Internship Report
On
Fellowship Training and Field Experience on Nutrition and Health

Submitted To

Dr. Md. Bellal Hossain

Professor & Head

Department of Nutrition & Food Engineering

Faculty of Allied Health Sciences (FAHS)

Daffodil International University

Submitted By

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ID - 151-34-346

Department of Nutrition & Food Engineering

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Date of Submission

December 20, 2018

LETTER OF TRANSMITTAL

December 20, 2018

Dr. Md. Bellal Hossain

Professor & Head

Department of Nutrition and Food Engineering

Faculty of Allied Health Sciences (FAHS)

Daffodil International University

Subject: Submission of internship report.

Dear Sir,

I would like to take this opportunity to thank you for the guidance and support you have provided me during the course of this report. Without your help, this report would have been impossible to complete.

To prepare the report I collected what I believe to be most relevant information to make my report as analytical and reliable as possible. I have concentrated my best effort to achieve the objectives of the report and hope that my endeavor will serve the purpose. The practical knowledge and experience gathered during report preparation will immeasurably help in my future professional life. I request you to excuse me for any mistake that may occur in the report despite of my best effort.

I would really appreciate if you enlighten me with your thoughts and views regarding the report. In addition, if you wish to enquire about an aspect of my report, I would gladly answer your queries.

Thank you again for your support and patience.

Yours Sincerely,

Mishu Ruram

ID: 151-34-346

Letter of Authorization

December 20, 2018
Dr. Md. Bellal Hossain
Professor & Head
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences (FAHS)
Daffodil International University

Subject: Declaration regarding the validity of the Internship Report.

Dear Sir,

This is my truthful declaration that the **"Internship Report"** I have prepared is not a copy of any Internship Report previously made by any other students.

I also express my honest confirmation in support to the fact that the said Internship report has neither been used before to fulfill my other course related nor it will be submitted to any other person in future.

Yours Sincerely,
Mishu Ruram
ID: 151-34-346

Approval Certification

This is to certify that Mishu Ruram bearing ID: 151-34-346, Program B.Sc. in Nutrition & Food Engineering is a regular student department of Nutrition & food Engineering, Faculty allied health Science Daffodil international University. She has successfully completed her Internship program of two weeks in icddr,b Mohakhali, Dhaka-1206, on Fellowship Training and Field Experience on Nutrition and Health and completed this report on November 18, 2018 under my direct report is a worth of fulfilling the partial requirements of NFE program.

Dr. Md. Bellal Hossain

Professor & Head
Department of Nutrition and Food Engineering
Faculty of Allied Health Sciences (FAHS)
Daffodil International University

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Dr Tahmeed Ahmed

Senior Director,
Nutrition and Clinical Services,
icddr,b
Mohakhali, Dhaka-1206.

Acknowledgement

I would like to express my sincere gratitude and appreciation to fouzia akter, internship supervision, for providing me with the wonderful guidelines to work in the research area of icddr,b. Again my wishes for her expert guidance and mentorship, patience, understanding, support and encouragement at all levels to complete internship works through the dissertation for under graduation program.

My special thanks to Dr.Tahmeed ahmed, Dr.Iqbal Hossain, Dr. sayda hoque and Anuwara parvin also sajeda parvin mam for providing me with the wonderful guidelines to work in the research area of icddr,b. without her help, support and supervision it would not be possible to complete my internship.

In addition, my sincere thanks to icddr,b diet unit, clinical unit also breastfeeding unit for giving me the opportunity to complete my internship.

Lastly, I would like to extend my sincere thanks of this dissertation to my parents for unlimited love support, their encouragement during the bad times and their enthusiasm during the good times gave me constant inspirations in future life.

Abstract/ summary:

Icddr,b known as the international Centre for Diarrhoeal disease research, Bangladesh. It is an international health research organization located in mohakhali, Dhaka, Bangladesh. Icddr,b addresses some of the most critical health concerns facing the whole today, they savings lives through research and treatment. Icddr,b in collaboration with academic and research institutions all over the world they conducts research, training and extension activities, as well as programme-based activities, to develop and share knowledge for global lifesaving solutions. They are working with the rural poor people also they donate free treatment, free hospitality cost, free food and free medicine. They are working on diarrhoealogy , nutritional status of child health, kwashiorkor, marasmus and edema ,severer acute malnutrition, moderate acute malnutrition, therapeutic diet, breast feeding counseling, etc .

They trained me on different topics e.g. therapeutic diet, severe acute malnutrition, moderate acute malnutrition, mid-upper armed circumstances (MUAC), and breast feeding counselling, anthropometric measurements, diarrhea (persistent), nutritional rehabilitation, follow up etc. Suitable foods for the treatment of diarrheal diseases and under nutrition, Assessment of nutritional status: anthropometric techniques, Z scores and their interpretation, Management of acute malnutrition in under-5 children , Preparation of therapeutic diets (F-75, F-100, ReSoMal, Low-lactose containing infant formula, Milk suji, Rice Suji, CC, Khichuri and Halwa) for acute malnutrition and diarrheal diseases, Nutritional rehabilitation of severely malnourished children, Community-based management of severe and moderate acute malnutrition in (CMAM) U-5 childrens,Ward round and observation of case management with particular interest in feeding and dietary intervention, Dietary and micronutrient therapy of persistent diarrhea,Observation and taking part in the health and nutrition education sessions in the wards and nutrition rehabilitation unit.

Topics and methods:

- What is nutrition and food
- Suitable foods for the treatment of diarrheal diseases and under nutrition
- Assessment of nutritional status: anthropometric techniques, Z scores and their interpretation
- Management of acute malnutrition in under-5 children
- Preparation of therapeutic diets (F-75, F-100, ReSoMal, Low-lactose containing infant formula, Milk suji, Rice Suji, CC, Khichuri and Halwa) for acute malnutrition and diarrheal diseases
- Nutritional rehabilitation of severely malnourished children
- Community-based management of severe and moderate acute malnutrition in (CMAM) U-5 childrens.
- Ward round and observation of case management with particular interest in feeding and dietary intervention
- Dietary and micronutrient therapy of persistent diarrhea
- Observation and taking part in the health and nutrition education sessions in the wards and nutrition rehabilitation unit.
- Brest feeding counselling
- Re-lactation technique
- Discussion on different types of research methods
- Discussion on preliminary statistical methods

Objectives--

- To know how they provide suitable foods for the treatment of diarrheal diseases and under nutrition
- To learn about their management acute malnutrition in under-5 children.
- To achieve the Community-based management of severe and moderate acute malnutrion in (CMAM) U-5 children.
- To learn about the therapeutic diets (infant formula, milk based diet, rice based suji, khichuri, naru, chicken based diet, soy-based diet etc).
- To know the how to Breast feeding counselling and Re-lactation technique.
- To aim the dietary and micronutrient therapy of persistent diarrhea.
- To Assessment of nutritional status: anthropometric techniques, Z scores and their interpretation
- To discuss on different types of research methods and preliminary methods.
- To Observation and taking part in the health and nutrition education sessions in the wards and nutrition rehabilitation unit.
- To counselling with the patient about their treatment and their dietary intervention.

