

Lesson Plan on common health problems of toddler

Submitted in partial fulfillment

For Yearly Evaluation of

Child health nursing

Bachelor of Nursing in Science



**TRIBHUWAN UNIVERSITY
INSTITUTE OF MEDICINE
POKHARA NURSING CAMPUS
RAMGHAT -11, POKHARA
ACADEMIC YEAR (2079-2082)**

SUBMITTED TO:

Respected madam

Dr. Ratnashila Bastola

BNS First Year

SUBMITTED BY:

Name: Kranti Rajbhandari

Faculty: BNS

Year: II

Roll no: 28

Date of Submission: 2080-11 -22

Lesson plan

Name of student	:Kranti Rajbhandari
Subject	:Child Health Nursing
Unit	:(6.3comon health problems of toddler)
Topic	:Nutritional disorder
Level of students	:BNS First year
No. of students	:36
Place	:BNS first year classroom
Date	:2080/11/21
Time	:1Pm to 2Pm
Duration	:1 hour
Language	:English and Nepali
Teaching \learning method: Brainstorming, interactive lecture, discussion, question and answer.	
Teaching \learning media: PowerPoint, whiteboard,	
Name of supervisor: Dr. Ratna shila Bastola (lecturer)	

General objectives

At the end of this teaching\ learning session, BNS first year students will be able to explain about nutritional disorder (PEM)

6.3 HEALTH PROBLEMS OF TODDLERHOOD PERIOD

NUTRITIONAL DISORDERS

Malnutrition: The world health organization (WHO) defines malnutrition as ‘the cellular imbalance between the supply of nutrients and energy and the body’s demand for them to ensure growth, maintenance, and specific functions.

Malnutrition is a condition that develops when the body does not get the right amounts of vitamins, minerals, and other nutrients which need to maintain healthy tissues and organ function.

STATUS OF MALNUTRITION IN NEPAL:

Current evidence shows that Nepal is facing a double burden of malnutrition. for example, the Nepal demographic and health survey report 2016 stated that the prevalence of stunting, wasting, underweight and overweight among the children younger than 5 years was 35.8%, 11%, 27%, and 1% respectively.

According to health survey report 2022 current nutritional status of Nepal is stunting, wasting, underweight and over weight among children younger than 5 years was 25%, 8%, 19% and 1% respectively.

CAUSES:

- Inadequate food intake (common cause)
- Parasitic infections
- Decreased absorption or abnormal metabolism
- Gastrointestinal infections
- Economic and cultural factors
- Poor hygiene
- Low birth weight

1. Macronutrient deficiency disorder
 - PEM

2. Micronutrient deficiency disorder

- Vitamin deficiency
- Mineral deficiency

MACRONUTRIENT DEFICIENCY DISORDER

1. Protein energy malnutrition

- It is potentially fatal body depletion disorder. Also referred as protein calorie malnutrition. The term protein energy malnutrition applied to a group of related disorders that include marasmus, kwashiorkor and intermediate status of marasmus kwashiorkor. PEM is a global issues seen primarily in resources- limited countries. It is the leading cause of death in children in developing countries.

CLASSIFICATION OF PEM

PEM is a spectrum of conditions ranging from failure to overt marasmus or kwashiorkor. Various classifications are given below:

1. Gomez classification
2. IAP classification
3. WHO (NCHS) classification
4. Water low's classifications
5. Welcome Trust classification

1. GOMEZ CLASSIFICATION:

- It is based on weight for age. It is easy to use as weight is very easy as weight is very easy to measure. In this system the normal reference child is the 50th percentile of the Boston standard.
- $\text{Weight for age (\%)} = (\text{weight of the child} / \text{weight of the normal child of the normal child of same age}) * 100$

Stages of malnutrition	Weight for age
Normal	>90%

Grade I	75-90%
Grade II	60-75%
Grade III	<60%

2.IAP classification (1972):

It is also based on weight for age.

