بسم الله الرحمن الرحيم

Shendi University

Faculty of Graduate Studies and Scientific Research

# Assessment of Nurses Knowledge regarding Nutritional status of Children less than 5 years

*A thesis Submitted in requirements to fulfill master degree in pediatric nursing*.


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**قال تعالى :**

(وَفِي الْأَرْضِ قِطَعٌ مُتَجَاوِرَاتٌ وَجَنَّاتٌ مِنْ أَعْنَابٍ وَزَرْعٌ وَنَخِيلٌ صِنْوَانٌ وَغَيْرُ صِنْوَانٍ يُسْقَى بِمَاءٍ وَاحِدٍ وَنُفَضِّلُ بَعْضَهَا عَلَى بَعْضٍ فِي الْأُكُلِ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يَعْقِلُونَ)

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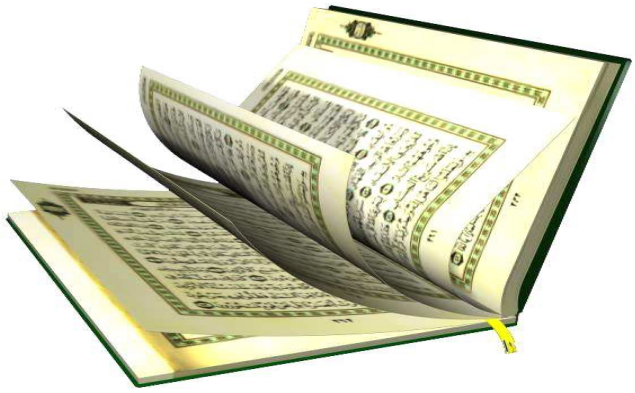

# DADICATION

To the essential one in my life, meaning of humanity,

To bright fence of the live

**My Mother**

To all whom I love and respect the one who thought me how to be positive member in the community

**My Father**

To hearts that shared with me the pleasure and sadness

**My Brothers and sisters**

To Dear: who gave me the sense of everlasting worth

To my collage and friends

To some people make my life special just by being in it

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# Abstract

Nutritional status of children is a proxy indicator for assessing the entire .Population health status and one of the major predictors of child survival. Despite the various efforts, malnutrition among children is remaining as a major public health problem in developing century.

This study was descriptive cross sectional carried out in Elmek Nimer hospital.

Shendi city during period extended from July to December 2014, to evaluate nurse's knowledge regarding nutrition and assessment of nutritional status of children less than 5 years.

The collection of data was done by questionnaire and checklist for weight and height.

The result were analyzed by SPSS statistical method then represented in forms of tables and figures. The study showed most of study group is female between age 20-25 years and their experience between 2-5 years; more than half nurses had poor knowledge about malnutrition but had good practice regarding assessment of weight and height.

The study recommended that:

- To ministry health to do a constructed notional program to educate the nurses and increase their knowledge.
- To hospital directors to organize courses about children nutrition and malnutrition to increase awareness among nurses are working in the pediatric department.
- To head nurse in pediatric department to develop plan to Increase nurse awareness about nutritional assessment and make more training about using of anthropometric measurements.
- To conduct further researches to do more evaluation.

# ملخص البحث

ان الحاله التغذويه للاطفال مؤشر جيد لصحه المجتمع ،تعتبر امراض سؤ التغزيه من اكبر المشاكل الصحيه فى الدول الاقل نمؤاً

أجريت هذه الدراسة الوصفية في مستشفى الملك نمر الجامعى بهدف تقييم معرفه الممرضين بتغذيه الأطفال وتقيم الحالة التغزويه للأطفال دون الخامسة في الفترة التي امتدت من شهر يوليو إلي شهر ديسمبر 2014م

جمعت البيانات عن طريق الاستبيان وملاحظه الأداء وتم تحليلها عن طريق برامج التحليل الإحصائي بواسطة الحاسوب ثم تم عرضها في شكل جداول وإشكال هندسيه

أوضحت الدراسة أن معظم تقني التمريض موضوع الدرس لديهم معرفه ضعيفة حول تغزيه الاطفال وإمراض سؤ التغزويه ،بالنسبة للجانب العملي الخاص بتقييم الحالة التغزويه للاطفال عن طريق القياسات الانثروبومتريه(قياس الوزن والطول) وجد أن معظم أفراد العينة أداءهم جيد ,أوصت الدراسة بتنظيم دورات تدريبيه وكورسات حول تغزيه الأطفال وأمراض سؤ التغزيه كما وجهت الدراسة بوضع خطه لزيادة توعيه تقني التمريض عن تغذية الاطفال وتقيم الحالة التغزويه لديهم.

# CONTENT


**Subjects** **Page**

Acknowledgement……..... 1

Abstract in English …… II

Abstract in Arabic…….. III

List of contents IV-VI

List of tables …….. VII-VIII

List of Figures ……..IX

**CHAPTER ONE**

Introduction ……. 1-2

Justification…… 3

Objectives…….. 4

**CHAPTER TWO**

Literature review…….

2.1. Nutrition ……..…….…… 5

2.2. Important Nutrient…….. 6

2.2.1. Macronutrients……... 7

2.2.2. Micronutrients…… 13

2.3. Nutritional status……. 16

2.4.Assessment of nutritional status……. 17

2.4.1.Anthropometric measurement…….. 18

2.4.2.Laboratory measurement……. 27

2.5.Malnutrition …… .. 28

2.6.Protein energy malnutrition ……. 30

2.6.1.Kwashiorkor…..……... 30

2.6.2.Marasmus…..……..... 31

2.6.3. Marasmic kwashiorkor…….... 33

**CHAPTER THREE**

3.Materials and Methods…… 34

3.1.Study design…… 34

3.2.Study area …… 34

3.3.Setting …… 34

3.4.Study population …… 34

3.5Sample size …… 34

3.6.Data collection tools …… 35

3.7Data collection technique …….. 35

3.8.Data analysis…… .. 35

3.9.Ethical consideration…… 35

**CHAPTER FOUR**

1- Results……

6.1. Sociodemographic Characteristics data.....36

6.2. Nurses knowledge about nutrition requirement……41

6.3. Nurses knowledge about nutritional assessment……..…….49 -50

6.4. Nurses knowledge about malnutrition……....55

6.5. Nurses practice about anthropometric measurements (weight and height)
…….. 60
6.6.Significant of the study……..63

## CHAPTER FIVE

5. Discussion…….……

5.1.Personal characteristic …….. 65

5.2.Nurses knowledge about nutrition …… 65

5.3.Nutritional assessment …… 65

5.4.Nurses knowledge about malnutrition …… 66

5.5.Nurses practice about weight and height measurement…… 67

Conclusions…… 68

Recommendations…… 69

## CHAPTER SIX

References ……. 70-71
Questionnaire…..…… 72-76
CHECK LIST……. 77

# List of tables


| Table No | Title | Page No |
|---|---|---|
| (1) | Table (1) the distribution of study population according to knowledge about micro nutrients component | 43 |
| (2) | Table (2) the distribution of study population according to knowledge about Energy substance | 43 |
| (3) | Table (3) the distribution of study population according to knowledge about most energy dense food (most calories/gram) | 44 |
| (4) | Table (4) the distribution of study population according to knowledge about some type contain large amounts of complex carbohydrates | 44 |
| (5) | Table (5) the distribution of study population according to knowledge about the fundamental component of protein | 45 |
| (6) | Table (6) the distribution of study population according to knowledge about classification of carbohydrates according to number of monomer unit | 45 |
| (7) | Table (7) the distribution of study population according to knowledge about the amount of calories provided by one gram of fat | 46 |
| (8) | Table (8) the distribution of study population according to knowledge about the good source of the potassium | 46 |
| (9) | Table (9) the distribution of study population according to knowledge about the good sources of vitamin A as retinol include | 47 |
| (10) | Table (10) the distribution of study population according to knowledge about low component in breast milk | 47 |
| (11) | Table (11) the distribution of study population according to knowledge about the assess the nutritional status | 48 |
| (12) | Table (12) the distribution of study population according to knowledge about the purpose of nutritional assessment | 48 |
| (13) | Table (13) the distribution of study population according to knowledge about the weighed of 3-year-old child | 51 |
| (14) | Table (14) the distribution of study population according to knowledge about appropriate way to measure the height for 5-year old cannot stand, but can sit Upright | 51 |
| (15) | Table (15) the distribution of study population according to knowledge about conditions are more likely to have short stature than a typically-developing child | 52 |
| (16) | Table (16) the distribution of study population according to knowledge about appropriate tool used to measure the length in children younger than 2years of age | 52 |

| Table No | Title | Page No |
|---|---|---|
| (17) | Table (17) the distribution of study population according to knowledge about the calculation of the Body mass index | **53** |
| (18) | Table (18) the distribution of study population according to knowledge about the assessment tools that used to assess the weight of children under the age of 2 years | 53 |
| (19) | Table (19) the distribution of study population according to knowledge about the best way to weighing the children who are too large for the infant scale, but cannot stand | 54 |
| (20) | Table (20) the distribution of study population according to knowledge about the useful way to measure the height for child with special health care needs | 54 |
| (21) | Table (21) the distribution of study population according to knowledge about the definition of the malnutrition | 56 |
| (22) | Table (22) the distribution of study population according to knowledge about the sign and symptom of malnutrition | 56 |
| (23) | Table (23) the distribution of study population according to knowledge about the definition of kowashencor | 57 |
| (24) | Table (24): Distribution of study population according to practice about the measurement of standing height | 57 |
| (25) | Table( 25): Distribution of study population according to practice about the measurement of standing weight | 58 |
| (26) | Table(26): Distribution of study population according to performance score about the measurement of standing height | 59 |
| (27) | Table( 27): Distribution of study population according to performance score about the measurement of standing weight | 61 |
| (28) | Table( 28) Level of education * to measuring the length in children younger than 2years of age should be used Cross tabulation P value =0.125 | 62 |
| (29) | Table( 29) Level of education * the best way to weighing the children who are too large for the infant scale, but cannot stand Cross tabulation P value=0.436 | 62 |
| (30) | Table( 30) Experience years * To measuring the length in children younger than 2years of age should be used Cross tabulation P value =0.075 | 63 |
| (31) | Table (31) Experience years * the best way to weighing the children who are too large for the infant scale, but cannot stand Cross tabulation P value =0.537 | 63 |
| (32) | Table 32: Experience years * To measuring the length in children younger than 2years of age should be used Cross tabulation | 64 |

| | | |
|---|---|---|
| (33) | Table 33: Experience years * the best way to weighing the children who are too large for the infant scale, but cannot stand Cross tabulation | 64 |

# List of figures


| No of figure | Title | Page No |
|---|---|---|
| Figure {1} | The age of study group | 37 |
| Figure {2} | The sex of study population | 38 |
| Figure {3} | The study population according to qualification. | 93 |
| Figure {4} | Figure 4: distribution of study group sex of experience | 40 |

# Chapter One

- Introduction
- Justification
- Objectives

# Chapter TWO

- Literature review

# Chapter Three

- Material &Methods

# Chapter Four

- Results

# Chapter Five

- Discussion
- Recommendation
- Conclusion

# Appendix

## 1.1 .Introduction:

Nutrition is essential for growth and development, health and wellbeing

Eating a healthy diet contributes to preventing future illness and improving quality and length of life there are several ways of assessing nutritional status, including anthropometric (i.e. physical body measurement), food intake and biochemical measurement.

The wide variations in the rates of the height and weight in children resulting from several factors such as quality and quantity of food, family income, family size and genetic constitution which may contribute to these variations. (1)

Early nutritional support can improve nutritional status, minimizing the chances for innocuous problems becoming more serious.

In the developing counters, malnutrition usually makes its greatest impact on children under5years mortality accounts for nearly 50% of total deaths, and careful examination has shown malnutrition as the major underlying factor.

Also, at this stage of life, there is continuous stress from bacterial, viral and parasitic infections which contribute to malnutrition. (2)

Malnutrition reduce ability to fight infection ability to work

The children with malnutrition grow at slower rate and have a higher rate of illness and infection and have more difficulty concentrating and achieving in school (3).

