences or aversions. It's also important to assess whether the woman is able to consume a balanced diet rich in fruits, vegetables, dairy and protein-rich foods. Special attention should be given to food insecurity or limited access to nutrient-rich foods.
- **Nutrient-Rich Foods:** Ensure that the pregnant woman consumes food that provides adequate amounts of key nutrients:
  - **Iron-rich foods:** Meat, legumes, spinach, fortified cereals
  - **Folate-rich foods:** Leafy greens, citrus fruits, legumes, fortified cereals
  - **Calcium-rich foods:** Dairy products, leafy greens
  - **Protein-rich foods:** Meat, eggs, beans, nuts

### Session 3.5 Identifying At-Risk Women

Certain women may be at a higher risk for poor nutrition due to various factors. These include:

- **Adolescents:** Young women, especially those under 18, are at greater risk of inadequate nutrition due to their own growing nutritional needs.
- **Underweight Women:** Women with a BMI under 18.5 before pregnancy are at greater risk of inadequate weight gain and poor fetal growth.
- **Women with Multiple Pregnancies:** Women carrying twins or multiples need additional nutrients and have a higher risk of nutritional deficiencies.
- **Women with Preexisting Health Conditions:** Conditions like diabetes, hypertension, or gastrointestinal disorders may affect nutrient absorption and utilization.
- **Socioeconomic Factors:** Women from lower socioeconomic backgrounds may have limited access to nutritious foods or healthcare services, which can affect their nutritional status.

Identifying these women early allows healthcare providers to offer targeted interventions, such as increased nutritional counseling, supplementation and referrals to nutritionists or community support programs.

### Session 3.6 Nutritional Counseling and Interventions

Once the nutritional assessment is completed, healthcare providers should offer tailored **nutrition counseling**. This may include:

- **Dietary Recommendations:** Based on the results of the dietary assessment and identified deficiencies, healthcare providers should guide women on how to improve their nutrition through food choices.
- **Supplements:** The WHO recommends iron and folic acid or Multiple Micronutrients Supplementation (MMS) for all pregnant women.
- **Addressing Barriers:** Healthcare provider should explore and address potential barriers to meeting nutritional needs, such as food insecurity, cultural practices, or financial constraints.

Healthcare providers should also educate women about the **importance of regular antenatal visits** to monitor nutrition and ensure a healthy pregnancy. Women should be encouraged to follow the recommended nutritional guidelines and maintain a healthy lifestyle, including adequate hydration, regular physical activity and avoidance of harmful substances (e.g., alcohol, tobacco, excessive caffeine).

## References:

1. Reference: Minimum Dietary Diversity (Available at: <https://openknowledge.fao.org/server/api/core/bitstreams/c949ea1a-bd5d-4788-87fa-2917f1a2ecdf/content>, accessed on: 26/05/2025).
- 2.

## LISTENING AND LEARNING SKILLS



**Introduction** Counseling is a vital part of healthcare, particularly when it comes to supporting mothers with infant and young child feeding. It's not just about giving advice but rather working together with mothers to understand their feelings, perspectives and challenges. This session focuses on helping healthcare workers develop the listening and learning skills needed to counsel mothers effectively. These skills not only improve breastfeeding and complementary feeding practices but also create a supportive environment for mothers to share their concerns and experiences.

## **Objectives**

By the end of this session, participants will be able to:

- List the six listening and learning skills for effective counseling.
- Provide examples of each listening and learning skill.
- Demonstrate the appropriate use of these skills in counseling mothers on infant and young child feeding.

## **Counseling: A Holistic Approach**

Counseling is a process of helping individuals reflect on their own feelings and decisions, enabling them to make informed choices about their lives. When counseling mothers on infant feeding, the objective is to understand how they feel, address their concerns and help them choose what they believe is best for themselves and their children. These counseling skills are useful in various contexts and can be applied in everyday conversations with families, colleagues and patients.

## **The Role of Listening and Learning in Counseling**

Effective counseling begins with listening. It is essential to create a comfortable, non-judgmental space where mothers feel heard and supported. By using the skills listed below, healthcare workers can build trust and help mothers feel more open about sharing their concerns. These skills are particularly important when discussing sensitive topics like feeding practices and the challenges that come with them.

## Listening and Learning Skills



### Skill 1: Use Helpful Non-Verbal Communication

Non-verbal communication is an essential tool for conveying empathy and attentiveness. It involves showing your interest and care through body language, facial expressions and other physical cues. Non-verbal communication can help a mother feel more comfortable and encourage her to share more openly.



### Examples of Helpful Non-Verbal Communication:

- **Maintain eye contact** to show attentiveness.
- **Keep your posture open and relaxed**, which signals approachability and understanding.
- **Use facial expressions** that convey empathy and concern (e.g., nodding, showing concern, smiling).
- **Remove physical barriers**, such as desks or other objects, to create a more open and comfortable space.
- **Appropriate use of touch**, such as a gentle touch on the arm, can be reassuring when culturally appropriate.

By using these cues, you are telling the mother that you are genuinely engaged and interested in what she has to say.

### Skill 2: Ask Open Questions

Open-ended questions encourage detailed responses and help you gather more information about the mother's feelings, experiences and challenges. These questions often start with "how," "what," "when," "where," "why," or "who," prompting mothers to explain their situation in more depth.

### Examples of Open Questions:

- "How are you feeding your baby?"
- "What challenges are you facing with breastfeeding?"
- "Can you tell me about your baby's feeding routine?"
- "What are your thoughts on introducing complementary foods?"

### **Why Open Questions Matter:**

- They provide deeper insight into the mother's situation.
- They help avoid yes/no answers that don't offer useful information.
- They foster a more natural and engaging conversation.

Closed questions can also be helpful in certain situations, such as verifying facts. However, open questions are generally more effective for starting and continuing conversations.

### **Skill 3: Use Responses and Gestures that Show Interest**

Active listening involves more than just hearing words—it requires responding in ways that show you are fully engaged. Simple responses like nodding, smiling and verbal acknowledgments such as “Aha,” or “Mmm,” signal to the mother that you are paying attention and that her words are valued.

#### **Examples of Responses and Gestures:**

- **Nodding** while the mother speaks to show you are following her.
- **Saying "Mm-hmm"** or “I understand” to acknowledge what she's saying.
- **Smiling** to provide warmth and reassurance.
- **Using encouraging phrases** like "Tell me more" to invite further discussion.

These non-verbal and verbal cues help create a supportive and empathetic environment.

### **Skill 4: Reflect Back What the Mother/Caregiver Says**

Reflection involves repeating or paraphrasing what the mother has said to ensure that you have understood correctly and to encourage her to elaborate. This technique shows the mother that her concerns are being heard and valued.

### **Example of Reflecting Back:**

- Mother says: "I don't know what to give my baby, she refuses everything."
- You reflect: "Your baby is refusing all the food you offer her?"

By rephrasing her words, you demonstrate active listening and invite her to elaborate further.

### **Why Reflection Matters:**

- It clarifies and confirms the information.
- It reassures the mother that she is being heard.
- It encourages the mother to open up more about her situation.

### **Skill 5: Empathize – Show that You Understand How the Mother/Caregiver Feels**

Empathy is about putting yourself in the mother's shoes and understanding her emotions. It's more than just acknowledging facts—it's about recognizing the emotional experience behind those facts.

### **Example of Empathy:**

- Mother says: "My baby wants to feed very often and it makes me feel so tired."
- You respond: "You must be feeling very tired from constant feeding, I understand how that can be overwhelming."

### **Why Empathy is Crucial:**

- It builds trust and rapport with the mother.
- It makes the mother feel supported and understood.
- It opens the door for her to discuss her emotions and challenges without feeling judged.

## **Skill 6: Avoid Using Words that Sound Judging**

Avoiding judgmental language is crucial to maintaining a supportive and non-critical environment. Words such as "right," "wrong," "good," or "bad" can make a mother feel as though she is being evaluated. Instead, use neutral, non-judgmental language to encourage a more open conversation.

### **Examples of Judging Words to Avoid:**

- "You should be doing this right."
- "That's wrong; you should feed your baby like this."
- "You're not doing it well."

Instead, use neutral phrases:

- "What are your thoughts on feeding your baby?"
- "What challenges have you experienced with feeding?"
- "How can I help you with this?"

### **Why Avoiding Judging Words Matters:**

- It prevents the mother from feeling criticized or inadequate.
- It promotes a more open and honest discussion.
- It supports a collaborative approach to problem-solving.

## **Conclusion**

Listening and learning skills are fundamental to effective counseling, especially when working with mothers on infant and young child feeding. By using non-verbal communication, open-ended questions, empathetic responses, reflection and neutral language, healthcare workers can foster an environment of trust and support. These skills help mothers feel heard, understood and empowered to make informed decisions about their infant's feeding practices.

## Infant and Young Child Feeding (IYCF)



## **Introduction:**

Breastfeeding and timely complementary feeding are essential for the health and development of children and the well-being of mothers. The World Health Organization (WHO) and UNICEF emphasize the importance of exclusive breastfeeding for the first six months and continued breastfeeding with appropriate complementary foods until at least two years of age. These practices help reduce child morbidity and mortality. In 2003, WHO and UNICEF launched the Global Strategy for Infant and Young Child Feeding to highlight the impact of feeding practices on children's growth, health and survival.

The WHO child growth standards, published in 2006, were based on a study of children from various countries and emphasized breastfeeding as the biological norm for growth and development. These standards complement the Global Strategy for Infant and Young Child Feeding. Despite these guidelines, many mothers face difficulties with breastfeeding and health practices often hinder proper infant feeding. This can lead to malnutrition, with a significant number of children under 5 years being undernourished or suffering from deficiencies in essential nutrients. Additionally, inappropriate feeding practices contribute to rising rates of overweight and obesity in children.

Feeding information for young children often comes from family beliefs, community practices and health workers, but can be influenced by misleading advertising from food manufacturers. Conflicting information makes it difficult for health workers to guide families on proper infant feeding. A lack of knowledge about breastfeeding, complementary feeding and good feeding practices is a major factor in malnutrition, even when food is available. Therefore, addressing these knowledge gaps is important in improving child nutrition and health.

The World Health Organization (WHO) and UNICEF provide comprehensive guidelines on infant and young child feeding (IYCF), which are crucial for promoting the health and well-being of children, especially in the first 1000 days of life. These guidelines emphasize the

importance of exclusive breastfeeding for the first six months, as breast milk provides essential nutrients and antibodies that protect infants from infections and diseases. Following this, appropriate complementary feeding, alongside continued breastfeeding, should be introduced at six months to ensure the child's nutritional needs are met. WHO and UNICEF also highlight the need for responsive feeding practices, where caregivers are encouraged to recognize hunger cues and provide timely, nutritious meals to support healthy growth and development. These practices not only reduce the risk of malnutrition but also help in fostering a strong emotional bond between mother and child.

#### Aims and Objectives:

For primary healthcare workers in Pakistan, understanding and implementing these guidelines is vital, as they are often the first point of contact for parents and caregivers seeking guidance on infant and young child nutrition. Given the challenges of malnutrition and suboptimal feeding practices in the country, it is essential for healthcare providers to be equipped with the knowledge and tools to educate families on the importance of proper feeding practices. This training manual, based on WHO and UNICEF's evidence-based guidelines, aims to empower healthcare workers to promote, support and protect optimal feeding practices, thus contributing to the reduction of infant mortality rates and the prevention of stunted growth and development in children across Pakistan.

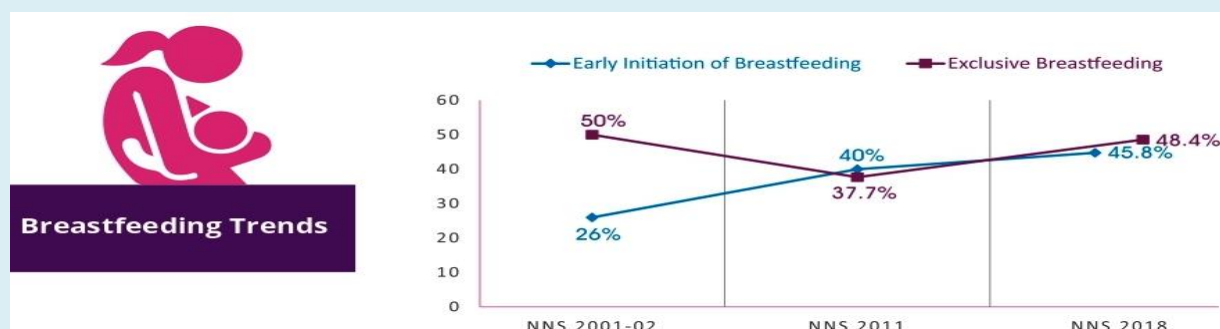
## Session 5.1: Statistics about IYCF in Pakistan & Window of Opportunity:

Evidence shows that approximately 22% of newborn deaths could be prevented if breastfeeding is initiated within the first hour after birth and 16% if it begins within the first 24 hours. Additionally, infants who are not breastfed are 15 times more likely to die from pneumonia and 11 times more likely to die from diarrhea compared to those who are exclusively breastfed for the first six months. Breastfeeding plays a critical role in reducing infection-related mortality among infants. Given these alarming statistics, there is an urgent need to intensify efforts to improve breastfeeding practices in the country and reduce preventable newborn and child mortality.

According to the National Nutrition Survey 2018, Infant and Young Child Feeding (IYCF) practices in Pakistan remain suboptimal.

Selected Infant and young child feeding indicators	
Percentage who were breastfed in first hour of birth	<b>45.8%</b>
Exclusive breastfeeding (0–5 months):	<b>48.4%</b>
Initiation of solid, semi-solid and soft foods (all infants aged 6–8 months):	<b>35.9%</b>
Minimum meal frequency (6–23 months):	<b>12.8%</b>
Minimum dietary diversity	<b>13.2%</b>
Minimum acceptable diet	<b>3.1%</b>

A simplified approach to ensuring continued support for IYCF is essential to reduce the morbidity and mortality associated with severe malnutrition during these challenging times.





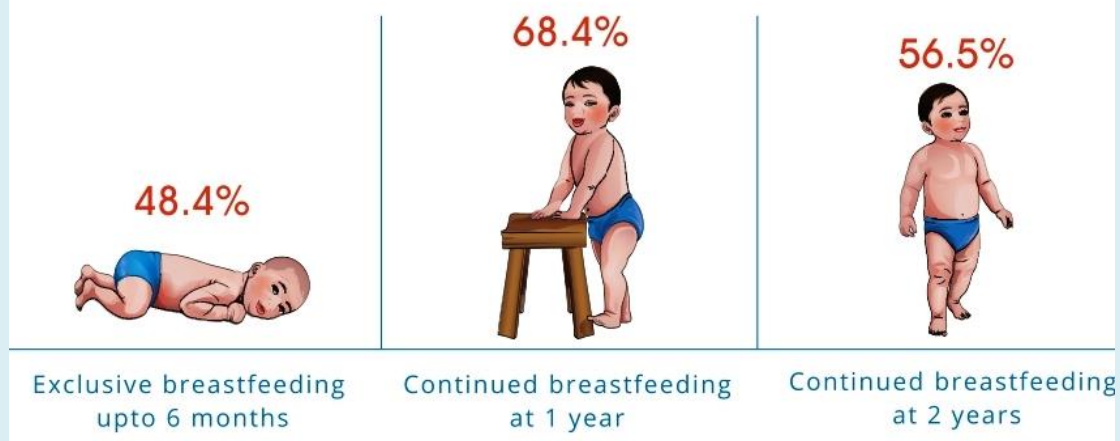
### Early Initiation of Breastfeeding (within first hour of birth) by Province/Region



The practice of early initiation of breastfeeding varies from 20.1% in GB to 61.1% in Balochistan.

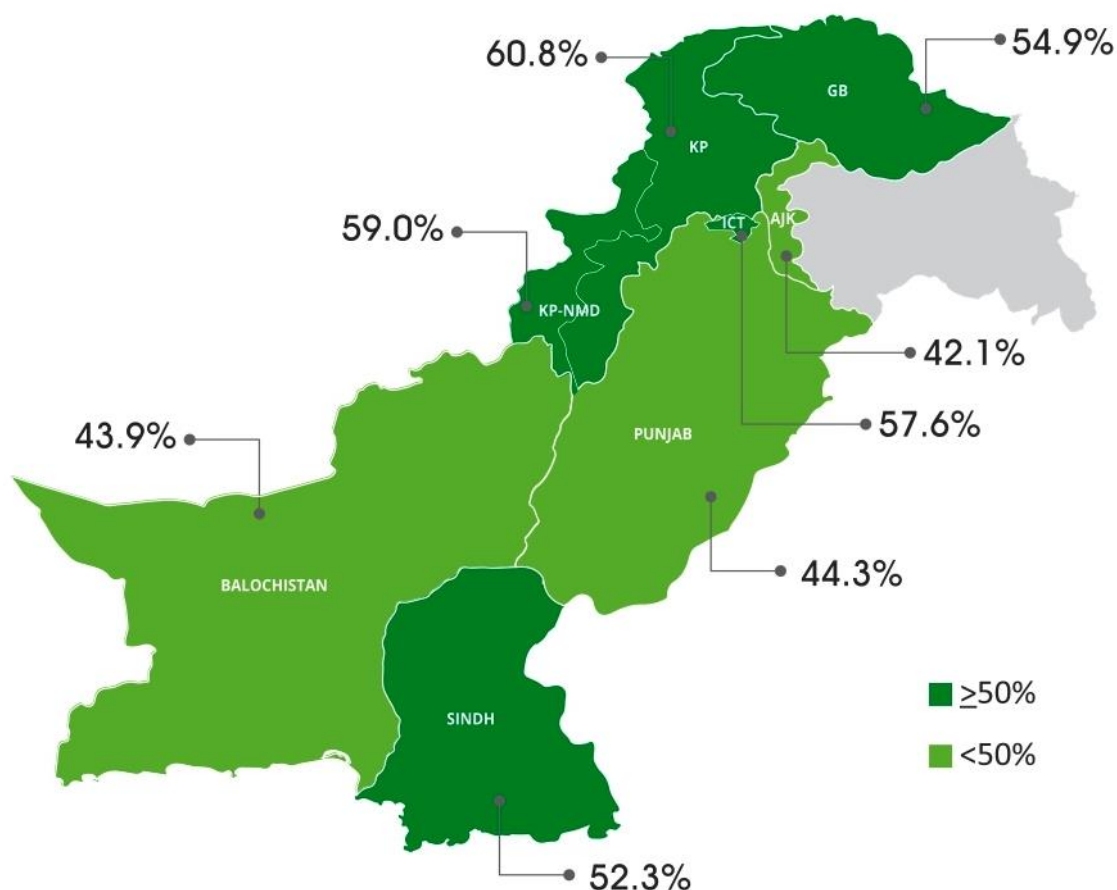


## Breastfeeding Practices in Pakistan



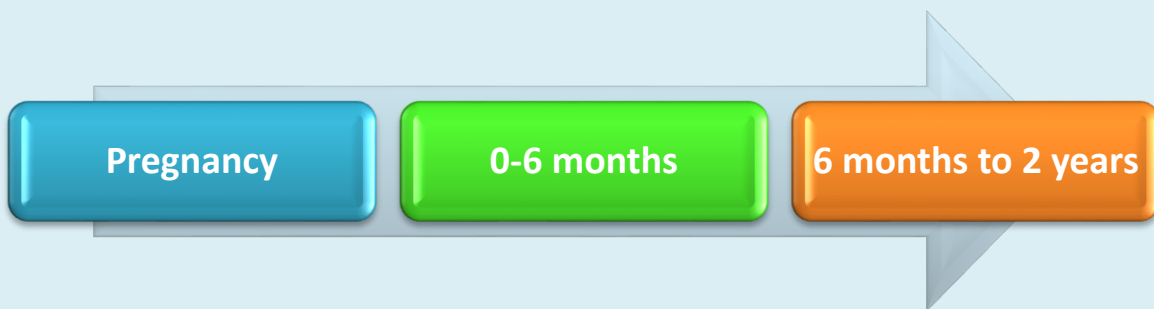
## Exclusive Breastfeeding by Province and Region

The proportion of children who are exclusively breastfed for the first six months of life is highest in KP (60.7%) and KP-NMD (59.0%), and lowest in AJK (42.1%) and Balochistan (43.9%) respectively.



### Window of Opportunity:

The importance of proper nutrition in infancy and early childhood is crucial for healthy development. Babies rely entirely on their mother for nutrients during pregnancy and breast milk provides essential nourishment and the first protection against illness. The early years, particularly the first 1,000 days, are a critical period for ensuring healthy growth, which helps prevent obesity and chronic diseases later in life. Poor nutrition during this time can cause lasting brain damage, impairing a child's ability to succeed academically and economically and may lead to health problems such as obesity and diabetes.



### IYCF Recommendations:

Recommendation	Details
<b>Start breastfeeding within 1 hour after birth</b>	<ul style="list-style-type: none"><li>○ Ensure immediate skin-to-skin contact between mother and baby.</li><li>○ Begin breastfeeding within the first hour after birth.</li><li>○ Avoid giving any food or drink before breastfeeding or before mature milk comes in.</li></ul>
<b>Exclusive breastfeeding up to 6 months of age</b>	<ul style="list-style-type: none"><li>○ Babies should be exclusively breastfed for the first 6 months.</li><li>○ No other foods or liquids should be given during this period.</li></ul>
<b>Introduce complementary foods at 6 months</b>	<ul style="list-style-type: none"><li>○ Begin providing complementary foods to all children from 6 months of age alongside continued breastfeeding.</li></ul>
<b>Continue breastfeeding up to 2 years and beyond</b>	<ul style="list-style-type: none"><li>○ Continue breastfeeding with complementary feeding until at least 2 years of age and beyond if possible, for optimal growth and development.</li></ul>

**A. Children who receive proper nutrition in the first 1,000 days are:**

- Be born at a healthy weight.
- Have a lower risk of diseases, including obesity and type 2 diabetes.
- Perform better in school with fewer behavioral issues.
- Experience better health and financial security as adults.

**B. Stunting Prevention:**

- Stunting is highly influenced by inadequate nutrition and poor feeding practices.
- Non-exclusive breastfeeding and contaminated liquids, foods, or utensils contribute to stunting.
- These factors can damage infants' immature gut, reduce their ability to protect against diseases and increase the risk of infections and illnesses.
- Stunting is associated with nutrient depletion and malabsorption, impacting growth and development.

**C. Wasting Prevention:**

- Wasting primarily affects children under 2 years of age, with more than half of cases occurring in this age group.
- Exclusive breastfeeding for the first 6 months meets all an infant's nutritional needs and helps prevent illness and support recovery.
- For children aged 6-23 months, appropriate complementary feeding is essential to prevent wasting.
- Wasting is linked to inadequate diets and unsanitary or unsafe food

**D. Benefits of Breastfeeding for Baby, Mother, Family and Community:**

- Supports the baby's protection from infections and illnesses.
- Provides warmth and comfort to the baby.
- Delivers essential nutrients in the right amounts.

- Promotes bonding between the baby and the mother.
- Ensures the baby receives adequate hydration, as breast milk contains 70% water.

**E. Consequences of Not Supporting Breastfeeding:**

- Increased risk of postpartum hemorrhage (PPH), especially when clinical interventions are limited.
- Higher likelihood of unplanned pregnancies and decreased birth spacing, particularly with limited access to reproductive health education and contraception.
- Risk of maternal depletion, such as iron-deficiency anemia.
- Increased risk of long-term health issues like breast and ovarian cancer, osteoporosis and cardiovascular disease.

### Activity: Local Nutrition Status and Common Practices:

In this session, we will explore the local nutrition situation in your community. You will have the opportunity to reflect on your experiences with both good and poor nutrition practices.

In the table below, you will find several questions regarding the current nutrition situation. For each question, there are three response options: "few," "half," and "most." Based on your experience, select the option that best represents the situation in your area by marking the corresponding box:

	Few	Half	Most
How many children aged under 5 years have acute severe malnutrition?			
How many children aged under 5 years have acute moderate malnutrition?			
How many children aged under 5 years are overweight/obese?			
How many women of childbearing age are overweight/obese?			
How many children aged under 5 years of age have anaemia?			
How many women of childbearing age have anaemia?			
How many children start solid/semi-solid foods at 6 months of age?			

### *Common Practices:*

In the table below, there are several questions related to infant feeding practices. Next to each question, you'll find three options: "few," "half," and "most." Select the answer that best reflects your experience by marking the appropriate box.

	Few	Half	Most
How many babies have immediate skin-to-skin contact?			
How many breastfeed within 1 hour after delivery?			
How many have other foods or drinks before they start breastfeeding?			
How many breastfeed exclusively for 6 months?			
How many have other foods or drinks before:			
1 day?			
1 month?			
2 months?			
3 months?			
4 months?			
6 months?			
How many continue to breastfeed for more than:			
6 months?			
12 months?			
24 months?			
How many children start solid/semi-solid foods:			
Before 6 months of age?			
Between 6 and 8 months of age?			
After 8 months of age?			
How many children aged 6 up to 24 months:			
Receive an appropriate variety of foods? <sup>1</sup>			
Receive an appropriate frequency of foods? <sup>2</sup>			
Receive an appropriate amount of food for each meal? <sup>3</sup>			
Receive an appropriate consistency of foods? <sup>4</sup>			

## Module 5: IYCF

### Session 5.2: Breast Feeding

#### Sub-Session 5.2.1: Exclusive Breastfeeding (EBF) for the First 6 Months





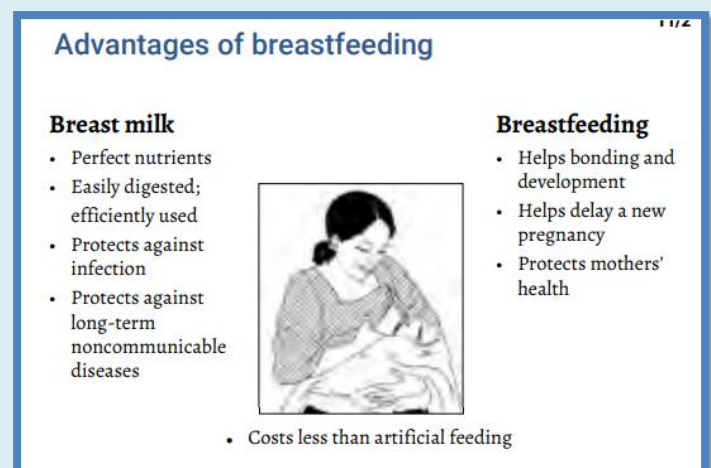
## Session 5.2: Breast Feeding

### Session 5.2.1: Exclusive Breastfeeding (EBF) for the First 6 Months:

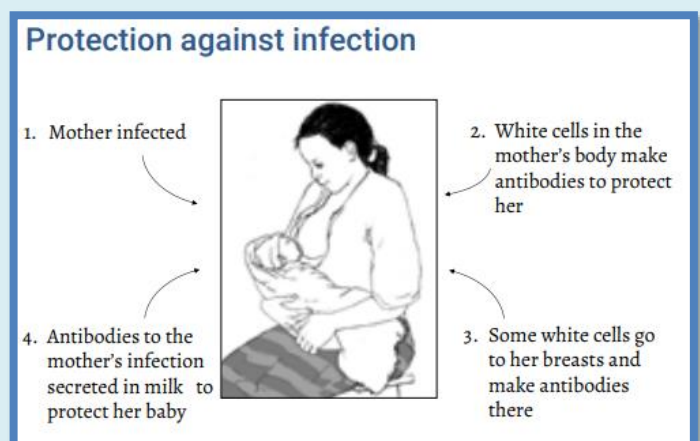
The World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) recommend that infants should be exclusively breastfed for the first 6 months, beginning within an hour of birth and continue breastfeeding until 2 years of age or longer. It is important for you to understand the benefits of breastfeeding so you can support mothers who may have concerns about the value of breast milk. Additionally, you should be aware of the differences between breast milk and formula milk.

A: Benefits of exclusive breastfeeding for the first six months:

This diagram highlights the key benefits of breastfeeding. It is helpful to consider the advantages of both **breast milk** (shown on the left) and **breastfeeding** (shown on the right).



Breast milk contains white blood cells and various anti-infective elements that help protect babies from a range of infections. Breastfeeding offers protection against conditions such as diarrhea, respiratory illnesses, ear infections, meningitis and urinary tract infections.



## **B: Risk of Artificial Feeding:**

### **Introduction**

- Artificial feeding refers to the practice of feeding infants with infant formula or other substitutes instead of breast milk.
- Breastfeeding is the natural and recommended form of infant feeding due to its numerous health benefits for both mother and baby.
- This section will discuss the risks that both mothers and newborns face when artificial feeding is used.