Introduction

Icddr,b known as the international Centre for Diarrhoeal disease research, Bangladesh. It is an international health research organization located in mohakhali, Dhaka, Bangladesh. Icddr,b addresses some of the most critical health concerns facing the whole today, they savings lives through research and treatment. Icddr,b in collaboration with academic and research institutions all over the world they conducts research, training and extension activities, as well as programme-based activities, to develop and share knowledge for global lifesaving solutions. They are working with the rural poor people also they donate free treatment, free hospitality cost, free food and free medicine.[1] they are working on diarrhoealogy , nutritional status of child health, kwashiorkor, marasmus and edema ,severer acute malnutrition, moderate acute malnutrition, therapeutic diet, breast feeding counseling, etc[2]. They have many types of unit e.g. short stage unit, longer stage unit, diet unit, nutritional rehabilitation unit, breast feeding counselling, immunization unit, outpatient department etc. icddr.b has a mix of national and international staff, including public health scientists, laboratory scientists, it professionals, and experts in emerging and re-emerging infectious diseases and vaccine sciences. That's are the different sectors of icddr,b who are many kinds of staffs .

Icddr,b is supported by about 55 donor countries and organizations, including Sweden, Canada, UK, republic of government of Bangladesh, USA, UN specialized agencies, foundations, universities, research institutes and private sector organizations and companies that share the centers concern for the health problems of developing countries and who value its proven experience in helping solve those problems[.3]. The Centre is governed by a distinguished

multinational board of trustee's comprising 17 members from all over the world. The centre has, among its other accomplishments, played a major role in the discovery and implementation of oral rehydration therapy for the treatment of diarrhea and cholera.{4] Oral rehydration therapy is thought to have saved over 50 million people worldwide.[5]

They trained me on different topics e.g. therapeutic diet, severe acute malnutrition, moderate acute malnutrition, mid-upper armed circumstances (MUAC), and breast feeding counselling, anthropometric measurements, diarrhea (persistent), nutritional rehabilitation, follow up etc.

Briefly discuss about following topics given below:

What is nutrition and food?

-nutrition is a science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. Nutrition totally interaction with food. Basically we get nutrition from food.

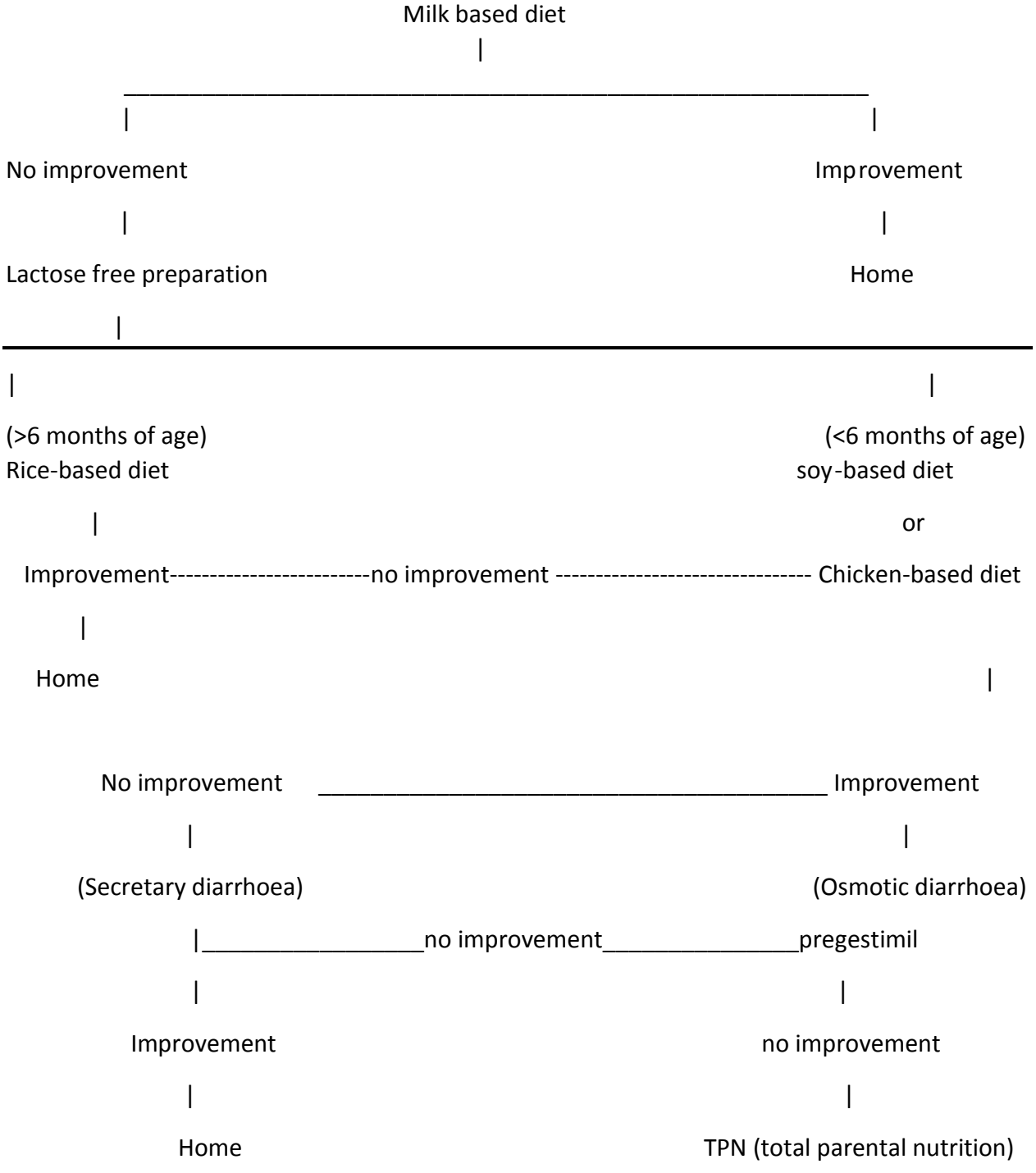
We know usually that food is a that type of thing which we eat to survive and life. Science tells you something different food not actually not for survive, for our energy, growth development, brain development, nutrition basically. Food usually comes from two sources e.g. plant source and animal source. Plant source gives us many different things there are vitamins, minerals, fiber, nutrient, fats (soybean oil, mastered oil etc.), carbohydrates, and proteins. Animal source contains high energy protein example-meat, eggs, milk etc.