A simple classification of nutritional status in early childhood is proposed using weight, height, and age it is based on the observation that at each age a certain amount of weight is associated with a certain length using weight/length/age calculated from the Boston standards a child may be classified as overweight (obesity) >110% of standard; within the normal range 90-110% underweight (mild protein-calorie

malnutrition PCM 90-85%, moderate PCM 85-75%, severe PCM <75%) Severe PCM is further divided according to type into marasmus (no edema) and kwashiorkor (with edema). [4]

## 1.2. Justification:

Malnutrition can be caused by lack of food or unbalanced diet that's missing or insufficient in one or more nutrients.

The World Health Organization says that malnutrition affects about 792 million people in worldwide, At least a third of them are children.

Malnutrition is considered a common third death of children less than five years that is reason guided me to select this topic

Because of that conduct my study to improve nurse knowledge to safe guard against it is occurrence.

## 1.3. Objectives:

### General objective:

To Assessment of nursing knowledge regarding nutrition and nutritional assessment of children under five years

**Specific objectives:**

- To identify nursing knowledge about nutritional requirement of children
- To identify nursing knowledge about assessment of nutritional of the children
- To identify nursing knowledge about malnutrition
- To identify nursing practical performance about using of anthropometrics measurements

# 2. Literature review

## 2.1. Nutrition:

Is the intake of food, considered in relation to the body's dietary need Nutrition is the science of food, and determining what nutrients are in different products. This science will also determine how the body ingests, digests, absorption, metabolizes, transports, stores and excretes different food products to determine what overall effects these nutrients have on the body.

Good nutrition an adequate, well balanced diet combined with regular physical activity is a cornerstone of good health; poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity food is the basic necessity of children. It is a mixture of different nutrients such as carbohydrate, protein, fat, vitamins and minerals these nutrients are essential for growth, development and maintenance of good health throughout life [(1)].

Normal growth and development depend largely upon the nutritional status of the new born which is in turn, related directly to the nutrition of the mother and inherited characteristics, and to the dietary intake of the infant

In early childhood [(3)].

Nutrition is importance for a child's later physical, mental and social development from birth to 6 months of life, breast milk is the sole or prime source of nutrients and optimal breastfeeding practice becomes a critical factor in child survival and development breast milk contains all nutrients, antibodies, hormones and antioxidants that an infant needs to thrive.

Early initiation within half an hour of birth will ensure that the protective antibodies in the colostrum are available rapidly to the infant, because after 24 to 48 hours, the level of antibodies in breast milk diminishes.The preschoolers especially those at the second year of life are 'transitional' as regards diet, immunity to infections and psychological dependency. [2] this period which is characterized by a high nutrient need, particularly that of protein for swiftly increasing muscle tissue, is also a period when several meals a day are required and when food should be easily mistakable and digestible also psychological trauma which occurs as a result of the sudden separation from the mother after a prolonged period of continuous intimate contact, and permissive breast feeding frequently caused by another pregnancy is common [4].

Children fewer than 5 years require a high supply of nutrients since they are usually very active and their growth is rapid also during this period, under-nutrition in the form of kwashiorkor, marasmus, anaemia and exophthalmia are common

It has been estimated that approximately one out of every three under-5 children is chronically malnourished and thereby subjected to a pattern of ill health and poor development in early life with malnutrition being associated with more than half of all deaths of children worldwide [1].

## 2.2. Important Nutrient:

Nutrients are the components in foods that an organism utilizes to survive and grow. Macronutrients provide the bulk energy for an organism's metabolic system to function, while micronutrients provide the necessary cofactors for metabolism to be carried out. Both types of nutrients can be acquired from the environment.

They are used to build and repair tissues, regulate body processes, and are converted to and used for energy. Methods for nutrient intake are different for plants and animals [5].

## 2.2.1. Macronutrients:

The macronutrients are carbohydrates, fats, protein, and water the macronutrients (excluding fiber and water) provide structural material (amino acids from which proteins are built, and lipids from which cell membranes and some signaling molecules are built) and energy; some of the structural material can be used to generate energy internally, and in either case it is measured in Joules or kilocalories (often called "Calories" and written with a capital *C* to distinguish them from little 'c' calories). Carbohydrates and proteins provide 17 kJ approximately (4 kcal) of energy per gram, while fats provide 37 kJ (9 kcal) per gram though the net energy from either depends on such factors as absorption and digestive effort, which vary substantially from instance to instance. [1]

### A. Carbohydrate:

Carbohydrates may be classified as monosaccharide, disaccharides, or polysaccharides depending on the number of monomer (sugar) units they contain. They constitute a large part of foods such as rice, noodles, bread, and other grain-based products.

Monosaccharide's, disaccharides, and polysaccharides contain one, two, and three or more sugar units, respectively ;polysaccharides are often referred to as complex carbohydrates because they are typically long, multiple branched chains of sugar units.

Glucose stimulates the production of insulin through food entering the bloodstream, which is grasped by the beta cells in the pancreas .[6]

According to the Institute of Medicine, adequate intake levels equal 60 grams of carbohydrates per day for infant's ages 0 to 6 months and 95 grams per day for infant's from7 to 12 months of age. [7]

**Functions:**

Carbohydrates are necessary in the infant's diet because they supply food energy for growth, body functions, and activity allow protein in the diet to be used efficiently for building new tissue allow for the normal use of fats in the body and provide the building blocks for some essential body compounds.

Carbohydrates serve as primary sources of energy to fuel bodily activities while protein and fat are needed for other essential functions in the body, such as building and repairing tissues. [8]

**Sources:**

The major type of carbohydrate normally consumed by young infants is lactose, the carbohydrate source in breast milk and cow's milk-based infant formula lactose-free infant formulas, such as soy-based infant formulas, provide carbohydrates in the form of sucrose, corn syrup, or corn syrup solids.

These infant formulas are prescribed to infants who cannot metabolize lactose or glucose, a component of lactose. Some specialty infant formulas contain other carbohydrates in the form of modified corn starch, tapioca dextrin, or tapioca starch.

In later infancy, infants derive carbohydrates from additional sources including cereal and other grain products, fruits, and vegetables.

Infants who consume sufficient breast milk or infant formula and appropriate complementary foods later in infancy will meet their dietary needs for carbohydrate

**B. Fat:**

Lipids are a group of substances including fats, oils, and fat-like substances, such as cholesterol ;fatty acids are the major constituent of many lipids.

Fatty acids that must be provided in the diet to maintain health are called essential fatty acids; linoleic acid (abbreviated 18:2n-6 or LA)

and α-linolenic acid (18:3n-3 or ALA) are both essential fatty acids; small amounts of linoleic and α-linolenic acid must be provided in the diet other fatty acids, arachidonic acid (20:4n-6 or ARA) and docosahexaenoic acid (22:6n-3 or DHA), also known as long-chain polyunsaturated fatty acids (LCPUFA), are derived from linoleic acid and α-linolenic acid respectively. They are considered essential fatty acids only when linoleic acid and α-linolenic acid are lacking in the diet

A molecule of dietary fat typically consists of several fatty acids (containing long chains of carbon and hydrogen atoms); bonded to a glycerol they are typically found as triglycerides (three fatty acids attached to one glycerol backbone). Fats may be classified as saturated or unsaturated depending on the detailed structure of the fatty acids involved. Saturated fats have all of the carbon atoms in their fatty acid chains bonded to hydrogen atoms, whereas unsaturated fats have some of these carbon atoms double-bonded, so their molecules have relatively fewer hydrogen atoms than a saturated fatty acid of the same length; unsaturated fats may be further classified as monounsaturated (one double-bond) or polyunsaturated (many double-bonds). Furthermore, depending on the location of the double-bond in the fatty acid chain, unsaturated fatty acids are classified as omega-3 or omega-6 fatty acids.

Trans fats are a type of unsaturated fat with Trans isomer bonds; these are rare in nature and in foods from natural sources; they are typically created in an industrial process called (partial) hydrogenation. There are nine kilocalories in each gram of fat; fatty acids such as conjugated linoleic acid, catalpic acid, eleostearic acid and punicic acid, in addition to providing energy, represent potent immune modulatory molecules.

Saturated fats (typically from animal sources) have been a staple in many world cultures for millennia. Unsaturated fats (e. g., vegetable oil) are considered healthier while transfers are to be avoided. Saturated and

some transfers are typically solid at room temperature (such as butter or lard), while unsaturated fats are typically liquids (such as olive oil or flaxseed oil). Tran's fats are very rare in nature, and have been shown to be highly detrimental to human health, but have properties useful in the food processing industry, such as rancidity resistance. [6]

**Functions:**

- Supply a major source of energy fat supplies approximately 50 percent of the energy consumed in breast milk and infant formula.
- Promote the accumulation of stored fat in the body which serves as insulation to reduce body heat loss, and as padding to protect body organs.
- Allow for the absorption of the fat-soluble vitamins A, D, E, and K, and
- Provide essential fatty acids that are required for normal brain development, healthy skin and hair, normal eye development, and resistance to infection and disease.

Sources:

Breast milk and infant formula are important sources of lipids, including essential fatty acids, during infancy the lipid content of breast milk varies, but after about the first 2weeks postpartum, breast milk provides approximately 50 percent of its calories from lipids. Infant formulas also provide approximately 50 percent of their calories as fat.

Breast milk provides approximately 5.6 g/liter of linoleic acid. [16] While infant formulas currently provide 3.3–8.6 g/liter. In addition, breast milk provides approximately 0.63 g/liter of n-3 polyunsaturated fatty acids16 (including α-linolenic acid and docosahexaenoic acid) while infant formulas provide 0.67 g/ AI for n-6 Polyunsaturated Fatty Acids (Linoleic acid [LA], Arachidonic acid [ARA].

From 0–6 months required 4.4 g/day of n-6 polyunsaturated fatty acids and need from 7–12 months 4.6 g/day of n-6 polyunsaturated fatty

acids AI for n-3 Polyunsaturated Fatty Acids (α Linolenic acid [ALA], Docosahexaenoic acid [DHA]) from 0–12 months need 0.50 g/day of n-3 polyunsaturated fatty acids

Manufacturers of infant formulas add blends of vegetable oils, which are high in linoleic acid, to improve essential fatty acid content.

Food sources of lipids in the older infant's diet, other than breast milk and infant formula, include meats, cheese and other dairy products, egg yolks, and any fats or oils added to home-prepared foods. [9]

## C. Protein:

Proteins are chains of amino acids found in most nutritional food Proteins are structural materials in much of the animal body (e.g. muscles, skin, and hair); hey also form the enzymes that control chemical reactions throughout the body each protein molecule is composed of amino acids; the body requires amino acids to produce new proteins (protein retention) and to replace damaged proteins (maintenance).

As there is no protein or amino acid storage provision, amino acids must be present in the diet. Excess amino acids are discarded, typically in the urine. [1]

About twenty amino acids are found in the human body, and about ten of these are essential and, therefore, must be included in the diet.

A diet that contains adequate amounts of amino acids (especially those that are essential) is particularly important during early development and maturation, complete protein source contains all the essential amino acids; an incomplete protein source lacks one or more of the essential amino acids it is possible with protein combinations of two incomplete protein sources (e.g., rice and beans). [10]

Excess amino acids from protein can be converted into glucose and used for fuel through a process called gluconeogenesis; the amino acids remaining after such conversion are discarded. [1]

**Functions:**

Build, maintain, and repair new tissues, including tissues of the skin, eyes, muscles, heart, lungs, brain, and other organs

Manufacture important enzymes, hormones, antibodies, and other components; and Perform very specialized functions in regulating body processes.