### **Maternal Risks of Artificial Feeding**

#### **1. Delayed Lactation**

- Artificial feeding can interfere with the natural initiation of lactation.
- Frequent and effective breastfeeding stimulates milk production; formula feeding does not promote this.
- This leads to reduced milk supply and possible early cessation of breastfeeding.

#### **2. Increased Risk of Postpartum Hemorrhage**

- Hormonal responses triggered by breastfeeding, such as oxytocin release, help the uterus contract and reduce the risk of postpartum hemorrhage.
- Artificial feeding may reduce these hormonal effects, increasing the risk of excessive bleeding after childbirth.

#### **3. Breast Health Issues**

- Artificial feeding can result in engorged breasts, blocked ducts, or mastitis (inflammation/infection of the breast tissue).
- If breastfeeding is not initiated or maintained, these complications may increase.

#### **4. Mental Health Impacts**

- Women who are unable to breastfeed due to the reliance on formula feeding may experience feelings of guilt, stress, and anxiety.
- The psychological burden of artificial feeding can affect maternal mental health and bonding with the infant.

#### **5. Financial and Emotional Stress**

- Purchasing infant formula can be expensive for families, leading to financial strain.
- The need to continuously prepare and sterilize bottles and formula can cause emotional stress for mothers, especially in rural or economically challenged areas.

### **Newborn Risks of Artificial Feeding**

#### **1. Increased Risk of Infections**

- Breast milk contains antibodies that help protect infants from infections. Formula feeding lacks these immune-boosting components.
- Infants fed with formula are at higher risk for gastrointestinal infections, respiratory infections, and ear infections.

#### **2. Poor Growth and Development**

- Breast milk is specially tailored to an infant's nutritional needs, promoting optimal growth and development.
- Artificial feeding may not provide the same balance of nutrients and could lead to malnutrition or underdevelopment in some cases.

#### **3. Increased Risk of Chronic Conditions**

- Formula-fed infants are at higher risk of developing chronic health conditions later in life, such as:
  - Obesity
  - Type 2 diabetes
  - Asthma
  - Allergies

#### 4. Difficulty with Feeding and Bonding

- Breastfeeding promotes the mother-child bond through skin-to-skin contact and emotional connection during feeding.
- Formula feeding may hinder this bonding process and may also cause difficulty in establishing optimal feeding practices due to bottle use.

#### 5. Risk of Contaminated Formula

- Improper preparation of formula, such as mixing with unclean water or unsanitary bottles, increases the risk of contamination and infection.
- In resource-limited settings like rural Pakistan, safe water and sanitation practices are not always guaranteed, heightening the risk of infant health issues.

#### 6. Increased Risk of Sudden Infant Death Syndrome (SIDS)

- Studies suggest that infants who are formula-fed are at a higher risk of SIDS compared to breastfed infants.
- Breastfeeding provides a protective effect against SIDS, possibly due to the enhanced immune response it offers.

##### **Risks of Artificial Feeding:**

##### **Maternal Risks:**

- Increased risk of anemia, ovarian and breast cancer
- Mother may become pregnant sooner
- Obesity
- Increased risk of some chronic diseases

##### **Newborn Risks:**

- Lower scores on intelligence tests
- Malnutrition; vitamin A deficiency
- More allergies and milk intolerance
- Higher likelihood of diarrhea
- More frequent respiratory infections
- Interferes with bonding

## C: Variations in Breast Milk Composition

### Colostrum:

In the first few days after delivery, mothers produce a special type of breast milk called colostrum. It is thick, yellowish or clear in color and contains higher levels of protein compared to mature milk, making it rich in nutrients and protective factors.

Colostrum	
Property	Importance
• Antibody rich	- protects against allergy & infection
• Many white cells	- protects against infection
• Purgative	- clears meconium - helps to prevent jaundice
• Growth factors	- helps intestine to mature - prevents allergy, intolerance
• Rich in vitamin A	- reduces severity of infection - prevents eye disease

### Mature Milk:

After a few days, mature milk begins to be produced in larger quantities. During this time, the breasts feel fuller, harder and heavier—a phase commonly known as the milk “coming in.”

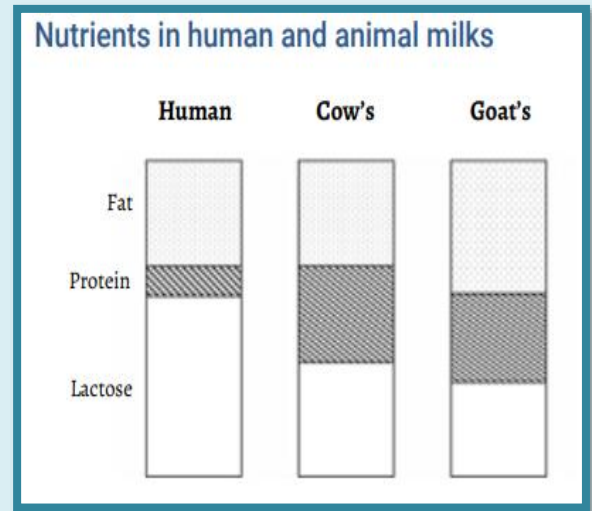
### Foremilk and Hindmilk:

Breast milk changes during a feed. *Foremilk* is the milk produced at the beginning of a feeding session. It is thinner and produced in larger quantities, providing essential proteins, lactose and nutrients. Importantly, foremilk also meets the baby’s hydration needs, so babies do not need extra water before 6 months, even in hot climates.

*Hindmilk*, produced later in the feed, is richer and whiter in appearance because it contains more fat. This fat is a key source of energy for the baby, which is why it’s important not to remove the baby from the breast too soon. Allowing the baby to continue feeding ensures they receive both the foremilk and hindmilk, promoting optimal growth and nourishment.

## D: Composition of Formula Milk and Its Differences from Human Milk

Formula milks are produced from a variety of ingredients, including animal milks, soybean and vegetable oils. While they are modified to resemble human milk more closely, they are still not ideal for infants. To understand the composition of formula milk, it's important to compare the differences between human and animal milks, as animal milks must be adjusted before they can be used in formula production.



## E: Comparison of Nutrients in Human Vs Cow and Goat Milk:

All three types of milk—breast milk, cow's milk and goat's milk—contain fat, which provides energy, protein for growth and lactose, a milk sugar that also serves as an energy source.

However, animal milks have higher protein levels than human milk. This extra protein can be challenging for a baby's immature kidneys to process due to the increased waste products produced.

## Essential Fatty Acids in Human Milk

In addition to these basic nutrients, human milk contains essential fatty acids that are crucial for the development of the brain, eyes and healthy blood vessels in infants. These fatty acids are absent in both cow's and goat's milk, though they may be added to formula milk to make it more similar to human milk.

## Protein Differences in Milk

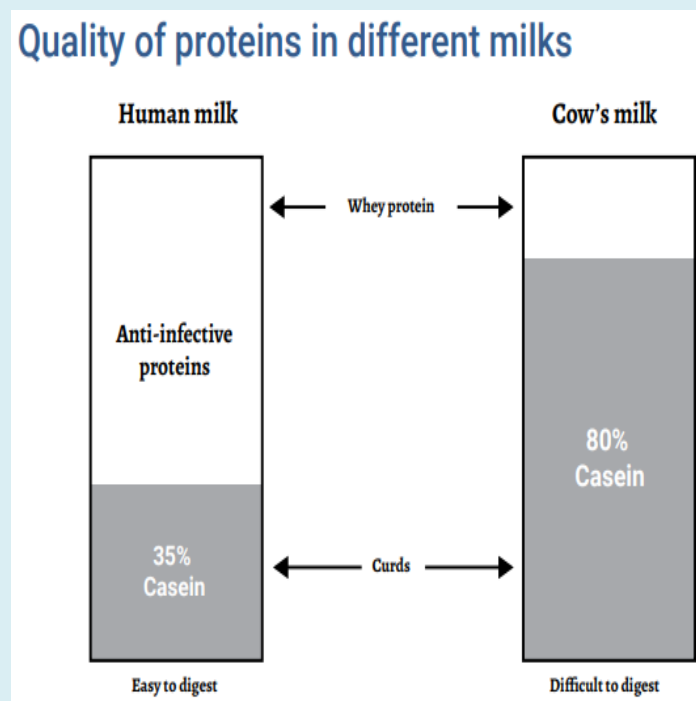
The protein in various types of milk differs not only in quantity but also in quality. While the amount of protein in cow's milk can be adjusted for formula milk, the quality of the proteins remains unchanged.

### Casein vs. Whey Protein

A large portion of the protein in cow's milk is casein, which forms thick, hard-to-digest curds in a baby's stomach. In contrast, human milk has more whey proteins, which are easier to digest and contain anti-infective properties that help protect babies from infections.

### Potential Reactions in Formula-Fed Babies

Babies who are fed formula may develop an intolerance to animal milk proteins. This can result in symptoms such as diarrhea, abdominal pain, rashes and other issues when they consume milk containing these proteins.



## F: Anatomy and Physiology of Breastfeeding

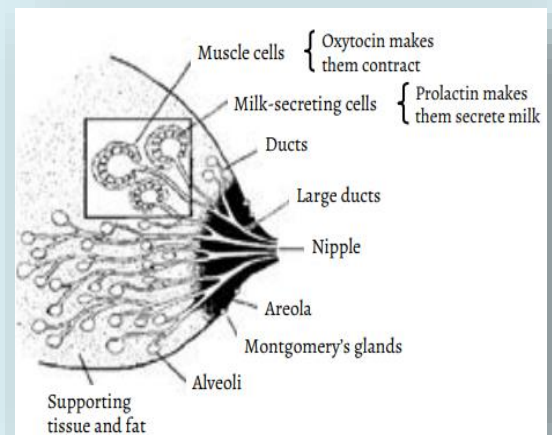
In this session, you will learn about the anatomy and physiology of breastfeeding. Understanding how breastfeeding works is essential for supporting mothers effectively. By grasping the biological processes involved, you will be better equipped to identify challenges and provide tailored guidance to each mother.

### Areola:

The dark skin around the nipple is called the areola. It contains small glands known as Montgomery's glands, which produce an oily fluid to keep the skin clean and lubricated.

### Alveoli:

Inside the breast are tiny sacs called alveoli, which are made up of milk-producing cells. There are millions of alveoli in the breast and the diagram shows just a few. These cells produce milk when a hormone called prolactin stimulates them.



### Muscle Cells:

Around the alveoli, there are muscle cells that help squeeze out the milk. The hormone oxytocin causes these muscle cells to contract and push milk out.

### Ducts:

Milk travels from the alveoli to the outside through small tubes called ducts. Between feedings, milk is stored in the alveoli and small ducts. During feeding, larger ducts beneath the areola expand and temporarily hold the milk.

### Breast Tissue:

The alveoli and ducts are surrounded by supporting tissue and fat, which give the breast its shape. This tissue is what makes the difference between large and small breasts. Both small and large breasts contain roughly the same amount of gland tissue, so both can produce enough milk.



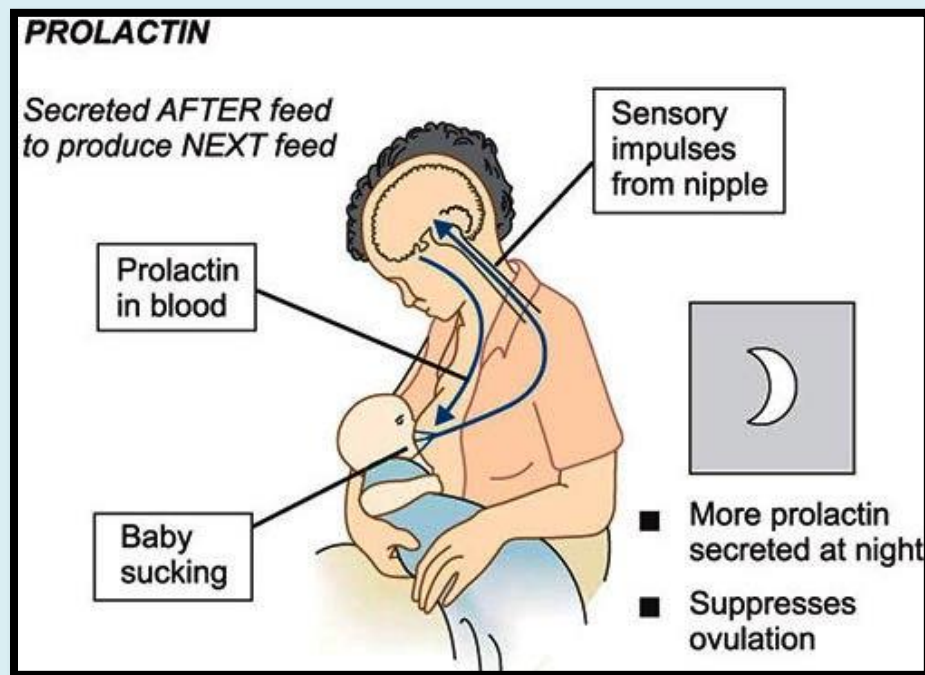
## G: Breast Milk Production and Suckling

- **How Milk is Produced:**

When a baby suckles at the breast, sensory signals are sent from the nipple to the brain. In response, the pituitary gland releases a hormone called prolactin. Prolactin travels through the bloodstream to the breast, where it helps the milk-secreting cells produce milk.

- **The Role of Suckling:**

The more a baby suckles the more milk the breast produces. After a feed, prolactin is present in the bloodstream about 30 minutes later, which prepares the breast to produce milk for the next feeding. The baby will take the milk that is already in the breast for the current feed.



- **Breastfeeding for Multiple Babies:**

If a mother has two babies and both suckle, her breasts will produce enough milk for both. If a baby stops suckling, the milk production will decrease.

- **Influence of Food, Drink and Rest:**

While it's important for a mother to eat well, stay hydrated and get enough rest, these things will not increase milk production if the baby is not suckling regularly. Milk production relies on the baby's suckling.

- **Breastfeeding at Night:**

More prolactin is produced at night, making nighttime breastfeeding especially helpful for maintaining milk supply.

- **Effect on Fertility:**

Hormones related to prolactin can prevent ovulation, which helps delay pregnancy while breastfeeding, especially with nighttime feeds.

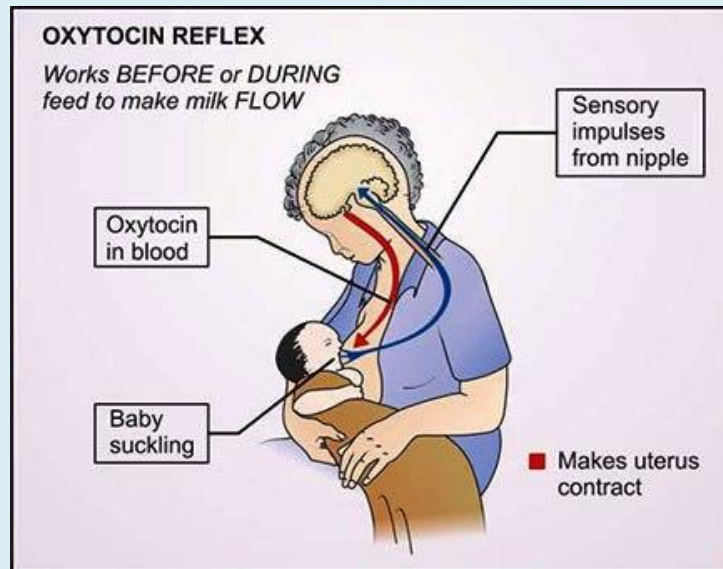
## **Oxytocin and Milk Ejection**

- **The Suckling Reflex:**

When a baby suckles, sensory signals travel from the nipple to the brain. In response, the pituitary gland releases the hormone **oxytocin**. Oxytocin travels through the bloodstream to the breast, where it causes the muscle cells around the alveoli to contract.

- **Milk Flow:**

This contraction helps the milk stored in the alveoli flow through the ducts to the larger ducts beneath the areola, where it is temporarily stored during the feed. This process is known as the **oxytocin reflex**, **milk-ejection reflex**, or **“let-down” reflex**.



- **Timing of Oxytocin:**

Oxytocin works faster than prolactin and triggers the milk to flow for the current feed. It can also start working before the baby suckles, when a mother anticipates a feed.

- **Challenges with Milk Flow:**

If the oxytocin reflex doesn't work properly, the milk may not flow, even though the breasts are producing milk. This can make it seem as though the breasts have stopped producing milk, causing difficulty for the baby in getting milk.

- **Post-Delivery Role of Oxytocin:**

Oxytocin also helps the uterus contract after delivery, which helps reduce bleeding.

## **H: Emotional Impact on the Oxytocin Reflex**

- **Positive Feelings:**

A mother's thoughts and emotions can strongly affect the oxytocin reflex. Positive feelings, such as being happy with her baby, thinking lovingly about them, or feeling confident that her milk is best for the baby, can help the oxytocin reflex work effectively and allow the milk to flow.

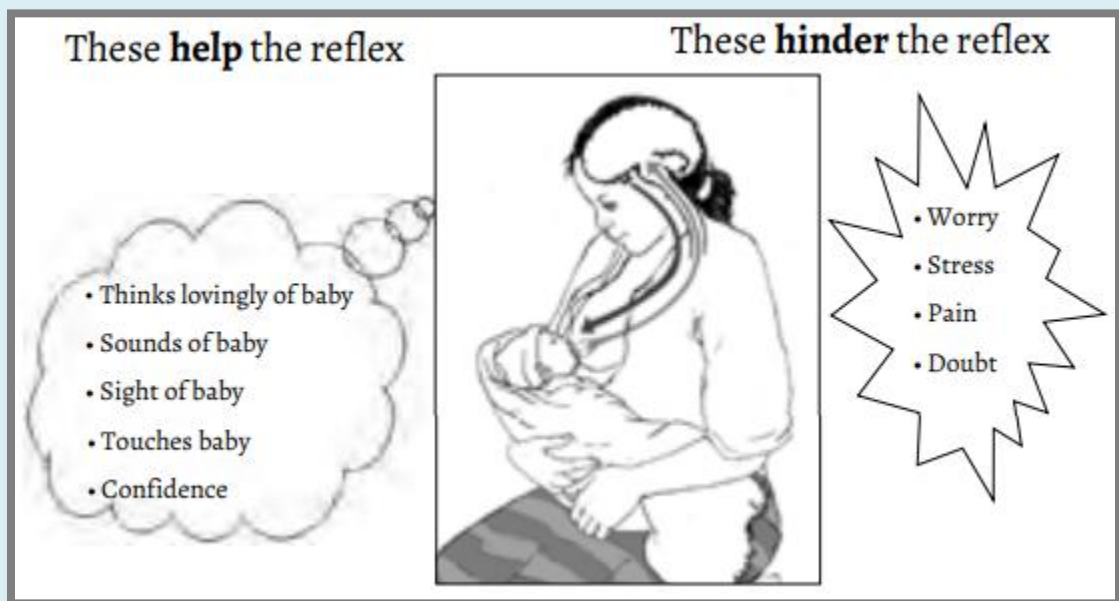
- **Physical Sensations:**

Sensory experiences, like touching or seeing the baby or hearing them cry, can also trigger the oxytocin reflex and encourage milk flow.

- **Negative Feelings:**

On the other hand, negative emotions like pain, worry, or doubt about having enough milk can interfere with the oxytocin reflex, making it harder for the milk to flow.

Fortunately, this effect is usually temporary and can be overcome with support and reassurance.



## I: Reflexes of the Baby:

There are three main reflexes – the rooting reflex, the sucking reflex and the swallowing reflex.

### Rooting Reflex

When a baby's lips or cheek are touched, the baby instinctively opens their mouth and may turn their head to find the source of the touch. The baby then moves their tongue downward and forward. This is known as the “rooting” reflex, which helps the baby find the breast for feeding.

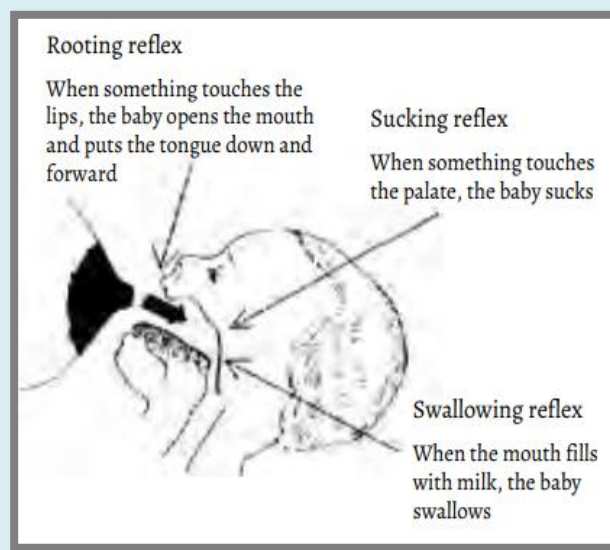
### Sucking Reflex

When something comes into contact with a baby's palate, the baby begins to suck automatically. This is the sucking reflex, which is essential for feeding.

### Swallowing Reflex

As the baby's mouth fills with milk, they instinctively swallow. This is the swallowing reflex, which ensures the milk is properly ingested.

These reflexes—rooting, sucking and swallowing—occur naturally and automatically, without the baby needing to learn them



## **J: Good Attachment during Breastfeeding:**

Good attachment is essential for effective breastfeeding. This ensures that the baby can extract milk efficiently while minimizing discomfort for the mother. A proper latch also promotes adequate milk production, as the baby's suckling stimulates the release of the hormones prolactin and oxytocin. Ensuring good attachment helps prevent common breastfeeding issues, such as nipple pain, low milk supply and inadequate weight gain for the baby. Primary healthcare providers should guide mothers to recognize and achieve good attachment to support successful breastfeeding.

Signs of Good Attachment:

The four key signs of good attachment are:

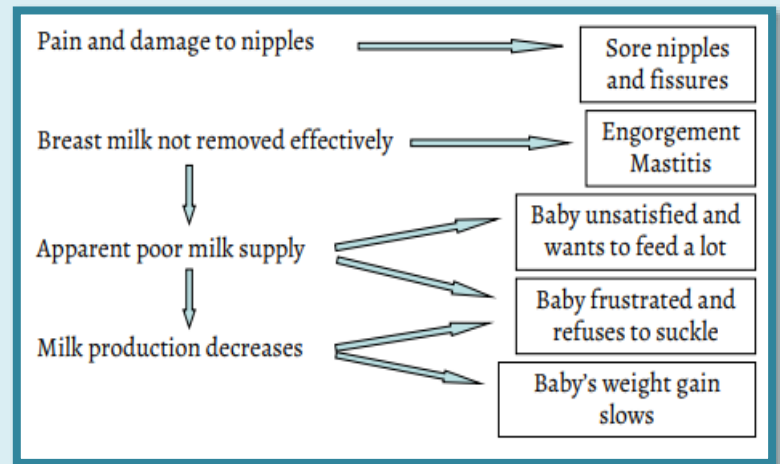
1. The baby's mouth is wide open.
2. The baby's lower lip is turned outwards.
3. The baby's chin is touching the mother's breast.
4. More areola is seen above the baby's top lip than below the bottom lip.



## Consequences of Poor Attachment:

### Damage to Nipple Skin

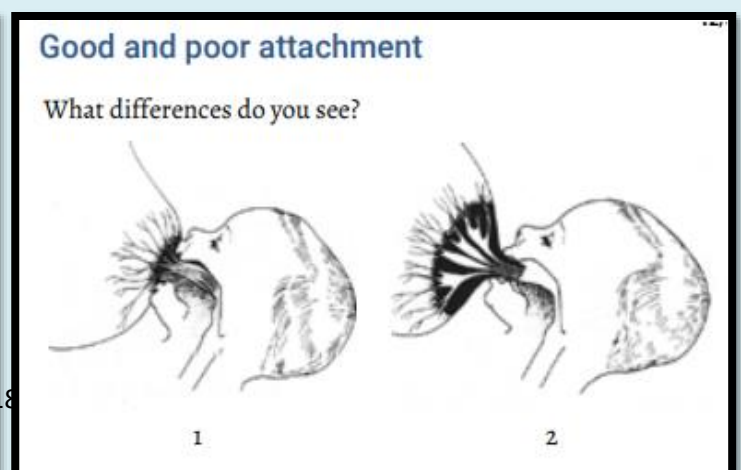
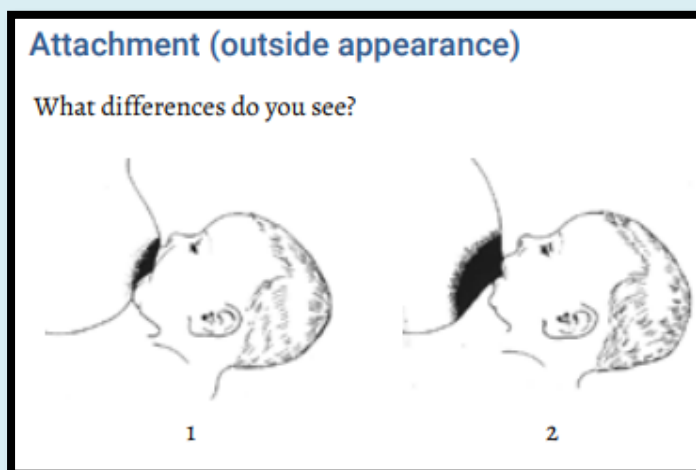
If a baby is poorly attached and "nipple sucks," it can cause significant pain for the mother. Poor attachment is the leading cause of sore nipples. When the baby sucks forcefully to get milk, the nipple is pulled in and out, causing friction against the baby's mouth. Continued poor sucking can lead to nipple skin damage and cracks (also known as fissures).



### Consequences for Milk Production

Improper sucking prevents the baby from effectively removing breast milk, leading to engorged breasts. As a result, the baby may remain unsatisfied and cry frequently. If milk is not adequately removed, the breasts may produce less milk over time. This can lead to the baby failing to gain weight and the mother feeling like a breastfeeding failure.

To prevent these problems, mothers need skilled assistance with positioning and latching their babies properly. Additionally, babies should avoid feeding bottles, especially before breastfeeding is well-established.









<p style="text-align: center;"><b>Picture 1</b></p> <p><b>Signs that you can see clearly are:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's mouth is quite wide open.</li> <li>✓ The baby's lower lip is turned outwards.</li> <li>✓ The baby's chin is almost touching the breast.</li> <li>✓ There is more areola above the baby's top lip than below the bottom lip.</li> </ul> <p><b>Other signs:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's cheeks are round.</li> <li>✓ The baby is close to the breast and facing it.</li> </ul> <p>These signs show that the baby is <b>well attached</b> and <b>well positioned</b> at the breast.</p>	<p style="text-align: center;"><b>Picture 2</b></p> <p><b>Signs of attachment:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's mouth is pointing forward.</li> <li>✓ The lower lip is partly turned outwards.</li> <li>✓ The baby's chin is not touching the breast.</li> <li>✓ It is difficult to see the areola clearly.</li> </ul> <p><b>Other signs:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's cheeks are pulled in.</li> </ul> <p>This baby is <b>poorly attached</b></p>
<p style="text-align: center;"><b>Picture 3</b></p> <p><b>Signs of attachment:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's mouth is not wide open, the lips are pointing forward.</li> <li>✓ The baby's lower lip is turned outwards.</li> <li>✓ The baby's chin is not touching the breast.</li> <li>✓ There is as much or more areola below the baby's mouth as above it.</li> </ul> <p><b>Other signs:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's cheeks are round.</li> <li>✓ The baby is not close to the breast.</li> <li>✓ The position of the baby's hands shows that the body is twisted away and not facing the mother.</li> </ul> <p>This baby is <b>poorly attached</b> and <b>poorly positioned</b>. The baby looks as though he is feeding from a bottle.</p>	<p style="text-align: center;"><b>Picture 4</b></p> <p><b>Signs of attachment:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's chin is touching the breast.</li> <li>✓ There is a little areola above the baby's mouth.</li> <li>✓ As the baby is very close to the breast, it makes it difficult to see many</li> </ul> <p><b>Other signs:</b></p> <ul style="list-style-type: none"> <li>✓ It is difficult to see the baby's mouth, but the little crease (fold) in his chin suggests that his mouth is wide open.</li> <li>✓ You cannot see the baby's lower lip (difficult if the baby is very close to the breast).</li> </ul> <p>The position of the baby's hand shows that he is facing the mother and not twisted.</p> <p>This baby is <b>well attached</b> and <b>well positioned</b>.</p>

Picture 5	Picture 6
<p><b>Signs of attachment:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's mouth is not wide open.</li> <li>✓ The lower lip is pointing forward, not fully outwards.</li> <li>✓ The baby's chin is not touching the breast.</li> <li>✓ There is as much areola below the baby's bottom lip as above the top lip.</li> </ul> <p><b>Other signs:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's cheek is slightly pulled in.</li> <li>✓ The baby's body is twisted away and not close to the mother's.</li> </ul> <p>This baby is <b>poorly attached</b> to the breast.</p>	<p><b>Signs of attachment:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's mouth is wide open.</li> <li>✓ The baby's lower lip is turned outwards.</li> <li>✓ The baby's chin is close to the breast.</li> <li>✓ There is more areola above the baby's mouth than below it.</li> </ul> <p><b>Other signs:</b></p> <ul style="list-style-type: none"> <li>✓ The baby's cheek is round.</li> <li>✓ The baby's body is turned slightly away from the mother and her neck is slightly twisted, but this is not very clear.</li> </ul> <p>This baby is <b>well attached</b>, but her <b>body position</b> is not very good.</p>

## **K: Common Breast Conditions affecting Breastfeeding:**

There are several common breast conditions that can create challenges for breastfeeding:

- Flat or Inverted Nipples and Long or Large Nipples
- Engorgement
- Blocked Duct and Mastitis
- Sore Nipples and Nipple Fissures

Proper diagnosis and management of these conditions are crucial to relieve the mother's discomfort and ensure breastfeeding can continue effectively.