Suitable foods for the treatment of diarrheal diseases and under nutrition

Diarrhea is a kind of disease which is more than 3 or 4 times of lose motion in a one day it's called a diarrhea. There are different types of diarrhea which are:

- Acute watery diarrhea: (80% of cases):
  Dehydration, malnutrition
- Dysentery: (10% of cases)
  Anorexia/weight loss, damage to the mucosa
- Persistent diarrhea: (10% of cases)
  Dehydration, malnutrition.
  So that's are the kind of diarrhea. Which they have taught very briefly on that type of diarrhea and their treatment. Different therapeutic diet and suitable food for the treatment of diarrheal diseases and under nutrition. These are:
  1. oral rehydration solution WHO and UNICEF recommended ORS/litre: a) Glucose ORS (reduced osmolality)/ litre, b) Rice ORS(Reduced osmolality)/litre.
  2. Composition of standard liquid feeds for hospital: Modified infant formula (low lactose), milk suji (low-lactose), milk suji-100, khichuri (semi-solid diet)/KG
  3. Liquid formula for persistent diarrhea patients milk based diet (low-lactose formula): modified infant formula/litre (<6 months age group), milk suji/litre (>6 months age group)
  4. Rice based diet (lactose and sucrose free formulae): ¾ strength rice suji/litre, full strength rice suji/litre
  5. Chicken based diet (lactose, sucrose and maltose free formulae): ¾ strength comminuted chicken, full strength comminuted chicken.

Dietary manipulation



Assessment of nutritional status

Anthropometric techniques, Z scores and their interpretation:

'Anthropos' means man, metrics is measurement. Measured of height, weight, BMI and MUAC. Actually measurement of body weight and dimensions and the subsequent interpretation of the measurements in relation to appropriate reference data.

Advantages:

Simple, safe, cheap, non-invasive, portable and requires minimal training.

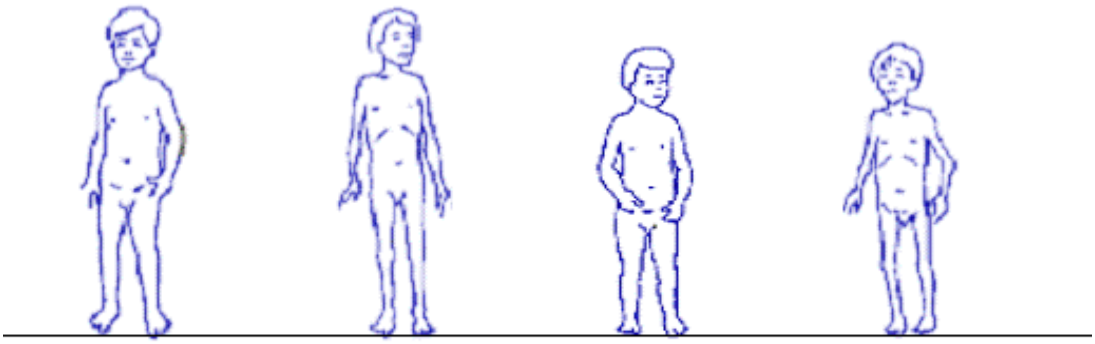
Limitations:

Cannot identify specific deficiencies and slow to respond to recent changes in nutritional satus.

Building blocks of anthropometry:

1) Sex
2) Age
3) Weight
4) Length or height

When used together called an index. Commonly used indices: WA, HA, and WH. Others: MUAC, BMI, SFT etc.



Indices used for infants and children:

Weight-for-age (WA):

Low WA indicates underweight. Unable to distinguish chronic or acute under nutrition. Short term + long term but it is highly affected by long term malnutrition. Less than weight for age.

Height-for-age (HA or LA):

Low HA indicates stunting (reduced linear growth), chronic/long term under nutrition,

LA for <2 years or unable to stand.

HA for <_2years. It is long term malnutrition height for age.

Weight-for-height (WH or WL):

Low WH indicates wasting, a deficit in weight compared to the expected weight for the same length/height of a person with same sex. Acute malnutrition wasting is a short term malnutrition / under nutrition and also acute malnutrition. Useful when exact age is difficult to determine, WL for <2 years, WH for >_2 years, appropriate for examining short-term effects.

There are three types of malnutrition:

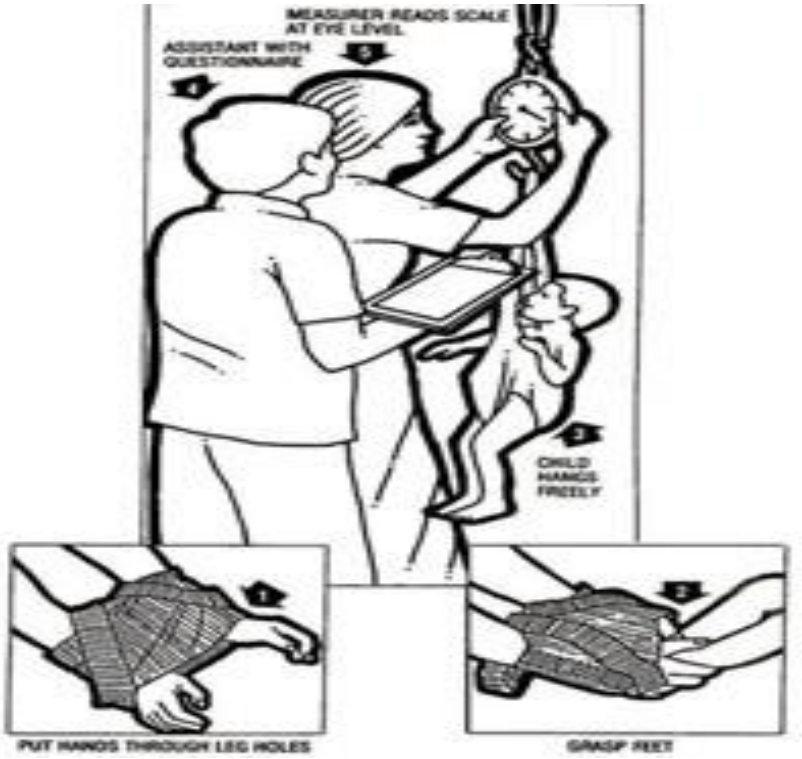
- Wasted: low weight for height, short term under nutrition.
- Stunted: low height for age, long term malnutrition,
- Underweight: low weight for age, combination of short and long term under nutrition.