They also serve as a potential source of energy if the diet does not furnish sufficient kilocalories from carbohydrate or fat; as with energy needs,

Protein needs for growth per unit of body weight are initially high and then decrease with age as growth rate decreases. (11)

## Sources:

Breast milk and infant formulas provide sufficient protein to meet a young infant's needs if consumed in amounts necessary to meet energy needs. In later infancy, sources of protein in addition to breast milk and infant formula include meat, poultry, fish, egg yolks, cheese, yogurt, legumes, and cereals and other grain products. When an infant starts receiving a substantial portion of energy from foods other than breast milk or infant formula, these complementary foods need to provide adequate protein. (12)

**D. Water**

Fluids are essential for proper functioning of human body and child are no different. They however do not know what is good for them and may not like having water. About a litre of fluids throughout the day is enough for the chid Milk is 90% water so that counts Soups, juice, fruits all contribute. It is however a good idea to get your child used to drinking water at regular intervals no need to measure and count each glass or cup; just keep an eye on number of time she is urinating. 5-6 times of clear urine is usually an indicator that the child is getting

enough to drink. Also, if you see that urine is darkish or scant, it means child is not getting enough fluids. [13]

## 2.2.2Micronutrients:

The micronutrients are minerals, vitamins, fibers and photochemical

**A.Minerals:**

Dietary minerals are the chemical elements required by living organisms, other than the four elements carbon, hydrogen, nitrogen, and oxygen that are present in nearly all organic molecules. The term "mineral" is archaic, since the intent is to describe simply the less common elements in the diet; some are heavier than the four just mentioned, including several metals, which often occur as ions in the body; some dietitians recommend that these be supplied from foods in which they occur naturally or at least as complex compounds, or sometimes even from natural inorganic sources (such as calcium carbonate from ground oyster shells). Some minerals are absorbed much more readily in the ionic forms found in such sources.

On the other hand, minerals are often artificially added to the diet as supplements; the most famous is likely iodine in iodized salt which prevents goiter, many elements are essential in relative quantity; they are usually called "bulk minerals". Some are structural, but many play a role as electrolytes

Calcium, a common electrolyte, but also needed structurally (for muscle and digestive system health, bone strength, some forms neutralize acidity, may help clear toxins, provides signaling ions for nerve and membrane functions). Chlorine as chloride ions; very common electrolyte. Magnesium, required for processing ATP and related reactions (builds bone, causes strong peristalsis, increases flexibility, increases alkalinity.

Phosphorus, required component of bones; essential for energy processing.

Potassium, a very common electrolyte (heart and nerve health) Sodium, a very common electrolyte; in general not found in dietary supplements, despite being needed in large quantities, because the ion is very common in food: typically as sodium chloride, or common salt. Excessive sodium consumption can deplete calcium and magnesium, leading to high blood pressure and osteoporosis. Sulfur, for three essential amino acids and therefore many proteins (skin, hair, nails, liver, and pancreas) sulfur is not consumed alone, but in the form of sulfur-containing amino acids. [13]

## B. Vitamins:

As with the minerals, some vitamins are recognized as essential nutrients, necessary in the diet for good health. (Vitamin D is the exception: it can be synthesized in the skin, in the presence of UVB radiation.) Certain vitamin-like compounds that are recommended in the diet, such as carnitine, are thought useful for survival and health, but these are not "essential" dietary nutrients because the human body has some capacity to produce them from other compounds.

Vitamin deficiencies may result in disease conditions, including goiter, scurvy, osteoporosis, impaired immune system, disorders of cell metabolism, certain forms of cancer, symptoms of premature aging, and poor psychological health (including eating disorders), among many others. Excess levels of some vitamins are also dangerous to health (notably vitamin A), and for at least one vitamin, B6, toxicity begins at levels not far above the required amount.

Deficient or excess levels of minerals can also have serious health consequences for the continued normal cellular maintenance, growth,

and division, these free radicals must be sufficiently neutralized by antioxidant compounds.

Some are produced by the human body with adequate precursors (glutathione, Vitamin C), and those the body cannot produce may only be obtained in the diet via direct sources (Vitamin C in humans, Vitamin A, Vitamin K) or produced by the body from other compounds (Beta-carotene converted to Vitamin A) by the body,(vita-D) synthesized from cholesterol by sunlight).

Photochemical and their subgroup, polyphones, make up the majority of antioxidants; about 4,000 are known. Different antioxidants are now known to function in a cooperative network. For example, Vitamin C can reactivate free radical-containing glutathione or Vitamin E by accepting the free radical itself. Some antioxidants are more effective than others at neutralizing different free radicals. Some cannot neutralize certain free radicals. Some cannot be present in certain areas of free radical development (Vitamin A is fat-soluble and protects fat areas vitamin C is water-soluble and protects those areas) ,when interacting with a free radical, some antioxidants produce a different free radical compound that is less dangerous or more dangerous than the previous compound.

Having a variety of antioxidants allows any byproducts to be safely dealt with by more efficient antioxidants in neutralizing a free radical's butterfly effect. [14]

## C. Fiber:

Dietary fiber consists mainly of cellulose; a large carbohydrate polymer is indigestible as humans do not have the required enzymes to disassemble it. There are two subcategories: soluble and insoluble fiber, whole grains, fruits (especially plums, prunes, and figs), and vegetables are good sources of dietary fiber there are many health benefits of a high-fiber diet.

Dietary fiber helps reduce the chance of gastrointestinal problems such as constipation and diarrhea by increasing the amount of stool and softening it.

Insoluble fiber, found in whole wheat flour, nuts and vegetables, especially stimulates peristalsis, which move digester along the digestive tract.

Soluble fiber, found in oats, peas, beans, and many fruits, dissolves in water in the intestinal tract to produce a gel that slows the movement of food through the intestines; this may help lower blood glucose levels because it can slow the absorption of sugar additionally, fiber, perhaps especially that from whole grains, is thought to possibly help lessen insulin spikes and therefore reduce the risk of type 2 diabetes. [15]

**2.3. Nutritional status:**

Nutritional status is defined as the evident state of nutrition of an individual.

A person is said to have a good nutritional status if he shows no evidence of malnutrition, the nutritional status of any person is his/her health as dictated by the quality of nutrients consumed, and the body's ability to utilize them for its metabolic need, nutritional status is generally accepted as an indicator of the nutritional status of any particular community, this is due to their easy susceptibility to malnutrition and infection.

Growth assessment has been identified as the most important measure for evaluating the health and nutritional status of under-5 children.

Nutritional status is determined from a nutritional assessment of anthropometric, biochemical, clinical, dietary, socioeconomic, and drug-nutrient interaction effects.

Each of these components reflects a child's nutrient requirements for optimal health and nutritional status.

Determining nutritional status can lead to early detection of nutritional deficiencies that can lead to increased morbidity and mortality

## 2.4. Assessment of nutritional status:

Assessment of nutritional status in the pediatric population is useful to estimate growth patterns and identify signs and symptoms associated with malnutrition or excessive nutritional intake.

Nutritional assessment should be a routine procedure for people of all ages and including young children demonstrates a preventive stance.

It's the tool by which the nutritionist evaluates the patient far maintenance of normal growth and health, risk factors contributing to disease, and early detection and treatment of nutritional deficiencies and excesses.

Comparison of an individual with an established norm provides a basis for objective recommendations and evaluation of nutrition therapy.

Although much information has been published on the use on increasingly sophisticated techniques, clinical judgment and perceptive history taking remain important overall components of nutritional assessment in children; this includes family history, developmental assessment, medical history including growth history, and physical examination including anthropometry .[11]

Nutritional assessment in children has special significance because under nutrition is the single most important cause of growth retardation

Acute and chronic malnutrition remain common in hospitalized pediatric patients, underscoring the need for early detection and treatment of nutritional deficiency in addition over nutrition in the pediatric population has risen significantly and the association of obesity with chronic diseases in adulthood such as heart disease and diabetes is strong; thus, nutrition assessment is equally important for the early referral and treatment of nutrition excess. [16]

Assessment of nutritional status of children is determined by anthropometry that includes weight, height, mid upper arm circumference, measurement of skin fold thicknesses, and head and chest circumferences, biochemistry includes haemoglobin level, urinary iodine, Iron status, levels of different nutrients or their by products; clinical examination which includes examination of skin, eyes, hairs, nails and thyroid and dietary surveys that includes eating habits overall. (11)

## 2.4.1. Anthropometric measurement

Anthropometry is the measurement of physical dimensions of the child body at different ages comparison with standard references for age and sex helps determine abnormalities in growth and development that may have result read from nutrient deficiencies or excesses, are commonly used to determine the prevalence of Protein Energy Malnutrition (PEM) they provide the most valid indicator of a child nutritional status and the most reliable indices for determining nutritional status this technique is usually preferred because it is non-invasive, relatively simple and can be easily carried out and interpreted without requiring professional expertise ,it deals with techniques highly useful on a widespread field basis, and rests on well adopted classification, it is the readily available method of assessing nutritional status .(17)

Anthropometric assessment for children involves the use of growth standards and/or growth references for assessing their growth, nutritional status and well being, a growth standard reflects optimal growth, suggesting that all children have the potential to achieve that level, while a growth reference is simply the distribution used for comparison.

Percentiles and $Z$ -scores in anthropometric measures have been widely used to help assess young children nutritional status and growth,

such as under nutrition (e.g., underweight, stunting and wasting) and over nutrition (i.e., overweight and obesity).

Through proper assessment, it can be employed to determine how well or how poor

Anthropometric measurement including: weight, length, head circumference and arm circumference. [11]

**A. Weight:**

Body weight is a reproducible growth parameter and a good index of acute and chronic nutritional status.

An accurate age, sex and reference standard is necessary for evaluation.

The child weight normally increases by age through the developmental stages.

Every stage has stander weight the understanding of this stander help to classification of nutrition status of the child.

Normally in the child weight after the child birth loses about 5 - 10% of his or her birth weight. However, by about age 2 weeks, an infant should start to gain weight and grow quickly, by age 4 - 6 months; an infant's weight should double the birth weight, during the second half of the first year of life, growth is not as rapid. Between ages 1 and 2, a toddler will gain only about 5 pounds, will remain at about 5 pounds per year between ages (2 – 5)

Weight is evaluated in three ways: weight for age, weight for height, and body mass index BMI. [7]

**Weight for age:**

Weight for age compares the individual to reference data for weight attained at any given age whereas weight for height looks at the appropriateness of the individual’s weight compared to his or her own height. For example, an infant may be at the 95th percentile weight for

age but at the 50th percentile weight for height, indicating appropriate weight.

Weight below the 10th percentile or above the 90th percentile may indicate weight deficit or excess, respectively. [6]

Weight can be calculated as a percentage of standard weight (the 50th percentile for age and sex) as follows:

Standard = 100

> 120% standard = excess

80 to 90% standard = marginal deficiency

60 to 80% standard = moderate deficiency

< 60% standard = severe deficiency [18]

Recent change in weight (loss or gain) is also important to note as it is often an indicator of acute nutritional problems.

**Weight for Height:**

This ratio more accurately assesses body built and distinguishes wasting (acute malnutrition) from stunting (chronic malnutrition) measurements that fall near the 50$^{th}$ percentile indicate appropriate weight for height; the greater the deviation, the more over- or undernourished the individual. [6]

**Considerations for children with special health care needs**

For children who are too large for the infant scale, but cannot stand, use a platform scale on which a wheelchair can be placed or a bed scale because these specialty scales are not available in many communities, an alternative is to weigh the child's caregiver holding the child, weigh the caregiver alone, and subtract the caregiver's weight from the weight of both individuals; if this method is used, it is important to note this on the growth chart. If the child can sit independently, use a chair scale. [19]

**B. Length and height:**

Measured with appropriate equipment and technique, length is a simple and reproducible growth parameter that provides, in conjunction with weight. Growth charts are used for standards of length, length for age below the 5th percentile indicates a severe deficit, and measurements that range between the 5th and 10th percentiles should be evaluated further.