## **Understanding Breast Size and Milk Production**

Breasts come in various shapes and sizes and all are capable of producing enough milk for one baby—or even multiple babies. Many mothers worry about the size of their breasts, particularly those with smaller breasts, fearing they may not produce enough milk. However, the size of the breasts is largely determined by the amount of fat, not the amount of milk-producing tissue. It is important to reassure mothers that they can produce sufficient milk, regardless of breast size.

### **a. Variations in Nipples and Areolas**

Nipples and areolas also vary in shape and size as shown in the figure. However, babies can breastfeed effectively from breasts of any size or nipple shape. It's essential to note that poor attachment can occur with any nipple shape, particularly if the baby has been given bottle feeds or if there is insufficient support to help the mother improve her breastfeeding technique.



#### i. Flat Nipple and Nipple Protractility

Remember: When breastfeeding, the baby does not just suck on the nipple. Instead, they take the nipple along with the underlying breast tissue, including the areola, into their mouth, forming a "teat." The nipple itself only makes up about one-third of the "teat" of breast tissue the baby holds in their mouth.

In picture 2, the mother is testing the protractility of her nipple. This means she is checking how easily the tissue underneath the nipple can be stretched. In this case, the nipple is quite protractile, which means it should be easy for the baby to stretch it and form a proper "teat" in their mouth. With this type of nipple, the baby should be able to breastfeed without difficulty.



Nipple protractility improves during pregnancy and continues to develop in the first week after birth. Therefore, even if a woman's nipples appear flat during early pregnancy, her baby may still be able to breastfeed without difficulty once the baby is born..

**Key point: Nipple protractility is more important than the shape of a nipple.**

ii. Inverted Nipple:

If a woman tests her breast for protractility and the nipple goes inward instead of protruding, it is considered inverted. In figure, you can observe a scar on her breast, which indicates a previous breast abscess. This abscess was likely caused by the baby not attaching properly to the breast and not removing milk effectively. With skilled support, she could have likely breastfed successfully. Fortunately, such challenging nipple conditions are rare.



Figure: Inverted Nipple

## Management:

### Antenatal Treatment for Flat or Inverted Nipples

Antenatal treatments, such as nipple stretching or wearing nipple shells, are generally not helpful. Most nipples naturally improve around the time of delivery without any intervention. If a woman is concerned about having flat or inverted nipples, it's important to assess the protractility of her nipples and reassure her that breastfeeding can still be successful. Building confidence and providing support during the early stages of breastfeeding is important.

### Support after Delivery

After delivery, when the baby begins breastfeeding, help is crucial. It may be difficult at first, but with patience and persistence, the mother can succeed. Explain that her breasts will become softer in the first couple of weeks postpartum and emphasize that the baby suckles from the breast—not just the nipple. The baby needs to take a large mouthful of breast tissue to latch properly. As the baby breastfeeds, they will help stretch the nipple and breast tissue.

During Antenatal Check-up	Not helpful
Soon after Delivery	Build the mother's confidence – breasts will improve Explain that the baby suckles BREAST not nipple Let the baby explore breast skin-to-skin Help the mother to position her baby on the first day Try different positions, e.g. underarm Help her to make the nipple stand out more Use a pump or syringe
For first 1-2 weeks, if necessary	Express breast milk and feed with a cup Express breast milk into the baby's mouth

## **Skin-to-Skin Contact**

Encourage plenty of skin-to-skin contact between mother and baby. Allow the baby to explore the breast and attempt to latch on their own when they show interest. Some babies learn best by self-latching. Show the mother how to position herself in a reclining position, which may help the baby latch more easily. This position allows for more skin-to-skin contact and some babies attach better this way.

## **Helping with Latch and Positioning**

Assist the mother in positioning the baby for better attachment. If the baby does not latch well on their own, guide the mother in how to position the baby properly. Early help is important, especially before the milk "comes in" and the breasts are engorged.

Encourage the mother to try different positions for holding her baby. Sometimes, adjusting the position can make latching easier. For example, the underarm position or leaning over the baby so that the breast falls toward the baby's mouth can help some babies attach more effectively.

## **Stimulating the Nipple**

Before a feed, it may help to make the nipple stand out more. Gentle nipple stimulation can encourage this and sometimes this is all that's needed for the baby to latch. If necessary, a hand breast pump or a syringe can also be used to pull the nipple out.

## **Shaping the Breast for Better Attachment**

Shaping the breast may also assist with easier attachment. To do this, the mother can support the breast from underneath with her fingers and gently press the top of the breast with her thumb—avoiding holding too close to the nipple. In some cases, if mutually acceptable, the mother's partner can help by gently sucking on the nipples to stretch them.

## Expressing Milk if Baby Cannot Suckle Effectively

If the baby is unable to suckle effectively in the first week or two, assist the mother in expressing her milk. This can be done manually or with a breast pump. Expressed milk can be fed to the baby by cup, which keeps the baby hydrated and less frustrated. Additionally, expressing milk helps to keep the breasts soft, making it easier for the baby to latch. It's important to avoid using bottles, as they can make breastfeeding more difficult.

## Direct Milk Expression

Some mothers find it helpful to express a small amount of milk directly into the baby's mouth. This immediate milk intake can reduce the baby's frustration and encourage them to try suckling more eagerly. Throughout this process, continue to offer skin-to-skin contact and allow the baby to explore the breast and try to latch independently.

By supporting the mother through these steps, you can help her feel more confident and increase the chances of successful breastfeeding

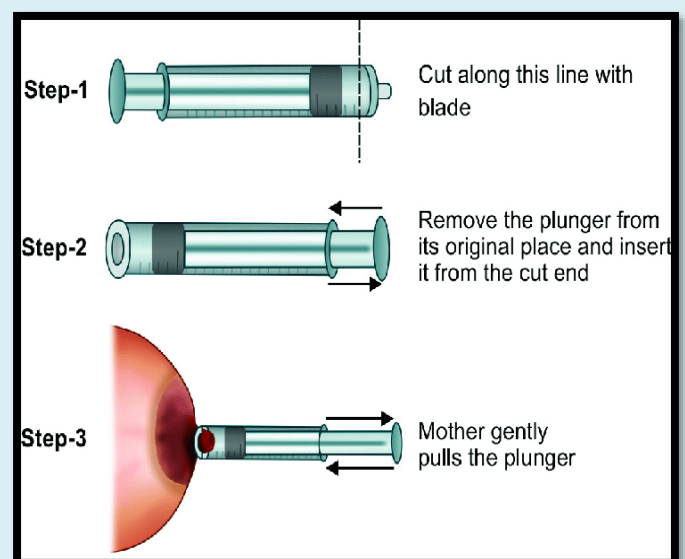
## Activity: Syringe Method for Treating Inverted Nipples

### Materials Needed:

- A 20 ml syringe
- Scissors or a knife to cut the adaptor end of the syringe barrel

### Steps for Preparation and Use:

1. **Prepare the Syringe:** Cut off the adaptor end of the syringe barrel, as shown in Fig. 28.1.
2. **Insert the Plunger:** Place the plunger into the cut end of the barrel, so it is positioned in reverse, compared to its usual placement.





3. **Using the Syringe:** Show the mother how to place the smooth end of the barrel over her nipple. Then, gently pull the plunger to create suction, which will help draw the nipple out.

### **Key Point:**

The mother should always use the syringe herself. A health worker should not pull on the syringe, as applying too much force can cause pain or damage the nipple.

### **Instructions for the Mother:**

1. **Position the Syringe:** Place the smooth end of the syringe over the nipple, as demonstrated.
2. **Plunger Placement:** Insert the plunger about two-thirds of the way into the barrel. Avoid inserting it all the way, as this could cause excessive suction and harm the nipple.
3. **Create Gentle Suction:** Gently pull the plunger to create steady, mild suction to help the nipple protrude.
4. **Duration:** Perform this process for 30 seconds to 1 minute, several times a day.
5. **Pain Management:** If the mother feels pain, she should push the plunger back to reduce the suction. This helps to avoid damaging the skin of the nipple and areola.
6. **Remove the Syringe:** When removing the syringe, always push the plunger back to reduce suction before taking it off the breast.
7. **Before Breastfeeding:** Use the syringe to help the nipple stand out just before offering the breast to the baby.

### **Testing the Syringe Suction**

To understand how the syringe creates suction, try it on the front of your forearms. Typically, the syringe will stay in place for a few minutes. This gives the mother a sense of how it works on her own body.

### iii. Long Nipples:

While long nipples might seem like an advantage for breastfeeding, they can actually create difficulties. A baby may tend to suck only on the nipple, rather than taking a larger portion of the breast, including the milk ducts, into their mouth.

#### Supporting the Mother

It's important to be prepared to assist this mother with her breastfeeding technique. Help her guide the baby to latch onto more of the breast—not just the nipple. Encouraging a deeper latch will help ensure the baby feeds effectively and prevent discomfort for the mother.



#### iv. Large Fibrous Nipples

Some mothers may have very large nipples, which can make it difficult for the baby to latch properly. However, with the right positioning and guidance, the baby can learn to attach successfully.

##### Large fibrous nipples



- Help the baby to open the mouth wide to attach
- Let the baby have skin-to-skin contact and try to find their own way
- Try different positions, e.g. mother leaning over the baby, or underarm
- Express milk and feed with a cup until the baby grows and their mouth is large enough

#### Helping with Positioning

To help the baby latch onto a large nipple, ensure the mother holds her baby in a good position and gently touches their mouth to encourage them to open wide. This may help the baby open their mouth wide enough to latch onto the breast. It will require extra patience and support from the mother.

#### Techniques for Successful Latching

- **Leaning Over the Baby:** Show the mother how to lean over her baby, resting on a bed or table, so that her breast naturally falls toward the baby's mouth. This position can make it easier for the baby to latch on.
- **Skin-to-Skin Contact:** Encourage the mother to provide plenty of skin-to-skin contact, allowing the baby to explore and find their way to the breast. Some babies may figure out how to latch on their own when given this opportunity.

#### Expressing Milk for Feeding

If the baby is not able to latch effectively due to the size of the nipple, teach the mother how to express her milk and feed it to the baby using a cup. This will ensure the baby receives milk while they grow and develop a larger mouth, making breastfeeding easier over time.

## **b. Full and Engorged Breasts:**

### **i. Normal Fullness of the Breasts after Delivery**

In **picture 1**, the woman's breasts appear large and milk is dripping out, causing stains on her skirt. This is a few days after delivery, when her milk has "come in," and her breasts have become full. At this stage, the breasts may feel hot, heavy and hard, but the milk is flowing well, which is a sign of normal fullness. Occasionally, full breasts may also feel lumpy.

The only treatment needed is for the baby to breastfeed frequently to remove the milk. After a feed, the heaviness, hardness, or lumpiness in the breasts typically decreases and they will feel softer and more comfortable. Within a few days, the breasts will adjust to the baby's needs and feel less full.



Picture 1



Picture 2

### **ii. Engorgement of the Breasts**

In **picture 2**, the breast appears engorged, showing a clear edge or "shelf" at the top, indicating swelling. Engorgement occurs when the breasts become overfull, not only with milk but also with excess tissue fluid and blood. This swelling interferes with milk flow, making it harder for milk to be expressed. An engorged breast may look shiny due to the excess fluid (oedema) and feels painful, with milk not flowing as easily. In some cases, the skin may appear red and the woman may develop a fever. This can be mistaken for mastitis, but the fever typically resolves within 24 hours. The nipple in an engorged breast is stretched tight and flat, which can make it difficult for the baby to latch and remove the milk effectively.

### Comparison of Full and Engorged Breasts

Characteristic	Full Breasts	Engorged Breasts
Feeling	Hot, heavy and hard	Painful
Texture	Milk flowing freely	Oedematous (swollen with fluid)
Nipple	No specific change	Tight, especially the nipple
Appearance	No redness	Shiny appearance
Milk Flow	Milk flowing well	Milk may not flow, but may drip
Fever	No fever	Possible fever for 24 hours

### Causes of Engorgement

Cause	Description
Plenty of milk	When there is an excess of milk produced in the early days after delivery.
Delay in starting breastfeeding	If breastfeeding is delayed after birth, the milk may accumulate in the breasts.
Poor attachment to the breast	If the baby does not latch well, breast milk is not effectively removed.
Infrequent removal of milk	Not breastfeeding on demand or delaying feedings can lead to engorgement.
Restricting the length of breastfeeds	Limiting how long the baby feeds may prevent the breasts from being emptied fully.

## Preventing Engorgement

Prevention Method	Description
<b>Let the baby feed as soon as possible after delivery</b>	Early breastfeeding helps initiate milk flow and prevent engorgement.
<b>Ensure proper positioning and attachment</b>	Proper latch ensures the baby effectively removes milk, preventing engorgement.
<b>Encourage unrestricted breastfeeding</b>	Allow the baby to breastfeed on demand, without restrictions on feed length.

## Treatment of Breast Engorgement

Treatment Method	When to Use
<b>Do not "rest" the breast</b>	The breast should not be left undisturbed. Frequent removal of milk is important.
<b>If the baby is able to suckle</b>	Ensure frequent feeding, help with proper attachment and allow the baby to remove milk effectively.
<b>If the baby is not able to suckle</b>	Express milk by hand or with a pump to relieve pressure and maintain milk flow.
<b>Before feed: stimulate oxytocin reflex</b>	Apply warm compresses or take a warm shower to encourage milk flow.
<b>After feed: reduce oedema</b>	Use cold compresses to reduce swelling and soothe the breast.
<b>Massage to neck and back</b>	Help relieve tension and promote milk flow.
<b>Light massage of the breast</b>	Gentle breast massage can help relieve discomfort and assist milk flow.
<b>Stimulate nipple skin</b>	Stimulating the nipple can encourage milk ejection.
<b>Help mother to relax</b>	Relaxation can help with milk flow and reduce stress, which may affect milk production.

### c. Mastitis:

Mastitis can develop in an engorged breast or as a result of a blocked duct.

#### Blocked Duct

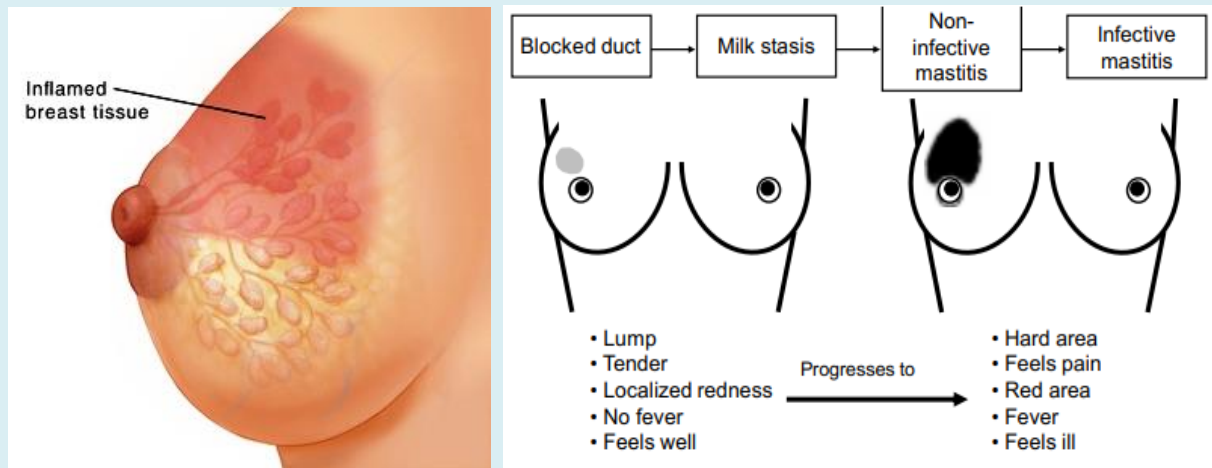
- A blocked duct occurs when milk is not removed from part of the breast, possibly due to a blockage in the duct from thickened milk.
- Symptoms include:
  - A tender lump in the breast.
  - Redness of the skin over the lump.
  - No fever and the woman feel well.

#### Milk Stasis

- When milk remains in part of the breast, either due to a blocked duct or engorgement, it is called milk stasis.
- If the milk is not removed, it can lead to inflammation of the breast tissue, referred to as **non-infective mastitis**.

#### Infective Mastitis

- If the breast becomes infected with bacteria, this is called **infective mastitis**.
- It is not always possible to distinguish between non-infective and infective mastitis based solely on symptoms.
- If symptoms are severe, the woman may require treatment with antibiotics for infective mastitis.

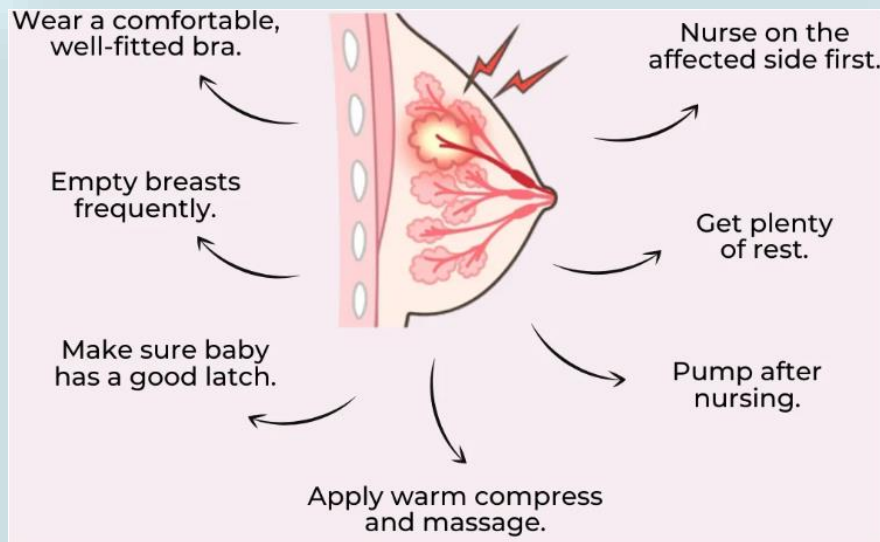


### Causes of Blocked Ducts and Mastitis:

Infrequent or short breastfeeds	owing to	<ul style="list-style-type: none"> <li>• Mother being very busy</li> <li>• Baby sleeping through night</li> <li>• Changed routine</li> <li>• Mother stressed</li> </ul>
Ineffecient removal of milk from part or all of breast	owing to	<ul style="list-style-type: none"> <li>• Ineffective suckling</li> <li>• Pressure from clothes</li> <li>• Pressure from fingers during feeds</li> <li>• Large breast draining poorly</li> </ul>
Damaged breast tissue	owing to	<ul style="list-style-type: none"> <li>• Trauma to breasts</li> </ul>
Bacteria gaining entry	owing to	<ul style="list-style-type: none"> <li>• Nipple fissure</li> </ul>



## How to prevent and treat mastitis:



## Differences between Mastitis and Engorgement

Characteristic	Mastitis	Engorgement
<b>Breast involvement</b>	Usually affects only one breast (can affect both)	Usually affects both breasts
<b>Affects Part or Whole of the Breast</b>	Affects part of the breast	Affects the whole breast
<b>Skin Redness</b>	Clearly demarcated bright redness in a specific area	Diffuse and patchy redness, not clearly marked
<b>Texture of Red Area</b>	Hard, possibly lumpy with soft surrounding tissue	Swollen whole breast, nipple may be tight or flattened
<b>Relief After Milk Removal</b>	No relief from hardness after milk removal	Some relief from hardness after milk removal
<b>Pain</b>	Severe pain, mostly in the red area	Less severe pain, spread throughout the breast
<b>Fever</b>	Continuous fever	Fever may occur, but usually resolves in 24 hours

## Management of Blocked Duct and Mastitis

### Key Treatment Strategies:

- **Frequent Breastfeeding:** Encourage the mother to rest with her baby and feed on demand to improve milk drainage.
- **Gentle Breast Massage:** While the baby is suckling, massage the blocked area down to the nipple to help clear the blockage. This may result in a plug of thick material being released, which is safe for the baby to swallow.
- **Warm Compresses:** Apply warm compresses to the affected breast between feeds to relieve discomfort.
- **Pain and Fever Relief:** Use ibuprofen to reduce inflammation and pain. Paracetamol can also be an alternative.
- **Change Feeding Positions:** Try different positions during feeds to help empty various parts of the breast more evenly (e.g., underarm or lying down positions).
- **Start on Unaffected Breast:** If pain is preventing milk flow, start feeding from the unaffected breast to initiate the oxytocin reflex, then switch to the affected breast.

### When to Seek Further Treatment:

- If there is no improvement after 24 hours or if symptoms are severe upon first presentation.
- If the mother has a fissure that could allow bacteria entry.
- If a bacterial infection is suspected and antibiotics are needed.

### Antibiotic Treatment:

- **Effective Antibiotics:** Flucloxacillin and erythromycin are usually effective, though availability may vary.

- **Complete the Antibiotic Course:** Ensure the mother understands the importance of finishing the full course of antibiotics to prevent recurrence.

<b>ANTIBIOTIC TREATMENT FOR INFECTIVE MASTITIS</b>		
The most common bacterium found in breast abscesses is <i>Staphylococcus aureus</i> . Therefore, it is necessary to treat breast infections with a penicillinase-resistant antibiotic such as either flucloxacillin or erythromycin.		
<b>Drug</b>	<b>Dose</b>	<b>Instructions</b>
Flucloxacillin	250 mg orally 6-hourly for 7–10 days	Take dose at least 30 minutes before food
Erythromycin	250–500 mg orally 6-hourly for 7–10 days	Take dose 2 hours after food

#### **Additional Care:**

- **Rest:** Advise complete rest for the mother, encourage sick leave if applicable, or help with domestic duties.
- **Encourage Frequent Breastfeeding:** Continued breastfeeds, massage and warm compresses are essential for effective milk removal.
- **Adequate Nutrition and Fluids:** Ensure the mother eats well and stays hydrated to support recovery.

**Note:** The primary treatment is to ensure regular and effective milk removal from the breast

#### d. Sore Nipples and Fissures

##### Key Points:

- **Cause of Sore Nipples:** Poor attachment is the most common cause of sore nipples. When a baby is not properly latched, they may pull the nipple in and out, rubbing the skin against their mouth, which causes pain and can lead to fissures.
- **Signs of Poor Attachment:**
  - The baby's head and body are not in line.
  - The baby's body is not held close to the mother.
  - The baby's chin is not touching the breast.
  - More of the areola is visible above the top lip than below the bottom lip.



Picture 1

Picture 2

- **Picture 1:** Shows a mother with a fissure (crack) around the base of the nipple. The breast appears swollen and shiny, indicating engorgement. This may have been caused by poor attachment during breastfeeding.
- **Picture 2:** The mother is breastfeeding, but the baby is poorly positioned. The baby's body is twisted away from the mother, leading to improper alignment of the head and body and the baby is not close enough to the breast. Additionally, the baby's mouth is closed and their lower lip is not fully flanged out. This poor attachment contributes to the nipple damage and engorgement.

## Recommendations for Treatment:

### 1. Breast Care:

- **Washing:** Advise the mother to wash her breasts no more than once a day. Do not recommend soap, as it removes natural oils and can increase soreness.
- **Avoid Medicated Lotions/Ointments:** These can irritate the skin and are not proven to be helpful.
- **Expressed Breast Milk:** After breastfeeding, suggest that the mother rub a small amount of expressed milk over the nipple and areola. This promotes healing.

### 2. Improving Baby's Position:

- Help the mother improve the baby's positioning to ensure a better latch. A well-attached baby will reduce pain and prevent further damage.
- **Benefits:** Once the baby is correctly attached, the pain typically decreases and the nipples will heal rapidly without needing to rest the breast.

### 3. Observing and Practicing:

- After helping the mother understand and correct the attachment, allow her to practice feeding a few times. Return to observe and see if additional help is needed.
- **Time to Heal:** If a baby has been poorly attached for several feeds, it may take some time to get it right, but with practice, the mother should see improvement.

**Prevention and Healing:** The key to preventing and healing sore nipples and fissures is ensuring that the baby is well-positioned and correctly attached. Proper latch technique will not only reduce pain but also allow the nipples to heal naturally.

### e. Ulcers on the Nipple

The image shows an open fissure or ulcer at the tip of the nipple, resulting from prolonged poor attachment during breastfeeding. This ulcer occurs when a baby continues to suckle improperly, causing persistent damage to the nipple over time.

- The ulcer occurs when the baby continues to breastfeed with poor attachment, despite the mother's pain. This can lead to severe nipple damage, including an open fissure.
- The mother may have ignored the pain and continued breastfeeding with the hope of providing the best for her baby, but this worsens the injury.



### Recommendations for Treatment:

#### 1. Improving Attachment:

- The first step is to improve the baby's attachment. Once the baby latches properly, breastfeeding will become less painful and the nipple will stop being damaged further.
- **Encourage Continued Breastfeeding:** If the pain becomes bearable, encourage the mother to continue breastfeeding from the other breast if it is not affected. This will help with milk production and prevent engorgement.

## 2. **Alternatives to Breastfeeding:**

- If the pain is severe, the mother may not be able to breastfeed immediately. In such cases, it is crucial to express the milk and feed it to the baby using a cup to prevent engorgement and mastitis.

## 3. **Wound Healing:**

- **Moist Wound Healing:** For open fissures or ulcers, healing works best in a moist environment. Drying out the wound can lead to the formation of a scab, which can delay healing and cause further discomfort.
- **Treatment:** Apply white soft paraffin or purified lanolin to keep the wound moist. Cover it with a clean dressing, such as a breast pad or gauze and secure it with zinc oxide tape or the mother's clothes.
- **Avoid Dry Dressings:** Do not use dry dressings that can stick to the wound, causing it to reopen when removed.

## 4. **Avoid Medicated Ointments:**

- Medicated ointments may cause sensitivity or allergies, so it's best to avoid them. The most effective treatment is keeping the wound moist and clean, allowing it to heal from the base up.

## 5. **Monitor for Infection:**

- If the wound becomes inflamed or there is a significant amount of pus, it may indicate infection. In such cases, the mother may need antibiotics, similar to the treatment for mastitis.

## **Key Points:**

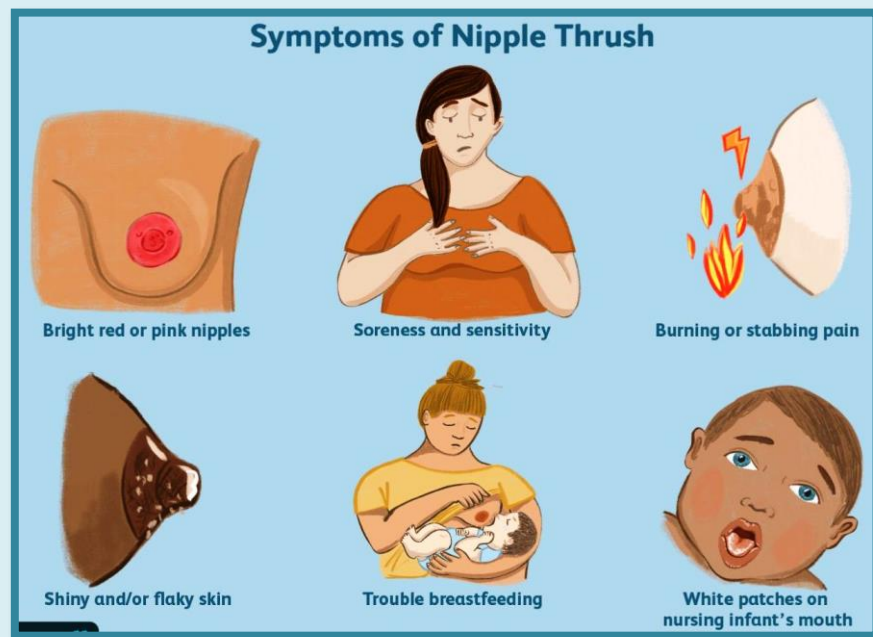
- Proper attachment is key to reducing pain and preventing further nipple damage. If necessary, expressing milk and using moist wound healing techniques can help the wound heal more effectively.
- Encourage the mother to continue breastfeeding as much as possible while ensuring the baby is well-positioned to prevent further damage. If the wound does not heal or becomes infected, seek medical advice and consider antibiotic treatment.