Stages of malnutrition	Weight for age (%)
Normal	>80%
Grade I (mild malnutrition)	70-80%
Grade II (moderate malnutrition)	60-70%
Grade III (severe malnutrition)	50-60%
Grade IV (very severe malnutrition)	<50%

3.WHO CLASSIFICATION: It is based on NCHS (national center for health statistics) data.

Stages of malnutrition	weight for age (%)
Moderate malnutrition	Weight below median minus 2SD (M-2SD)
Severe malnutrition	Weight below median minus 3SD (M-SD)

1. WATER LOW'S CLASSIFICATION: It is based on weight and height.

W/H \ H/A	>M-2SD	<M-2SD
>M-2SD	Normal	wasted
<M-2SD	stunted	Wasted and stunted

5.WELCOME TRUST CLASSIFICATION:

It is based on percentage of expected weight for age and the percentage of expected weight for age and the presence or the absence of edema. Between 60 and 80% of expected weight is under nutrition in the absence of edema, and kwashiorkor if edema is present: under 60% of expected weight is marasmus in the absence of oedema, and marasmic kwashiorkor if edema is present.

Range of weight for age	Edema +/-	Nutrition
>80%	Absent	Normal
60-80%	Absent	Under nutrition
60-80%	Present	Kwashiorkor
<60%	Absent	Marasmus
<60%	Present	Marasmic kwashiorkor

Indicators of malnutrition:

NDHS,2016

Stunted	Drop in height for age (<90%)	36%
wasting	Drop in weight for height (<80%)	10%
Under weight	Drop in weight for age (<80%)	27%

Categories of Protein-Energy Malnutrition (PEM)

According to deficiency of protein and energy in varying degree, PEM is categorized into:

- 1. Mild PEM:** This is common in between 9 months to 3 years of age. it is characterized by growth failure, repeated infection and lethargy. The main cause of mild PEM is deficit dietary intake for a short period.
- 2. Moderate PEM:** this is common in between 1 to 4 years of age. Moderate PEM is developed when dietary deficit persists for longer period. It is also known as “*Runche*” which describe the miserable thinning child who is always crying.

The presentation of moderate PEM are similar to mild PEM but it is more recognizable form like:

- More slow and less energetic child
- Flatten buttocks with the wrinkling of skin over the front of the thighs,
- Growth failure, thin limbs
- Winged scapula
- Distended abdomen
- Repeated infection
- Loss of subcutaneous fat beneath the skin

3. Severe PEM: Severe PEM is manifested as kwashiorkor, marasmus and marasmus kwashiorkor.

i. Kwashiorkor: it is also called as protein- energy malnutrition. It is a form PEM characterized primarily by protein deficiency. This condition usually appears about the 1-4 years when the need for protein is high. It is characterized by:

- Failure to grow or gain weight
- Lethargy, fatigue, apathy, irritability
- Loss of muscle of muscle mass
- Peeling and pigmentation of skin
- Moon faces, pot belly
- Loss of muscles mass, dermatitis
- Brownish color, sparse and easily pluckable hair
- Edema of the ankles, feet and belly
- Pursed mouth
- Hepatomegaly
- Recurrent diarrhea
- Damage immune system
- Anemia, vitamin deficiency

ii. Marasmus: marasmus, a PEM disorder, is caused by total calorie/energy depletion rather than primarily protein depletion. Marasmus is characterized by stunted growth and wasting of muscle and tissue. It represents starvation. Marasmus usually develops

between the ages of six month and one year in children who have been weaned from breast milk or who suffer from weakening conditions such as chronic diarrhea. It is characterized by:

- Wrinkled skin folds are prominent over glutei and inner side of thigh
- Bony points appear unduly prominent
- Dry, scaly and inelastic skin, thin hair
- Low weight for height
- Marked weight loss and sub normal height
- Abnormal distention
- Hungry, irritability
- Head that appears large relative to the rest of body
- Dehydration, chronic diarrhea

iii. Marasmus kwashiorkor: it is the condition which manifest as the combination of both forms (marasmus and kwashiorkor). children may also present with a mixed picture of marasmus and kwashiorkor or with milder forms of malnutrition.