Evaluation of growth velocity can be helpful in the determination of chronicity or constitutional short stature. Length assesses growth failure and chronic under nutrition, especially in early childhood and adolescence the child height should be increased by age as the normal growth in the infancy ( 0-12 months) grows about 10 inches (25 cm) from 1-2 years - grows about 5 inches (13 cm) at age 2-3 years - grows about 3 1/2 inches a year Most children will double their birth height by 3-4 years of age 3 years to puberty - grows about 2 inches (5cm) a year .[14]

**Measurement of length:**

Is frequently erroneous because of improper technique or equipment children younger than 2 years of age should be measured recumbent on a length board

**-Technique:**

Cover the length board with a thin cloth or soft paper for hygiene and for the baby's comfort. Explain to the mother that she will need to place the baby on the length board herself and then help to hold the baby's head in place while you take the measurement. Show her where to stand when

Placing the baby down show her where to place the baby's head (against the fixed headboard) so that she can move quickly and surely without distressing the baby. Ask her to lay the child on his back with his head against the fixed headboard compressing the heir.

Check that the child lies straight along the board and does not change position. Shoulders should touch the board, and the spine should not be arched hold down the child's legs with one hand and move the footboard with the other. Apply gentle pressure to the knees to straighten the legs as far as they can go without causing injury.

Held in position, measure with one leg in position While holding the knees, pull the footboard against the child's feet. Read the measurement and record the child's length in centimeters. [17]

**Measurement of the height:**

If the child more than 2years can assess by standing height

**Technique:**

Ensure that the height board is on level ground; check that shoes, socks and hair ornaments have been removed. Help the child to stand on the baseboard with feet slightly apart. The back of the head, shoulder blades, buttocks, calves, and heels should all touch the vertical board.

Position the child's head so that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the base board. To keep the head in this position, hold the bridge between your thumb and forefinger over the child's chin.

If necessary, push gently on the tummy to help the child stand to full height. Still keeping the head in position use your other hand to pull down the headboard to rest firmly on top of the head and compress the hair.

Read the measurement and record the child's height in centimeters to the last completed 0.1 cm. [17]

**Considerations for children with special health care needs:**

Contractures about the hips, knees, and ankles can interfere with an accurate stature measurement.

Several measures are useful alternatives to length or height; these include crown-rump length, sitting height, arm span, and tibia length.

**Crown-rump length and sitting height:**

Crown-rump length and sitting height measurements are often useful for children with contractures of the lower body. These measurements will not correlate directly with height or length, but can indicate a child's rate of growth when plotted on CDC growth charts. Although the measurements will be below the 5th percentile for age, they will show whether or not the child is following a consistent growth curve.

**Arm span measurement**

The stature of children with involvement of the lower body only (e.g., some children with myelomeningocele or lower body paralysis) can be estimated by using arm-span measurements. This requires the use of a specialized anthropometer. Note that arms must be perpendicular to body and the anthropometer is touching. The extended middle fingers of the right and left hands. For children with contractures of the upper extremities such as in cerebral palsy, accurate arm span measurements are also difficult.

For typically-developing children, the ratio of arm span to height is about 1:1.

This May not be the case for children with special health care needs. Monitoring an individual’s arm span measurements over time can provide information about rate of growth. Arm span cannot accurately estimate stature in young children. (Younger than 5 to 6years) because the proportions of limb length and trunk length to total body length are different for younger than older children.[19]

**C. Head Circumference**

Head circumference can be influenced by nutritional status until the age of 36 months, but deficiencies are manifest in weight and height before being seen in brain growth .[4]

Routine examination also screens for other possible influences on brain growth measurements below the 5th percentile may indicate chronic under nutrition during fetal life and early childhood.

. Head circumference increase in age 0-3 months 2 centimeters ber month at age (4-6) months can increse1 centimeters ber month, at age 6-12 months increase 1/2 centimeter month and at1-2 years - 2 centimeters ber year.[6]

**Technique:**

A flexible, narrow tape measure is placed firmly around the head above the supraorbital ridges and over the frontal bulge. [17]

**D. Body Mass Index (BMI)**

Is a good indicator of the child nutritional status it takes into account the weight and height, and correlates well with total body fat expressed as a percentage of body weight; the correlation depends on age, Body mass index is determined by dividing the child weight in kilograms by their height in meters squared The formula for BMI is:

BMI = weight (kg)/height' (meters squires).

BMI correlates well with adiposity in children and because of its relative ease and accuracy of basic measures, is recommended for use in screening for obesity in child.

In the pediatric population use of BMI is still being evaluated.

It is recommended that percentiles be used rather than an absolute number because this value changes throughout periods of currently.

BMI at or above the 95th percentile for age and sex using the NCHS growth data, indicates need for evaluation and treatment for obesity.

A BMI at the 95th percentile may range from 18 to 30 depending on the age and sex of the child).

BMI < 18.5 = under eight BMI 18.5-24.5= Healthy weight rang BMI 25-30 = Overweight (grade 1obesity) BMI >30-40 = Obese (grade 2 obesity)

BMI >40 =Very obese (morbid or grade 3 obesity). [1].

**H. Z score:**

An alternative way to express height, weight, and weight for height is Z score, which denotes units of standard deviation from the median. It allows the clinician to locate an observation on the normal curve by the number of standard deviations from the center of the curve, and thus detect movement toward or away from the median, which is more sensitive than percentile changes.

This is especially useful in cases that lie outside the percentiles (ie, below the 5th or above the 95th percentile). [15]

**E. Growth chart:**

Growth charts are an essential component of the pediatric toolkit. Their value resides in helping to determine the degree to which physiological needs for growth and development are met during the important childhood period. Beyond their usefulness in assessing children's nutritional status, many governmental and United Nations agencies rely on growth charts to measure the general well-being of populations, formulate health and related policies, and plan interventions and monitor their effectiveness is used by pediatricians and other health care providers to follow a child's growth over time, they cover more of the population being used for comparison so are more inclusive of those people who are bigger or smaller than the majority .In growth charts the height, weight, and head circumference of a child can be compared to the expected parameters of children of the same age and sex to determine whether the child is growing appropriately.

Growth charts can also be used to predict the expected adult height and weight of a child because, in general, children maintain a fairly constant growth curve.

When a child deviates from his or her previously established growth curve, investigation into the cause is generally warranted.

For instance, a decrease in the growth velocity may indicate the onset of a chronic illness such as inflammatory bowel disease. Growth charts are different for boys and girls, due in part to pubertal differences in addition children with diseases such as down syndrome and turner syndrome follow distinct growth curves which deviate significantly from children without these diseases as such, growth charts have been created to describe the expected growth patterns of several genetic diseases, the World Health Organization (WHO) released a new international growth standard statistical distribution in 2006, which describes the growth of children ages 0 to 59 months living in environments believed to support what WHO researchers view as optimal growth of children in six countries throughout the world, including the U.S. The distribution shows how infants and young children grow under these conditions, rather than how they grow in environments that may not support optimal growth.

Use the WHO_growth_charts to monitor growth for infants and children ages 0 to 2 years of age use the CDC growth charts to monitor growth for children age 2 years and older.

The WHO charts reflect growth patterns among children who were predominantly breastfed for at least 4 months and still breastfeeding at 12 months. The WHO standards were constructed using longitudinal length and weight data measured at frequent intervals. For the CDC growth charts, weight data were not available between birth and 3 months of age and the sample sizes were small for sex and age groups during the first 6 months of age.

The CDC growth charts can be used continuously from ages 2-19. In contrast the WHO growth charts only provide information on children up to 5 years of age. For children 2-5 years, the methods used to create the CDC growth charts and the WHO growth charts are similar. [17].

### 2.4.3. Laboratory assessment of nutritional status:

#### A. Serum Proteins:

Proteins synthesized by the liver have long been used to assess protein status, since decreased blood concentrations presumably reflect a reduced supply of amino acid precursors and/or decreased hepatic (and other visceral ) mass.

Serum proteins may also be classified according t o whether their serum concentration increase\ or decrease\ in the setting of acute infection or catabolism

The concentrations of positive acute phase proteins are increased in infectious or other catabolic illnesses, whereas those of negative acute phase proteins are decreased. [11]

#### B. Albumin

Albumin is the most abundant serum protein, is the least expensive and easiest to measure, and is therefore the most commonly used biochemical marker in assessing protein status.

Since more than half of body albumin is extra vascular (primarily in skin and muscle), maintenance of normal serum levels can occur from mobilization of these stores despite prolonged energy or protein inadequacy.

Combined with its long half-life of 20 days, that make serum albumin a relatively insensitive marker of nutritional status or of the effectiveness of nutritional status

Normal concentrations of serum albumin are 3.5 to 5.0 g/dL. Hypoalbuminemia is not necessarily a definitive indicator of malnutrition.

It can also be seen in situations of decreased synthesis (eg, liver disease, malignancy), increased losses (eg, nephritis. protein losing enteropathy, burn injuries. [11]

**C. Retinol Binding Protein**

Retinol binding protein (RBP) has similar properties to pre albumin in that it has a small body pool and a rapid response to protein-energy depletion and repletion.

- Its half-life is 12 hours.
- Since RBP is metabolized in the kidneys, levels will be artificially high in renal failure.
- Retinol binding protein levels also drop in vitamin A deficiency and, as with albumin and pre albumin, with infectious or other catabolic stresses.
- Normal levels of RBP are 3 to 6 mg/dL. [11]

**D. Transferrin:**

Transferrin is another serum protein sometimes used to assess visceral protein status. It is synthesized primarily in the liver and has a half-life of 8 days.

Transferrin concentrations are decreased in all situations depressing serum albumin as well as with steroid therapy, iron overload, and anemia of chronic disease. Increased concentrations are seen in pregnancy, oral contraceptive use, and iron deficiency anemia. Normal levels of transferrin are 220 to 350 mg/Dl. [11]

**2.5. Malnutrition:**

Malnutrition is pathological condition brought about by the inadequacy or over consumption of one or more of the essential nutrients necessary for survival, growth, reproduction as well as productivity at work

The inadequate or excessive intake of nutrients may result from disease factors that affect digestion, absorption, transport, and utilization of nutrients

Malabsorption of nutrients may result from genetic cum environmental conditions or illness.

Malnutrition affects all levels of development physically, mentally, socially, psychologically and physiologically.

It thus multiplies the effect of prevailing disease or mortality in children and infants.

**Definition:**

Malnutrition is the condition that develops when the body does not get the right amount of the vitamins, minerals, and other nutrients it needs to maintain healthy tissues and organ function. (5)

American nursing association wrote that the malnutrition is a condition in which an individual has insufficient energy to maintain their body's essential functions, including growth, maintenance and movement. (6)

The world health organization cites malnutrition as the greatest single threat to the world's public health. (7)

**Tiology of malnutrition:**

There are a number of causes of malnutrition. It may result from:

- Inadequate or unbalanced diet.
- Problems with digestion or absorption.
- Certain medical conditions.

Malnutrition can occur if the individual do not eat enough food. Starvation is a form of malnutrition.

In some cases, malnutrition is very mild and causes no symptoms. However, sometimes it can be so severe that the damage done to the body is permanent, even though you survive.

Malnutrition continues to be a significant problem all over the world, especially among children. Poverty, natural disasters, political problems, and war all contribute to conditions even epidemics of malnutrition and starvation, and not just in developing countries .[8]

**2.6. Protein energy malnutrition:**

Is range of pathological conditions arising from coincident lack of protein and calories in varying proportions most frequent in infants and young children and commonly associated with infection.

**Types of BEM:**

**2.6.1. Kwashiorkor:**

Is severe form of PEM occurring principally in the weaning and post weaning periods when the diet is persistently deficient in essential proteins.

**A. Etiology:**

**Dietary inadequacy:**

When there is a rapid transition from the balance diet supplied by the breast milk to an unbalanced inadequate diet, very low in protein and consisting mainly of carbohydrate this occurs usually during period of weaning and post weaning.

The poverty, ignorance and lack of basic health education and nutritional knowledge are important factors in this mistake

**B. Participating factors:**

Acute infections like acute infantile diarrhea and measles can participate the appearance of kwashiorkor in borderline.

Malaria and severe helminthic infestation may be playing a role in the development of kwashiorkor in some regions of the world.

**C. Clinical manifestations of kwashiorkor:**

The clinical manifestations of kwashiorkor are divided into 3 groups:

1. Constant or cardinal manifestations.
2. Usual manifestations.

3. Occasional manifestations.

**1. Constant "cardinal" manifestations:**

- Edema.
- Growth retardation.
- Muscle wasting with some retention of subcutaneous fat.
- Psychic changes.