Age:

- Accurate age is required
- Evidence of the birthdate: birth certificate, immunization card
- Cross-checking is necessary
- If dates cannot be recalled, use a local or events- calendar.

Weight:

- Body weight indicates combined mass of all body compartments (fat, fat-free mass, water, skeleton).
- Regular validation of the weighing scale is very important.



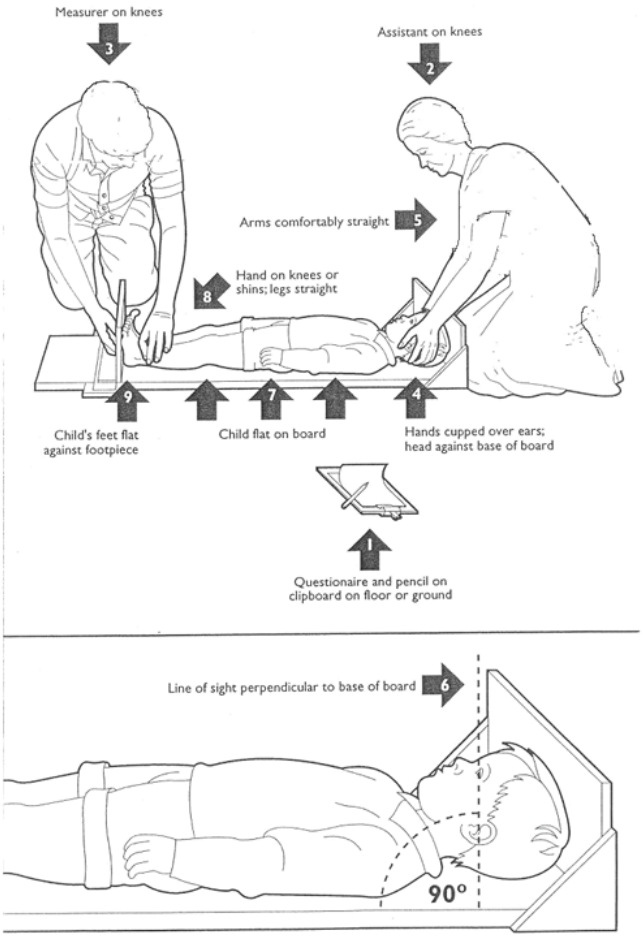
- Salter scale for weighing infants and young children
- Can measure up to 25kg.
- Accuracy 100 g.

- Weight measurements by floor type weighing scale
- Can measure up to 150kg.
- Accuracy 100 g.

Different types of weighing scales

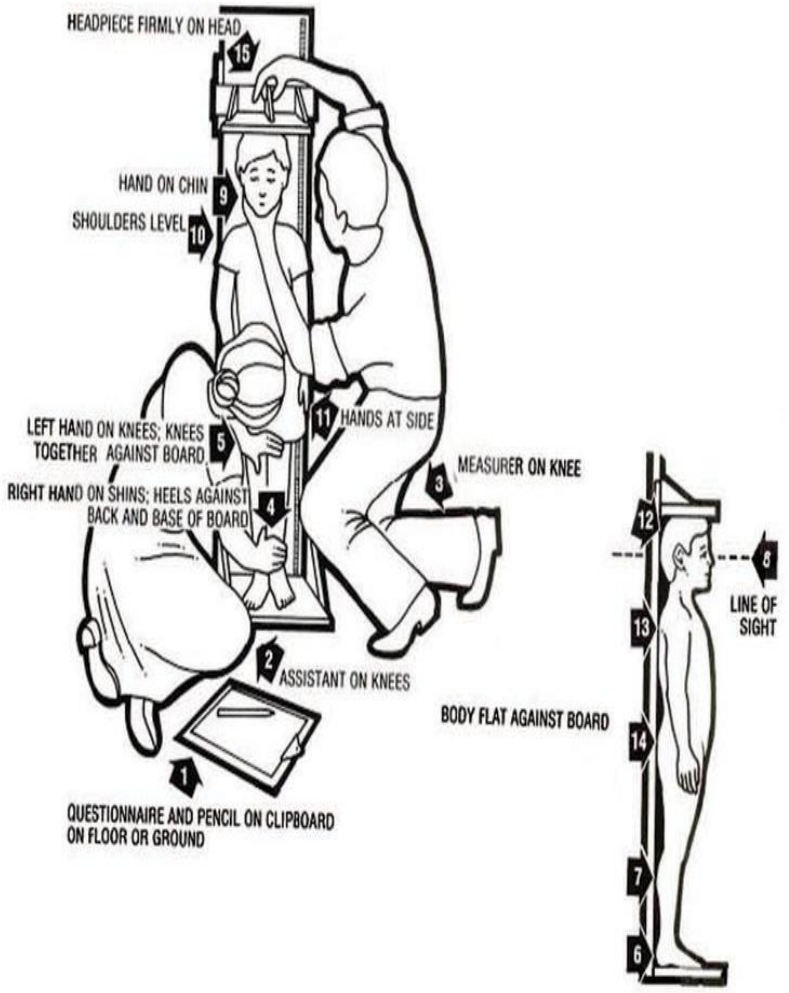
- Accuracy 1g

- Accuracy 10g



Measuring length using the length board

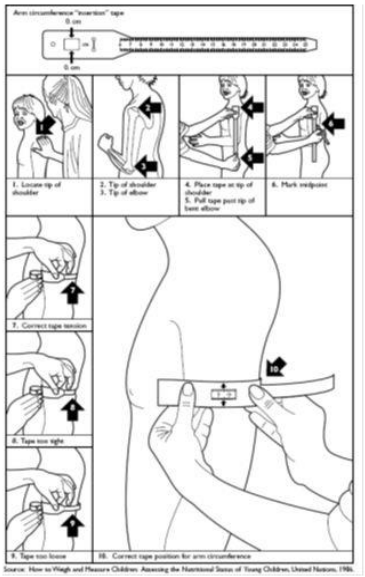
- Children <2yrs
- Too till to stand
- Accuracy 0.1 cm