Main features of kwashiorkor and marasmus

features	kwashiorkor	marasmus
Occurrence	Less common	More common
Edema	present	absent
Activity	apathetic	active
Appetite	Poor	Good
weight	underweight	Grossly weight
Subcutaneous fat	Some present	Greatly reduced
Skin changes	Present in lower limb	absent
Vitamin A absorption	Markedly reduced	Normal
Liver enlargement	present	Absent
mortality	High in early stage	Less than kwashiorkor

recovery	Slow recovery	Early recovery
infections	More prone	Less prone

DIAGNOSTIC EVALUATION:

- History taking: dietary, child health and family history.
- Physical examination to assess:
 - Eating habits and weight changes
 - Body fat composition and muscle strength
 - Presence of underlying illness
 - Developmental delays and loss of acquired milestones in children
 - Nutritional status
- Assess the nutritional status by:
 - Comparing height and weight to standardized norms
 - Calculating body mass index (BMI)
 - Measuring skin fold thickness or the circumference of mid upper arm
- Laboratory test: lipid profile, CBC, albumin, total protein, iron, ferritin, vitamin and mineral ((vitamin D, K, vitamin B 12, Ca, Mg
- Non laboratory test: x-ray, CT and MRI helps to evaluate the condition of internal organs and normal growth and development of muscles and bones.

MANAGEMENT:

- Provide adequate nutrition to restore normal body composition, and cure the condition that caused the deficiency.
- Tube feeding or I/V feeding is used to supply nutrients to children who cannot or will not eat protein rich foods.

IN PATIENT WITH SEVERE PEM:

- Correct fluid and electrolyte imbalance.
- Treat infection with antibiotics that do not affect protein synthesis, and addressing related medical problems.
- Complete essential nutrients slowly to prevent patient's weakened system.

- Physical therapy may benefit patients whose muscles have deteriorated significantly.

PARENTAL CONCERN:

- Ensure that children are getting a healthy and balanced diet
- Children should not be put on weight loss or other special diets without first consulting a pediatrician

10-STEPS MANAGEMENT OF SEVERE ACUTE MALNUTRITION (WHO)

These steps are accomplished in two phases: an initial stabilization phase(2-6 weeks). Treatment procedure are similar for marasmus and kwashiorkor.

- Hypoglycemia
- Hypothermia
- Dehydration
- Electrolytes
- Infections
- Micronutrients
- Caution feeding
- Catch up growth
- Sensory stimulation
- Prepare for follow-up

1. Treat/ prevent hypoglycemia

- Hypoglycemia and hypothermia usually occur together and are signs of infection. Frequent feeding is important in preventing both conditions.
- If the child is conscious and dextrostix show $<3\text{mmol/l}$ or 54mg/dl : give 50ml bolus of 10% glucose or 10% sucrose solution orally or by nasogastric tube. Then feed the starter F-75 every 30 minutes for two hours and every hourly in day and night.

- If the child is unconscious, lethargic or convulsing. give IV sterile 10% glucose (5ml/kg), followed by 50ml of 10% glucose or sucrose by NG tube. Then give starter F-75 as above.
- Monitor blood glucose, rectal temperature and level of consciousness.

2. Treat /prevent hypothermia

- Monitor axillary temperature. If the axillary temperature is <35-degree celcius, take the rectal temperature is < 35.5-degree celcius feed straight away, rewarm the child by using blanket and heater or lamp nearby (do not use a hot water bottle)
- Put the child on skin-to-skin contact
- Monitor temperature two hourly until it rises to >36.5-degree celcius (take half hourly if heater is used)
- Ensure the child is covered at all times, especially at night.
- Check for hypoglycemia whenever hypothermia is found.

3. Treat/prevent dehydration

- It is difficult to estimate dehydration status in a severely malnourished child using clinical signs alone. So, assume all children with watery diarrhea may have dehydration. Give Resomal (special rehydration solution) 5ml/kg every 30 minutes for two hours, orally or by nasogastric tube then 5-10 ml/kg/h next 4-10 hours.
- If the child is in shock, treat dehydration by R/L or N/S in 5% dextrose (30ml/kg in next 2 hours)
- Then give N/6 saline in 5% dextrose (100ml/kg at the rate of 10 ml/kg in next 10 hours and same solution 5ml/kg for next 12 hours.
- If the child is breast feeding, continue feeding.
- Monitor hydration level, vital signs and passage of urine, stool and vomiting.