**There are also 2 constant biochemical changes in case of kwashiorkor:**

**A.** Hypoproteinemia

**B.** Fatty infiltration of the liver.

**2. Usual manifestations:**

- Hair changes.
- Associated infections.
- Diarrhea

**3. Occasional manifestations:**

- Skin changes.
- Anemia.
- Associated vitamin and mineral deficiency

**D. Complication:**

Complication of diarrhea: dehydration, electrolyte and acid base disturbance.

A. Infection and septicemia.

B. Severe hypoglycemia.

C. Hypothermia.

D. Heart failure. [8]

**2.6.2.Marasmus:**

Is form of PEM that may occur at any age particularly in early infancy and is characterized by severe wasting, loss of subcutaneous fat, gross muscle wasting and absence of edema.

**A. Etiology:**

**Nutritional marasmus:**

Most cause of nutritional marasmus is loss of balance diet or deficient in both protein and calories such as failure of breastfeeding, inadequate amount of milk formula, starvation therapy for diarrhea, feeding difficulties and prematurity.

**Secondary marasmus**: caused by:

1. Chronic severe infection as tuberculosis, urinary tract infection, bronchiectasis, and 2. Chronic osteomyelitis.
3. Chronic diarrhea and vomiting.
4. Malabsorption syndrome.
5. Congenital malformations.
6. Metabolic disorders as galactosemia.
7. Endocrinal disease hyperthyroidism.
8. Psychological disorders.
9. Malignance as neuroblastoma

**B. Clinical manifestations:**

1. Growth failure, weight less than 60% of expected for age and sex.
2. Loss of subcutaneous fat especially from abdominal wall and limps and loss skin elasticity.
3. Marked wasting of muscle, the limps appears stick like.
4. Psychic changes the child looks anxious, irritable, excessively cry and sleep little.
5. Chronic diarrhea with or without vomiting.
6. Intercurrent infection like otitis media.
7. Hypothermia due to loss of subcutaneous fat.
8. Associated deficiency of iron and vitamin A.

**C. Complication of marasmus:**

1. Infections like thrush stomatitis, bronchopneumonia, urinary tract infection and TB.

2. Purpura and bleeding diathesis.

3. Hypoglycemia.

4. Hypothermia.

5. Early prolonged malnutrition may lead to metal sub normality. [9]

**2.6.3. Marasmic kwashiorkor:**

Is form of PEM in which clinical findings of both kwashiorkor and marasmus are evident the child has edema severe wasting and stunted growth.

Marasmus is characterized by general wasting and atrophy of the body tissue, especially of subcutaneous fat.

The child appears to be very old with flabby and wrinkled skin, unlike the child with kwashiorkor who appears more rounded from the edema fat metabolism is less impaired than kwashiorkor so that deficiency of fat soluble vitamin is usually minimal or absent.

The child is fretful, apathetic, withdrawal and so lethargic that prostration frequently occurs, intercurrent infection with debilitating disease such as tuberculosis parasitosis, and dysentery are common.

**Prevention of malnutrition:**

1. Encourage breast feeding to last as long as possible" at least in the first year.

2. Educate the people to supplement the diet of their infant with animal protein like milk, egg, meat fish etc.

3. Family planning to ensure adequate spacing of child birth.

4. Proper immunization program.

5. Proper sanitation environment fly control, garbage disposal etc.

# 3. Methodology

## 3.1. Study design:

Descriptive, cross-sectional hospital-based study, study destined: - November- 2014

## 3. 2. Study area:

The study is carried out at Shendi town which is 176km north to Khartoum and 110 km south to Elddamer, the capital of River Nile State; Shendi town lies on the eastern bank of the River Nile with a total area of about 14596 $Km^2$. The total population of Shendi 'locality' is estimated about 197589 of whom 116713 live in rural areas and 80876 in urban centers, most of them are farmers. Shendi University was established in the early 1990s and stands as a landmark institution in Higher Education. There are three big hospital; Elmek-Nimir university hospital, Shendi hospital teaching and military hospital.

## 3.3. Setting:

The study was conducted at Elmek Nimer university hospital

Elmek Nimer hospital established in 2002, it includes many departments such as medicine, pediatric, surgery, obstetric, renal and cardiac center

## 3.4. Study population:

Include all nurses' work in pediatric department both sexes male and female have deferent age, experience years and qualification.

## 3.5. Sample size:

70 nurses were participated in the study

## 3.6. Data collection tools:

Data was be collected by questionnaire and checklist to fulfill the purpose of the study.

## 3.7. Data collection technique:

1-questionnaire:

Multiple choice questions fulfill by nurses it composes 33 questions it included the fallowing parts:

**Part One**: sociodemographic Characteristics data.

**Part two**: nutrition requirement.

**Part three**: assessment of nutritional status**.**

**Part four**: malnutrition.

**2-checklist:**

Done by observation while the nurses measuring the weight and height each checklist given score according to number of steps done by nurses.

Each item evaluated as done or not done and scored as the following:

1- Poor (>3 steps)

2-Fair (3-6)

3-Good (7-10)

## 3.7. Data analysis:

Data transferred into special designed formats for data entry then data were analyzed and computed using the statistical package for social sciences (SPSS version 16.0). And presented in forms of table and figure.

## 3.8. Ethical consideration:

An explanation of the aim of the study was given to every nurse before their enrolment in the study. An oral consent was obtained; each study subject. They were assured that all the gathered data will be used for research purpose only. Participants', confidentiality, privacy, safety and protection were secured

# 4. Results

## 4.1. Sociodemographic Characteristics data

The study showed that the 28 nurse of candidate (40.0%) of study population their age between (20-25 years) and 20 of candidate (28.6%) between (30-35 years),and 22 of candidate (31.4%) between (more than 35 years), Figure (1) .61 candidate (87.1%) of them their female and 9 of candidate(12.9) is male (Figure( 2)). 63 candidate (90.0%) of the study population their qualification is Bacaloria,3 of candidate (4.3%) of the study population their qualification is diploma (figure (3)).

4 of candidate (5.7%) of the study population their qualification is master degree . and 11candidate (15.7%) of the study population have experience less than 2years ,37 of candidate (52.9) of the study population have experience between (2-5 years) ,22 of candidate (31.4%) of the study population have experience more than 5 years figure (4).