## f. Candida Infection (Thrush) in the Breastfeeding Mother

### Symptoms and Diagnosis:

- **Signs of Candida Infection:**

- The mother experiences sore, itchy nipples with a shiny red area on the nipple and areola.
- Often follows antibiotic use (e.g., to treat mastitis or other infections).
- Pain may be described as burning, stinging, or as though needles are being driven into the breast. This pain persists after the feed and sometimes worsens between feeds. This differs from soreness caused by poor attachment, which primarily occurs during breastfeeding.
- The skin of the nipple and areola may appear red, shiny and flaky. Sometimes, the pigmentation may diminish. In some cases, the nipple may appear normal despite the pain.





## Diagnosis:

- **Suspect Candida Infection if:**
  - The sore nipples persist even after improving the baby's attachment.
  - The baby has signs of thrush, such as white patches in their mouth (on the tongue or cheeks) or a rash on their bottom.

## Treatment:

### 1. Medication:

- **For the Mother:** Treat with **nystatin**, which is effective for treating Candida infections on the skin and breast.
- **For the Baby:** Also treat the baby with **nystatin** to prevent reinfection.
- If nystatin is ineffective, consider using **fluconazole** (given orally) for both the mother and baby, under the guidance of a healthcare professional.

### 2. Breastfeeding Tips:

- **Stop Using Pacifiers and Nipple Shields:** Advise the mother to stop using pacifiers (dummies) and nipple shields, as these can contribute to the spread of the infection. If these must be used, they should be boiled for 20 minutes daily and replaced weekly.
- **Hygiene:** Ensure proper hygiene of any teats, pacifiers, or nipple shields used, with daily boiling and regular replacement.

### 3. Additional Considerations for HIV-positive Women:

- **Prompt Treatment:** For women living with HIV, it is critical to treat both **breast thrush** and **oral thrush** in the infant as soon as possible to prevent complications and further infections.

### TREATMENT OF CANDIDA INFECTION OF THE BREAST

- **Gentian violet paint**
  - To baby's mouth: 0.25%, apply daily or alternate days for 5 days, or until 3 days after the lesions have healed
  - To mother's nipples: 0.5% apply daily for 5 days
- **Nystatin** cream 100 000 IU/g:
  - Apply to nipples 4 times daily after breastfeeds
  - Continue to apply for 7 days after lesions have healed
- **Nystatin** suspension 100 000 IU/mL:
  - Apply 1 mL by dropper to child's mouth 4 times daily after breastfeeds for 7 days, or as long as mother is being treated

OR

- For mother: **fluconazole** 150–300 mg orally once, followed by 50–100 mg twice daily for 2–3 weeks
- For infant, oral *Candida*: **fluconazole** 6 mg/kg orally once, followed by 3 mg/kg per day for 14 days

**Stop** using pacifiers, teats and nipple shields

#### Key Points:

- **Pain Pattern:** Candida infections cause deep, persistent pain in the breast, often worse between feeds.
- **Treatment:** Nystatin is the first-line treatment, with fluconazole used if necessary.
- **Hygiene:** Proper cleaning of feeding accessories and stopping the use of pacifiers/nipple shields are essential in preventing reinfection.
- **Special Care for HIV-positive Women:** Prompt and comprehensive treatment is crucial in preventing complications for both mother and baby.

## Management of Sore Nipples: Summary

Step	Action/Consideration
<b>Look for a cause</b>	- Observe the baby breastfeeding and check for signs of poor attachment.
	- Examine the mother's breasts for signs of Candida infection, engorgement, or fissures.
	- Look in the baby's mouth for signs of Candida and check for tongue tie.
	- Check the baby's bottom for a Candida rash.
<b>Give appropriate treatment</b>	- Build the mother's confidence and reassure her that soreness is temporary.
	- Help her improve the baby's attachment. Often this is all that is necessary to alleviate pain.
	- If necessary, help the mother reduce engorgement by breastfeeding frequently or expressing breast milk.
	- Consider treatment for Candida if pain is deep in the breast, continues between feeds, persists after attachment correction, or if there is itchiness.
<b>Advise the mother</b>	- Avoid washing breasts more than once a day and not to use soap or rub hard with a towel.
	- Breasts don't need to be washed before or after feeds; normal washing is sufficient.
	- Do not use medicated lotions and ointments, as they can irritate the skin and offer no evidence of benefit.
	- After breastfeeding, apply a little expressed breast milk over the nipple and areola to promote healing.

## **L: Management of Refusal to Breastfeed:**

### **Introduction**

In many communities, refusal to breastfeed is a common issue, which may often lead to the early cessation of breastfeeding. However, it is important to understand that refusal can usually be overcome and does not necessarily mean the end of breastfeeding. As a primary healthcare worker in Khyber Pakhtunkhwa, you will encounter mothers who are distressed by their babies' refusal to breastfeed. Your role is crucial in helping both the mother and baby to overcome this challenge and re-establish a healthy breastfeeding relationship. This training session will help you identify the underlying causes of breastfeeding refusal and provide effective solutions.

### **1. Causes of Refusal to Breastfeed**

Babies refuse to breastfeed for a variety of reasons. These can be grouped into several categories based on their origin:

#### **A. Illness, Pain, or Sedation**

- **Illness:** The baby may be sick due to infections, birth complications, or other medical issues.
- **Pain:** If the baby experiences pain, such as from a vacuum extraction bruise or teething, they may refuse to suckle.
- **Sedation:** Babies may be overly sleepy due to medications the mother took during labor or for other health conditions.

#### **B. Difficulty with Breastfeeding Technique**

- **Separation after birth:** The baby may have been separated from the mother after delivery, affecting bonding and breastfeeding.
- **Bottle or pacifier use:** Babies may develop a preference for bottles or pacifiers, which can interfere with breastfeeding.
- **Poor attachment:** Improper attachment or positioning can cause ineffective breastfeeding.

- **Engorgement:** If the mother's milk is not coming in well or if there is engorgement, the baby may find breastfeeding difficult.

### **C. Changes in Baby's Environment**

- **Separation from the mother:** If the mother has returned to work or there are changes in caregivers, babies may experience stress.
- **Routine changes:** A change in the family's routine (moving house, visiting relatives) may upset the baby.
- **Changes in mother's smell:** Changes in the mother's perfume, diet, or soap can upset the baby's preference for breastfeeding.

### **D. Apparent Refusal**

- **Rooting behavior in newborns:** Newborn babies often display rooting behavior, which is normal.
- **Distraction (4-8 months):** Babies may stop suckling if they are distracted by their environment.
- **Self-weaning (after 1 year):** Older babies may naturally reduce breastfeeding frequency, which is part of the weaning process.

## 2. Identifying Why a Baby is Refusing to Breastfeed

The first step in managing breastfeeding refusal is to accurately identify the reason behind it. By asking the following questions, you can narrow down the possible causes:

Question	Possible Cause
Is the baby sick or in pain?	Illness, pain from delivery (vacuum extraction, bruises), sedation due to medications.
Is the baby having difficulty with breastfeeding?	Poor attachment, difficulty in positioning, separation after birth, or using bottles/pacifiers.
Is there any significant change in the baby's environment or routine?	Separation from mother, new caregiver, change in family routine, or changes in the mother's scent.
Is the baby distracted or weaning naturally?	Normal rooting behavior, distraction due to developmental stages, or self-weaning after one year.

## 3. Management of Refusal to Breastfeed

The goal of managing breastfeeding refusal is to address the underlying cause and help the mother and baby reconnect with breastfeeding.

### A. Treat or Remove the Cause if Possible

#### 1. Illness:

- Refer the baby to a healthcare facility for treatment if needed.
- In cases of infection, provide appropriate treatment and assist with expressing breast milk to feed the baby via a cup or tube.

#### 2. Pain:

- Ensure that the baby is positioned comfortably and that no painful areas (such as bruises from a difficult delivery) are being pressed during breastfeeding.

#### 3. Sedation:

- If the mother is on medication, advise her to consult with her healthcare provider to find an alternative, if possible.
- Support the mother until the medication is cleared from her system.

#### 4. **Breastfeeding Difficulty:**

- Teach the mother how to express milk to maintain milk supply.
- Assist with positioning and attachment techniques.
- Encourage more frequent feeding, skin-to-skin contact and ensure that the baby is not being restricted in terms of feeding time or frequency.

#### 5. **Oversupply of Milk:**

- Advise the mother to express milk before offering the breast to prevent choking.
- Suggest lying down while breastfeeding to slow down the flow of milk.

#### 6. **Blocked Nose or Sore Mouth:**

- Teach the mother how to clear the baby's blocked nose.
- Advise short and frequent feeds if the baby has a sore mouth due to thrush or teething.

#### 7. **Changes That Upset the Baby:**

- Discuss the situation with the mother and try to minimize changes in the baby's environment.
- Reassure the mother that this phase is temporary and it's important to keep the baby close.

### **B. Help the Mother and Baby to Enjoy Breastfeeding Again**

- **Close Contact:** Ensure that the baby remains close to the mother, with plenty of skin-to-skin contact. Encourage the mother to sleep with the baby and handle the baby herself as much as possible.
- **Support System:** Advise the mother to take sick leave from work if necessary and ask family members (father, grandparents) to help with non-breastfeeding tasks.
- **Offer the Breast:** Encourage the mother to offer the breast when the baby is sleepy or after cup feeding. Suggest a variety of feeding positions to help the baby latch comfortably.
- **Express Milk:** If the baby is not breastfeeding, the mother should express her milk to maintain supply and feed it to the baby via cup or spoon.
- **Avoid Bottles and Pacifiers:** Discourage the use of bottles and pacifiers, as they can interfere with breastfeeding.

#### 4. Management of Refusal to Breastfeed

Management Strategy	Cause Addressed	Description
<b>Express Milk</b>	Difficulty with attachment or weak baby	Maintain milk supply and offer milk via cup or spoon.
<b>Skin-to-Skin Contact</b>	Separation from mother, emotional stress	Increase bonding and comfort to encourage breastfeeding.
<b>Offer the Breast Frequently</b>	Apparent refusal, distraction	Encourage feeding when the baby is calm or sleepy.
<b>Change Environment</b>	Stress, changes in routine	Reduce stressors like environmental changes or caregiver transitions.

#### **M: Introduction to Taking a Feeding History:**

##### **Purpose of a Feeding History:**

Taking a feeding history helps health workers understand the feeding practices, health status and family situation of an infant, leading to better guidance and support for mothers. A systematic history aids in identifying problems such as feeding difficulties, health concerns and socio-cultural issues that might impact feeding.

##### **Steps for Taking a Feeding History:**

1. **Greet the mother warmly:** Approach the mother and child with a friendly demeanor.
2. **Introduce yourself:** Always introduce yourself with your name and role.
3. **Allow the mother to speak first:** Ask her to share what she feels is important and let her lead the conversation.
4. **Look at the infant's growth chart:** Assess growth data before asking about feeding practices.
5. **Use open-ended questions:** Begin with broad questions and narrow down based on the answers.



## **Counseling Techniques:**

- Empathize with the mother's experiences.
- Use active listening skills such as reflecting back her statements.
- Use non-judgmental language to avoid sounding critical.
- Ask follow-up questions based on responses to gain clarity.

## **Feeding History (0 to 6 Months)**

Health workers should familiarize themselves with these sections and use them as a guide for asking relevant questions.

### **1. Feeding**

- What type of milk is being used (breast milk, formula, cow's milk, etc.)
- Frequency of milk feeds
- Duration of breastfeeding or volume of other milks
- Any complementary foods or fluids introduced
- Bottle use and cleanliness
- Feeding difficulties (if any)

### **2. Health**

- Growth chart review (birth weight, current weight, height)
- Frequency and consistency of stools
- Urine output (6 times or more a day)
- Illnesses in the past month

### **3. Pregnancy, Birth and Early Feeds**

- Antenatal care received
- Birth experience and delivery complications
- Rooming-in and breastfeeding initiation
- Any prelacteal feeds or early challenges

#### 4. **Mother's Condition and Family Planning**

- Maternal health and any relevant conditions (e.g., breast health, nutrition, medications)
- Family planning considerations

#### 5. **Previous Infant Feeding Experience**

- History of previous pregnancies and breastfeeding
- Feeding practices for previous children
- Challenges faced and successes

#### 6. **Family and Social Situation**

- The mother's work situation
- Family's attitude toward feeding practices
- Support systems available at home

Each section is intended to capture key information needed to identify potential feeding issues. Below is a detailed look at each section and its focus:

#### 1. **Feeding**

Question	Purpose
<b>What milk is being given?</b>	To assess if the baby is receiving appropriate nutrition (breast milk vs formula).
<b>Frequency of milk feeds?</b>	To evaluate if the baby is being fed adequately and on time.
<b>Length of breastfeeds or quantity of formula?</b>	Helps identify if the infant is receiving sufficient milk per feed.
<b>Introduction of complementary foods?</b>	To ensure timely and appropriate introduction of solid foods.

## 2. Health

Question	Purpose
Growth chart analysis?	Check if the infant is growing adequately.
Frequency and consistency of stools?	Identify potential gastrointestinal issues or feeding problems.
Illnesses in the past month?	Recognize if any illness is affecting the infant's feeding behavior or growth.

- **Pregnancy, Birth and Early Feeds**

Question	Purpose
Antenatal care and feeding discussions?	Ensure that the mother received adequate education on feeding during pregnancy.
Rooming-in and breastfeeding initiation?	Identify challenges in the early days that might have impacted breastfeeding.

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## Role-Playing and Demonstration

### Key Skills and Techniques for Effective Counseling

- **Building Trust:**

Begin by listening to the mother's concerns, showing understanding and empathy. Use positive reinforcement to support the mother's feeding efforts. For example: "You've been doing well by giving her the milk she needs, even though it's been tough."

- **Being Non-Critical:**

Avoid criticizing the mother's feeding choices. Instead, ask open-ended questions to gather information without making the mother feel guilty or inadequate. For example: "I noticed you mix in some cereal. What made you decide to start that?"

- **Responding to Sensitive Topics:**

Some mothers may feel embarrassed or uncomfortable discussing certain issues, such as their health or family planning. Create a comfortable space where they feel able to share. For example: "It's okay if you're not sure about family planning right now. We can talk about it when you're ready."

### **Summary of Key Points:**

- **Feeding History:** It is a systematic approach to understanding the baby's feeding and health, focusing on 6 main areas: feeding practices, health, pregnancy and early feeds, maternal health and family planning, previous experiences and family/social situation.
- **Counseling Skills:** Open-ended questions, empathy and active listening are crucial to effectively taking a feeding history.

### **Takeaway Message:**

Effective feeding history-taking is essential in providing tailored support to mothers, helping to improve infant feeding practices and addressing any concerns in a timely manner.

## N: Expressing Breast Milk

### Why Expressing Breast Milk is Important

Expressing breast milk is beneficial in several situations. Learning how to express breast milk allows mothers to continue breastfeeding in cases where direct breastfeeding may not be possible.



### Situations When Expressing Breast Milk is Useful

Situation	Description
<b>Relieve engorgement</b>	To reduce swelling and discomfort in the breasts.
<b>Relieve blocked ducts or milk stasis</b>	To prevent or alleviate painful blockage in milk ducts.
<b>Leaving milk for a baby (e.g., for work or outings)</b>	Ensures baby has breast milk when the mother is away.
<b>Feeding a low-birth-weight or sick baby</b>	Provides nutrition to babies who can't suckle effectively.
<b>Help with latch issues (e.g., inverted nipples)</b>	Aids babies in learning how to latch properly.
<b>To maintain milk supply</b>	Expressing regularly can help keep the milk supply adequate.

## Stimulating the Oxytocin Reflex

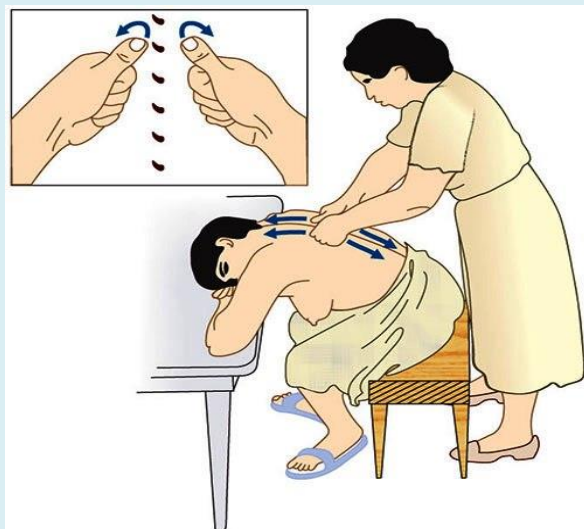
The oxytocin reflex is crucial for milk let-down. The mother's body needs to be in a calm, relaxed state for effective milk expression.

### How to Stimulate the Oxytocin Reflex

Method	Description
Psychological support	Help the mother feel confident and relaxed.
Physical support	Lightly rubbing or massaging the back to stimulate the reflex.
Baby interaction	Holding the baby, looking at a photo, or having skin-to-skin contact can help.
Warmth	Applying warm compresses or having a warm shower may aid in relaxation.
Breast stimulation	Gently stimulating the nipples can help trigger milk flow.

### Key Note:

Encouragement and support in a calm environment is important for initiating the reflex.



## Hand Expression of Breast Milk

Hand expression is a useful, portable and efficient method for expressing breast milk, particularly when a pump is unavailable or inappropriate.

### Steps for Hand Expression

#### 1. Prepare the Area and Equipment

- Ensure a clean, quiet and private area.
- Use a clean, dry container for collecting milk.

#### 2. Positioning the Hands:

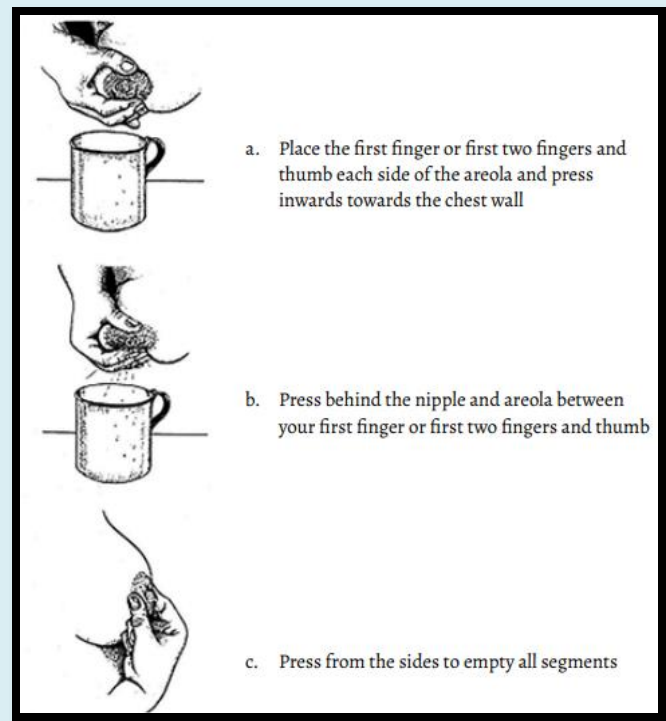
- Place the thumb above the nipple and the fingers below the nipple and areola (Fig. 33.2).

#### 3. Apply Pressure:

- Press gently inwards towards the chest wall.
- Alternate between pressing and releasing, ensuring the areola is emptied from all sides.

#### 4. Repeat for Both Breasts:

- Express each breast for 3-5 minutes or until the milk flow slows, then switch sides.



### Key Tips:

- Avoid squeezing the nipple itself.
- Do not slide your fingers along the skin; always press and release in a rolling motion.

## Preparing and Storing Expressed Milk

Correct storage is essential to maintain the nutritional quality of the milk and prevent contamination.

### Preparing Containers for Expressed Milk

- **Choose a clean, wide-mouthed container** such as glass jars or BPA-free plastic containers.
- **Sterilize** the container by washing with soap and boiling water before use.

### Storing Expressed Milk

Storage Method	Time Frame
<b>Room Temperature (up to 6 hours)</b>	Suitable for short-term storage in cool conditions.
<b>Refrigerator (up to 24 hours)</b>	Store in the main compartment for best quality.
<b>Freezer (up to 3 months)</b>	For long-term storage, label with date and time.
<b>Defrosting</b>	Allow milk to thaw in the refrigerator or at room temperature. Never refreeze once thawed.

### Key Note:

Always store milk in small amounts, appropriate for one feeding to avoid wasting milk

### Troubleshooting and Maintaining Milk Supply

Expressing breast milk is a skill that requires practice and maintaining milk supply is essential for ongoing breastfeeding.



## How Often Should Mother Express Milk?

- **To establish lactation** (first few days): Express frequently, at least every 3 hours.
- **For a sick or premature baby:** Express at least every 3 hours, including at night.
- **To maintain milk supply:** Express regularly, especially during the first few weeks.
- **If working:** Express at least twice during work hours, every 3 hours if possible.

### Key Tip:

For mothers with low milk production, express more frequently, even every 2 hours, to stimulate milk production.

## Avoiding Common Mistakes

- Do not squeeze the nipple directly.
- Avoid overly tight hand positions or excessive force during hand expression.
- Ensure containers are thoroughly sterilized before use.

Hand expression is often the most useful and effective method of expressing breast milk. It has several advantages over using a breast pump, such as reducing the risk of infection and being readily available at any time without the need for equipment. It is essential that all women learn how to express milk by hand, as it provides flexibility and control in various situations.

## Advantages of Hand Expression

- **Reduced Risk of Infection:** Hand expression carries a lower risk of contamination compared to using a breast pump, which may have parts that can be difficult to clean properly.
- **Accessibility:** Hand expression can be done anywhere, at any time, without needing a pump. This makes it especially useful when a pump is unavailable or when privacy and convenience are a concern.
- **Cost-Effective:** Unlike manual or electric pumps, hand expression requires no additional costs or maintenance, making it an accessible option for all mothers.

- **Control:** With hand expression, a mother can easily control the pressure and rhythm of milk expression, allowing for a more personalized and effective experience.

### Why Learn Hand Expression?

It is important for mothers to understand that they do not need to rely on a pump to express breast milk. Hand expression should be considered the primary method for milk expression, as it can be done anytime and anywhere. It is beneficial to teach women how to hand express, especially early on in their breastfeeding journey.

### Key Benefits:

- **Flexibility:** A mother can express milk wherever she is, whether at home, at work, or in public.
- **No Need for Equipment:** Hand expression eliminates the need for potentially expensive or complex equipment, making it an ideal choice for all women.
- **Immediate Relief:** When breasts are engorged or when a mother needs to relieve discomfort, hand expression can provide immediate relief.

### Using Breast Pumps

Breast pumps are devices designed to extract milk from the breasts. There are different types of pumps, but the most commonly used for relieving engorgement are manual and electric pumps. However, **rubber-bulb breast relievers** (often referred to as breast relievers) are widely available but have limited efficiency and should be used cautiously.

When hand expression is difficult due to engorged or painful breasts, a breast pump can be a helpful alternative. Pumps are more effective when the breasts are full, but they can be less efficient when the breasts are softer. It's important to understand how and when to use a breast pump for optimal results.



## Rubber-Bulb Breast Relievers

**Purpose:** Rubber-bulb breast relievers are best used when hand expression is difficult, particularly during engorgement. They are not designed for regular milk collection but for providing temporary relief.

### How to Use a Rubber-Bulb Breast Reliever:

1. **Prepare the Pump:**

- Compress the rubber bulb to push out all the air before using it.

2. **Position the Pump:**

- Place the wide end of the pump over the nipple, ensuring the glass or tube touches the skin all around the nipple to form an airtight seal.

3. **Pump Action:**

- Release the bulb. This will create a vacuum effect and the nipple and areola will be drawn into the glass.
- Compress and release the bulb repeatedly. This pumping action helps draw out milk.

4. **Milk Flow:**

- After a few compressions, milk will start to flow and collect in the swelling of the tube.

5. **Empty the Milk:**

- Break the seal, pour out the milk and repeat the process if necessary.

### Limitations of Rubber-Bulb Breast Relievers

- **Difficult to Clean:** Rubber-bulb breast relievers can be difficult to clean thoroughly. Milk may collect inside the rubber bulb, which is hard to remove and clean properly. This can lead to contamination of the milk.
- **Efficiency:** Rubber-bulb relievers are not very efficient in expressing milk, especially when the breasts are soft or not engorged. They should not be used for regular milk collection.

- **Not Recommended for Feeding:** Since these pumps can be inefficient and difficult to clean, they are not suitable for collecting milk intended for feeding a baby. They should only be used in emergency situations to relieve engorgement.

## **O: Increasing Breast Milk Supply and Relactation:**

### **Introduction**

Breast milk is essential for a baby's growth and development and sometimes a mother may experience a reduced milk supply. This could happen due to various reasons such as breastfeeding difficulties, illness, or a change in feeding practices. In cases where breastfeeding has stopped, relactation can be pursued to restart breastfeeding.

Relactation refers to the process where a mother, who has previously stopped breastfeeding, resumes providing breast milk to her baby. It is important to understand that both increasing a reduced milk supply and relactation share the same principles and methods, though relactation tends to be more challenging and takes more time.

### **Situations leading to the need for increased Milk Supply or Relactation:**

Mothers may seek to increase milk supply or relactate under the following circumstances:

- A baby has been sick and unable to suckle for a period of time.
- A baby has been artificially fed but the mother wishes to try breastfeeding.
- A baby has been ill or failed to thrive on artificial feeding.
- A mother has been sick and has temporarily stopped breastfeeding.
- A mother who previously breastfed her own baby adopts another baby.
- A disaster, either natural or man-made, has resulted in orphaned or artificially fed babies needing breastfeeding support.

## How to Help a Mother Increase Her Supply of Breast Milk

To support a mother in increasing her breast milk supply, the most important action she can take is to **let her baby suckle often**. This regular suckling stimulates the breasts and increases the production of **prolactin**, the hormone responsible for milk production. Without frequent suckling, it is difficult for a mother's milk supply to increase, regardless of other measures.

### Key Steps to Increase Breast Milk Supply:

#### 1. Frequent Suckling:

- The baby should be encouraged to breastfeed **often** and for **longer periods**. Each time the baby suckles, it sends a signal to the mother's body to produce more milk.
- If the baby is not suckling often enough, the mother's milk supply may not increase as needed.

#### 2. Proper Latching:

- Ensure the baby is **well-attached** to the breast. A poor latch can hinder milk transfer and reduce the effectiveness of breastfeeding, leading to inadequate stimulation of the breast and reduced milk production.

#### 3. Mother's Nutrition:

- While eating more does not directly increase milk supply, **proper nutrition** is essential. If the mother is **undernourished**, she needs to consume more food to maintain her energy levels and health.
- **Nourishing foods** can help the mother feel confident and relaxed, which can indirectly support her milk supply by reducing stress.

#### 4. Hydration:

- Many mothers feel **thirstier than usual** during breastfeeding. It's important for them to **drink to satisfy their thirst**. However, drinking more fluids than needed will not necessarily increase milk production. The key is staying well-hydrated to meet personal thirst levels.

## 5. Lactagogues:

- In many communities, there are traditional **lactagogues** – foods, drinks, or herbs believed to help increase milk supply. While lactagogues do not work in the same way as drugs, they may help a mother feel **more confident** and **relaxed**, which could indirectly aid milk production.
- Common lactagogues might include certain herbal teas or specific foods that are thought to have milk-boosting properties. However, these should not replace other essential practices like frequent breastfeeding.

### Important Considerations:

- **Emotional and Psychological Support:** Increasing milk supply can take time and mothers need emotional encouragement and confidence. Stress can negatively impact milk production, so creating a relaxed and supportive environment is crucial.
- **Rest and Recovery:** While **resting more** or taking additional time for relaxation is not directly linked to increasing milk production, ensuring that the mother is not overexerted and has time to recover from the demands of breastfeeding is important for her overall well-being.

By focusing on these principles, a mother can increase her milk supply, provided she is encouraged to maintain consistent breastfeeding practices and receives emotional and practical support.