4. Correct electrolyte imbalance:

- All severely malnourished children have excess body sodium even though plasma sodium may be low.
- Deficiencies of potassium and magnesium are also present.
- Edema is partly due to these imbalances. Do not treat edema with a diuretic.
- Give potassium 3-4 mmol per kg per day and magnesium 0.4-0.6 mmol/kg per day.
- When rehydrating give low sodium rehydration fluid (Resomal). Prepare food with low salt if the child has excess edema.

5. Treat/prevent infection:

- In severe malnutrition, signs of infection are often absent, and infections are often hidden.
- Give routinely broad-spectrum antibiotic (cotrimoxazole and amoxycillin) and measles vaccine if child is >6 months and not immunized. Give in addition to broad spectrum antibiotics metronidazole (7.5mg/kg 8 hourly for 7 days).
- If the child appears to have no complications give cotrimoxazole 5ml pediatric suspension orally twice daily for 5 days (2.5ml if weight <6kg),
OR
- If the child is severely ill or has complications, give ampicillin 15mg/kg/8-hourly for 5 days,
OR
- If amoxycillin is not available, continue with ampicillin but give orally 50 mg/kg 6 hourly and Gentamicin 7.5 mg/kg IM/IV once daily for 7 days.
- If the child fails to improve clinically within 48 hours, give chloramphenicol 25 mg/kg IM/IV 8 hourly for 5 days.

6. Correct micronutrient deficiencies:

- All severely malnourished children have vitamin and mineral deficiencies. Give vitamin A orally first day and give multivitamin supplement for at least 2 weeks.

Vitamin A	Multivitamin
Age >12 month 2,00,000 IU	Folic acid 1mg/day (give 5mg on first day) Zinc 2mg/kg/day Copper 0.3mg/kg/day Iron 3mg/kg/d but only when gaining weight.
Age 6-12 months: 100000 IU	
0-5 months: 50,000 IU	

7. Start caution feeding

- Give small frequent feeds of low osmolarity and low lactose.
- Give oral or nasogastric feeds but never give parenteral preparations. The amounts of feeding will be 100 kcal/kg/day, 1-1.5 g protein/kg/day and 130 ml/kg/day of fluid (100 ml/kg/d if the child has severe oedema)
- Encourage to continue breastfeeding if the child is breastfed
- Milk based formulas such as starter F-75 containing 75 kcal/100 ml and 0.9 g protein/100 ml can be given.
- A recommended schedule in which volume is gradually increased, and feeding frequency gradually decreased is:

FEEDING PATTERN:

Days	Frequency	Volume/kg/feed	Volume/kg/day
1-2	2 hourly	11ml	130ml
3-5	3 hourly	16ml	130ml
6-7	4 hourly	22ml	130ml

- Monitor and note amounts offered and left over vomiting, frequency of watery stool, daily body weight.

Step 8: Achieve catch-up growth

- In the rehabilitation phase a vigorous approach to feeding is required to achieve very high intakes and rapid weight gain of >10 g gain/kg/day.
- The recommended milk-based F-100 contains 100 kcal and 2.9 g protein/100 ml.
- Modified porridges or modified family foods can be used provided they have comparable energy and protein concentrations.
- When appetite is return the child is ready for rehabilitation. • To change from starter to catch-up formula: Replace starter F-75 with the same amount of catch-up formula F- 100 for 48 hours then, increase each successive feed by 10 ml until some feed remains uneaten or when intakes reach about 30 ml/kg/feed (200 ml/kg/day).
- Monitor during the transition for signs of heart failure, respiratory rate and pulse rate.
- Monitor progress after the transition by assessing the rate of weight gain.