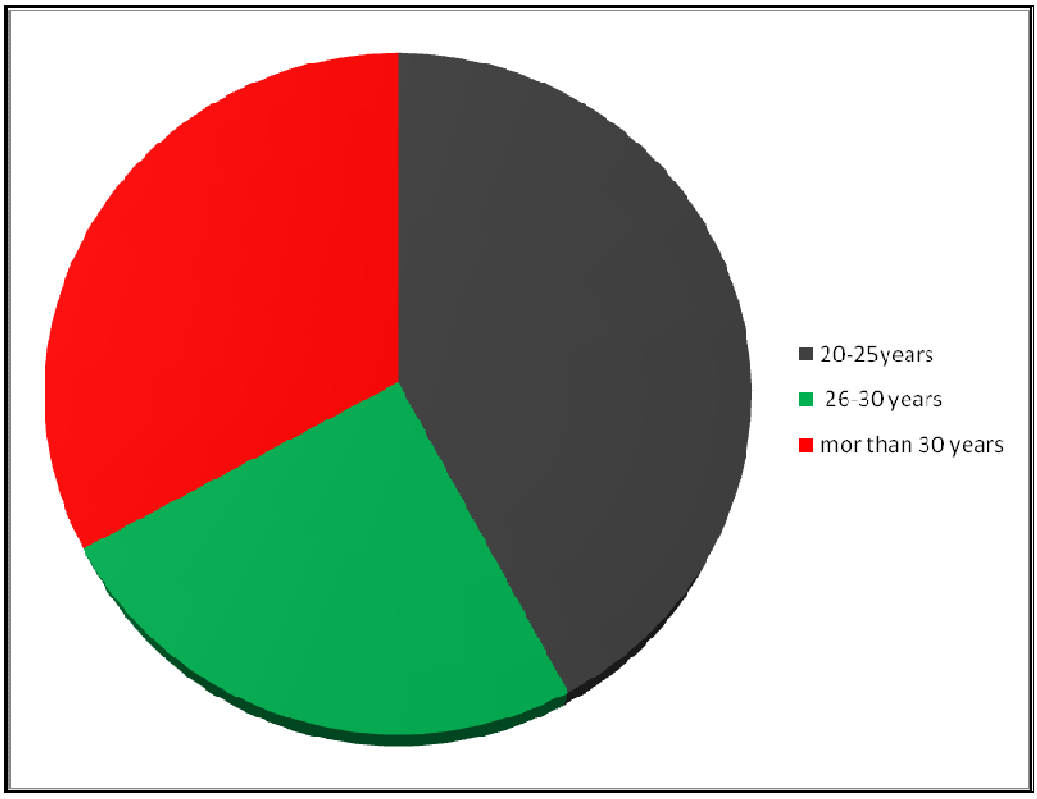


**Figure 1: Age distribution of study group**

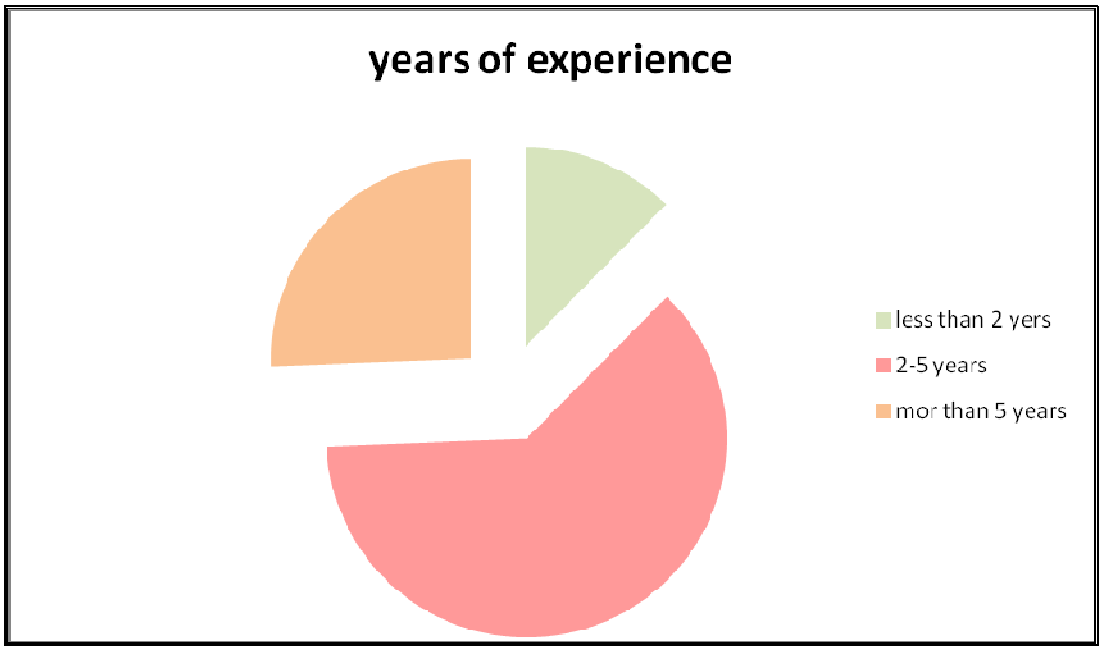


**Figure 2: show years of experience of study group**

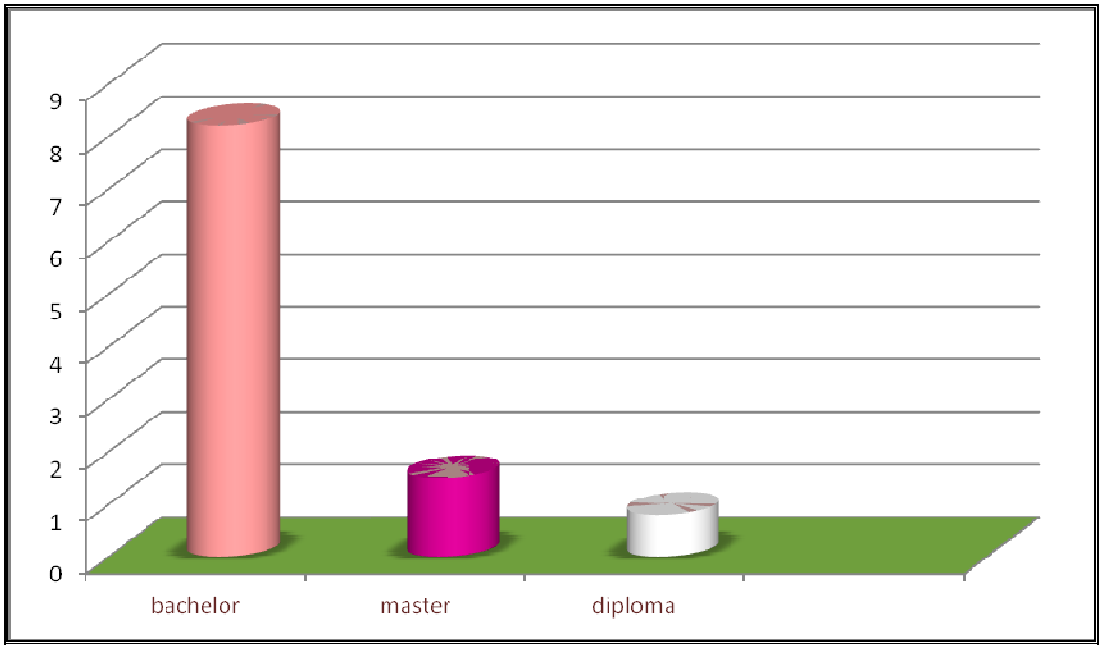


**Figure 3: distribution of study group qualification**

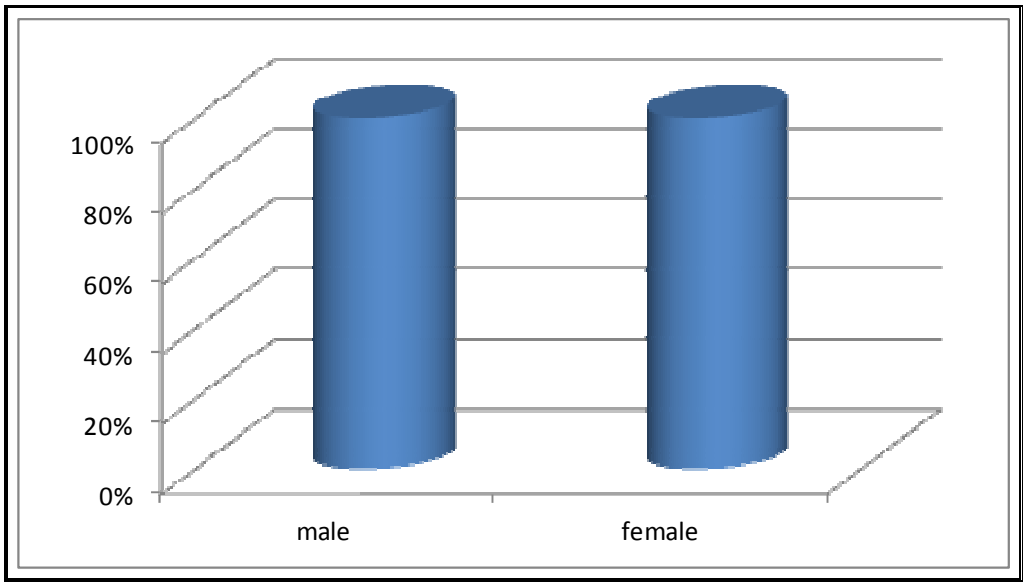


**Figure 4: distribution of study group sex of experience**

## 4.2. Nurses knowledge about nutrition requirement:

The study reveals that 47candidate (67.1%) of study population have good knowledge about the micro nutrients component and 23 candidates (32.9%) of study population have poor knowledge (table (1))

The study show that: the 9 candidate (12.9%) of study population have good knowledge and 58 candidate (87.1%) of study population have poor knowledge about the sources of energy in the food (table (2))

Also the study show that: the8of candidate (11.4%) of study population have good knowledge and 62 of candidate (89.6%) of study population have poor knowledge about the (table (3))

The study show that: the 18 of candidates (25.7%) of study population have good knowledge and 52of candidates (74.3%) of study population have poor knowledge about the classification of carbohydrates according to number of monomer unit (table (4))

The study show that: the 39 of candidate (55.7%) of study population have good knowledge and 31of candidates (54.3%) of study population have poor knowledge about the type food contain large amounts of complex carbohydrates (Table (5))

The study show that: the 39 of candidates (55.7%) of study population have good knowledge and 31 candidates (54.3%) of study population have poor knowledge about the fundamental component of protein (table (6))

The study show that: the 27 of candidates (38.6%) of study population have good knowledge and 43 candidates (61.4%) of study population have poor knowledge about the amount of calories provided by one gram of carbohydrate (table (7))

The study shows that: the 21of candidates (30.0%) of study population have good knowledge and 49candidates (70.0%) of study

population have poor knowledge about the amount of calories provided by one gram of protein (table (8))

The study show that: the 20 of candidate (28.6%) of study population have good knowledge and 50 of candidate (71.4%) of study population have poor knowledge about the amount of calories provided by one gram of fat (table (9))

The study show that: the 46 of candidates (65.7%) of study population have good knowledge and 24 of candidates (34.3%) of study population have poor knowledge about the good source of potassium (table (10))

The study show that: the 9 of candidates (12.9%) of study population have good knowledge and 61 candidates (87.1%) of study population have poor knowledge about the good sources of vitamin (A) (table (11))

The study shows that: the29 of candidates (41.4%) of study population have good knowledge and 41candidates (58.6%) of study population have poor knowledge about the low component in breast milk (table (12))

**Table 1: Distribution of study population according to knowledge about Energy substance**

| Energy substance | Frequency | Percentage |
|---|---|---|
| All of macro nutrient | 36 | 51.4% |
| vitamins, mineral and fats | 16 | 22.9% |
| Micro nutrient | 9 | 12.9% |
| macro nutrient except fiber and water | 9 | 12.9% |
| Total | 70 | 100.0% |

**Table 2: Distribution of study population according to knowledge about most energy dense food (most calories/gram)**

| Type of food | Frequency | Percentage |
|---|---|---|
| Carbohydrates | 41 | 58.6% |
| Protein | 14 | 20.0% |
| Fats | 8 | 11.4% |
| Fibers | 7 | 10.0% |
| Total | 70 | 100.0% |

**Table 3: Distribution of study population according to knowledge about classification of carbohydrates according to number of monomer unit**

| Classification of carbohydrates | Frequency | Percentage |
|---|---|---|
| Mono saccharides, disaccharides and poly saccharides | 18 | 25.7% |
| Simple and complex | 26 | 37.1% |
| Animal and blunt | 5 | 7.1% |
| Glucose, fructose and maltose | 21 | 30.0% |
| Total | 70 | 100.0% |

**Table 4: Distribution of study population according to knowledge about some type contain large amounts of complex carbohydrates**

| Type of food | Frequency | Percentage |
|---|---|---|
| White bread | 39 | 55.7% |
| Ice cream | 11 | 15.7% |
| Fructose | 10 | 14.3% |
| Sucrose | 10 | 14.3% |
| Total | 70 | 100.0% |

**Table 5: the distribution of study population according to knowledge about the fundamental component of protein**

| **Component** | Frequency | Percentage |
|---|---|---|
| Nitrogen contenting amino acid | 39 | 55.7% |
| Carbon and oxygen | 9 | 12.9% |
| Carbon and glucose | 10 | 14.35% |
| Amino acid and hydrogen | 12 | 17.1% |
| Total | 70 | 100.0% |

**Table 6: Distribution of study population according to knowledge about the amount of calories provided by one gram of carbohydrate**

| **Amount of calories** | Percentage | Frequency |
|---|---|---|
| 1 kcal of energy | 20% | 14 |
| 5 kcal of energy | 24.3% | 17 |
| 4 kcal of energy | 38.6% | 27 |
| 9 kcal of energy | 17.1% | 12 |
| Total | 100.0% | 70 |

**Table 7: Distribution of study population according to knowledge about the amount of calories provided by one gram of protean**

| **Amount of calories** | Percentage | Frequency |
|---|---|---|
| 1 kcal of energy | 38.6% | 27 |
| 5 kcal of energy | 18.6 % | 13 |
| 4 kcal of energy | 30.0% | 21 |
| 9 kcal of energy | 12.9% | 9 |
| Total | 100.0% | 70 |

**Table 8: Distribution of study population according to knowledge about the amount of calories provided by one gram of fat**

| **Amount of calories** | Percentage | Frequency |
|---|---|---|
| 1 kcal of energy | 31.4% | 22 |
| 5 kcal of energy | 25.7% | 18 |
| 4 kcal of energy | 14.3% | 10 |
| 9 kcal of energy | 28.6% | 20 |
| Total | 100.0% | 70 |

**Table 9: Distribution of study population according to knowledge about the good source of the potassium**

| **Source of the potassium** | Percentage | Frequency |
|---|---|---|
| Tomatoes | 15.7% | 11 |
| Corrote | 10.0% | 7 |
| Beans | 8.6% | 6 |
| Banana | 65.7% | 46 |
| Total | 100.0% | 70 |

**Table 10: Distribution of study population according to knowledge about the good sources of vitamin A**

| **Sources of vitamin A** | Percentage | Frequency |
|---|---|---|
| Milk | 48.6% | 34 |
| Egg | 20.0% | 14 |
| Oily fish. Liver | 12.9% | 9 |
| Cereal | 18.6% | 13 |
| Total | 100.0% | 70 |

**Table 11: Distribution of study population according to knowledge about low component in breast milk**

| **Component** | Percentage | Frequency |
|---|---|---|
| Fatty acid | 41.4% | 29 |
| Iron | 27.1% | 19 |
| Water | 15.7% | 11 |
| Sugar | 15.7% | 11 |
| Total | 100.0% | 70 |

**Table 12: Distribution of study population according to knowledge about the assess the nutritional status**

| **Assess the nutritional status** | Frequency | Percentage |
|---|---|---|
| Yes | 58 | 82.9% |
| No | 12 | 17.1% |
| Total | 70 | 100.0% |

### 4.3. Nurses knowledge about nutritional assessment:

The study show that: the 58 of candidates (82.9%) of study population have good knowledge and 12 of candidates (17.1%) of study population have poor knowledge about the assessment of the nutritional status (table (13))

The study show that: the 27 of candidates (38%) of study population have good knowledge and 43 of candidates (61.4%) of study population have poor knowledge about the purpose of nutritional assessment (table (14))

The study show that: the 26 of candidates (37.1%) of study population have good knowledge and 43 candidates (62.9%) of study population have poor knowledge about the weight measuring for child > 3 year-old

(Table (15))

The study show that: the 39 candidates (55.7%) of study population have good knowledge and 31candidates (44.5%) of study population have poor knowledge about the appropriate way to measure the height for child > 2 years old cannot stand, but can sit upright (table (16))

The study show that: the 36 candidates (51.4%) of study population have good knowledge and 34candidates (48.4%) of study population have poor knowledge about the appropriate tool used to measure the length in children younger than 2years of age (table (17))

The study show that: the 29 candidates (41.4%) of study population have good knowledge and 41 candidates (58.6%) of study population have poor knowledge about the calculation of the Body mass index (table (18))

The study show that: the 26of candidates (37.1%) of study population have good knowledge and 44candidates (62.1%) of study population have poor knowledge about the assessment tools that used to assess the weight of children under the age of 2 years (table (19))

The study show that: the 20 of candidates (55.7%) of study population have good knowledge and 50 of candidate (44.%) of study population have poor knowledge about the useful way to measure the height for child with special health care needs (table(20)).