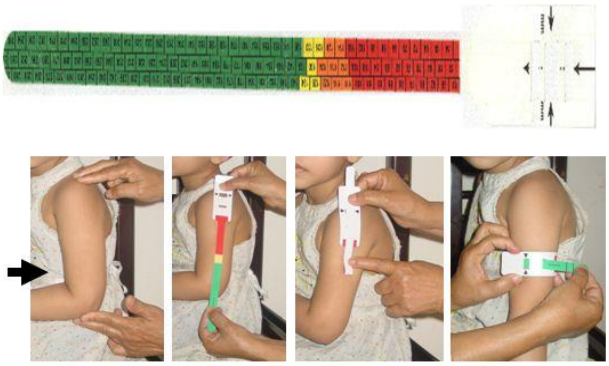


Measuring height using the height board

- Children ≥ 2years
- Accuracy 0.1cm
- Length is ~0.7 cm more than corresponding height
- Height is ~0.7 cm less than corresponding length.

OVERVIEW OF METHODOLOGY: MUAC MEASUREMENT





- 6 mo – 5 yrs
- < 12.5 cm acute malnutrition

Anthropometric indicators Measurement guide FANTA, 2003

Lecture X: Title of the Presentation -Name of Presenter

<11.5 cm = severe acute malnutrition (SAM)

11.5 to <12.5 = moderate acute malnutrition (MAM)

Z score (or SD) score is the number of standard deviations from the mean a data point.

$$\text{Z score} = \frac{\text{(Observed value)- (Reference value)}}{\text{Standard deviation of reference population}}$$

Calculation of HA Z score

Age: 3yrs, sex: girl, height: 82.2 cm (reference Ht = 95.1 cm, SD 3.9)

$$\text{HA Z score} = \frac{82.2-95.1}{3.9} = -3.3 \text{ Z score.}$$

Management of acute malnutrition in under-5 children

There are two types of malnutrition. Such as:

- Under nutrition and
- over nutrition

That are the protein energy malnutrition. When a child admit the hospital with diarrhoea his/her first treatment is saline and keep her/his short stage if he recovered from diarrhoea then he get back home but no improvement then doctors are shifted them to longer stage, then his first treatment started from here, they are different types of therapeutic diet given to the patient e.g F-75, F-100, ORS, Rice suji, Milk suji, infant formula etc. when he recovered from his diarrhea but his health condition is not good weight for age(wA) Z score is below -3 and still have nutritional problem(oedema, malnourished) then shifted to the NRU(nutritional rehabilitation unit) for regrowth. They provided some therapeutic diet are khichuri, halwa, with F-100. And they stay minimum 7days in NRW/NRU. When their weight gain minimum 15% to 20%, no edema and Wl <-2 Z score then the discharge from NRW/NRU. When they discharge from this ward the health workers teach the every mother how to cook halwa, khichuri, F-100, F-75, infant formula etc. then must be call them next follow up session.

Time- frame for the management of a child with sever acute malnutrition

Step	**Phase**
	Stabilization **Rehabilitation** **Days 1-2 Days 3-7 weeks 2-6**
1.hypoglyceamia	→
2.hypothermia	→
3.dehydration	→
4.eletrolytes	→
5.infection	→ **no iron** → **with**
6.micronutrients	**iron** →
7.cautious feeding	→
8.catch-up growth	→
9.sensory stimulation	→
10.prepare for follow-up	→

Preparation of therapeutic diets

(F-75, F-100, ReSoMal, Low-lactose containing infant formula, Milk suji, Rice Suji, CC, Khichuri and Halwa) for acute malnutrition and diarrheal diseases:

F-75:

F-75 is the 'starter' formula used during initial management of malnutrition, beginning as soon as possible and continuing for 2-7 days until the child is stabilized.75 is a kilocalorie of 1000ml. severely malnourished children cannot tolerate normal amounts of protein and sodium or high amounts of fat.F-75 has is specially mixed to meet the child's needs without overwhelming the body's systems in the initial stage of treatment. Use of F-75 prevents deaths, F-75 contains 75kcl and 0.9g protein per 100ml.

Preparation: without cooking process

Ingredient	-	amount
Powder milk		-35gm
Soybean oil		-20gm
Sugar		-100gm
Water up to		-1000ml
Total amount		-1000ml

- First of all, smoothly mixture all of ingredients for homogenous mixture by a spoon.
- Then blend the all ingredients for 2-3 seconds.
- Then serve the formula.

F-100:

F-100 is used as a catch-up formula to rebuild wasted tissues, F-100 contains more calories and protein, 100kcl and 2.9 protein per 100ml.

Preparation: without cooking process

Ingredient	-	amount
Powder milk		-110gm
Sugar		-50gm
Soybean oil-		-30gm
Warm water		-200ml
Cool Water up to		-1000ml
Total		-1000ml

- Same as first of all, smoothly mixture all of ingredients for homogenous mixture by a spoon.
- Then blend the all ingredients for 2-3 seconds.

Recipe for ReSoMal:

Ingredient	-	amount
Water (boiled and cooled)		- 850ml
WHO-ORS		- one 500 ml-packet
Sugar		-20 gm.
Electrolyte/mineral solution		-16.5ml

WHO and UNICEF recommended ORS/Litre:

1. Glucose ORS (Reduced osmolarity)/litre:
   For, 500gm ½ litre

Ingredients	-	amount
Glucose	-	6.75gm
Potassium chloride	-	0.75g
Sodium citrate	-	1.45gm
Sodium chloride	-	1.30gm

Total osmolality - 122.5 mosm/litre

2. Rice ORS (Reduced osmolarity)/litre:

Ingredients	-	amount
Rice powder	-	40gm
Potassium chloride	-	1.5gm
Sodium chloride	-	2.6gm
Trisodium citrate	-	2.9gm
Total osmolality	-	170mosm/litre

Method of preparation/ one litre packet:

1. One litre water to be taken in a clean saucepan
2. Then to add 50ml more water for cooking loss
3. Now to cut down both the packets and to pour into the saucepan
4. Then to mix thoroughly and cook to make it even solution, it needs one minute boiling when bubbles come out.
5. It needs continuous stirring when cooking.
6. Now the solution is ready to serve.
7. Solution can be kept 6 hours in room temperature during summer season and 8 hours in the winter in Bangladesh.