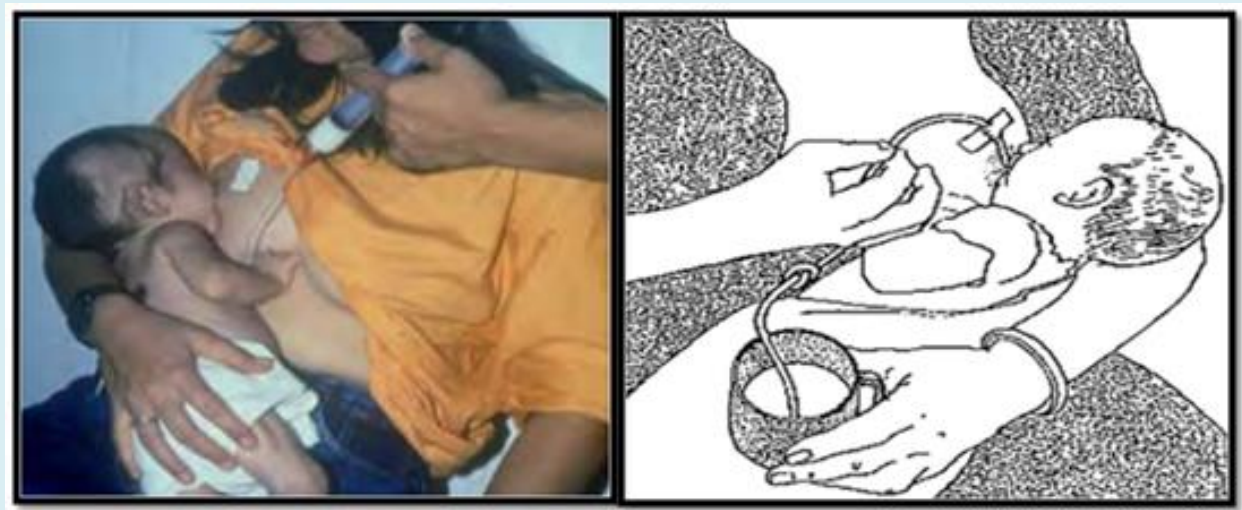
Table: Steps to help a woman increase her supply of breast milk:

Action	Details
<b>Support at Home or Hospital</b>	Try to assist the mother and baby at home. If necessary, admit to the hospital for 1-2 weeks, with skilled support available.
<b>Discuss the Cause</b>	Understand and discuss the reason for poor milk supply.
<b>Patience and Perseverance</b>	Explain to the mother that increasing milk supply takes time, patience and perseverance.
<b>Build Confidence</b>	Provide encouragement and reassurance. Visit and speak to her daily.
<b>Nutrition and Hydration</b>	Ensure the mother has enough to eat and drink.
<b>Lactagogues</b>	Encourage the use of locally valued lactagogues if available.
<b>Rest and Relaxation</b>	Encourage rest and relaxation, especially during breastfeeding.
<b>Skin-to-Skin Contact</b>	Keep the baby close, provide skin-to-skin contact and allow the mother to care for the baby herself. Grandmothers can help with other responsibilities.
<b>Frequent Suckling</b>	Encourage the baby to suckle at least 10 times in 24 hours (more if willing). Offer the breast every 2 hours.
<b>Suckling on Demand</b>	Let the baby suckle whenever they seem interested and for longer periods at each breast. Breastfeed at night.
<b>Proper Latch</b>	Ensure the baby attaches well to the breast.
<b>Other Milk Feeds</b>	If needed, provide other milk (e.g., formula) while waiting for breast milk.
<b>Feeding from a Cup</b>	Teach the mother to give feeds from a cup, not a bottle and avoid pacifiers.
<b>Use Supplementer if Necessary</b>	If the baby refuses to suckle an "empty" breast, use a breastfeeding supplementer or dropper.

<b>Amount of Other Feeds</b>	Provide artificial feed as per baby's weight (150 mL/kg body weight/day).
<b>Gradual Reduction of Artificial Milk</b>	Once breast milk comes, reduce artificial milk by 30-60 mL each day.
<b>Feeding Frequency</b>	Divide the daily feed total by the number of feeds (8-12 feeds per day) and add for spillage.
<b>Monitor Baby's Progress</b>	Check weight gain and urine output to ensure the baby is getting enough milk.
<b>Adjust Artificial Feeds</b>	If the baby is not gaining weight, do not reduce artificial feeds for a few days. Increase the artificial milk temporarily if needed.

### **How to use a breastfeeding supplementer:**

A breastfeeding supplementer is a device for giving a baby a supplement while they are suckling at a breast that is not producing enough milk. A hungry baby may suckle at an “empty” breast a few times, but they may become frustrated and refuse to suckle any more – especially if they have become used to sucking from a bottle. To stimulate a breast to produce milk, it is necessary for a baby to suckle. A breastfeeding supplementer helps to get the baby to continue suckling.





## **P: Not Enough Milk:**

### **Session Objectives:**

#### **Introduction:**

Mothers often worry that they are not producing enough breast milk for their baby, but in most cases, the baby is getting all the milk they need. Nearly all mothers can produce enough milk for one or even two babies and often more than what is necessary. However, some babies may not be getting enough milk, usually because they are not suckling enough or not suckling effectively. It is rarely because the mother cannot produce enough milk.

Worries about insufficient milk supply are most common during the first 2 weeks of life as breastfeeding is being established. After breastfeeding has been established, concerns may arise again after 1 month of age. This session will explore the signs of insufficient milk intake, the common causes of low milk intake and how to manage both real and apparent low milk supply.

#### **Signs That a Baby May Not Be Getting Enough Milk:**

##### **Reliable Signs**

These are the most accurate indicators of low milk intake:

<b>Signs</b>	<b>Description</b>
<b>Poor weight gain</b>	Growth is slower than standard growth charts.
<b>Neonate loses more than 10% of birth weight</b>	The baby loses more than 10% of their birth weight or weighs less than birth weight at 2 weeks.
<b>Small amount of urine</b>	Passing fewer than 6 times a day and concentrated, yellow, strong-smelling urine.

## Possible Signs

These signs may indicate low milk intake but are less reliable:

Signs	Description
<b>Baby not satisfied after breastfeeds</b>	The baby seems still hungry after breastfeeding.
<b>Frequent crying</b>	Excessive crying, especially after feeds.
<b>Very frequent or long breastfeeds</b>	Baby feeds too often or for unusually long durations.
<b>Refusal to breastfeed</b>	Baby rejects the breast.
<b>Hard, dry or green stools</b>	Stool appears hard, dry, or green.
<b>Infrequent small stools</b>	Stools are infrequent or unusually small.
<b>No milk comes out when expressing</b>	Milk does not express when the mother attempts hand expression.
<b>Breasts did not enlarge during pregnancy</b>	Breasts did not increase in size as expected during pregnancy.
<b>Milk did not come in after delivery</b>	Milk did not arrive within a few days after childbirth.

## How to Find Out Whether a Baby is Getting Enough Milk:

### 1. Check Weight Gain:

Step	Action
<b>1st step: Assess weight</b>	Weight gain is the most reliable sign of sufficient milk intake.
<b>Growth chart</b>	For the first 6 months, use a growth chart to assess if the baby's weight gain is within expected ranges (typically 1 kg per month).
<b>Monitor weight</b>	If weight gain follows the curve or remains steady, the baby is getting enough milk. If the weight is declining, investigate further.

## 2. Check Urine Output:

Step	Action
<b>Frequency of urination</b>	By 6 days old, a baby should pass urine at least 6 times a day.
<b>Concentration of urine</b>	Urine should be pale and dilute. If it is dark yellow or strong-smelling after 4 weeks, it may indicate dehydration.
<b>Infrequent urination</b>	Fewer than 6 times a day or concentrated urine means the baby may not be getting enough milk.

## 3. Other Signs:

- If the baby seems content after feedings and has no signs of dehydration, they are likely getting enough milk.
- If the baby is passing enough urine and has good weight gain, it is a good sign that breastfeeding is sufficient.

## Common Reasons Why a Baby May Not Get Enough Milk:

**Breastfeeding Factors:** These are common and often addressable factors:

Factors	Description
<b>Delayed start</b>	Not beginning breastfeeding within the first hour of birth.
<b>Feeding at fixed times</b>	Restricting feeds to a schedule, limiting the baby's intake.
<b>Infrequent feeds</b>	Not breastfeeding often enough, leading to lower milk production.
<b>Short feeds</b>	Breastfeeding for too short a time, preventing full milk removal.
<b>Poor attachment</b>	Ineffective latch can result in insufficient milk transfer.
<b>Use of bottles/pacifiers</b>	Interfering with proper latch and suckling.
<b>Introduction of other foods or fluids</b>	Giving the baby water, teas, or formula instead of breast milk.

### **Mother: Psychological Factors:**

Psychological factors often influence breastfeeding and can impact milk supply:

<b>Factors</b>	<b>Description</b>
<b>Lack of confidence</b>	A mother's worries or lack of belief in her milk supply.
<b>Stress or worry</b>	Mental stress can reduce milk production.
<b>Tiredness</b>	Fatigue can make it harder for the mother to maintain regular feedings.
<b>Dislike of breastfeeding</b>	Emotional aversion to breastfeeding can reduce milk production.
<b>Rejection of baby</b>	Emotional issues may cause a mother to breastfeed less often.

### **Mother: Physical Condition:**

Less common but possible physical causes:

<b>Condition</b>	<b>Description</b>
<b>Severe malnutrition</b>	Poor nutrition can affect milk production.
<b>Alcohol consumption</b>	Excessive alcohol can lower milk supply.
<b>Smoking</b>	Nicotine can reduce milk production.
<b>Contraceptive pill (estrogen)</b>	Hormonal contraceptives can decrease milk supply.

### **Baby's Condition:**

<b>Condition</b>	<b>Description</b>
<b>Prematurity or illness</b>	Premature babies or those with medical conditions may have difficulty feeding effectively.
<b>Abnormalities</b>	Physical abnormalities that impact sucking or feeding.

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## Management of Low Milk Supply:

### 1. Identify the Cause:

Carefully assess the situation to determine whether the milk supply issue is real or apparent.

### 2. Address Common Issues:

- **Poor latch or attachment:** Ensure the baby is latching properly. Seek help from a lactation consultant if needed.
- **Frequency of feedings:** Encourage frequent breastfeeding (8-12 times per day) to stimulate milk production.
- **Exclusive breastfeeding:** Avoid introducing bottles, pacifiers, or other foods early on.
- **Increase milk supply:** For mothers experiencing a low supply, offer more frequent feeds, ensure good nutrition and stay hydrated.

### 3. Monitor and Follow-up:

- **Weigh the baby:** Track weight gain over time to see if the baby is gaining weight appropriately.
- **Urine output:** Check for sufficient urine output (6 or more wet diapers per day).
- **Consultation:** If the baby continues to show signs of insufficient milk intake, refer the mother to a lactation expert.

### Conclusion:

In most cases, mothers are capable of producing enough milk for their babies. Concerns about insufficient milk supply can often be resolved with proper education, support and understanding of breastfeeding mechanics. Always consider the common breastfeeding factors first before exploring less common causes of low milk supply. If a problem persists, professional support is essential to ensure both mother and baby are thriving.

## Q: Feeding Low-Birth-Weight and Sick Babies:

### Introduction

Breast milk is the ideal food for all babies, but it holds even greater significance for low-birth-weight or sick infants. In this session, we will first focus on low-birth-weight babies and then on sick babies.

A "low-birth-weight baby" refers to any baby with a birth weight below 2500 grams (up to and including 2499 grams). These babies may either be preterm (born before 37 weeks of gestation) or small for their gestational age, even if born at term. Low-birth-weight babies, whether preterm or full term, are particularly vulnerable to infections and illnesses. In fact, low birth weight is a major factor in approximately 60–80% of neonatal deaths.



In many countries, 15–20% of all infants are born with low birth weight. In this country, ..... % of all babies are low birth weight.

Advantages of Breastfeeding to LBWs:

Benefit	Low-Birth-Weight Babies
<b>Reduces Risk of Infections</b>	Breast milk lowers the risk of septicaemia and other infections.
<b>Reduces Risk of Necrotizing Enterocolitis</b>	Breast milk decreases the likelihood of necrotizing enterocolitis (a severe gut disease).
<b>Decreases Mortality</b>	The consumption of breast milk reduces the mortality rate of low-birth-weight babies.
<b>Improves Mental Development</b>	Breast milk contributes to better mental development in low-birth-weight babies.
<b>Risk of Artificial Feeding</b>	Artificial feeding is even more harmful for low-birth-weight babies compared to full-term babies.

Breast milk provides all the essential nutrients for low-birth-weight babies weighing 1500 g or more. However, babies weighing less than 1500 g require additional supplements of calcium, phosphorus and vitamin D. All low-birth-weight babies also need iron starting at 6 weeks of age. If a mother is initially unable to express enough breast milk, pasteurized donor milk can be used until the mother can provide enough milk, provided it is acceptable to her and permitted by the country's policy. If neither the mother's milk nor donor milk is available, preterm formula should be used for babies weighing less than 1500 g and standard formula should be used for those over 1500 g.



If a baby cannot suckle, expressed breast milk should be given through an intragastric tube or cup, with skilled assistance for the mother. It's important to help the mother start expressing within 6 hours of delivery, aiming to express every 3 hours, which promotes milk production and flow until the baby can breastfeed. Colostrum, which provides protection against infections, is crucial for low-birth-weight babies and even small amounts are valuable. If only a few drops are expressed, they can be collected using a syringe and given directly to the baby.

## Methods of feeding low-birth-weight babies

Gestational age, weeks	Approximate weights, g	Oral feeding method
Before 32	1000–1500	Intragastric feeding
32–34	1300–1800	Cup for most feeds Try breastfeeding
33–35	1600–2000	Breastfeeding for part of feed Feed by cup or tube to ensure enough
34–36	1800–2200	Coordinated breastfeeding May need some supplements

### Readiness to take feed:

Low-birth-weight babies develop feeding readiness gradually, based on their gestational age. Babies under 28 weeks may show few mouthing movements and require intravenous feeding, with oral feeds starting once they can tolerate them. Between 28 and 31 weeks, babies begin making mouth and tongue movements but cannot coordinate suckling and breathing, necessitating intragastric feeding. At 32 to 34 weeks, babies start rooting and attempting weak suckling and while they may not fully breastfeed, they can begin cup-feeding, which helps development. From 33 to 35 weeks, babies can root, attach and occasionally suckle effectively, with breastfeeding possible for part of the feed, supplemented by cup-feeding. By 34 to 36 weeks, many babies can coordinate suckling well, though some may still need cup-feeding for complete intake. After 36 weeks, most babies can breastfeed fully. These stages are also applicable to sick or clinically unstable babies.



Range of Birth Weight (g)	Gestational Age (Weeks)	Behavior at the Breast	Response When Offered Expressed Breast Milk by Cup	Feeding Readiness
<b>&lt;1000</b>	<28	No definite mouthing	Does not put tongue forward, no licking	Intravenous feeding needed
<b>1000–1500</b>	28–31	Occasional, ineffective suckling attempts	Opens mouth, puts tongue forward, licks milk	Cannot coordinate breathing and swallowing, Intra-gastric feeding
<b>1300–1800</b>	32–34	May root and attach to breast, weak suckling attempts	Opens mouth, puts tongue forward, licks milk	Able to coordinate breathing and swallowing, Cup or alternative feeding for most feeds, Try breastfeeding
<b>1600–2000</b>	33–35	Able to root and attach to the breast, may have periods of organized suckling with long pauses	As above, able to suck at the milk from a cup and other alternatives	Breastfeed for part of the feed, Cup or alternative to ensure adequate intake
<b>1800–2200</b>	34–36	Able to suckle effectively at the breast	Able to suck at milk from the cup and other alternative feeding methods	Breastfeed, may need some supplements by cup or other alternative

### **Feeding through Nasogastric Tube:**

The image depicts a baby under 32 weeks' gestational age being fed via an intragastric tube. If possible, expressed breast milk from the baby's mother should be given. Additionally, the mother can allow her baby to suck on her finger during tube feeding. This action is thought to stimulate the baby's digestive system and may aid in weight gain. It is important for the mother to always wash her hands before engaging in this practice to ensure proper hygiene.



Cup feeding can be introduced once or twice a day while the baby is still receiving most of their nutrition through tube feeds. If the baby takes to cup feeding well, the amount of tube feeding can be gradually reduced. Some babies at this stage may breastfeed for short periods, so if possible, it is beneficial to offer the breast before using alternative methods. Cup and spoon feeding provide valuable experiences for the baby, helping them learn to take food orally and enjoy the taste. These feeding methods also stimulate digestion, as many babies at this age show an interest in putting things in their mouths, even if they are not yet able to effectively suckle at the breast.



### **Positioning for Effective Breastfeeding in Low Birth Weight Babies:**

It is essential to position the baby correctly to enable effective breastfeeding. Regular follow-up and weighing of the baby will help ensure they are receiving enough breast milk. The best positions for a mother to hold her low-birth-weight baby at the breast include:

- **Across the Body Position:** The baby is held with the arm on the opposite side of the breast.
- **Underarm Position:** The baby is supported from underneath, with the head and body properly supported.

In both positions, the mother supports the baby's body with her arm and carefully controls the baby's head with her hand. Low-birth-weight and sick babies require more head support than larger babies. However, the mother should be careful to support the head without applying any pressure to it.

A mother holding her baby in the underarm position Useful for:

- ✓ Twins
- ✓ Blocked duct
- ✓ Difficulty attaching the baby
- ✓ Very small or low-birth-weight babies



A mother holding her baby with the arm opposite the breast

Useful for:

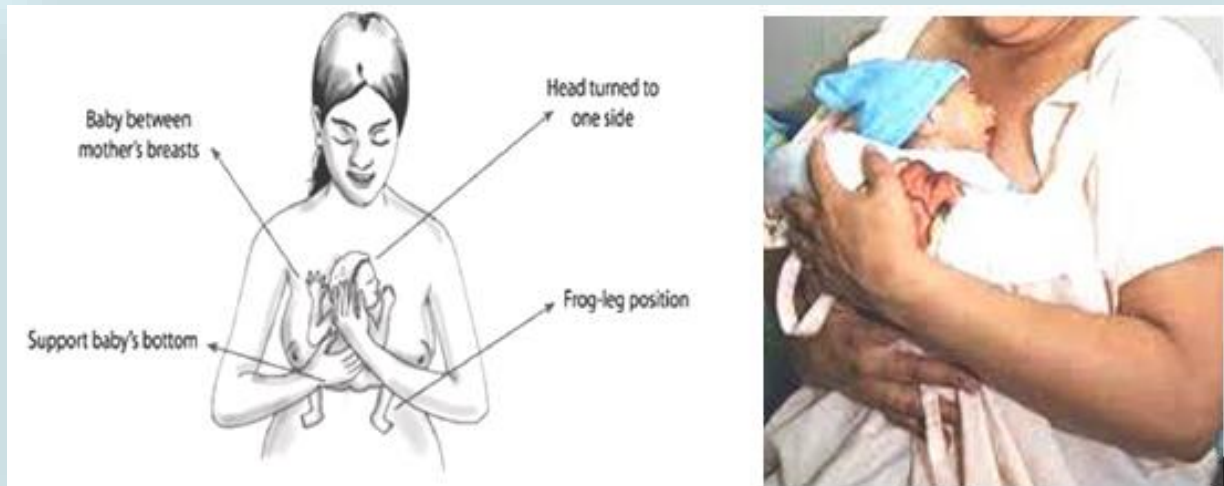
- ✓ very small or low-birth-weight babies
- ✓ sick babies
- ✓ blocked duct



### **Kangaroo Mother Care:**

For babies well enough to tolerate it, the best place for skin-to-skin contact is between the mother's breasts, where the baby's body can touch hers under her clothes. If the baby is too sick to move, the mother can still maintain contact by gently placing her hand on the baby's body.

The babies are held in skin-to-skin contact like this for much of the day and night. Mothers can walk about and do other activities with the baby in this position. Kangaroo mother care is very helpful for the babies' breastfeeding and general development.



### Advantages of Skin-to-Skin Contact

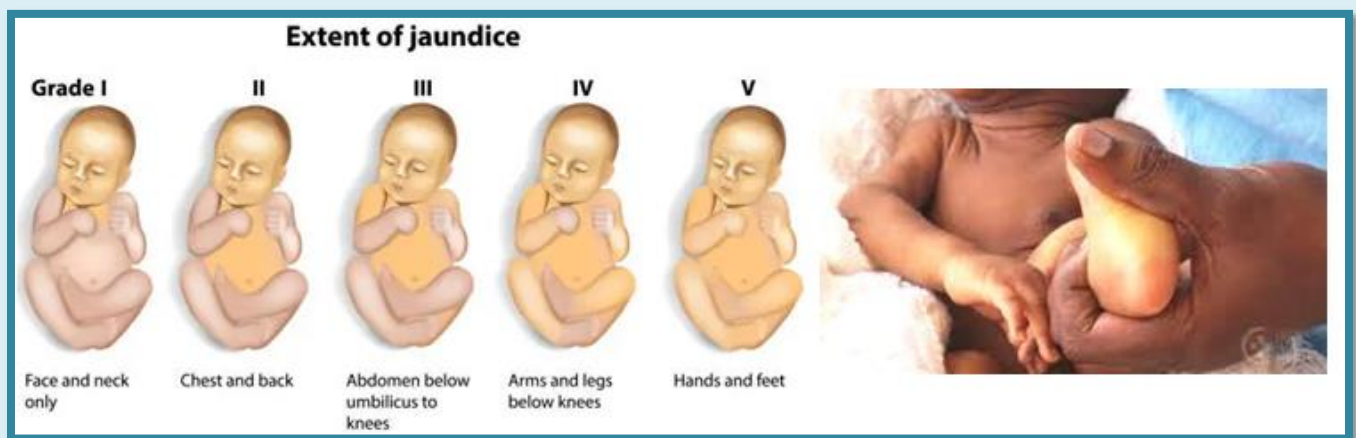
- **Promotes Breastfeeding:** The baby is close to the breast, helping them learn to respond to it and develop better feeding skills.
- **Stimulates Milk Production:** Skin-to-skin contact encourages the secretion of prolactin, aiding the mother in producing breast milk.
- **Enhances Bonding:** It stimulates oxytocin secretion, helping to strengthen the bond between mother and baby.
- **Maintains Baby's Warmth:** The warmth from the mother's body keeps the baby warm, reducing the need for an incubator and improving weight gain.
- **Improves Baby's Health:** It supports better heart function, more regular breathing and reduces the need for extra oxygen.
- **Promotes Calmness:** Babies who experience skin-to-skin contact tend to cry less and sleep better.

Encourage mothers of low-birth-weight or stable sick babies to engage in skin-to-skin contact as much as possible, not only to promote breastfeeding but also to reap all these physical and emotional benefits. Cup or tube feeding can still be done while the baby is in skin-to-skin contact.

## R: Jaundice and Hypoglycemia:

### a. Jaundice in Newborns

Jaundice is a condition that causes yellowing of the skin and eyes due to high bilirubin levels in the blood. The most common form is **early jaundice**, which typically appears between the 2nd and 10th days of life.



### Misconception about Extra Fluids

Some hospitals routinely administer fluids like glucose water to help clear jaundice. However, research has shown that these extra fluids do not aid in jaundice treatment. In fact, they may even hinder breastfeeding by reducing the baby's breast milk intake.

### Impact of Breastfeeding on Jaundice

Jaundice is more likely to occur or worsen in babies who are not receiving enough breast milk. Delays in starting breastfeeding, infrequent breastfeeding sessions, or restricted breastfeeding can increase the risk of jaundice. Additionally, artificial milk feeds can interfere with breastfeeding, further exacerbating the problem.



## Preventing and Managing Jaundice

To prevent jaundice from becoming severe, babies need more breast milk.

- **Early initiation of breastfeeding:** Babies should begin breastfeeding as soon as possible after delivery.
- **Frequent, unrestricted breastfeeding:** Babies should have unrestricted access to the breast to ensure regular milk intake.
- **Expressed breast milk:** If a baby is fed expressed milk, they should receive 20% more milk to compensate for the need for additional intake.

## The Role of Colostrum

Early feeds, especially colostrum, are particularly beneficial. Colostrum has a mild purgative effect that helps the baby pass meconium (the first dark stool). Since bilirubin is excreted in the stool, colostrum helps to prevent and clear jaundice by facilitating the removal of bilirubin through the baby's stool.

### b. Hypoglycaemia in Newborns

**Hypoglycaemia** refers to a condition where a baby's blood sugar level is too low. Full-term, healthy babies are not typically at risk of hypoglycaemia and do not require additional tests or extra feeds to prevent it.

## Risk in Low-Birth-Weight and Sick Babies

Low-birth-weight and sick babies are more vulnerable to hypoglycaemia. To reduce the risk of this condition, the following measures are essential:

- **Keep the baby warm:** Skin-to-skin contact is particularly beneficial for maintaining the baby's body temperature.
- **Initiate early breastfeeding:** Start breastfeeding or provide expressed colostrum within the first hour after birth to help stabilize the baby's blood sugar levels.

## **S: Supplementary Feeding in Infants (Before 6 Months)**

- According to **WHO and UNICEF**, all babies should be **exclusively breastfed for the first 6 months**.
- However, in **some medical cases**, infants may need **supplementary feeding**.
- Supplementation should only be given when advised by a **qualified health professional**.

### **What is Supplementary Feeding?**

- Supplementary feeding means **giving extra fluids or foods** to a **breastfed baby under 6 months**, apart from the mother's own milk.
- These may include:
  - Donor breast milk
  - Infant formula
  - Glucose water
  - Other milk substitutes

### **What Happens in the Community?**

- Giving other foods or fluids too early:
  - **Reduces baby's sucking at the breast**
  - **Reduces breast milk production**
  - Can lead to **breastfeeding failure**
  - May expose the baby to **infections or harmful bacteria**




## When is Supplementary Feeding Needed?

Category	Condition	Details
<b>A. Infant Medical Conditions</b>	<b>Low Birth Weight or Preterm</b>	- Born before 32 weeks or <1500g- May be too weak to breastfeed- Need supplements temporarily
	<b>Low Blood Sugar (Hypoglycemia)</b>	- Common in premature or sick babies- Healthy, full-term babies usually do <b>not</b> need supplements
	<b>Jaundice (Yellow Skin or Eyes)</b>	- Common in the first week- Breastfeeding helps remove bilirubin- Supplements only if milk is very low
	<b>Signs of Poor Feeding</b>	May include: - Dehydration - Weight loss >8–10% by day 5 - No stool by day 4 or only meconium by day 5 - Metabolic disorders (e.g. PKU)
<b>B. Mother's Medical Conditions</b>	<b>Delayed Milk Coming In</b>	- Milk usually increases by day 3- Delay beyond day 5 with poor feeding may need supplements
	<b>Breast Gland Problems or Surgery</b>	- May cause low milk production- Supplements needed if supply is inadequate
	<b>Severe Breastfeeding Pain</b>	- If not relieved by correcting position- Temporary supplementation may be required
	<b>Serious Illness in Mother</b>	- Conditions like sepsis may stop mother from breastfeeding- She may express milk if possible
	<b>Herpes on Breasts</b>	- If mother has open sores (Herpes Type 1)- No breastfeeding from affected side until healed

## Special Cases Requiring Breast-Milk Substitutes

- **Mother is absent or has died**
- **Mother on chemotherapy or harmful medications**
- **Mother living with HIV** and not breastfeeding due to national guidelines or personal decision

 Refer to WHO/UNICEF guide: “**Acceptable medical reasons for use of breast-milk substitutes**”

WHO/UNICEF. Acceptable medical reasons for use of breast-milk substitutes. Geneva: World Health Organization; 2009

([http://apps.who.int/iris/bitstream/10665/69938/1/WHO\\_FCH\\_CAH\\_09.01\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/69938/1/WHO_FCH_CAH_09.01_eng.pdf) , accessed 8 June 2020).

## Goals of Supplementary Feeding

When needed, supplementation should:

- **Provide necessary nutrition to the baby**
- **Help continue and protect breastfeeding**
- **Find out the reason** for low milk or poor feeding

**To support breastfeeding:**

- Give **only the amount needed**
- Help mother to **hand express or pump milk**
- Let baby **continue trying to breastfeed**

## Common Situations Where Supplements Are Given (But NOT Needed)

- **Cluster feeding** (baby feeds often) – This is normal behavior.
- **Mother is tired after delivery** – Do not give formula just to let her rest.
- **Perceived low milk** – Always assess feeding before deciding on supplements.
- **Healthy low-birth-weight baby** – Often breast milk is still best.
- **Preventing dehydration or jaundice in healthy babies** – Not needed with proper breastfeeding.