**Table 13: Distribution of study population according to knowledge about the purpose of nutritional assessment**

| **Purpose of nutritional assessment** | Frequency | Percentage |
|---|---|---|
| Growth pattern | 27 | 38.6% |
| Food component | 19 | 27.1% |
| s\s of malnutrition | 20 | 28.6% |
| Non above | 4 | 5.7% |
| Total | 70 | 100.0% |

**Table 14: Distribution of study population according to knowledge about the proper method in weighing the children > 2 years**

| **Methods** | Frequency | Percentage |
|---|---|---|
| In light clothing and shoes | 26 | 37.1% |
| With outer clothing and shoes removed | 26 | 37.1% |
| Fully clothed | 12 | 17.1% |
| Dressed, in a parent's arms | 6 | 8.6% |
| Total | 70 | 100.0% |

**Table 15: Distribution of study population according to knowledge about the assessment tools that used to assess the weight of children < 2 years**

| **Assessment tools** | Frequency | Percentage |
|---|---|---|
| pan- or bucket seat-type | 26 | 37.1% |
| platform scale | 26 | 37.1% |
| standing scale | 12 | 17.1% |
| calibrated beam | 6 | 8.6% |
| Total | 70 | 100.0% |

**Table 16: Distribution of study population according to knowledge about the best tool to weighing the children >2 years but with special need**

| **Best tool** | Frequency | Percentage |
|---|---|---|
| use a platform Scale on which a wheelchair can be placed | 32 | 45.7% |
| a bed scale | 20 | 28.6% |
| calibrated beam balance scale | 17 | 24.3% |
| platform scale | 1 | 1.4% |
| Total | 70 | 100.0% |

**Table 17: Distribution of study population according to knowledge about appropriate tool used to measure the length in children younger than 2years of age**

| **Appropriate tool** | Frequency | Percentage |
|---|---|---|
| Length board | 36 | 51.4% |
| Standing scale | 30 | 42.9% |
| Digital scale | 4 | 5.7% |
| Total | 70 | 100.0% |

**Table 18: Distribution of study population according to knowledge about appropriate way to measure the height for children >2 years old cannot stand, but can sit upright**

| **Appropriate way** | Frequency | Percentage |
|---|---|---|
| Sitting height | 39 | 55.7% |
| Arm span | 17 | 24.3% |
| Mid arm muscle circumference | 5 | 7.1% |
| Crown-rump length | 9 | 12.9% |
| Total | 70 | 100.0% |

**Table 19: Distribution of study population according to knowledge about the calculation of the Body mass index**

| **Calculation of the BMI** | Frequency | Percentage |
|---|---|---|
| Dividing the child weight in Kg by their height in meters sq | 29 | 41.4% |
| Dividing the child weight in Kg by their height in centimeter | 23 | 32.9% |
| Adding the child weight in Kg to their height in meters | 10 | 14.3% |
| Compeer the actual child weight to standard weight | 8 | 11.4% |
| Total | 70 | 100.0% |

**Table 20: Distribution of study population according to knowledge about the definition of the malnutrition**

| **Definitions** | Frequency | Percentage |
|---|---|---|
| Insufficient of the nutrient and energy | 35 | 50.0% |
| Inadequate body fluid | 20 | 28.6% |
| Increase in the body fats | 3 | 4.3% |
| Over weight | 12 | 17.1% |
| Total | 70 | 100.0% |

### 4.4. Nurses knowledge about malnutrition:

The study show that: the 35 candidates (50.0%) of study population have good knowledge and 35candidates (50.0%) of study population have poor knowledge about the definition of the malnutrition (table (21))

The study show that: the 26 of candidates (37.1%) of study population have good knowledge and 44 of candidates (62%) of study population have poor knowledge about the sign and symptom of malnutrition (table (22))

The study show that: the 22 of candidates (35.7%) of study population have good knowledge and 48 of candidates (65%) of study population have poor knowledge about the definition of kowashencor (table (23))

The study shows that: the 13of candidates (18.6%) of study population have good knowledge and 47ofcandidates (81.4%) of study population have poor knowledge about the cardinal manifestation of the kowashencor (table (24))

The study show that: the 31of candidate (44.3%) of study population have good knowledge and 39 of candidate (55.7%) of study population have poor knowledge about the nutrient deficiency in marasmus (table (25))

The study shows that: the 42 of candidates (60.0%) of study population have good knowledge and 28candidates (40.0%) of study population have poor knowledge about the complication of marasmus (table (26)

**Table 21: Distribution of study population according to knowledge about the sign and symptom of BIM**

| **Symptoms** | Frequency | Percentage |
|---|---|---|
| Edema | 23 | 32.9% |
| Growth change | 16 | 22.9% |
| Muscle wasting | 5 | 7.1% |
| All of above | 26 | 37.1% |
| Total | 70 | 100.0% |

**Table 22: Distribution of study population according to knowledge about the cause of kowashencor**

| **Definitions** | Frequency | Percentage |
|---|---|---|
| Carbohydrate deficiency | 25 | 35.7% |
| Protein deficiency | 22 | 31.4% |
| Increase in protein intake | 8 | 11.4% |
| Micronutrients deficiency | 15 | 21.4% |
| Total | 70 | 100.0% |

**Table 23: distribution of study population according to knowledge about the cardinal manifestation of the kowashencor**

| **Manifestations** | Frequency | Percentage |
|---|---|---|
| Anaemia, diarrhoea and heir change | 31 | 44.3% |
| Hypoproteinemia | 19 | 27.1% |
| Vomiting and revised the feeding | 7 | 10.0% |
| Oedema, growth retardation, muscle wasting and psychic change | 13 | 18.6% |
| Total | 70 | 100.0% |

**Table 24: Distribution of study population according to knowledge about the cause of marasmus**

| **Nutrients** | Frequency | Percentage |
|---|---|---|
| Carbohydrate + protein deficiency | 31 | 44.3% |
| Manly carbohydrate deficiency | 18 | 25.7% |
| Manly protein deficiency | 7 | 10.0% |
| Protein +fatty acid deficiency | 14 | 20.0% |
| Total | 70 | 100.0% |

**Table 25: Distribution of study population according to knowledge about the complication of marasmus**

| **Complications** | Frequency | Percentage |
|---|---|---|
| Hypothermia | 42 | 60.0% |
| Hyponatremia | 14 | 20.0% |
| Hyperthermia | 2 | 2.9% |
| Hyperglycemia | 12 | 17.1% |
| Total | 70 | 100.0% |

## Table 26: Distribution of study population according to practice about the measurement of standing height

| | Not done | | Done | | Items |
|---|---|---|---|---|---|
| **Total** | **Percentage** | **Frequency** | **Percentage** | Frequency | |
| 70<br><br>100 % | 92% | 65 | 7.1% | 5 | **Explain the procedure to child and his\her parent and calm the child to remove anxiety and fair** |
| | 31 % | 22 | 68 % | 48 | **Place clean paper where child stands** |
| | 82.9% | 58 | 17.1% | 12 | **Remove child shoes and hats** |
| | 85.8 % | 60 | 14.2 % | 10 | **child should stand tall and straight with head in midline and line of vision parallel to the floor** |
| | 44.3% | 31 | 55.7% | 39 | **the child back should be to the vertical flat surface with heals ,buttocks and back of the shoulders touching the surface** |
| | 45.7 % | 32 | 54.3 % | 38 | **Insuring that the child hands at sides, knees or thighs together and** |
| | 55.7% | 39 | 44.3 % | 31 | **Stand directly to the side of the child** |
| | 100.0 % | 70 | 00.0 | 0 | **Lower the headboard until it firmly touches the crown of the head and creates a right angle with the measurement surface.** |
| | 57.1% | 40 | 42.9% | 30 | **Read the stature to the nearest 1/2th cm where the bottom of the headboard touches the measuring tape.** |
| | 100.0 % | 70 | 00.0 | 0 | **Record the height immediately** |

**4.5. Nurses practice about anthropometric measurements (weight and height):**

The study shows that: the (92%) of study population have good practice about explain the procedure to child and his\her, only (22%) Place clean paper where child stands (58%) Remove child shoes and hats,(55.7%) stand directly to the side of the child and (100.0%) record the height immediately (table (27))

The study shows that: the (52.9%) of study population have good practice about confirm that the sliding weights are at the zero, (80.0%) rise up the child chine by flections the nick slightly and (28.6%) return the weight scale to the zero position(table (28))

The study shows that: the (61.5%) of study population has good practice about

Measurement of standing height and (38.5%) of study population has fair practice (table (29))

The study shows that: the (71.5%) of study population has good practice about measurement of standing weight and (28.5%) of study population has fair practice

(Table (30))

## Table 27: Distribution of study population according to practice about the measurement of standing weight

| Total | Percentage | Frequency | Percentage | Frequency | Items |
|---|---|---|---|---|---|
| 70<br>%100 | 78.6% | 55 | Percentage | 15 | Explain the procedure to child and his\her parent and calm the child to remove anxiety and fair |
| | 52.9% | 37 | 21.4 % | 33 | Confirm that the sliding weights are at the zero |
| | 54.3% | 38 | 45.7% | 32 | Place clean paper on foot area |
| | 55.7 % | 39 | 45.7% | 31 | Child |
| | 80.0 % | 56 | 44.3% | 31 | Remove all heavy clothing and shoes |
| | 60.0% | 42 | 44.3% | 28 | Help the child to stand in the center of the platform with body upright and arms hanging naturally |
| | 80.0 % | 54 | 40.0% | 14 | Rise up the child chine by flections the nick slightly |
| | 100.0 % | 70 | 20.0 % | 0 | Read the weight While the child remains in position |
| | 100.0 % | 70 | 00.0% | 0 | Record the child weight |
| | 28.6% | 20 | 00.0% | 50 | Return the weights to the zero position |

**Table 28: Distribution of study population according to performance score about the measurement of standing height**

| **Scores** | Frequency | Percentage |
|---|---|---|
| Poor(< 3) | 0 | 00.0% |
| Fair ( 3-6) | 27 | 38.5% |
| Good ( 7-10) | 43 | 61.5 % |
| Total | 70 | 100.0% |

**Table 29: Distribution of study population according to performance score about the measurement of standing weight**

| **Scores** | Frequency | Percentage |
|---|---|---|
| Poor(< 3) | 0 | 00.0% |
| Fair ( 3-6) | 20 | 28.5% |
| Good ( 7-10) | 50 | 71.5 % |
| Total | 70 | 100.0% |

### 6.6. Significant of the study:

The study shows that the correlation is not significant

**Table 30: Relation between level of education and knowledge about tool used to measure the length in children younger than 2years of age should be used Cross tabulation**

| level of education | Tool used | | | Total |
|---|---|---|---|---|
| | Digital scale | **Standing scale** | **Length board** | |
| Diploma | 0 | 1 | 2 | 3 |
| Bachelor | 3 | 27 | 33 | 63 |
| Master | 1 | 2 | 1 | 4 |
| Total | 4 | 30 | 36 | 70 |

**P value =0.125**

**Table 31: level of education * the best way to weighing the children who are too large for the infant scale, but cannot stand Cross tabulation**

| **level of education** | **Tool used** | | | | **Total** |
|---|---|---|---|---|---|
| | **platform Scale on which a wheelchair** | **a bed scale** | **calibrated beam balance scale** | **platform Scale on which a wheelchair** | |
| **Diploma** | **3** | **0** | **0** | **3** | **3** |
| **Bachelor** | **26** | **19** | **17** | **26** | **63** |
| **Master** | **3** | **1** | **0** | **3** | **4** |
| **Total** | **32** | **20** | **17** | **32** | **70** |

**P value=0.436**

**Table 32: Experience years to measuring the length in children younger than 2years of age should be used Cross tabulation**

| Experience years | | Tool used | | Total |
|---|---|---|---|---|
| | Digital scale | Standing scale | Length board | |
| Less than 2 years | 0 | 2 | 9 | 3 |
| 2-5 years | 2 | 18 | 17 | 63 |
| More than 5 years | 2 | 10 | 10 | 4 |
| Total | 4 | 30 | 36 | 70 |

**P value =0.075**

**Table 33: Experience years * the best way to weighing the children who are too large for the infant scale, but cannot stand Cross tabulation**

| Experience years | Tool used | | | Total |
|---|---|---|---|---|
| | Platform scale | Calibrated beam balance scale | A bed scale | |
| Less than 2 years | 0 | 2 | 3 | 3 |
| 2-5 years | 1 | 11 | 12 | 63 |
| More than 5 years | 0 | 4 | 5 | 4 |
| Total | 1 | 17 | 20 | 70 |

**P value =0.53**

# 5. Discussion

This study was done in Elmek Nimer hospital in period extend of July to distemper 2014 to Assessment of nursing knowledge regarding nutrition and assessment of nutritional status in children under 5 years

**5.1. Personal characteristic:**

The study found that the 40.0% of candidate their age group (20-25), (87.0% ) were female,( 90.0%) of nurses were Bacaloria and 15% of them their experience less than 2years is indicate that most nurses are young and have experience and high certificate that make the training for them so easy

**5.2. Nurses knowledge about nutrition**

It was show that (67.1%) of study population their knowledge about the micro nutrients component which are vitamins, mineral, fiber and photo chemicals.(1) that matched with (Kristy, M ,H) .