Low-lactose infant formulae:

Modified infant formulae: cooking process

(<6 months age group)

Ingredients	-	amount
Whole milk powder	-	60g
Sugar	-	50g
Oil edible	-	20g
Magnesium chloride	-	0.5g
Potassium chloride	-	1g
Calcium carbonate	-	2g
Water up to	-	1000ml
Energy	-	68kcal/100ml
Protein	-	1.5g/100ml

Osmolality - 369 mosm/litre

PER (protein Energy Ratio) - 9%

FER (Fat Energy Ratio) - 47%

Milk-suji/litre (>6 months age group): cooking process

Ingredients - amount

Whole milk powder - 40g

Rice powder - 40g

Sugar - 25g

Oil edible - 25g

Magnesium chloride - 0.5g

Potassium chloride - 1g

Calcium carbonate - 2g

After cooked volume - 1000ml

Energy - 67kcal/100ml

Protein - 1.3g/100ml

Osmolality - 246 mosm/litre

PER (protein Energy Ratio) - 8%

FER (Fat Energy Ratio) - 48%

Preparation:

- After measuring all the ingredients keep into sauce pan for cooking, must be needed measure empty sauce pan.
- Then all the ingredients homogenous mixture by spoon.
- Then add water up to 1000ml but add some more water because can be loss water by cooked.
- Then cook ingredients approximately thick .ready to serve milk suji.

Rice Based diet (lactose & sucrose free formulae)

¾ strength rice suji/litre: cooking process

Ingredients	-	amount
Rice powder	-	40g
Egg white	-	100g
Glucose	-	30g
Salt	-	1g
Oil edible	-	25g
Magnesium chloride	-	0.5g
Potassium chloride	-	1g
Calcium carbonate	-	2g
After cooked volume	-	1000ml
Energy	-	57kcal/100ml
Protein	-	1.9g/100ml
Osmolality	-	296 mosm/litre
PER (protein Energy Ratio)	-	13%
FER (Fat Energy Ratio)	-	40%

Full strength rice suji/litre: cooking process

Ingredients	-	amount
Rice powder	-	60g
Egg white	-	100g (three)
Glucose	-	35g
Salt	-	1g
Oil edible	-	30g
Magnesium chloride	-	0.5g
Potassium chloride	-	1g
Calcium carbonate	-	2g

After cooked volume - 1000ml

Energy - 70kcal/100ml

Protein - 2.1g/100ml

Osmolality - 315 mosm/litre

PER (protein Energy Ratio) - 12%

FER (Fat Energy Ratio) - 39%

Chicken Based Diet (lactose, sucrose, maltose free formulae)

¾ strength comminuted chicken: cooking process

Chicken, minced - 150g

Oil edible - 20g

Glucose - 30g

Onion - 10g

Salt - 1g

Potassium chloride - 1g

Magnesium chloride - 0.5g

Calcium carbonate - 2g

After-cooked volume - 1000ml

Energy - 46kcal/100ml

Protein - 3.8g/100ml

Osmolality - 267 mosm/L

PER (Protein Energy ratio) - 34%

FER (fat energy ratio) - 39%

Full strength comminuted chicken: cooking process

Ingredients - amount

Chicken, minced - 180g

Oil edible - 30g

Glucose - 35g

Onion - 10g

Salt - 1g

Potassium chloride - 1g

Magnesium chloride - 0.5g

Calcium carbonate - 2g

After-cooked volume - 1000ml

Energy - 60kcal/100ml

Protein - 4.7g/100ml

Osmolality - 272 mosm/L

PER (Protein Energy ratio) - 31%

FER (fat energy ratio) - 45%

Composition & preparation of khichuri:

Ingredient	**Amount**	**Energy**	**Protein**
rice	120g	415	5

lentil	60g	206	15.6
Oil (soya)	70ml	630	-
Potato	100g	97	1.6
pumpkin	100g	25	1.4
Leafy vegetable	80g	22	2
Onion	50g	25	-
Spices	50g	22	1
Water	1000ml		
Total weight of khichuri	1000g		
Total energy and protein / kg	-	1,442	29.6

Nutritional value of khichuri:

	Khichuri/100gm
Energy (kcal)	145
Protein/energy ratio (%)	8
Fat /energy ratio (%)	44.7
Total fat (g)	7.2
Total carbohydrate (g)	16.6
Total protein (g)	2.9

Preparation:

100g of cooked khichuri contains 145 kcal and 3g protein. Rice, dal, oil, spices and water are added to a pot and boiled. After about 20 minutes, the potatoes and pumpkin cut into picces, and spices are added, just 5 minutes before the rice is cooked cleaned and chopped leafy vegetable is added. The pot is kept coverd during cooking khichuri takes about 50 minutes to cook. These diets can be kept in room temperature for 6 hours. But the prepared diet that will need to be stored more than two hours should preferably be kept in a refrigerator or re-heated and then allowed to cool before being served. These diets can be kept in room temperature for 6 hours, but the prepared diet that will need to be stored more than two hours.

Composition & preparation of halwa :

Ingredients	**Amount**	**Energy (kcal)**	**Protein (g)**
Wheat flour (atta)	200g	682	24

lentil	100g	343	26
Oil (soya)	100ml	900	-
Molasses (brown sugar)	125g	479	0.5
water	600ml to (make a thick paste).	-	-
Total weight of halwa	1000g	-	-
Total energy & protein/kg	-	2,404	50.5

Nutritional value of halwa:

	Halwa/100gm
Energy (kcal)	240
Protein/energy ratio (%)	8
Fat/energy ratio (%)	38.6
Total fat (g)	10.3
Total carbohydrate (g)	32.6
Total protein (g)	4.8

Preparation:

100gm of cooked halwa continues 240 kcal and 5 gm protein. The dal is soaked for 30 minutes and then crushed. Atta is fried on a hot pan for a few minutes. The atta crushed dal and oil are mixed with water, gur is melted and added to the mixture to make a thick halwa.

Nutritional rehabilitation of severely malnourished children:

(SAM)

- Bipedal edema
- MUAC <115 mm (6m to 5yr)
- Weight for length or ht Z scores (WLZ or WHZ) <-3
- Length for age Z score (LAZ or HAZ) <-3.

When a child recovered his diarrhea but edema and nutritional problem still have in his body , then doctor send his to NRU(nutritional Rehabilitation Unit). There are feeding F-100 for catch-up growth and also >6 months children are feeding khichuri and halwa. Replace starter formula F-75 with the same amount of catch-up formula F-100 every 4 hours then, increase each successive feed by 10 ml until some feed remains uneaten. The point when some remains

unconsumed after most feeds is likely to occur when intakes reach about 30 ml/kg/feed (200 ml/kg/d).