## Important Tips for Health Workers

- Only recommend supplementation when **medically necessary**.
- Help mothers with **correct breastfeeding techniques**.
- Always try to **protect and support exclusive breastfeeding**.
- **Follow-up** on babies who need supplements with an **individual feeding plan**.
- **Educate families** clearly on how and when to use supplements if needed.

## Feeding a Baby by Cup

- **When to Use a Cup:** Cups and alternative feeding methods are used when a baby cannot fully breastfeed or when the mother is unavailable.
- **Benefits of Using a Cup:**
  - **Easy to Clean:** Cups are easy to wash with soap and water if boiling is not possible.
  - **Hygiene:** Cups are less likely than bottles to be left around for extended periods, reducing the risk of bacterial growth.
  - **Encourages Contact:** The person feeding the baby by cup must hold and interact with the baby, providing needed contact.
- **Considerations for Cup-Feeding:**
  - **Impact on Breastfeeding:** Cup-feeding does not interfere with breastfeeding, although a term baby who can breastfeed may refuse a cup. This is less likely in low birth weight or sick babies.

- **Health Benefits:** Cup-feeding is linked to a lower risk of diarrhoea, ear infections and tooth decay.
- **Baby's Control:** A baby can control their milk intake at their own pace when using a cup.
- **Positioning:** The baby should sit semi-upright to reduce the risk of aspiration.
- **Milk Administration:** Milk should never be poured directly into the baby's mouth; they should be allowed to take the milk at their own pace.

### Placing the feeding cup correctly

Tilt the cup just far enough that the milk touches baby's tongue

Baby's head must be upright

Baby's entire bottom lip is in contact with the cup

The cup should touch the corners of baby's mouth



### HOW TO FEED A BABY BY CUP

- Wash your hands.
- Wrap the baby in a cloth to hold their hands by their side, and to support their back.
- Hold the baby sitting upright or semi-upright on your lap.
- Put a cloth in front to protect the baby's clothes from spilled milk.
- Place the estimated amount of milk for one feed into the cup.
- Hold the small cup of milk to the baby's lips.
  - Tip the cup so that the milk just reaches the baby's lips.
  - The cup rests lightly on the baby's lower lip, and the edges of the cup touch the outer part of the baby's upper lip.
- The baby becomes alert, and opens their mouth and eyes.
  - A low-birth-weight baby starts to take the milk into their mouth with their tongue.
  - A full-term or older baby sucks the milk, spilling some of it.
- **Do not pour** the milk into the baby's mouth. Just hold the cup to their lips and let them take it themselves (sipping or lapping).
- When the baby has had enough, they will close their mouth and will not take any more. If the baby has not taken the calculated amount, they may take more next time, or you may need to feed them more often.
- Measure the baby's intake over 24 hours – not just at each feed.

## **AMOUNT OF MILK TO GIVE TO BABIES WHO CANNOT BREASTFEED**

### **What milk to give**

- Choice 1: expressed breast milk (if possible from the baby's mother, or from a donor); this may be pasteurized or heat-treated according to local policy.
- Choice 2: formula milk made up according to the instructions and World Health Organization (WHO) guidelines.

### **Amount of milk to give**

#### **Babies who weigh 2.5 kg or more**

- 150 mL milk/kg body weight per day.
- Divide the total into 8 feeds, and give 3-hourly.

#### **Babies who weigh less than 2.5 kg (low birth weight)**

- Start with 60 mL/kg body weight per day.
- Increase the total volume by 20 mL/kg per day, until the baby is taking a total of 180–200 mL/kg per day .
- Divide the total into 8–12 feeds, to feed every 2–3 hours.
- Continue until the baby weighs 1800 g or more, and is fully breastfeeding.

Check the baby's 24-hour intake.

The size of individual feeds may vary.

## **Module 5: IYCF**

### **Session 5.2: Breast Feeding**

#### **Sub-Session 5.2.2: Baby Friendly Hospital Initiative**



## Sub-Session 5.2.2: Baby Friendly Hospital Initiative:

### Learning Objectives

By the end of this session, participants will be able to:

- ✓ Explain the significance of exclusive and continued breastfeeding
- ✓ Summarize the WHO/UNICEF Global Strategy for Infant and Young Child Feeding
- ✓ Describe the key components of the Baby-friendly Hospital Initiative
- ✓ Identify and list the Ten Steps to Successful Breastfeeding

### What is the Baby-friendly Hospital Initiative (BFHI)?

- **Launched in 1991** by WHO and UNICEF to support breastfeeding in hospitals and health centers.
- By 2007, over **20,000 hospitals in 152 countries** were certified as “baby-friendly.”
- BFHI helps create **supportive environments** in healthcare settings, so mothers can learn and succeed in **exclusive breastfeeding for six months**, and continue breastfeeding **for two years or longer**.

### Purpose of the BFHI

- To ensure all hospitals and maternity centers follow the **Ten Steps to Successful Breastfeeding**, a set of guidelines first introduced in **1989**, updated in **2009**, and again in **2018**.
- These steps remain the core foundation of the BFHI globally.

### Baby-Friendly Maternity Facilities Must:

- **Fully implement the Ten Steps** to help mothers successfully breastfeed.
- Provide **support to all mothers**, even those who are not breastfeeding, to help them care for their babies in the best way possible.



Offer **inclusive and respectful care** to all families, including those facing health challenges like HIV.

## Creating Supportive Environments

- Supportive policies and programs are essential to encourage exclusive and continued breastfeeding.
- Key measures include:
  - Legislation supporting maternity leave and breastfeeding-friendly workplaces
  - Community-based support networks
  - Training healthcare workers to offer skilled breastfeeding support

## Global Strategy for Infant and Young Child Feeding

- **2002:** WHO and UNICEF endorsed the **Global Strategy for Infant and Young Child Feeding**, promoting and protecting optimal feeding practices.
- **2012:** WHO introduced six global nutrition targets as part of a **Comprehensive Implementation Plan** on maternal, infant, and young child nutrition.
  - One major target: **Increase the global rate of exclusive breastfeeding** in the first six months of life.

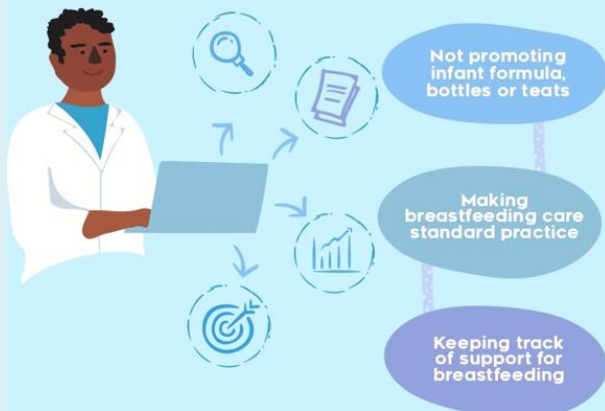
## The Global Strategy for Infant and Young Child Feeding Calls for:

1. Expanding the **Baby-friendly Hospital Initiative (BFHI)** in more health facilities.
2. Including **breastfeeding and lactation management** in training programs for all health workers.
3. Collecting **accurate and up-to-date data** on breastfeeding practices.

## TEN STEPS of BFHI

### 1 HOSPITAL POLICIES

Hospitals **support mothers** to breastfeed by...



### 2 STAFF COMPETENCY

Hospitals **support mothers** to breastfeed by...



### 3 ANTENATAL CARE

Hospitals **support mothers** to breastfeed by...



### 4 CARE RIGHT AFTER BIRTH

Hospitals **support mothers** to breastfeed by...



### 5 SUPPORT MOTHERS WITH BREASTFEEDING

Hospitals **support mothers** to breastfeed by...



## 6 SUPPLEMENTING

Hospitals support mothers to breastfeed by...

- Giving only breast milk unless there are medical reasons
- Prioritizing donor human milk when a supplement is needed
- Helping mothers who want to formula feed to do so safely

## 7 ROOMING-IN

Hospitals support mothers to breastfeed by...

- Letting mothers and babies stay together day and night
- Making sure that mothers of sick babies can stay near their baby

## 8 RESPONSIVE FEEDING

Hospitals support mothers to breastfeed by...

- Helping mothers know when their baby is hungry
- Not limiting breastfeeding times

## 9 BOTTLES, TEATS AND PACIFIERS

Hospitals support mothers to breastfeed by...

- Counsel mothers on the use and risks of feeding bottles, teats, and pacifiers

## 10 DISCHARGE

Hospitals support mothers to breastfeed by...

- Referring mothers to community resources for breastfeeding support
- Working with communities to improve breastfeeding support services

## ✓ Summary of Key Considerations for Optimal Breastfeeding

### 1. Implement Baby-Friendly Standards:

- Ensure all maternity health facilities follow the **Baby Friendly Hospital Initiative (BFHI)** and are officially certified.

### 2. Enforce Marketing Regulations:

- Monitor and enforce laws regulating the marketing of infant and young child foods.

### 3. Promote Mother-Infant Bonding:

- Ensure **rooming-in** (keeping mothers and newborns together).
- Support **early skin-to-skin contact** for at least one hour after birth.
- Promote **breastfeeding initiation within the first hour** of birth.

### 4. Encourage Optimal Feeding Practices:

- Feed infants **colostrum (first milk)**.
- Encourage **frequent, on-demand breastfeeding**, day and night.
- **Avoid pre-lacteal feeds** (e.g., water, teas, glucose).

### 5. Support Effective Breastfeeding Techniques:

- Help mothers with **correct positioning and attachment**.
- Guide them to **fully empty one breast before switching** to ensure infant gets hind milk and prevent breast issues.

### 6. Educate and Support Mothers:

- Train mothers to **identify and address breastfeeding difficulties** early with approved healthcare support.
- Encourage use of **child health cards** to monitor growth and attend regular health checkups.
- Promote **timely immunizations** and **sleeping under insecticide-treated nets (ITNs)**.

### 7. Protect Maternal Rights:

- Advocate for **employer support for maternity rights and benefits**.

### 8. Promote Responsive Parenting:

- Encourage **responsive caregiving**, and **age-appropriate play and stimulation** to aid child development.



## Module 5: IYCF

### Session 5.3: Complementary Feeding after 6 Months



## Module 5: IYCF

### Session 5.3: Complementary Feeding (CF) after 6 Months

#### A: The Importance of Complementary Feeding

##### Introduction

The period from birth to 6 months of age is crucial for a child's growth and development, primarily through exclusive breastfeeding. However, the next stage, from 6 months to 2 years, is equally vital for a child's nutritional and physical development. As primary health care workers, it is your role to assist families during this important time.

In this session, we will focus on **complementary feeding**, its importance and when to start introducing solid foods. The content aims to equip you with the knowledge to provide guidance and support to caregivers, emphasizing the continuation of breastfeeding alongside complementary feeding.

##### Sustaining Breastfeeding

Breastfeeding is the cornerstone of infant nutrition. **Exclusive breastfeeding** should continue for the first 6 months of life. Breast milk provides all the nutritional needs of an infant during this time, protecting them from infections and fostering emotional bonding.

From 6 to 12 months, breastfeeding remains the primary source of nutrition, supplying approximately 60% of the child's nutritional needs. From 12 to 24 months, breastfeeding continues to provide about 40% of the child's daily nutrition. In addition to nutrition, breast milk offers protection against illness and supports psychological development through close mother-child contact.

As health care workers, you have a crucial role in promoting and supporting breastfeeding. Encouraging mothers and caregivers to breastfeed for at least the first two years is vital for the child's health and development.

### Key Message 1:

*Breastfeeding for 2 years or longer helps a child to develop and grow strong and healthy.*

### What is Complementary Feeding?

Complementary feeding refers to the introduction of other foods and liquids, in addition to breast milk, to meet the growing nutritional needs of a child after 6 months of age. These foods do not replace breast milk but are offered alongside it to supplement the diet. The goal is to provide adequate, nutritious foods to ensure that the child receives all the essential nutrients they need for growth.

**Complementary foods** are those foods that provide the necessary nutrients, vitamins and energy required for the child's growth and development. It is important that complementary foods are nutritionally rich and provided in appropriate quantities to support the child's increasing needs.

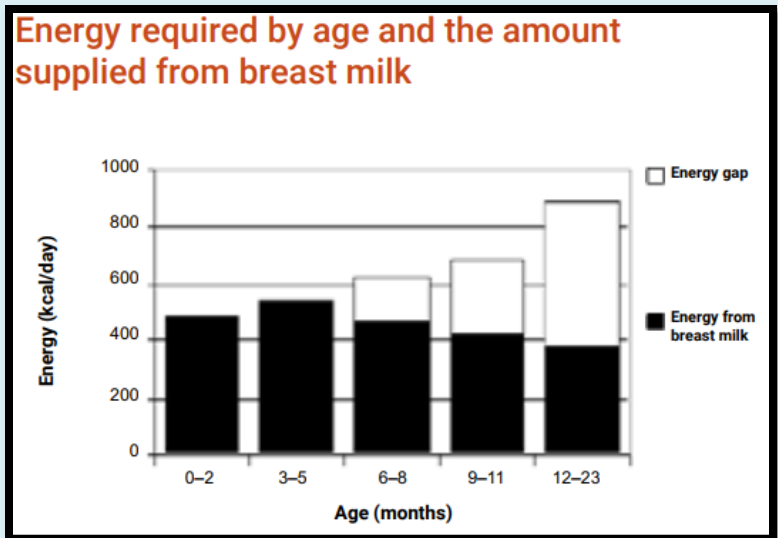


At this stage, babies are gradually introduced to family foods, while breastfeeding continues to be a significant source of nutrients and protective factors.

## Why 6 Months is the Optimal Age to Start Complementary Feeding

A child's energy requirements increase as they grow. While breast milk provides essential nutrients, it cannot meet the increasing energy needs of the child after 6 months. The **energy gap** arises when breast milk alone cannot supply all the energy required for the child's growth and activity.

**Energy Gap Example:** As children grow older, their energy requirements increase. For an average child, the energy provided by breast milk starts to fall short after 6 months, creating a gap. This is why, at this stage, complementary foods are essential to meet the child's energy needs.



From around 6 months onward, the child needs additional food to support their physical growth and development. Therefore, it is crucial to begin complementary feeding at 6 months of age to ensure that the child receives adequate nutrition.

### Key Message 2:

*Starting other foods in addition to breast milk at 6 completed months helps a child to grow well.*



At 6 months, babies begin to show signs that they are ready for complementary foods. These signs include:

- Showing interest in the food others are eating.
- Reaching out for food.
- Putting objects into their mouth.
- Developing better tongue control to move food around their mouth.
- Beginning to make munching movements with their jaws.

Additionally, the digestive system of a 6-month-old baby matures enough to handle a variety of foods.

### **Risks of Starting Complementary Foods Too Early**

Introducing complementary foods before 6 months can pose several risks:

- **Breast milk may be replaced:** Starting solids too early may reduce breastfeeding frequency, making it difficult to meet the baby's nutritional needs.
- **Nutrient deficiencies:** If foods like thin porridge or watery soups are given, these may not provide the necessary nutrients, leading to a nutrient-deficient diet.
- **Increased risk of illness:** Complementary foods may not have the same protective qualities as breast milk, increasing the child's risk of infections.
- **Digestive issues:** Babies under 6 months may not be able to digest solid foods well, leading to discomfort or diarrhea.
- **Allergic reactions:** Early introduction of solids may increase the risk of allergies or other health issues due to the child's inability to digest non-human proteins efficiently.

## Risks of Starting Complementary Foods Too Late

Delaying the introduction of complementary foods past 6 months can also have negative consequences:

- **Growth issues:** The baby may not receive enough food to meet their growing nutritional needs, leading to delayed growth and development.
- **Malnutrition:** Without complementary foods, the child may be at risk of malnutrition or deficiencies, such as iron-deficiency anemia.
- **Slower development:** The child may not receive the necessary nutrients to support cognitive, physical and emotional development.

Starting complementary feeding at 6 months ensures that the baby receives the extra nutrients they need for healthy growth.

## Guidelines for Complementary Feeding

When introducing complementary foods, keep in mind the following principles to ensure the child's growth and development are supported:

1. **Begin at 6 months:** Start introducing thick porridge, purees and mashed foods at 6 completed months to fill the energy gap.
2. **Gradual introduction:** Introduce a variety of complementary foods gradually, starting with simple, easily digestible foods.
3. **Continue breastfeeding:** Breastfeeding should continue alongside complementary feeding for at least the first 2 years.
4. **Nutritionally rich foods:** Ensure that complementary foods are rich in energy, protein, vitamins and minerals.
5. **Safe and clean food preparation:** Always ensure that complementary foods are prepared hygienically to avoid the risk of illness.

## **Conclusion**

Complementary feeding is an essential part of a child's growth and development from 6 months onwards. While breastfeeding continues to be a critical source of nutrition, complementary foods are needed to fill the energy gap and provide additional nutrients. As a health care worker, your role is to guide and support caregivers in introducing complementary foods at the appropriate time, ensuring that children receive the nutrients they need for optimal growth.

By promoting breastfeeding and complementary feeding practices, you contribute to the health and well-being of children and help families ensure that their babies grow up strong and healthy.

## **B: Foods to Fill the Energy Gap**

### **Introduction**

As a child grows, the energy provided by breast milk becomes insufficient to meet their increasing nutritional needs. While breast milk continues to offer essential nutrients, there is an increasing gap in the child's energy requirements. If this gap is not filled with appropriate complementary foods, the child may fail to grow at an optimal rate, leading to malnutrition and a higher susceptibility to illness. As healthcare workers, it is essential for you to guide caregivers on how to introduce appropriate foods that help fill this energy gap, ensuring the child receives the nutrition required for healthy growth.

This session focuses on identifying foods that can help fill the energy gap, the importance of food consistency and ways to enrich a child's diet. Additionally, we will emphasize the significance of using local foods and various techniques to ensure that young children receive enough energy for their growth and development.

## Understanding the Energy Gap

As a child ages, their energy needs increase significantly and breast milk alone may no longer meet these demands. It is essential to recognize that although all foods provide energy, some foods are better suited to filling the energy gap. The child's stomach is small, especially around 8 months of age, where it can hold approximately 200 mL at a time. Thin foods or liquids fill the stomach quickly, but they do not provide adequate energy to support growth.

**Stomach size: 8 months**



To ensure that a child's energy needs are met, it is crucial to introduce complementary foods that are dense in nutrients and energy. Foods with a thick consistency are ideal as they stay on the spoon, providing more energy to the child in smaller quantities.

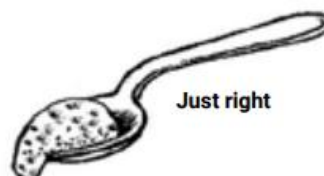


### **Key Message:**

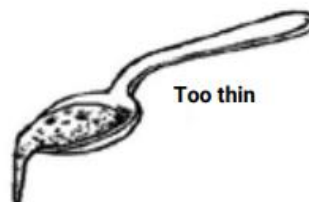
***Thick Foods Provide More Energy***

### **THICK FOODS**

Foods that are thick enough to stay on the spoon give more energy to the child



**Just right**



**Too thin**

## **Foods That Can Help Fill the Energy Gap**

Every community has staple foods that are commonly consumed in large quantities and provide most of the energy required. These foods are often rich in carbohydrates, protein and some micronutrients but cannot provide all the nutrients a child needs. It is important to ensure that these staples are paired with other complementary foods that supply essential vitamins and minerals.

Here are some examples of foods that can help fill the energy gap:

### **Local Staple Foods**

- **Cereals:** Rice, maize, millet and wheat.
- **Tubers:** Sweet potatoes
- **Legumes:** Lentils, beans, peas, chickpeas.

### **Foods to Supplement Staples**

- **Vegetables:** Leafy greens, carrots, pumpkin, tomatoes.
- **Fruits:** Bananas, apples, oranges, melons, mangoes.
- **Animal-based foods:** Eggs, meat, fish, poultry, milk.

These foods should be introduced in a thick consistency to maximize energy intake.

## Reasons for Recommending Thick Consistency Foods

The consistency of foods plays an important role in how effectively they meet a child's energy requirements. Thin, watery foods fill the stomach quickly but provide limited energy. To ensure that a child consumes enough food to meet their growing energy needs, it is crucial to recommend foods that have a thicker consistency.

- **Thicker foods stay on the spoon:** Foods that can remain on the spoon provide more energy in a smaller volume, making them more effective at filling the child's energy gap.
- **Better for digestion:** Thick foods are more easily digested and provide better absorption of nutrients, ensuring that the child receives the maximum benefit.
- **Promotes adequate intake:** Thick foods encourage children to eat more since they feel more satisfied after consuming energy-dense meals.

## Ways to Enrich a Child's Food

To further ensure that a child receives sufficient energy and nutrients, caregivers can enrich foods by adding nutrient-dense ingredients. Here are several ways to enrich a child's meals:

### 1. Thicker Porridge or Staple Foods

- **Reduce the water content:** To make a thicker porridge, reduce the amount of water used when cooking.
- **Toast cereal grains:** Toasting cereal grains before grinding them into flour reduces the amount of water required to make the porridge thicker.

### 2. Enriching Soups and Stews

- **Mash solids from soups:** Take a portion of the solid pieces (beans, vegetables, meat) from the soup or stew and mash them into a thick puree. This can then be fed to the child instead of the liquid part of the soup.
- **Add nutrient-dense ingredients:**

- Replace some of the cooking water with milk (either fresh or soured milk) or coconut milk to make the food more energy-dense.
- Stir in milk powder after cooking.
- Add legume flour or bean flour to the main flour before cooking.
- Stir in paste made from nuts or seeds (e.g., peanut butter, sesame seed paste, tahini).
- Add a spoonful of margarine, ghee, or oil to increase the energy density of the food.

### **Fats and Oils: Concentrated Energy Sources**

Fats and oils are concentrated sources of energy. Adding small amounts of fat can provide extra calories to meet the child's needs:

- **Oil or fat** can be added to food after cooking to increase energy content without increasing the volume of food.
- **Fat makes food easier to eat:** Adding fats or oils can make porridge or other foods softer, making it easier for the child to consume.
- **Small amounts:** Only a small amount (no more than half a teaspoon per meal) should be added to avoid overwhelming the child and to ensure they still eat enough of other nutrients.

### **Use of Sugar, Gurr and Honey**

Sugar, honey and jaggery are energy-dense foods, but they lack other nutrients. They can be added in small quantities to increase the energy density of a meal, but they should not replace more nutritious foods. It is important to ensure that sugary foods do not replace essential meals.

### **Fermented Foods and Germinated Grains**

Two other methods of enriching complementary foods are fermentation and germination:

## Fermented Porridge

- **Fermentation process:** Grains can be mixed with water and set to ferment overnight, or the cooked porridge can be fermented.
- **Advantages of fermented porridge:**
  - Fermented porridge contains more energy and nutrients because more flour can be used with the same amount of water.
  - The sour taste may make the porridge more appealing to children, encouraging them to eat more.
  - Fermentation increases the bioavailability of iron and other minerals, enhancing nutrient absorption.

## Germinated Grains

- **Germination process:** Soak cereal or legume seeds in water and leave them to sprout. Once sprouted, the grains are dried and ground into flour.
- **Advantages of using germinated flour:**
  - Germinated flour thickens less during cooking, allowing the preparation of thicker porridge with less water.
  - Germination helps to increase iron absorption.

### Key Message

*Enriching Foods for Better Nutrition*

Enriching complementary foods with nutrient-dense ingredients, such as milk, legumes, fats, or nut pastes, ensures the child receives the necessary energy and nutrients for optimal growth.

## The Iron Gap

Iron is an essential nutrient for young children, necessary for the production of new blood, growth and development and to support the immune system in fighting infections. After the first



six months of life, a child's iron reserves, which are initially stored at birth, become depleted, creating a need for additional sources of iron through complementary foods. This gap between the child's iron needs and what is provided by breast milk is known as the *iron gap*.

### Iron Requirements and the Iron Gap

- A full-term baby is born with sufficient iron stores to cover the first six months of life. This period is marked by the striped area in the graph (below).
- Breastfeeding continues to provide some iron, but it is not enough to meet the child's increasing needs after six months (represented by the black area).
- The **iron gap** (white area) appears when the child's iron stores are depleted and additional sources of iron become necessary through complementary foods.

Iron plays a critical role in a child's growth and development and it is important to fill this gap with the right iron-rich foods to ensure healthy development.

### Key Messages

1. Iron is vital for blood production, growth and immunity.
2. The iron gap appears after the first six months of life, as a child's iron stores from birth are depleted.
3. Complementary foods are essential to meet the child's iron needs after the first six months.

### The Role of Animal-Source Foods

Animal-source foods such as meat, fish, poultry, eggs and dairy products are excellent sources of iron, zinc, protein and other essential nutrients. These foods play a crucial role in filling the iron gap, especially for children who are not breastfed.

### Key Benefits of Animal-Source Foods:

- **Rich in Iron and Zinc:** Animal flesh (meat) and organs (liver, heart, blood), along with fish and shellfish, are the best sources of bioavailable iron.

- **Iron-rich organ meats:** Liver, in particular, is not only rich in iron but also contains vitamin A, which supports growth.
- **Dairy and Eggs:** While milk and dairy products (like yogurt and cheese) are not high in iron, they are rich in protein and other nutrients. Eggs are an excellent source of both protein and vitamin A.

#### **Key Message 4:**

Animal-source foods are essential for children's growth, providing vital nutrients like iron, zinc and vitamin A, helping children grow strong and healthy.

To meet a child's iron requirements, it is important to include a variety of animal-based foods in the diet whenever possible.

#### **The Importance of Legumes, Pulses, Nuts and Seeds**

In addition to animal-source foods, legumes (such as beans, peas, lentils), nuts and seeds are valuable sources of protein and iron. These foods can be an important part of a child's diet, especially in areas where animal foods are less accessible or affordable.

### Iron-rich Legumes and Seeds:

- **Beans, Lentils and Peas:** These are great plant-based sources of iron. They are also rich in protein, making them an excellent complementary food.
- **Nuts and Seeds:** Almonds, peanuts and sesame seeds provide iron and other essential nutrients.

### Key Message:

Legumes, beans, peas, lentils, nuts and seeds are important sources of iron for young children.

### Preparation Methods for Easier Consumption:

- **Soak beans:** Before cooking beans, soak them and discard the soaking water to reduce anti-nutrients.
- **Remove skins:** Soak raw seeds or beans to loosen their skins, making them easier to digest after cooking.
- **Cook and mash:** For younger children, cook beans thoroughly and mash them well to ensure they are easy to consume.
- **Roast and grind nuts:** Toast or roast nuts and seeds, then pound them into a paste for easier consumption.

### Combining Foods for Better Nutrient Absorption:

To enhance the body's ability to absorb iron, it's beneficial to combine different types of foods in a single meal. For instance:

- Pair **cereals** with **legumes** (e.g., rice with beans).
- Add **milk** or **eggs** to legumes (e.g., maize meal with milk or lentils with eggs).
- These combinations help increase the bioavailability of iron, ensuring better absorption.

### Key Takeaways and Nutrient Gaps:

Nutrient	Food Sources	Additional Notes
<b>Iron</b>	Animal meats (liver, meat, poultry), fish, eggs, legumes (beans, lentils, peas), nuts, seeds	Animal-source foods are best for absorption; legumes are great for vegetarians.
<b>Zinc</b>	Meat, fish, legumes, seeds, nuts	Zinc often accompanies iron in foods, improving overall health.
<b>Vitamin A</b>	Liver, eggs, dairy, carrots, dark leafy greens	Vital for growth and immunity, often found in animal foods.
<b>Protein</b>	Meat, poultry, fish, eggs, legumes, nuts, seeds	Essential for growth, repair and immunity.

### Conclusion

Iron is a critical nutrient for young children and as they grow, the gap between their increasing iron needs and the amount provided by breast milk widens. Animal-source foods are the best sources of bioavailable iron, while legumes, pulses, nuts and seeds also provide valuable iron, along with protein and other nutrients. By using a variety of these foods in complementary feeding and combining them effectively, caregivers can help ensure that their children get the iron they need for healthy growth and development.

## C: Variety, Frequency and Quantity of Feeding

### Introduction

In earlier sessions, we discussed the types of foods that help fill nutritional gaps for children over 6 months. However, just suggesting foods is not enough; caregivers also need clear guidance on how much food to offer and how frequently. This session will address these critical aspects to ensure that children are receiving adequate nourishment for healthy growth and development.

### Importance of Using a Variety of Foods

It is essential for young children to receive a mix of complementary foods. Most adults and older children eat a variety of foods at every meal and the same approach should be applied to young children. By incorporating the family's usual food preparations, it becomes easier to provide a well-balanced and nutritious diet for children. For young children, the gaps in energy and iron are often the hardest to fill. Animal-source foods are particularly important and should be consumed daily, or as often as possible. If available, fortified foods can help fill the iron gap. If animal-source foods or iron-rich foods are unavailable, consider micronutrient supplements to ensure the child's nutritional needs are met.