Majority of the study group (87.1%) their knowledge about sources of energy is good and ( 58.0%) belief that the most energy dense foods are carbohydrates this is not true at (Kristy ,M ,H) how is reported that the sources are all of macronutrients except the water and fiber, and the fat is the most energy dense food. (1) That indicate to most nurses haven't knowledge about the sources of energy.

Regarding the classification of carbohydrates according to number of monomer unit only (25.0%) believed that which are mono saccharides, disaccharides and poly saccharides. and ( 55.7% )their belief about the type of food contain large amounts of complex carbohydrates is white bread this result is matched with (Joyce Y Johnson) is indicate that more than half of nurses has poor knowledge about the classification of carbohydrates but has good knowledge about type of food contain large amounts of complex carbohydrates .

Study show that the (55.7%) of nurses their knowledge about the fundamental component of protein is nitrogen contenting amino acid. [1] This is matching with Kristy (2006).

Most of the nurses has poor knowledge about the amount of calories provided by food component as the (38.6%) of nurses their knowledge about the amount of calories provided by 1g of carbohydrate are 4kcal, (30.0%) of nurses their knowledge about the amount of calories provided by 1g of protein is 4kcal and (28.6%) of nurses their knowledge about the amount of calories provided by 1g of fats is provide 9kcal of energy.

Nurses knowledge about the source of the potassium from some type of food is good (65.7%) of study group but their knowledge about the source vitamin A is poor (12.9) of the study group

Nurses knowledge about the low component in the breast milk is poor that correlated with Jill KR who found that more nurses has poor knowledge.

**5.3. Nutritional assessment:**

It was show that is (38.6%) are known that the purpose of nutritional assessment is growth pattern. [6]

The study showed that (37.1%) their knowledge about the proper method in weighing of normal children >2 years is weighing the child with outer clothing and shoes removed. [7] ,( 55.7%) are know the appropriate tool that used to assess the weight of normal children < 2 years and 74.3% their knowledge about the best tool to weighing the children >2 years but with special need is platform Scale on which a wheelchair can be placed and used of the abed scale.

The study show that the 51.4% their Nurses have good knowledge about both the appropriate tool and way used to measure the length in

children <2years and to measure the height for children >2 years old cannot stand, but can sit upright are sitting height. [1]

Only (41.4%) their knowledge about the calculation of the Body mass index are Dividing the child weight in Kg by their height in meters sq.[1] that is indicate the poor knowledge about BMI calculation

**5.4. Nurses knowledge about malnutrition:**

Malnutrition is defined as insufficient of the nutrient and energy [5] only half the nurses (50.0%) know the definition, indicate is good knowledge

Regarding knowledge about the BIM just (37.1) their knowledge about the sign and symptom of BIM which are edema, growth change and muscle wasting, (43.3%) know the cardinal manifestation of kowashencor, (33.7%) know the causes of kowashencor and (44.3%) know the causes of marasmus, this result correlated with (Vocalic, T) who found that most of the nurses has poor knowledge about BIM [4].

**5.5. Nurses practice about weight and height measurement:**

It was show that the (61.5%) of nurses has good performance about height measurement practice and (71.5%) of nurses has good performance about weight measurement practice that indicate the most nurses have good performance.

# 5.1. Conclusion

Based on the finding of present study it was concluded that:

- Half of study population had poor knowledge about children nutrition, and needed more orientation and lectures about pediatric nutrition.
- They have good knowledge about micronutrient.
- Nurses have poor knowledge about causes; singe and symptoms of malnutrition bout have good knowledge about complications of marasmus.
- Half of the nurses have poor knowledge about calculation of BMI.
- Most of study population has good performance about anthropometric measurements practice.

# 5.2. Recommendations

Based on the study result the following recommendation should be implemented:-

- To ministry health to do a constructed notional program to educate the nurses and increase their knowledge about the children nutrition.
- To hospital directors to organize courses about children nutrition and malnutrition to increase awareness among nurses are working in the padeiatric department.
- To head nurse in padeiatric department to develop plan to Increase nurse awareness about nutritional assessment and make more training about using of anthropometric measurements.
- To conduct further researches to do more evaluation.

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بسم الله الرحمن الرحيم

**UNEVERSITY OF SHENDI**

**FACULTY OF GRADUATE AND SCINTIFIC RESEARCH**

**Questionnaire about Assessment of nursing knowledge regarding nutrition and assessment of nutritional status of children less than 5 years**

Part (1) demographical data

1-age:

A-20 - 25 years ( ) b- 26- 30 years ( ) more than 30years ( )

Gender:

Male ( ) female ( )

2-Level of education:

a- Diploma ( ) b- bachelor ( ) c- master ( )

D- PhD ( )

3- years of experience:

a-Less than 2 years ( ) b- 2-5 years ( ) more than 5 years

Part (2) related to nutrition knowledge:

1-Micr nutrients component are: -

A- Vitamins and mineral fibers and photochemical ( )

B-water, fiber and fats ( )

C-vitamins only ( )

D-Sugar, salt and oil ( )

2-Energy provided by:-

A-All of macro nutrients ( ) B-vitamins, mineral and fats ( ) C- Micro nutrient ( ) D-macro nutrient except fiber and water ( )

3- The most energy dense food (most calories/gram) is:

A-Carbohydrates ( ) B- Protein ( ) C- Fats ( ) D-fibres ( ) 4. The source of large amounts of complex carbohydrates

A- White bread ( ) B- ice cream( ) C- fructose ( ) D-sucrose( )

5-the fundamental component of protein is:-

A-Nitrogen contenting amino acid ( ) B-Carbon and oxygen( ) C- Carbon and glucose( ) D-Amino acid and hydrogen( )

6-Carbohydrates according to number of monomer unit classification as:-

A-Mono saccharides, disaccharides and poly saccharides ( )

B-Simple and complex ( ) C-Animal and blunt ( )

D-Glucose, fructose and maltose ( )

7-One gram of fat provide approximately:-

A-1 kcal of energy ( ) b- 5 kcal of energy ( )

C-4 kcal of energy ( ) D-9 kcal of energy ( )

8- 1g of protean provide approximately:

A-1 kcal of energy ( ) b- 5 kcal of energy ( )

C-4 kcal of energy ( ) D-9 kcal of energy ( )

9-1g of carbohydrate provide approximately:

A-1 kcal of energy ( ) b- 5 kcal of energy ( )

C-4 kcal of energy ( ) D-9 kcal of energy ( )

10-witch the flowing foods is good source of the potassium

A- tomatoes ( ) B-Corrote ( )

C-beans ( ) D-banana( )

9-Good sources of vitamin A include:-

A- milk ( ) B-egg ( ) C- oily fish. Liver( ) D-cereal ( )

10- breast milk is low in :-

A-Fatty acid B-Iron( ) C-Water( ) D-sugar( )

<u>Part (3) related to assessment of nutritional status:</u>

11-Do you know how to assess the nutritional status?

A-Yes ( ) B-No ( )

12-Nuritonal assessment is routine procedure to estimate the;

A- Growth pattern B-food component ( )

C- S\S of malnutrition ( ) d-non above

13-A 3-year-old child should be weighed:

A. in light clothing and shoes ( ) B-with outer clothing and shoes removed( ) C. fully clothed ( ) D. dressed, in a parent's arms( )

14-child >2 years old cannot stand, but can sit Upright which of the following measurements would be the most appropriate estimator of height:

A. sitting height ( ) B. arm span ( )

C. mid arm muscle circumference ( ) D. crown-rump length( )

16-To measuring the length in children younger than 2years of age should be used:-

A-Length board ( ) B-Standing scale ( ) C-Digital scale( )

17-Body mass index is determined by:-

A-Dividing the child weight in Kg by their height in meters squared ( )

B- Dividing the child weight in Kg by their height in centimetres ( )

C- Adding the child weight in Kg to their height in meters ( )

D-Compeer the actual child weight to standard weight ( )

18-to assess the weight of children under the age of 2 years should be measured on:

A- pan- or bucket seat-type B- platform scale ( )

C-digital scale( ) D- calibrated beam ( )

19-the best way to weighing the children who are too large for the infant scale, but cannot stand:-

A-use a platform Scale on which a wheelchair can be placed ( )

B- a bed scale ( ) C- calibrated beam balance scale( )

D- platform scale ( )

20- the useful measure of the height for child >2 years with special health care needs are A-crown-rump length( ) B- sitting height ( )

C-board box( )

Part (4) related to malnutrition:-

21- Malnutrition Is:-

A-Insufficient of the nutrient and energy ( )

B-Inadequate body fluid ( ) C-Increase in the body fats ( )

D-Over weight ( )

22-the sign and symptom of malnutrition is:-

a-oedema ( ) b- growth change ( )

c-muscle wasting ( ) d-all of above ( )

23-Kowashencor is manly deficiency of:-

A-carbohydrate deficiency ( ) B-Deficiency of essential protein

C-Increase in protein intake ( ) D-Micronutrients deficiency ( )

24-Cardinal manifestation of the kowashencor is: -

A-Anaemia, diarrhoea and heir change ( ) B-Hypoproteinemia ( )

C-Vomiting and revised the feeding ( )

D-Oedema, growth retardation, muscle wasting and psychic change ( )

24- marasmus is manly deficiency of:-

a- carbohydrate + protein ( ) b- manly carbohydrate ( )

c-manly protein ( ) d-protein +fatty acid ( )

25-Complication of marasmus is:

Hypothermia ( ) B-Hyponatremia ( ) C-Hyperthermia ( )

D-Hyperglycaemia ( )

| Skill step | Done | Not done |
|---|---|---|
| Explain the procedure to child and his\her parent and calm the child to remove anxiety and fair | | |
| Place clean paper where child stands. | | |
| Remove child shoes and hats. | | |
| child should stand tall and straight with head in midline and line of vision parallel to the floor | | |
| the child back should be to the vertical flat surface with heals ,buttocks and back of the shoulders touching the surface | | |
| Insuring that the child hands at sides, knees or thighs together and feet flat on floor or foot piece | | |
| Stand directly to the side of the child | | |
| Lower the headboard until it firmly touches the crown of the head and creates a right angle with the measurement surface. | | |
| Read the stature to the nearest 1/2th cm where the bottom of the headboard touches the measuring tape. | | |
| Record the height immediately | | |

| Skill step | Done | Not done |
|---|---|---|
| Explain the procedure to child and his\her parent and calm the child to remove anxiety and fair | | |
| Confirm that the sliding weights are at the zero | | |
| Place clean paper on foot area | | |
| Remove all heavy clothing and shoes | | |
| Help the child to stand in the center of the platform with body upright and arms hanging naturally | | |
| Rise up the child chine by flections the nick slightly | | |
| Read the weight While the child remains in position | | |
| Record the child weight | | |
| Return the weights to the zero position. | | |