NRW discharge criteria:

- Minimum 7-day stay at NRW
- No edema
- Weight gain from lowest weight at NRW of 15% of minimum to 20% who is interested to stay at NRW.
- Good general condition.

Ward round and observation of case management with particular interest in feeding and dietary intervention:

We are basically work in longer stage. There are three types of sub unit:

- Nutrition ward
- Gastrointestinal ward
- Acute respiratory infection ward

Nutrition ward: there are admit the patient who are suffering diarrhea with nutritional problem like under nutrition, overweight, edema etc, basically most of the child are suffering under weight malnourished these are marasmus, kwashiorkor, marasmic-kwashiorkor, if the child is below < 6 month than provided infant formula which is same calorie as F-75 and it is only provided in icddrb. If the patient greater >6month than provided F-75 as a milk suji. Marasmic/ kwashiorkor children provide 10 ml/kg/feed in 1st day, after every 2 hours frequently. And 2nd day provide 12ml/kg/feed in 2 hours frequently. Kwashiorkor children provide 9 ml/kg/feed, after 2 hours frequently.

Gastrointestinal ward: if any diarrheal diseases patient remain GI tract problem then they are stay in GI tract ward and also GI tract ward diet same as nutritional ward.

Acute respiratory infection ward: with diarrheal diseases which patient have other problem they have sift in ARI ward, all patient provide same diet as nutrition ward.

In 3rd day we round the ward and observation of case management with particular interest in feeding and dietary intervention. We all are divided into 5 group each group in 2 persons then I and my partner choose the gastro intestinal ward then we were taking the patients dietary history and his height weight also Z score of weight for age, then we try to find out the patients main problem. His problem was he is suffering diarrhea from many days. This was our first case

of ward round. Every day we had the round and visited with all patient and try to take their dietary history. Icddr,b provide their infant formula and saline also encourage the breast feeding.

Dietary and micronutrient therapy of persistent diarrhea:

Persistent diarrhea: long term diarrhea cut off point 14 days, if patient is better within 48 hours. It will not consider as persistent diarrhea in 14 days, if patient was better less than 48 hours it will consider in persistent diarrhea. For adult it is called chronic diarrhea, for children persistent diarrhea. Liquid formulae for persistent diarrhea patients milk based diet (low- lactose formulae) e.g. modified infant formula/litre (<6 months age group), milk-suji/litre (>6 months age group), Rice based diet (lactose & sucrose free formulae) e.g. ¾ strength rice suji/litre, full strength rice suji/litre, for persistent diarrhea patient vitamins and minerals also folic acid have to provide micronutrient therapy are: potassium chloride, magnesium chloride, calcium carbonate. 80-87% patient recovered their diarrhea by the full strength rice suji.

Observation and taking part in the health and nutrition education sessions in the wards and nutrition rehabilitation unit: In OPD (outdoor patient) they provide health and nutritional education sessions also they teach every mother how to make their required diet etc. When a patient discharge then the health workers are taken the health and education sessions for every patient and mothers. Also in NRU/NRW nutritional rehabilitation unit or ward we could observe and taking part in the health and nutritional sessions.

Breast feeding counselling

Breast milk is the milk which is coming from women breasts after her pregnancy. Breast milk is regards the most important source of nutrition for new born baby before they can digest other foods. When a mother intake nutritional foods its directly affects the milks nutritional elements such as vitamin A, vitamin D, vitamin B, iodine also some essential fatty acids and DHA. That's why every mothers milk and nutritional elements different from each other. So, human breast milk is the best component of infants after birth for 6 months or 180 days. Human breast milk helps to children to their growth development, brain development, height development, blood vessel development, bone development, better IQ etc.

Types of breast milk

There are three types of breast milk such as: colostrum, transitional milk and mature milk.

Colostrum

Colostrum is the yellowish milk which is first stage of breast milk. It is produced during the pregnancy and can be 2-4days after the baby's birth. Colostrum contains highly rich in nutrients and antibodies, it is making the food perfect for newborn baby. It contains also high in protein, fat-soluble vitamins, minerals, and immune globulin. Colostrum has Immune globulin's are antibodies which is pass into the mother and provides passive immunity to the babies. This Passive immunity protects the babies from different types of diseases it can be bacterial and viral diseases. Then Colostrum will be converted into transitional milk.

Transitional milk

Transitional milk replaces by colostrum within four days for about two weeks. It contains lactose, water-soluble vitamins, and high levels of fat. It also contains more calories than colostrum does.

Mature milk

mature milk replaces when two week finish the thinner and more water than transitional milk does. Mature milk contains more water up to 90%, which helps to keep the babies hydrated. 10% is the carbohydrates, proteins and fats which is much needed to the child growth, bone and brain development. Mature milk classified into two milk: foremilk and hind milk. Foremilk is beginning of the feeding which is contains vitamins, lactose, water also protein. Hind milk occurs the end of the feeding and contains higher levels of fat, protein and lactose. Which helps to weight development. Actually both are helps to the nutritional status of children by the breast feeding process.

Why they counselling to the mother?

Because there are different types of alternative way of breast milk. These are very harmful to the child. That's why they counselling on breast feeding. Disadvantages of artificial feeding:

1. Effects on bonding
2. More diarrhea also persistent diarrhea
3. Edema or kwashiorkor
4. Obesity or overweight
5. Lower score on IQ test
6. More frequent respiratory infections
7. Ovarian cancer
8. Best cancer
9. Malnutrition
10. Allergy and milk intolerance

That's why breast feeding counselling is very important and needed to the women.

How they counselling to the mother?

Many women discontinue breastfeeding when their child has diarrhea, there's a common myth that breastfeeding causes diarrhea, when in fact nothing could be further from the truth.