## Frequency of Feeding Complementary Foods

Young children need regular meals throughout the day to meet their growing nutritional needs. The frequency of feeding should be consistent to support steady growth and energy levels. The meals should be spaced out to provide the necessary nutrients while ensuring the child is not hungry between meals.

### Key message

*A growing child needs 2–4 meals a day, plus 1–2 snacks if hungry: give a variety of foods*

## Quantity of Complementary Foods

Caregivers should be encouraged to offer the correct portion sizes based on the child's age and developmental stage. Overfeeding or underfeeding can both lead to malnutrition, so it is important to understand the right amount of food to offer. The child's appetite should guide the quantity, with adjustments made as needed based on the child's growth and activity level.

AMOUNTS OF FOOD TO OFFER			
Age	Texture	Frequency	Amount of food an average child will usually eat at each meal <sup>1</sup>
6–8 months	Start with thick porridge, well-mashed foods  Continue with mashed family foods	2–3 meals per day plus frequent breastfeeds  Depending on the child's appetite, 1–2 snacks may be offered	Start with 2–3 tablespoonfuls per feed increasing gradually to ½ of a 250 mL cup
9–11 months	Finely chopped or mashed foods, and foods that baby can pick up	3–4 meals plus breastfeeds  Depending on the child's appetite, 1–2 snacks may be offered	½ of a 250 mL cup/bowl
12–23 months	Family foods, chopped or mashed if necessary	3–4 meals plus breastfeeds  Depending on the child's appetite, 1–2 snacks may be offered	¾ to one 250 mL cup/bowl
If the baby is not breastfed, give in addition: 1–2 cups of milk per day, and 1–2 extra meals per day.			

## **Recommendations for feeding the non-breastfed child aged 6–24 months**

The non-breastfed child should receive:

- extra water each day (2–3 cups in temperate climate and 4–6 cups in hot climate)
- essential fatty acids (animal-source foods, fish, avocado, vegetable oil, nut pastes)
- adequate iron (animal-source foods, fortified foods or supplements)
- milk (1–2 cups per day)
- extra meals (1–2 meals per day)

### **Snacks: A Vital Source of Energy**

In addition to regular meals, children can be offered nutrient-rich snacks between meals. These snacks should be energy- and nutrient-dense, complementing the child's meals, but not replacing them. Healthy snacks include:

- Yoghurt and other dairy products
- Bread or biscuits with butter, margarine, or nut paste
- Fresh fruit (Mashed Banana)
- Bean cakes
- Cooked potatoes

It is essential to avoid processed snacks like sweets or chips, which may offer empty calories and little nutritional value.

## Daily Recommendations

Encourage families to provide the following daily:

1. **A dark-green vegetable or yellow-colored fruit or vegetable** – These foods are rich in essential vitamins and minerals.
2. **Animal-source foods** – Include meat, fish, eggs, or dairy to provide the necessary protein and micronutrients like iron and zinc.
3. **Staple foods** – These should continue to form the base of the child's diet, providing energy.

## Key Messages:

1. A variety of complementary foods is crucial for a child's development.
2. Regular meals and appropriate portion sizes should be provided based on the child's age.
3. Healthy snacks between meals can provide essential nutrients and energy.
4. Encourage daily intake of a dark-green vegetable, yellow-colored fruits or vegetables and animal-source foods.

## D: Hygienic Preparation of Feeds

### Objectives

By the end of this session, participants will be able to:

- Explain the ways of ensuring clean and safe feeding of young children.
- Demonstrate how to prepare a cup hygienically for feeding a baby.

### Introduction

This session focuses on the importance of hygienic practices in the preparation and feeding of young children. Infants and young children, particularly those who are not breastfed, are more vulnerable to illnesses due to contamination. The lack of protection from breast milk increases the risk of infections. Therefore, it is essential to practice clean, safe preparation and feeding techniques for complementary foods to prevent contamination and safeguard the child's health.



## **Requirements for Clean and Safe Feeding**

The hygienic preparation of feeds involves four key components:

1. **Clean Hands**
2. **Clean Utensils**
3. **Safe Water and Food**
4. **Safe Storage**

Each of these plays a critical role in reducing the risk of contamination and promoting healthy feeding practices.

### **1. Clean Hands**

Proper handwashing is one of the most effective ways to prevent the spread of harmful microorganisms. Caregivers must wash their hands at critical moments:

- **When to Wash Hands:**
  - After using the toilet.
  - After cleaning the baby's bottom.
  - After disposing of children's stools, washing nappies, or soiled cloths.
  - After handling raw meat, poultry, or other foods that may be contaminated.
  - After touching animals or animal feces.
  - Before preparing or serving food.
  - Before feeding the baby or eating.
- **How to Wash Hands:**
  - Wash thoroughly with soap or ash.
  - Use plenty of clean running water.
  - Scrub hands from front to back, between fingers and under nails.
  - Dry hands by air or with a clean cloth, avoiding shared towels.

**Note:** Hand washing before breastfeeding is not necessary unless there is another reason, such as dirty hands.



## 2. Clean Utensils

Keeping utensils and surfaces clean is crucial for preventing contamination during feed preparation.

- **Key Points for Clean Utensils:**
  - **Wash utensils immediately** after use to remove milk or food particles before they dry.
  - **Use hot, soapy water** for washing.
  - A soft brush is useful to reach corners of bottles, cups and utensils.
  - **Cover clean utensils** to keep off insects and dust.



- Use a **clean spoon** when feeding the baby complementary foods. Similarly, a clean cup should be used for milk or other fluids.
- If caregivers use the same spoon to taste the food, ensure they use a different spoon to prevent contamination.

Activity	When to Do	How to Do
Washing Utensils	After each use	Wash immediately with hot, soapy water and a brush.
Cleaning Surfaces	After every use	Use a clean mat or table and wipe it after every use.
Covering Utensils	Before use	Keep utensils covered until ready to use.

### 3. Safe Water and Food

Water and food can contain harmful microorganisms if not handled properly. The following steps are necessary to ensure water and food are safe for babies:

- **Water Safety:**

- Boil water before use to kill harmful microorganisms. The water must come to a **rolling boil** for 1-2 minutes.
- Store boiled water in a **clean, covered container**, preferably with a narrow top and a tap to prevent contamination.
- If water has been stored for more than 48 hours, it should be used for cooking or given to older children, but not to babies.



- **Milk Safety:**

- **Fresh cow's milk** should be boiled briefly to kill harmful bacteria and improve digestibility.

- **Packaged milk** (pasteurized, UHT, or sterilized) can be used immediately if unopened. Once opened, milk should be consumed within an hour, or it should be boiled before giving it to the baby.
- **Complementary Foods:**
  - Prepare **freshly made complementary foods** each time, particularly if the food is semi-liquid or contains easily spoilable ingredients.

Water Safety	Milk Safety	Complementary Food Safety
<b>Boil water for 1-2 minutes.</b>	Boil fresh milk briefly to kill bacteria.	Always prepare complementary foods fresh.
<b>Store boiled water in a clean, covered container.</b>	Use pasteurized or UHT milk immediately.	Avoid storing leftover food for babies.
<b>Use the water within 48 hours.</b>	Boil milk once opened if unused for over an hour.	Keep milk and semi-liquid foods prepared fresh.

#### 4. Safe Storage

Proper food storage is key to preventing contamination and preserving food quality.

- **Storage Guidelines:**
  - **Keep foods in tightly covered containers** to prevent exposure to insects or dirt.
  - Dry foods such as milk powder, sugar, bread and biscuits can be stored longer than liquid or semi-liquid foods.
  - **Fresh fruits and vegetables** should be covered and stored in a cool, dry place. Those with thick peels, like bananas, last longer.
  - Fresh milk can be kept at room temperature for a few hours. For infants, it is best to **boil and use milk within an hour** of boiling.
- If a caregiver does not have a refrigerator:
  - Always prepare fresh feeds, especially if formula or powdered milk is used. Feeds should be used within an hour.

- **Thermos Flask Use:**

- Thermos flasks can keep water hot, but **never store milk or formula in them** as bacteria can grow when kept warm.

Storage Tips	What to Do	Why It Matters
<b>Store food in tight</b> containers	Keep food in sealed, clean containers.	Prevent contamination from dust and insects.
<b>Use dry food</b> <b>storage options</b>	Store milk powder, sugar, bread and biscuits in dry form.	Helps food last longer.
<b>Fresh milk storage</b>	Keep fresh milk at room temperature for a few hours and use within an hour if boiled.	Prevent bacterial growth.

## Disadvantages of Feeding Bottles

Feeding bottles have several disadvantages, particularly in terms of hygiene:

- Bottles are difficult to clean properly and can easily harbor harmful bacteria if milk is left in them for extended periods.
- Feeding bottles can result in **less direct attention** for the baby during feeding, which reduces the opportunity for bonding.
- Bottles can cause **diarrhea and illness** if not cleaned and sterilized properly.

## Bottle Care:

- **Rinse bottles immediately** with cold water after use.
- **Scrub** bottles and teats with hot, soapy water using a bottle brush.
- **Sterilize** bottles and teats at least once a day. Methods include:
  - Boiling for 10 minutes (the bottle must be completely submerged in water).
  - Soaking in a **diluted bleach solution** for 30 minutes (ensure thorough rinsing afterward).

### Cleaning a Cup vs. Bottle:

- A cup can be cleaned easily with **hot soapy water**. If desired, pour boiling water over it just before use.
- Bottles require extra steps, such as **scrubbing** and **sterilization**, due to their complex design.

### Leaving Prepared Ingredients for Caregivers

If a mother is not available to prepare the feed herself, she can leave pre-measured ingredients for the caregiver to mix when needed.

- The mother needs to:
  - **Boil and measure water** and **measure milk powder**.
  - **Cover ingredients** and keep them in a cool, safe place, away from animals and insects.
  - Teach the caregiver to mix ingredients **just before feeding** to ensure safety.
  - Instruct caregivers to use a **cup** instead of a bottle for feeding.

## MODULE SIX

### EARLY CHILDHOOD DEVELOPMENT



## Early Childhood Development (ECD)

### Importance of Early Childhood Development

Over the past decade, Pakistan has made progress in improving mother and child health. However, the number of mothers and children dying remains unacceptably high. Every hour, one woman dies due to pregnancy and birth-related causes and even more children die every minute. Many children who survive face serious health problems such as diarrhea, pneumonia and malnutrition, which prevent them from reaching their full potential.

Because of factors like low birth weight, poor feeding and frequent illnesses, many children fail to grow properly. This is often visible in their weight and height, but the internal effects are more serious. Poor growth can harm a child's brain development, leading to learning difficulties and poor school performance. As adults, these children may earn less and struggle to provide for their own families, continuing the cycle of poverty and poor health for the next generation.

While hospitals, doctors and medical staff play a crucial role, families also have an important part to play. Children spend most of their time at home and parents and caregivers can make a huge difference in their development. Small actions at home can ensure that children grow and develop well, both physically and emotionally.

Educating families on key care practices and motivating them to use them can help ensure children's healthy growth and development. It is essential that families, caregivers and communities understand the importance of early childhood development, the critical stages of a child's growth and how different aspects of nurturing care contribute to a child's overall development. Parents need to understand why it's so important to provide children with the right care during this crucial period of their life.





## Key Messages:

- ✓ Early childhood development (0-8 years) includes physical, socio-emotional, cognitive and motor growth. The most critical period is from 0-2 years.
- ✓ The early years are important because a child's brain develops quickly and are highly adaptable, forming the foundation for their future.
- ✓ A nurturing environment increases the chances of a child's healthy development and future success.
- ✓ In Pakistan, every hour a woman dies due to pregnancy and childbirth-related issues and every minute a child dies, with many surviving children facing health issues like diarrhea, pneumonia and malnutrition.
- ✓ A nurturing environment improves a child's chances of survival and growth. Parents should ensure children's health, nutrition, safety, early learning, emotional support and developmental stimulation.
- ✓ The household environment is vital for a child's health and development, including safe structures, proper food and access to books and play materials.
- ✓ Social and emotional factors like love, affection from family and early learning through play are equally important for a child's growth and positive development.
- ✓ Video Link:

[https://www.google.com/search?q=ECD+animated+videos&oq=ECD+animated+videos&gs\\_lcrp=EgZjaHJvbWUyBggAEEUYOdIBCTExOTI5ajBqMagCALACAA&sourceid=chrome&ie=UTF8#fpstate=ive&vld=cid:f73ba12d,vid:yvXEHk9zHWk,st:0](https://www.google.com/search?q=ECD+animated+videos&oq=ECD+animated+videos&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBCTExOTI5ajBqMagCALACAA&sourceid=chrome&ie=UTF8#fpstate=ive&vld=cid:f73ba12d,vid:yvXEHk9zHWk,st:0)



## Session 5.1: Factors Affecting Early Childhood Development

### A. Nutrition: A Foundation for Healthy Development

#### Why is nutrition important?

- Good nutrition is essential for healthy brain development, physical growth and overall health in young children.
- The brain grows rapidly during the first few years and it needs the right nutrients to build healthy connections.
- Malnutrition, especially during the early years, can lead to long-term developmental problems, including delayed growth and learning difficulties.

#### Key Nutrients for Brain Development:

- **Proteins:** Help in building tissues and cells, including brain cells.
- **Iron:** Vital for cognitive function and memory.
- **Zinc:** Important for brain development and immune function.
- **Healthy fats:** Omega-3 fatty acids, found in fish, are important for brain cell structure and function.
- **Vitamins:** Vitamins A, C, D and the B vitamins support brain health and immune function.



#### What can you do?

- Encourage mothers to breastfeed exclusively for the first 6 months and then continue breastfeeding while introducing complementary foods.
- Promote healthy, balanced meals with plenty of fruits, vegetables, grains and proteins.

## B. Parenting: Love, Care and Interaction

### How does parenting affect development?

- **Positive parent-child interactions** help to build strong emotional bonds, which are important for social and emotional development.
- Responsive care giving (such as talking, playing and comforting the child) helps children feel safe, loved and secure. This builds trust and allows the child to develop healthy emotional regulation and social skills.

### The Impact of Responsive Parenting:

- Children who receive nurturing care are more likely to have good cognitive and emotional development.
- Parents who talk to their children, sing to them, or read books help improve language skills and stimulate brain growth.

### What can you do?

- Encourage parents to talk to their children, even from a young age, to support language development.
- Advise parents on the importance of positive interactions like eye contact, hugging and playing together.



## C. Environment: Safe, Stimulating and Supportive Spaces

### Why does the environment matter?

- A child's environment is the setting where they learn and grow. It includes the home, school and community.
- Children need a **safe, clean** and **stimulating** environment for healthy development.
- Exposure to **toxic stress**—like violence, neglect, or abuse—can harm the child's brain and impact their emotional development.

### Safe and Stimulating Environment:

- A safe home means no hazards (like sharp objects or dangerous chemicals) and a place where the child feels protected from harm.
- A stimulating environment encourages curiosity. Simple things like playing with toys, looking at picture books, or being around other children can help brain development.



### What can you do?

- Educate parents on childproofing their homes to ensure safety.
- Suggest activities that stimulate the child's brain, such as playing games, reading and encouraging exploration.

## D. Healthcare: Regular Check-ups and Early Intervention

### Why is healthcare important?

- Regular health check-ups ensure that children are growing well and getting the care they need to develop.
- Early detection of health problems, such as vision or hearing impairments, can prevent developmental delays.
- Vaccinations protect children from serious diseases that could harm their growth and development.

### Key Aspects of Child Healthcare:

- **Regular growth monitoring:** Helps track whether the child is developing physically as expected.
- **Immunization:** Protects children from diseases that can have long-term effects on health and development.
- **Early interventions:** If a child shows signs of developmental delays, early intervention programs can make a big difference.



The illustration shows a community health center where several women and children are gathered. A large chart on the wall lists vaccination schedules. The chart is organized into rows for different visits, with columns for 'WHEN', 'AGE', and 'VACCINES'. The vaccines listed include BCG, OPV-0, Hep-B, OPV-1, Poliovirus-1, Pneumococcal-1, OPV-2, Poliovirus-2, Pneumococcal-2, OPV-3, Poliovirus-3, Pneumococcal-3, Hib-1, Typhoid, DPO-2, and Hib-2.

WHEN	AGE	VACCINES	
At Birth	At Birth	BCG	OPV-0 Hep-B
2nd Visit	6 weeks	OPV-1	Poliovirus-1
3rd Visit	10 weeks	Pneumococcal-1	Poliovirus-2
4th Visit	14 weeks	OPV-2	Poliovirus-3
5th Visit	18 weeks	Pneumococcal-2	Poliovirus-3
6th Visit	9 months	OPV-3	Poliovirus-3
7th Visit	15 months	Hib-1	DPO-2
8th Visit	18 months	Typhoid	Hib-2

### What can you do?

- Ensure children are getting their regular vaccinations.
- Encourage parents to bring their children for regular health check-ups to monitor growth and development.
- Be proactive in identifying and referring children who may need early developmental support.

## E. Impact of Malnutrition on Brain Development

### What is malnutrition?

Malnutrition occurs when a child doesn't get enough of the right nutrients, which can affect their physical and brain development.

### How does malnutrition affect the brain?

- Malnutrition, especially in the first 2 years of life, can result in **stunted growth**, delays in cognitive abilities and reduced ability to learn.
- Lack of essential nutrients like **iron** and **zinc** can lead to learning difficulties, poor memory and slower development.



### What can you do?

- Educate caregivers about the importance of proper nutrition, including both quantity (enough food) and quality (right types of food).
- Encourage early intervention to address malnutrition before it leads to long-term developmental delays.

## F. The Impact of Lack of Stimulation on Brain Development

Stimulation refers to activities that help a child learn and engage with their surroundings. These activities can include playing with toys, talking to the child, reading stories and interacting with other people.

### Why is stimulation important?

- **Lack of stimulation** in the early years can lead to slower brain development, especially in areas related to **language, memory** and **problem-solving**.
- Without stimulation, children may have difficulty developing social skills and emotional regulation.



### What can you do?

- Encourage caregivers to engage with their children through simple activities such as talking, singing, or playing games.
- Suggest age-appropriate toys and activities that encourage thinking, problem-solving and creativity.



## Handout for participants: List of key family care practices

### Practices 1:

Husband and wife should talk to each other frequently about family matters including child's health, growth and development; and positive discipline.



### Practices 2:

Avoid unplanned pregnancy and ensure three years of interval/ spacing between births of children by using appropriate contraceptive methods.



### Practices 3:

Ensure that every pregnant woman receives at least four antenatal visits from appropriate health care provider including recommended doses of tetanus toxide vaccination.





#### **Practices 4:**

Have your babies' delivery be attended by a skilled birth attendant to avoid complications.



#### **Practices 5:**

Ensure that the baby is breastfed immediately after birth (at least within one hour) and is exclusively breastfed for six months.



#### **Practices 6:**

Keep the newborn baby warm, have body contact with the baby, keep the umbilical cord clean and avoid bathing the baby for the first 24 hours of birth.



### Practices 7:

Recognize danger signs in newborns and take them to the health care provider for immediate treatment.



### Practices 8:

Register birth of boys and girls as soon as possible and obtain a birth certificate



### Practices 9:

Starting at six months of age, feed children freshly prepared variety of complementary food, while continuing to breastfeed babies up to two years or longer.



**Practices 10:**

Take all girls and boys for vaccination at birth, 6 weeks, 10 weeks, 14 weeks and 9 months for full course of immunization to protect them from communicable diseases.

**Practices 11:**

Ensure that children, adolescents and women receive adequate amounts of micronutrients (vitamin A, iron, zinc and folic acid) either in their diet or through supplements.

**Practices 12:**

Protect children and pregnant women in malaria endemic areas by ensuring that they sleep under insecticide –treated bed nets



### Practices 13:

Continue to feed and offer more fluids including breast milk when children are sick.



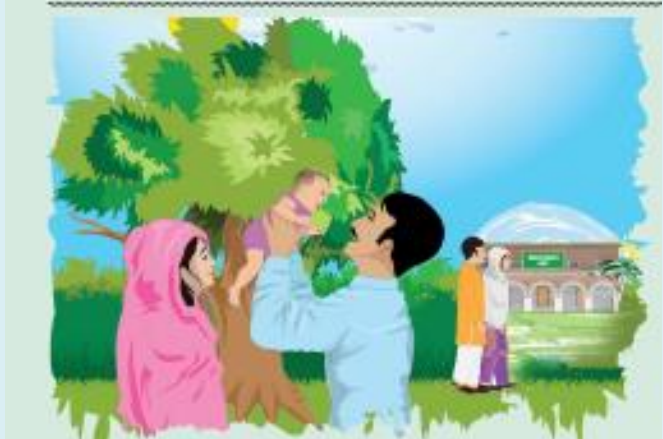
### Practices 14:

Promote children's mental and social development by responding to the child's need for care and by stimulating the child through talking, playing and other appropriate physical and affective interactions.



### Practices 15:

Ensure that men actively participate in providing nurturing and care to children and are involved in reproductive health initiatives.





### Practices 16:

Seek appropriate care and social support during perinatal period to manage maternal mental health.



### Practices 17:

Ensure that all family members use a toilet and always wash hands with clean water and soap/ash after disposing of children's faeces, after using the latrine, before preparing and serving food and before feeding children.

### Practices 18:

Monitor and promote child's growth and follow health worker's advice about treatment, follow-up and referral in case of disabilities, for timely intervention and management

**Practices 19:**

Prevent and respond to abuse of girls, boys and women.



**Practices 20:**

Take appropriate actions to prevent and manage child injuries and accidents.



**Practices 21:**

Make sure that children are brought up with warmth, care, kind words and gentle guidance and positive discipline from parents and family members.



**Practices 22:**

Support children's learning, enroll and keep girls and boys in school until the age of 16.



## Session 5.2: Key Milestones in Early Childhood Development

### Introduction:

Early childhood is a period of rapid growth and development. Children undergo significant changes in their physical, cognitive, social and emotional abilities during the first few years of life. As primary healthcare providers, you play a crucial role in monitoring and supporting this development. Recognizing the key milestones in these areas allows you to identify children who may need additional support or early interventions.

In this session, we will explore the **physical, cognitive, social** and **emotional** milestones in early childhood. We will also discuss how to monitor children's growth and development to ensure they are on track and how to respond if there are concerns.

### A. Physical Development Milestones

Physical development refers to the changes in a child's body, including growth, motor skills and coordination. This includes everything from the growth of organs and muscles to the development of fine and gross motor skills.



### Physical milestones by age:

Age	Key Physical Milestones
<b>At Birth</b>	<ul style="list-style-type: none"><li>- Reflexes such as sucking, rooting and grasping.</li><li>- Can move arms and legs, but movements are jerky and uncoordinated.</li></ul>
<b>2-3 months</b>	<ul style="list-style-type: none"><li>- Holds head steady while sitting.</li><li>- Begins to push up when lying on stomach.</li></ul>
<b>4-6 months</b>	<ul style="list-style-type: none"><li>- Rolls over from front to back and vice versa.</li><li>- Starts to sit with support.</li><li>- Reaches and grasps toys.</li></ul>
<b>6-9 months</b>	<ul style="list-style-type: none"><li>- Sits without support.</li><li>- Begins crawling.</li><li>- Transfers objects from hand to hand.</li></ul>
<b>9-12 months</b>	<ul style="list-style-type: none"><li>- Pulls to stand and may begin cruising along furniture.</li><li>- Starts taking first steps or walking with support.</li></ul>
<b>12-18 months</b>	<ul style="list-style-type: none"><li>- Walks independently or with minimal support.</li><li>- Uses hands to manipulate objects and explore the environment.</li></ul>
<b>2-3 years</b>	<ul style="list-style-type: none"><li>- Run, climb and kick a ball.</li><li>- Begins to stack blocks and draw simple shapes (e.g., circles).</li><li>- Improved hand-eye coordination, can feed them with a spoon.</li></ul>
<b>3-5 years</b>	<ul style="list-style-type: none"><li>- Hops, skip and balance on one foot.</li><li>- Uses scissors to cut along lines.</li><li>- Dresses and undresses with little help.</li></ul>

### What can you do as a healthcare provider?

- Monitor physical growth through regular check-ups and growth charts.
- Provide guidance to parents on age-appropriate activities that promote motor development (e.g., tummy time for infants, walking and play activities for toddlers).
- Address concerns if a child is not meeting milestones—this could be a sign of developmental delay or health issues.



## B. Cognitive Development Milestones

Cognitive development refers to how children think, learn and understand the world around them. It includes skills like problem-solving, memory, language acquisition and the ability to focus and pay attention.



Age	Key Cognitive Milestones
<b>At Birth</b>	<ul style="list-style-type: none"><li>- Recognizes the sound of their mother's voice.</li><li>- Begins to follow objects with eyes (visual tracking).</li></ul>
<b>2-3 months</b>	<ul style="list-style-type: none"><li>- Starts to smile in response to stimuli.</li><li>- Begins to focus on objects and people.</li></ul>
<b>4-6 months</b>	<ul style="list-style-type: none"><li>- Shows curiosity by looking at surroundings.</li><li>- Begins to understand cause and effect (e.g., shaking a rattle makes noise).</li></ul>
<b>6-9 months</b>	<ul style="list-style-type: none"><li>- Recognizes familiar faces and objects.</li><li>- Begins to understand object permanence (understanding that objects continue to exist even when out of sight).</li></ul>
<b>9-12 months</b>	<ul style="list-style-type: none"><li>- Imitates simple actions (e.g., clapping).</li><li>- Begins to understand simple instructions (e.g., "wave bye-bye").</li></ul>
<b>12-18 months</b>	<ul style="list-style-type: none"><li>- Points to objects to show interest.</li><li>- Recognizes their name and responds.</li></ul>
<b>2-3 years</b>	<ul style="list-style-type: none"><li>- Can name objects, people and places.</li><li>- Starts to engage in pretend play (e.g., feeding a doll).</li><li>- Understands the concept of "mine" and "yours."</li></ul>
<b>3-5 years</b>	<ul style="list-style-type: none"><li>- Can sort objects by shape, size and color.</li><li>- Asks many questions and can understand simple explanations.</li></ul>

### What can you do as a healthcare provider?

Assess cognitive development through observation and parent reports. Encourage activities that stimulate thinking, like playing with puzzles, reading and interactive games. Screen for any developmental concerns, such as delays in language or problem-solving skills, which may require referral to specialists.

### C. Social Development Milestones

Social development refers to how children learn to interact with others, form relationships and understand social norms. It includes skills like communication, empathy and cooperation.



Age	Key Social Milestones
<b>At Birth</b>	<ul style="list-style-type: none"><li>- Cries to communicate needs.</li><li>- Responds to familiar voices and sounds.</li></ul>
<b>2-3 months</b>	<ul style="list-style-type: none"><li>- Begins to smile at people.</li><li>- Enjoys interacting with caregivers through eye contact and vocalizations.</li></ul>
<b>4-6 months</b>	<ul style="list-style-type: none"><li>- Shows interest in other babies or children.</li><li>- Can differentiate between familiar and unfamiliar faces.</li></ul>
<b>6-9 months</b>	<ul style="list-style-type: none"><li>- May show stranger anxiety (discomfort with unfamiliar people).</li><li>- Begins to engage in social play (e.g., laughing when someone plays peek-a-boo).</li></ul>
<b>9-12 months</b>	<ul style="list-style-type: none"><li>- Responds to own name.</li><li>- May begin to show affection by hugging or kissing.</li></ul>
<b>12-18 months</b>	<ul style="list-style-type: none"><li>- Mimics others and engages in parallel play (playing alongside other children but not necessarily interacting).</li><li>- Shows interest in playing with other children but may not share toys.</li></ul>
<b>2-3 years</b>	<ul style="list-style-type: none"><li>- Enjoys playing with other children, though may struggle with sharing.</li><li>- Uses simple words or phrases to express needs and feelings.</li><li>- Shows signs of empathy (e.g., comforting a crying friend).</li></ul>
<b>3-5 years</b>	<ul style="list-style-type: none"><li>- Begins to understand the concept of friendship.</li><li>- Engages in cooperative play (e.g., playing pretend games with others).</li></ul>

### What can you do as a healthcare provider?

Observe social interactions during routine visits and ask parents about the child's behavior in social settings. Encourage parents to arrange play dates and social activities to help the child develop social skills. Address concerns if a child shows signs of extreme social withdrawal or lack of empathy, as these may indicate social or developmental challenges.

## D. Emotional Development Milestones

Emotional development refers to the ability to recognize, understand and manage emotions. It includes developing self-regulation, empathy and the ability to cope with feelings.