Step 9: Provide sensory stimulation and emotional support

- In severe malnutrition there is delayed mental and behavioural development.
- Provide tender loving care, a cheerful, stimulating environment, structured play therapy 15-30 minutes/day
- Physical activity as soon as the child is well enough, maternal involvement when possible (e.g comforting, feeding, bathing, play).

Step 10: Prepare for follow-up after recovery

- A child who is 90% weight for length can be considered to have recovered.
- The child is still likely to have a low weight for age because of stunting. Good feeding practices and sensory stimulation should be continued at home.
- Teach parent or carer on feeding practice and structured play therapy. Advise parent or carer to bring child back for regular follow up checks, ensure booster Immunizations and vitamin A (every six months) is given.

Prevention

1. Health Promotion

- Provide education to the women regarding adequate nutrition starts prior to childbirth.
- Educate the women to be healthy during pregnancy to meet the nutritional demands not only of her child, but also herself.
- Provide education to women regarding the importance of breastfeeding and low cost weaning food.
- Encourage breastfeeding a baby for at least six months to prevent early childhood malnutrition

2. Specific Protection

- Provide food rich in protein and energy e.g. milk, egg, fresh fruits
- Immunize the children according to national immunization schedule.

- Food fortification is the addition of one or more essential nutrients to a foodstuff (food, food product, ingredient or condiment) to prevent micronutrient deficiencies

3. Early diagnosis and treatment:

- Obtain the history including clinical features of malnutrition.
- Obtain anthropometry, biochemical and laboratory investigations. Screen every child being admitted to hospital for the presence of illnesses and conditions that could lead to PEM.
- Assess the nutritional status of children at high risk thoroughly and periodically re-evaluate during extended hospital stays.
- Ensure the proper and effective management of malnutrition.

4. Rehabilitation

- Ensure effective hospital treatment.
- Provide nutritional rehabilitation services.
- Ensure effective follow up care.

Control of protein energy malnutrition in Nepal (Annual Report 2074/75)

- Promote breastfeeding within one hour of birth and avoid pre-lacteal feeding
- Promote exclusive breastfeeding for first six months and the timely introduction of complementary food.
- Ensure continuation of breastfeeding for at least 2 years and the introduction of appropriate complementary feeding after 6 months.
- Strengthen the capacity of health workers and medical professionals for nutrition and management and counseling.
- Improve skills and knowledge of health workers on growth monitoring and nutrition counseling
- Strengthen the system of growth monitoring and its supervision and monitoring.

- Promote the use of appropriate locally available complementary foods such as jaulo and sarbottam pitho.
- Increase awareness on the importance of appropriate and adequate nutrition for children and pregnant and lactating mothers.
- Strengthen the knowledge of health personnel on the dietary and clinical management of severely malnourished children.
- Distribute fortified foods to pregnant and lactating women and children aged 6 to 23 months in food deficient areas.
- Improve maternal and adolescent nutrition and low birth weight through improved maternal nutrition.
- Create awareness of the importance of additional dietary intake during pregnancy and lactation.
- Strengthen nutrition education and nutrition counseling.

Prognosis:

- Most children can lose some of their body weight without side effects, but losing more than 40 percent is usually fatal.
- Recovery from marasmus usually takes longer than recovery from kwashiorkor.
- The long term effects of childhood malnutrition are uncertain.
- Some children recover completely, while others may have a variety of lifelong impairments.
- The outcome appears to be related to the length and severity of the malnutrition and age of the child when malnutrition occurred.
- Persistent diarrhea, jaundice and low blood sodium levels, have a poorer prognosis than other children.

Complications

- Water, electrolyte and mineral imbalance
- Hypothermia, hypoglycemia
- Superadded infections, cardiac failure
- Vitamin deficiency, lactose intolerance
- Bleeding tendency, renal impairment
- **Long term:** Growth retardation and mental retardation

Summary:

Post test

Fill in the blanks:

- Kwashiorkor is also known as -----
- Hypoglycemia and hypothermia usually occur together and are signs of -----.

Write true or false:

- The basic of Gomez classifications for malnutrition is weight for age. -----
- Kwashiorkor is a condition where child looks like as an old man. -----

Assignment:

- Explain about the management of PEM.