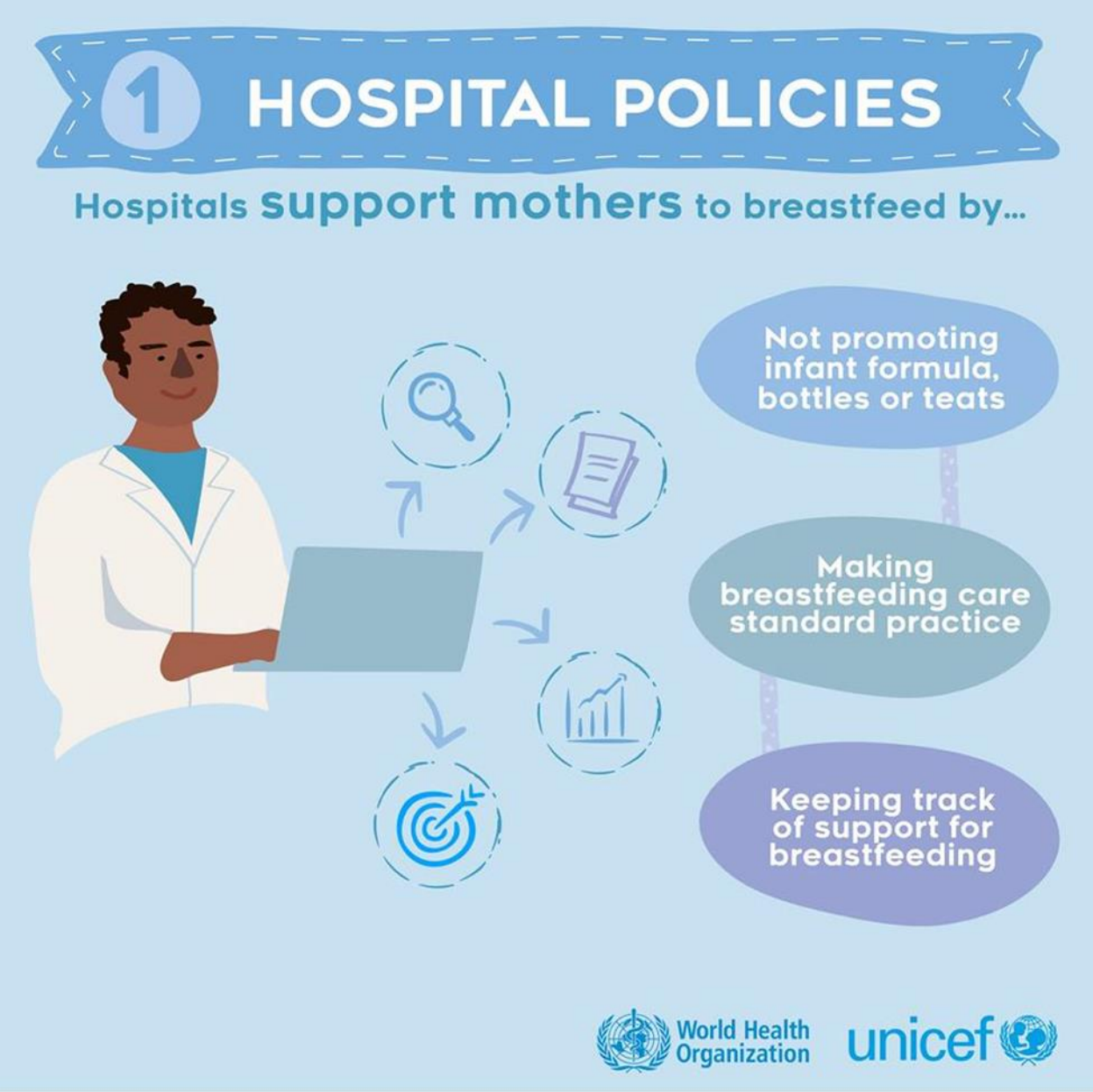
But that breast milk is an important component of oral rehydration therapy for infants, which is more effective than other treatment in tracking the severe dehydration that diarrhea can cause. They try to encourage mothers to exclusively breastfeed their infants until at least six months of age. Sometimes it is very difficult to learn or know them. In particular for first time mothers to recognize the importance of breastfeeding, and to do it properly. They provide counselling for these mothers and in extreme cases, try to re-initiate lactation in mothers who have abstained from breastfeeding for long.

Listening and learning skills:

1. They do their work very friendly and also they keep head level so that mother can create a comfort zone.
2. Must be get their attention and listen their problems.
3. Must be remove their barriers.
4. Must remove that type of word which sounds like judging
5. Make them understand and feel their good and right.
6. Must have open question.

Re-lactation technique: Re-lactation is a when a mother once stopped breast feeding but she again wanted to feed her child and it is a re-establishing breastfeeding after stopping breastfeeding. Little research on re-lactation that strongly suggest with proper support and most mothers can partially or fully re-lactate.

Ten steps of successful breastfeeding: these are created by WHO and UNICEF



Nutrition follow up

- Follow up schedule: 1week----2week----monthly
- GMP until WLZ -1
- Micronutrients including iron for 2-3 mo.
- Treatment of inter current illness
- Health and nutrition education
- Counselling for birth-spacing.

The patient of this unit are the patients who have been discharged from the NRU, also those are malnourished but not stay in the NRU (WH<80%, WA<60% without edema) they are controlled in nutritional follow up unit. When patient enrollment in the NFU, children are seen at intervals of one week, two weeks, and then one months until they WH>90% or WA >65%. This success is normally possible in 6-8 months. Follow up should be twice a year and ideally continue until the child is 3 years old. There are provide treatment of inter current illness. Also they encourage their mother for awareness of health and nutrition education. They also provide them to counselling for birth spacing. Because this is very important to the family also a children for her growth, care, development.

Discussion on different types of research methods

There are two types of methods are qualitative research and quantitative research.

Qualitative research: qualitative research means a non- quantitative method. This research is collecting data, analysing also the interpreting data by the peoples say. Qualitative research remains the meanings, definitions, characteristics, symbols and description of the things. It is most of the subjective and usually it uses different methods of collecting information mainly individual in depth interviews and focus groups.

Quantitative Research: Quantitative research is the measure the quantity or amount and compares. Quantitative research based on numeric numbers. It remains to the systematic empirical investigation of quantitative properties and phenomena and their relationship. This purpose is to develop and employ mathematical models and theories to phenomena.

Discussion on preliminary statistical methods:

Statistical methods are used extensively with in fields such as economics and commerce. This methods are mathematical formulas, models and also techniques that are used in statistical analysis of raw research data.The application of statistical methods extracts information from research data and provides different ways to assess the robustness of research outputs. Different types of statistical methods:

- Analysis of variance (ANOVA)
- Chi-squared test.
- Correlation.
- Factor analysis.
- Mann–Whitney U.
- Mean square weighted deviation (MSWD)
- Pearson product-moment correlation coefficient.
- Cross-sectional methods
- Regression analysis.

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