Age	Key Emotional Milestones
<b>At Birth</b>	- Experiences basic emotions such as distress, comfort and pleasure.
<b>2-3 months</b>	- Begins to show positive emotions like smiling and cooing.
<b>4-6 months</b>	- Displays a wider range of emotions such as excitement, frustration and contentment.
<b>6-9 months</b>	- May show fear of strangers (stranger anxiety). - Develops attachment to primary caregivers.
<b>9-12 months</b>	- Shows strong attachment to familiar people and objects. - Can experience separation anxiety when separated from a caregiver.
<b>12-18 months</b>	- Shows frustration when unable to communicate needs. - Begins to express feelings like happiness, sadness, or anger more clearly.
<b>2-3 years</b>	- Becomes more aware of their own feelings and may begin to express them with words (e.g., "I'm sad"). - Can start to manage basic emotions like frustration, though may still have temper tantrums.
<b>3-5 years</b>	- Begins to understand that other people have feelings and may show empathy. - May express emotions through play (e.g., acting out scenarios with toys to express feelings).

### What can you do as a healthcare provider?

- Encourage parents to model healthy emotional expression and coping strategies.
- Observe signs of emotional distress, such as frequent tantrums or withdrawal, which could indicate emotional or behavioral concerns.
- Provide support for parents on how to help their child manage emotions through positive reinforcement and calming techniques.

## Session 5.3: Assess, Classify and Manage Child's Development

1. Care for Child Development 0-6 Months
2. Care for Child Development 6-12 Months
3. Care for Child Development 12 Months – 2 years
4. Care for Child Development 2 years – 5 years



**0-6 Months**



**6-12 Months**



**12 Months -2 Years**



**2-5 Years**

# RECOMMENDATIONS FOR CARE FOR CHILD DEVELOPMENT



**NEWBORN,  
BIRTH UP  
TO 1 WEEK**



## **PLAY**

Provide ways for your baby to see, hear, move arms and legs freely, and touch you. Gently soothe, stroke and hold your child. Skin to skin contact is good.

## **COMMUNICATE**

Look into the baby's eyes and talk to your baby. When you are breastfeeding is a good time. Even a newborn baby sees your face and hears your voice.



**1 WEEK  
UP TO  
6 MONTHS**



## **PLAY**

Provide ways for your child to see, hear, feel, move freely, and touch you. Slowly move colorful things for your child to see and reach for. Sample toys: shaker rattle, big ring on a string.

## **COMMUNICATE**

Smile and laugh with your child. Talk to your child. Get a conversation going by copying your child's sounds or gestures.



**6 MONTHS  
UP TO  
9 MONTHS**



## **PLAY**

Give your child clean, safe household things to handle, bang and drop. Sample toys: containers with lids, metal pots and spoons.

## **COMMUNICATE**

Respond to your child's sounds and interests. Call the child's name, and see your child's response.





**9 MONTHS  
UP TO  
12 MONTHS**



### **PLAY**

Hide a child's favourite toy under a cloth or box. See if the child can find it. Play peek-a-boo.

### **COMMUNICATE**

Tell your child the name of things and people. Show your child how to say things with hands, like "bye bye". Sample toy: doll with face.



**12 MONTHS  
UP TO  
2 YEARS**



### **PLAY**

Give your child things to stack up, and to put into containers and take out. Sample toys: nesting and stacking objects, containers and cloth clips.

### **COMMUNICATE**

Look into the baby's eyes and talk to your baby. When you are breastfeeding is a good time. Even a newborn baby sees your face and hears your voice.



**2 YEARS  
AND  
OLDER**



### **PLAY**

Help your child count, name and compare things. Make simple toys for your child. Sample toys: objects of different colors and shapes to sort, stick or chalk board, puzzle.

### **COMMUNICATE**

Encourage your child to talk and answer your child's questions. Teach your child stories, songs and games.

Talk about pictures or books.

Sample toy: book with pictures.

- Give your child affection and show your love.
- Be aware of your child's interests and respond to them.
- Praise your child for trying to learn new skills.

# CARE FOR CHILD DEVELOPMENT 0-6 MONTHS

## ASSESS

### ASK THE CAREGIVER:

- How old is your child?
- Does your child see and hear?
- Does your child move its legs and arms freely?

### IDENTIFY RISK FACTORS:

- Did you receive antenatal care? If so, how many times?
- Did you take iron supplements during pregnancy?
- Did you take any other medication from the hospital or clinic while pregnant? If yes, specify.
- Were there any problems during your pregnancy and the child's birth?
- Was your baby delivered prematurely?
- What was your baby's weight at birth? Was the baby hospitalized at birth?
- Did your child's eyes or skin become yellow after birth?
- Has your child had any serious disease, such as meningitis, head injury and/or convulsions?
- Are there any physical or mental illnesses in the family?
- What do you think of your child's development?

### IDENTIFY:

**Any social or environmental risk factors (Examples: mother's level of education, alcoholism, drugs use domestic violence abuse, neglect, maternal mental health, etc.)**

- What is your level of education?
- What is your family's source of water?
- Does your family have a toilet?
- Did you smoke cigarettes or use alcohol or drugs during pregnancy? Is there anybody in the household who smokes?
- Do you leave the baby to younger children less than 10 years old?
- Do you insult your children at times for doing something wrong?
- Do you frequently quarrel with your partner in your home in the child's presence?
- How old were you when the child was born? Is the child your firstborn?
- Are there any other family members living in the household? What is your household's composition?
- Do you frequently suffer from burnout (what is your state of well-being)?

**Further information for follow-up:** If you move, who

in the village would be able to contact you? Please give a name and phone number.

## OBSERVE:

### Newborns (Under 1 month)

- Lying face up with arms and legs flexed and head side ways
- Moro reflex
- Looks at your face
- Coos
- Blinking reflex
- Lying face down, raises his or her head
- Sucks well

### 1-2 months old

- Social smile
- Tracks an object at mid-range
- Uses voice to make sounds (vocalizing)
- Alternate kicking

### 2-4 months old

- Responds to the examiner
- Holds objects
- Makes sounds
- Holds head up

### 4-6 months old

- Reaches for a toy
- Brings objects to her/his mouth
- Locates the source of a sound by turning towards the sound
- Babbles
- Smiles
- Actively changes position (rolls over)

### MEASURE head circumference

< -2SDs or > +2SDs (refer to reference charts)

### LOOK for presence of any abnormal physical features

- An upward slant to the eyes (oblique palpebral fissures)
- Exceptionally wide-set eyes (hypertelorism)
- Low-set ears
- Harelip
- Cleft palate
- An exceptionally short or long neck
- A single crease across the centre of the palm (single palmar crease)
- Abnormality of the finger (i.e. very short and the bone is curved or bent)

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<ul style="list-style-type: none"> <li>• Head circumference is <math>&lt;- 2SD</math> or <math>&gt;+2SD</math></li> <li>• 3 or more abnormal features are present</li> <li>• The infant does not display one or more of the reflexes/positions/skills corresponding to the age group</li> </ul>	<p>Pink:</p> <p><b>PROBABLE DEVELOPMENT DELAY</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver and emphasize the importance of referral treatment</li> <li>• Refer the infant for neurological and psychomotor assessment</li> </ul>
<ul style="list-style-type: none"> <li>• The infant does not display one or more of the reflexes/positions/skills corresponding to her/his age group, but there are one or more risk factors</li> </ul>	<p>Yellow:</p> <p><b>DEVELOPMENTAL ALERT</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver about playing and communicating with the baby (refer to the counselling card)</li> <li>• Schedule a return visit within 2 weeks. Tell the caregiver what warning signs to look for indicating, that they should return as soon as they notices a warning sign but not later than in 2 weeks</li> </ul>
<ul style="list-style-type: none"> <li>• The infant displays all the reflexes/positions/skills corresponding to her/his age group, but there are one or more risk factors</li> </ul>	<p>Yellow:</p> <p><b>NORMAL DEVELOPEMENT WITH RISK FACTORS</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver about playing and communicating with the baby (refer to the counselling card)</li> <li>• Schedule a return visit within 2 weeks. Tell the caregiver what warning signs to look for, indicating that they should return with the child as soon as possible, but not later than in 2 weeks</li> </ul>
<ul style="list-style-type: none"> <li>• The child displays all the reflexes/positions/skills corresponding to her or his age group, and there are no risk factors</li> </ul>	<p>Green:</p> <p><b>NORMAL DEVELOPMENT</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Praise the caregiver</li> <li>• Counsel the caregiver to continue playing and communicating with the baby</li> <li>• Schedule a return visit for routine mentoring based on the timetable followed by the health facility</li> <li>• Tell the caregivers what warning signs to look, for indicating that they should bring their child back sooner, e.g. convulsions, sleeps too much, extremely irritated, refuses to eat</li> </ul>



## Care for CHILD DEVELOPMENT 6-12 MONTHS

### ASSESS

#### ASK THE CAREGIVER:

- How old is your child?
- Is your child able to respond when you call her/his name?
- What type of sounds does the child make?
- Is your child able to say a few simple words?
- Does the child cry or cling to you when you leave?

#### IDENTIFY RISK FACTORS:

- Did you attend antenatal care? If so, how many times?
- Did you take iron and folic supplements during pregnancy?
- Did you take any other medications from the hospital or clinic while pregnant? If yes, specify.
- Were there any problems during your pregnancy or the child's birth?
- Was your baby delivered prematurely?
- What was your baby's weight at birth?
- Was the baby hospitalized after birth?
- Did your child's eyes or skin become yellow after birth?
- Has your child had any serious disease, such as meningitis, head injury or convulsions?
- Are there any physical or mental illnesses in the family?
- What do you think of your child's development?
- Did you smoke or drink alcohol during your pregnancy?

#### IDENTIFY:

**Any social or environmental risk factors (Examples: mother's level of schooling, alcoholism, drug use domestic violence, abuse, neglect, maternal mental health, etc.):**

- What is your level of education?
- What is your family's source of water?
- Does your family have a toilet?
- Did you smoke cigarettes or use alcohol or drugs during pregnancy? Is there anybody in the household who smokes?
- Do you leave the baby with younger children less than 10 years old?
- Do you insult the child at times for doing something wrong?
- Do you frequently quarrel with your partner in your home in the child's presence?
- How old were you when the child was born? Is the child your firstborn?
- Are there any other family members living in the household? What is the household's composition?
- Do you frequently suffer from burnout (what is your state of well-being)?

**Further information for follow-up:** If you move, who in the village would be able to contact you? Please give a name and phone number.

### OBSERVE:

#### 6-9 months

- Able to handle, bang and drop simple toys
- Able to sit without support and able to crawl
- Able to smile/laugh
- Able to transfer object from hand to hand
- Able to duplicate syllables

#### 9-12 months

- Attempts to stand and/or start walking with support.
- Able to understand and perform simple commands (e.g. come, go, stand)
- Able to search for and find hidden objects
- Able to speak a few simple words like bye-bye, mama, papa
- Imitates gestures
- Cries when the caregiver leaves

#### MEASURE head circumference

< -2SDs or > +2SDs (refer to reference charts)

#### LOOK for the presence of any phenotypical/ abnormal physical features

- An upward slant to the eyes (oblique palpebral fissures)
- Exceptionally wide-set eyes (hypertelorism)
- Low-set ears
- Harelip
- Cleft palate
- An exceptionally short or long neck
- A single crease across the centre of the palm (single palmar crease)
- A crooked little finger (i.e. very short and the bone is curved or bent)

CLASS

<ul style="list-style-type: none"> <li>• Head circumference is <math>&lt; -2SD</math> or <math>&gt; +2SD</math> or,</li> <li>• 3 or more alterations in physical features are present (e.g. abnormally small/big head)</li> <li>• The infant does not display one or more of the reflexes/positions/skills corresponding to the age group and/or previous age group, i.e. 0-6 months</li> </ul>	<p>Pink:</p> <p><b>PROBABLE DEVELOPMENT DELAY</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver and emphasize the importance of referral for treatment</li> <li>• Refer the infant for neurological and psychomotor screening</li> </ul>
<ul style="list-style-type: none"> <li>• The infant does not display one or more of the reflexes/positions/skills corresponding to her/his age group (6-12 months)</li> </ul>	<p>Yellow:</p> <p><b>DEVELOPMENTAL ALERT</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver on playing and communicating with the infant</li> <li>• Schedule a return visit within 4 weeks</li> <li>• Tell the caregiver what warning signs to look for, indicating that they should return with the child immediately</li> </ul>
<ul style="list-style-type: none"> <li>• The infant displays all the reflexes/positions/skills corresponding to her/his age group, but there are one or more risk factors</li> </ul>	<p>Yellow:</p> <p><b>NORMAL DEVELOPEMENT WITH RISK FACTORS</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver on playing and communicating with the infant</li> <li>• Schedule a return visit within 4 weeks</li> <li>• Tell the caregiver what warning signs to look for, indicating that they should return as soon as they notice a warning sign, but no later than in 2 weeks</li> </ul>
<ul style="list-style-type: none"> <li>• The child displays all the reflexes/positions/skills corresponding to her/his age group, and there are no risk factors</li> </ul>	<p>Green:</p> <p><b>NORMAL DEVELOPMENT</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Praise the caregiver</li> <li>• Counsel the caregiver to continue stimulating the infant through play and communication</li> <li>• Schedule a return visit for routine mentoring based on the timetable followed by the health facility</li> <li>• Tell the caregivers what warning signs to look for, indicating that they should bring the child back as soon as possible but no later than in 2 weeks if the child experiences these signs (e.g. convulsions, sleeps too much, extremely irritated, refuses to eat)</li> </ul>



## Care for CHILD DEVELOPMENT 12 MONTHS–2 YEARS

### ASSESS

#### ASK THE CAREGIVER:

- Does your child say any words?
- Is your child able to walk on her/his own?

#### IDENTIFY RISK FACTORS:

- Did you attend antenatal care? If so, how many times?
- Did you take iron supplements during pregnancy?
- Did you take any other medications from the hospital or clinic while pregnant? If yes, specify.
- Were there any problems during your pregnancy or the child's birth?
- Was your child premature?
- How much did your baby weigh at birth?
- Has your child had any serious disease such as meningitis, head injury, convulsions, etc.?
- Are there any physical and mental illnesses in the family?
- What do you think of the child's development?

#### IDENTIFY THE FAMILY SOCIAL HISTORY:

- Who stays with the child at home most of the time? (to capture children cared for by maids)
- Explore to evaluate if there are family disruptions.
- Is the child an orphan?
- Is the child staying with both parents or they are separated?
- Is the child staying with a step-father or a step-mother?

#### IDENTIFY:

**Any social or environmental risk factors (mother's level of education, alcoholism, drugs, domestic violence, abuse, neglect and maternal mental health, etc.)**

- What is your level of education?
- What is your family's source of water?
- Does your family have a toilet?
- Did you smoke cigarettes or use alcohol or drugs during pregnancy? Is there anybody in the household who smokes?
- Do you leave the baby with younger children less than 10 years old?
- Do you insult the child at times for doing something wrong?
- Do you frequently quarrel with your partner in your home in the child's presence?
- How old were you when the child was born? Is the child your firstborn?
- Are there any other family members living in the household? What is the household's composition?
- Do you frequently suffer from burnout (what is your state of well-being)?

#### Further information for follow-up:

If you move, who in the village would be able to contact you? Please give a name and phone number.

### OBSERVE:

- Make gestures on request e.g. bye-bye, clapping, etc.
- Can put objects in a cup
- Identifies/points at objects such as a chair, cup, plate, etc.
- Stacks objects
- Scribbles spontaneously
- Takes off her/his clothes
- Says 1–3 words
- Takes steps without support
- Can kick a ball
- Size of the tongue
- Evaluate if the child can see or hear (call the child's name, hand the child an object to pick up)

### MEASURE head circumference

< -2SDs or > +2SDs (refer to reference charts): MUAC

### LOOK for any abnormalities:

- An upward slant to the eyes (oblique palpebral fissures)
- Exceptionally wide-set eyes (hypertelorism)
- Low-set ears
- Harelip
- Cleft palate
- An exceptionally short or long neck
- Shape and size of the head
- A single crease across the centre of the palm (single palmar crease)
- A crooked little finger (i.e. very short and the bone is curved and bent)

CLA

<ul style="list-style-type: none"> <li>• Head circumference is <math>&lt; -2SD</math> or <math>&gt; +2SD</math></li> <li>• 3 or more physical abnormalities are present. The child does not display one or more of the behaviours corresponding to the age group (12 months to 2 years)</li> </ul>	<p>Pink:</p> <p><b>PROBABLE DEVELOPMENT DELAY</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver and emphasize the importance of referral treatment</li> <li>• Refer the child for neurological and psychomotor screening</li> </ul>
<ul style="list-style-type: none"> <li>• The child does not display one of the behaviours corresponding to the age group (12 months up to 2 years)</li> </ul>	<p>Yellow:</p> <p><b>DEVELOPMENTAL ALERT</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver about playing and communicating with the child according to the guidelines for 12 months up to 2 years</li> <li>• Schedule a return within 30 days</li> <li>• Tell the caregiver what warning signs to look for indicating that they should return as soon as possible, but no later than in 2 weeks</li> </ul>
<ul style="list-style-type: none"> <li>• The child displays all the behaviours of the age group (12 months to 2 years) but there are one or more risk factors</li> </ul>	<p>Yellow:</p> <p><b>NORMAL DEVELOPEMENT WITH RISK FACTORS</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver about playing and communicating with the child according to the guidelines for children aged 12 months up to 2 years</li> <li>• Schedule a return visit within 30 days</li> <li>• Tell the caregiver what warning signs to look, for indicating that they should return as soon as they notice a warning sign, but no later than in 2 weeks</li> </ul>

## Care for CHILD DEVELOPMENT 2-5 YEARS

### ASSESS

#### ASK THE CAREGIVER:

- Does your child speak any words?
- Is your child able to walk/jump and run around?

#### IDENTIFY RISK FACTORS:

- Did you attend antenatal care? If so, how many times?
- Did you take iron supplements during pregnancy?
- Did you take any other medications from the hospital or clinic while pregnant? If yes, specify.
- Were there any problems during your pregnancy or the child's birth?
- Was your child premature?
- How much did your baby weigh at birth?
- Was the baby hospitalized at birth?
- Did your child's eyes or skin become yellow after birth?
- Has your child had any serious disease, such as meningitis, head injury, convulsions, etc.?
- Has your child had any form of malnutrition, such as wasting or stunting (identified by a health worker)?
- Are there any physical and mental illnesses in the family?
- What do you think of the child's development?

#### IDENTIFY THE FAMILY'S SOCIAL HISTORY:

- Who stays with the child at home most of the time (to identify the children cared for by maids)?
- Are there any family disruptions?
- Is the child an orphan?
- Is the child staying with both parents or they are separated?
- Is the child staying with a step-father or a step-mother?

#### IDENTIFY:

**Any social or environmental risk factors (mother's level of education, alcoholism, drug use domestic violence, abuse, neglect and maternal mental health, etc.)**

- What is your level of education?
- What is your family's source of water?
- Does your family have a toilet?
- Did you smoke cigarettes or use alcohol or drugs during pregnancy? Is there anybody in the household who smokes?
- Do you leave the child with children less than 10 years old?
- Do you insult the child at times for doing something wrong?
- Do you frequently quarrel with your partner in your home in the child's presence?
- How old were you when the child was born? Is the child your firstborn?
- Are there any other family members living in the household? What is the household's composition?
- Are there any other family members living in the household? What is the household's composition?
- Do you frequently suffer from burnout (what is your state of well-being)?

**Further information for follow-up:** If you move, who in the village would be able to contact you? Please give a name and phone number.

### OBSERVE:

- Dresses and undresses herself/himself
- Can match colours
- Can make shapes, e.g. a circle
- Can stand, jump and balance on one foot
- Can kick a ball
- Can throw a ball
- Points at pictures of two word sentences, e.g. "give food", "want sleep". Recognizes actions in pictures, e.g. kicking a ball, sweeping, eating
- Speaks intelligently (small intelligent conversation)
- Understands and performs simple commands
- Observe for speech disorders, i.e. murmuring, stammering and stuttering

### MEASURE head circumference

< -2SDs or > +2SDs (refer to reference charts): MUAC

### LOOK for any abnormalities:

- An upward slant to the eyes (oblique palpebral fissures)
- Exceptionally wide-set eyes (hypertelorism)
- Low-set ears
- Harelip
- Cleft palate
- An exceptionally short or long neck
- Shape and size of the head
- A single crease across the centre of the palm (single palmar crease)
- A crooked little finger (i.e. very short and the bone is curved and bent)

CLASS



<ul style="list-style-type: none"> <li>• Head circumference is <math>&lt;-2SD</math> or <math>&gt;+2SD</math></li> <li>• 3 or more physical abnormalities are present. The child does not display one or more of the behaviours corresponding to the age group (probe previous history)</li> </ul>	<p>Pink:</p> <p><b>PROBABLE DEVELOPMENT DELAY</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver and emphasize the importance of referral treatment</li> <li>• Refer the child for neurological and psychomotor screening</li> </ul>
<ul style="list-style-type: none"> <li>• The child does not display one of the behaviours corresponding to the age group (2-5 years)</li> </ul>	<p>Yellow:</p> <p><b>DEVELOPMENTAL ALERT</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver about playing and communicating with the child according to the guidelines for children aged 2 to 5 years</li> <li>• Schedule a return within 30 days</li> <li>• Tell the caregivers what warning signs to look for, indicating that they should return as soon as possible, but no later than in 2 weeks</li> </ul>
<ul style="list-style-type: none"> <li>• The child displays all the behaviours of the age group (2-5 years), but there are one or more risk factors corresponding to the current or previous history</li> </ul>	<p>Yellow:</p> <p><b>NORMAL DEVELOPEMENT WITH RISK FACTORS</b></p>	<p><b>IDENTIFY TREATMENT:</b></p> <ul style="list-style-type: none"> <li>• Counsel the caregiver about playing and communicating with the child according to the guidelines for children aged 2 to 5 years</li> <li>• Schedule a return visit within 30 days</li> <li>• Tell the caregivers what warning signs to look for, indicating that they should return as soon as they notice a warning sign, but no later than in 2 weeks</li> </ul>

# PARTICIPANT'S HANDOUTS



## **Annexure 1**

### **Case Scenarios (Module 2: Adolescent Nutrition)**

#### **Case Study: Aisha**

Aisha is a 14-year-old adolescent girl from a rural village in Khyber Pakhtunkhwa, brought to the Basic Health Unit (BHU) by her mother due to concerns about her health and behavior. Aisha reports feeling constantly fatigued and dizzy, with pale skin and irregular menstruation—she has not had her period for the past two months.

She frequently skips breakfast and prefers consuming chips, sugary drinks, and roadside snacks over home-cooked meals. Influenced by social media, she follows unverified diet tips and refuses to eat vegetables. Most of her time is spent indoors, watching TV dramas or using her phone, and she avoids outdoor games or school sports.

Her mother is concerned about her withdrawal from daily activities, lack of energy, and disinterest in studies. The local school lacks a playground, and there are no lessons on nutrition or health. The family uses non-iodized salt purchased in bulk and is unaware of its health implications. Aisha has never received iron or folic acid supplements from school or health workers. Additionally, there are ongoing rumors in the village about marriage proposals for Aisha as she approaches her 15th birthday.

Upon examination, the healthcare provider notes that Aisha has pale conjunctiva and a low BMI, with no recorded history of deworming or reproductive health education. The BHU also lacks adolescent-friendly counselling services, and the school curriculum does not include critical information on nutrition, physical activity, or reproductive health.



## **Annexure 2**

### **Case Scenarios (Module 3: Maternal Nutrition)**

#### **Sub-Theme: Socio-cultural Factors Effecting Maternal and Child Nutrition in Pakistan**

##### **Scenario 1: Poverty and Limited Access to Nutrient-Rich Foods**

###### **Background:**

A pregnant woman from a low-income household in a rural area of Khyber Pakhtunkhwa comes to the clinic for her antenatal check-up. She reports feeling weak and tired and is concerned about her baby's health. She mentions that her family struggles to afford nutritious food, and they primarily eat a simple diet of bread and vegetables. She is not taking iron or folic acid supplements due to the cost.

##### **Scenario 2: Cultural Practices and Breastfeeding Challenges**

###### **Background:**

A mother in a small village of Khyber Pakhtunkhwa shares that her mother-in-law advises her to stop breastfeeding her 3-month-old baby because “the baby is old enough to drink milk from a glass.” The mother is confused and unsure about how to respond. She also mentions that she feels pressured by her family to start feeding the baby solid foods early, despite being told breastfeeding is important.

##### **Scenario 3: Healthcare System Challenges in Rural Areas**

###### **Background:**

A woman in a remote village of Khyber Pakhtunkhwa is pregnant and seeking advice on nutrition during pregnancy. However, the local healthcare facility is under-resourced and lacks a trained nutritionist. The healthcare worker providing the consultation is overwhelmed with a heavy patient load and has limited time to provide detailed nutrition counseling.

## **Scenario 4: Poor Sanitation and Child Nutrition**

### **Background:**

A mother from an urban slum in Khyber Pakhtunkhwa brings her 1-year-old child to the clinic with concerns about the child's frequent episodes of diarrhea. She mentions that the family has limited access to clean drinking water and that the child's meals are often prepared in unsanitary conditions due to lack of proper kitchen facilities. The mother is also concerned about her child's poor weight gain and reports that the child is not eating enough.

## Annexure 3

### Case Scenario of Zahra (Module 3: Maternal Nutrition)

**Background Information:** Zahra is a 22-year-old married woman who is in her second trimester of pregnancy with her first child. She resides in a rural village in Khyber Pakhtunkhwa, Pakistan. Zahra lives with her husband, in-laws, and two younger siblings. Zahra's family relies on farming for their livelihood, but they have limited financial resources, as farming yields are low due to water scarcity and poor soil quality. Zahra has not received regular antenatal care because her family struggles to afford the costs of transportation to the nearest healthcare facility, which is several kilometers away. Zahra's husband works in a nearby city but only sends money home irregularly, and Zahra's family has few savings.

Zahra is uncertain of her exact due date, but she estimates that she is around 16 weeks pregnant. She has not yet had a blood test or ultrasound, and her pregnancy was confirmed by a local midwife, who has given her some general advice on diet but has not conducted a comprehensive nutritional assessment. Zahra's diet mainly consists of bread, rice, lentils, and some seasonal vegetables. Meat is rarely consumed due to its cost. She occasionally has milk, but it is often a luxury when the family can afford it. Zahra has also noticed that she feels fatigued frequently, especially in the late afternoon, and has been experiencing light-headedness and dizziness at times. She does not take any prenatal vitamins and is unaware of the importance of supplements during pregnancy.

Zahra also reports having some difficulty with food access, as her family's farm has faced significant crop failure due to water scarcity, and there is limited access to markets due to the village's remote location. There is also a cultural preference for traditional foods that may not be nutritionally balanced, and Zahra feels pressure from her family to continue preparing these meals despite her growing concerns about her health.

Zahra's family is supportive, but she feels increasingly anxious about her pregnancy, particularly because she has not had any professional medical care and is unsure about how to properly care for herself and her baby. She is eager to ensure her child is healthy and wishes to learn how to improve her diet but is unsure where to turn for help.

## Annexure 4

### Case Scenarios (Module 4: Listening and Learning Skills)

#### Scenario 1: Breastfeeding Challenges in Rural Areas

**Background:** A mother from a rural village has just delivered her first baby. She is facing difficulties with breastfeeding because she is unsure of how to latch her baby correctly. Additionally, she mentions that there are no breastfeeding support groups in her community, and she is hesitant to ask for help because of traditional beliefs that breastfeeding only works if the mother eats specific foods.

#### Scenario 2: Early Introduction of Solid Foods

**Background:** A mother comes to your clinic with her 6-month-old infant and mentions that she has started giving her baby mashed rice and other soft foods. She says that her mother-in-law and neighbors advised her to start early because the baby is "too hungry" and not satisfied with breastfeeding alone.

#### Scenario 3: Dealing with Malnutrition Concerns

**Background:** A mother brings her 2-year-old child to the clinic, concerned that her child is not gaining weight and looks undernourished. The mother is following the local practice of feeding the child a basic diet of rice and lentils but is unsure if this is enough. She mentions that she has heard conflicting advice about how to feed her child from family members and neighbors.

#### Scenario 4: Maternal Health and Nutrition during Pregnancy

**Background:** A pregnant woman visits the clinic for a routine check-up. She mentions feeling weak and tired all the time and is concerned that she's not getting the nutrients she needs. She expresses that she cannot afford expensive foods and is unsure about what to eat for better health during her pregnancy. Her family believes that eating "heavy foods" will help her feel stronger, but she is not sure what that means.