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FACTORS EFFECTING PROTEIN ENERGY MULNUTRITION ON CHILDREN UNDER FIVE YEARS IN BENADIR REGION.

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DECLARATION

we declare that this thesis entitled factors effecting protein energy malnutrition on children under five year children in Mogadishu-Somalia is the result of our own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature for any other degree.

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This thesis entitled factors effecting protein energy malnutrition on children under five years in Mogadishu-Somalia, was prepared by and submitted by ,**Mohamed Abrisaq Mahamuud, Amina Nor Siad, Anfac Abdulahi Mohamed, Ikram Said Ali Hussein Zakia Abdulahi Abdi** in partial fulfillment of the requirement for the award of the degree of Bachelor of public administration has been examined and accepted by examining panel with a grade of **passed**

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DEDICATION

This work is dedicated to our parents who taught us discipline, patience, and self-righteousness.

May Allah reward and keep them prosperous and wellbeing.

To our beloved mothers and fathers

Table of contents

Original literary work declaration……...I

Abstract …….....II

Acknowledgement ……..…...III

Dedication…….……IV

Table of contents….....V

List of Tables….....VIII

List of figures……..….....VIII

Abbreviation…….….....IX

Chapter one: introduction…….....1

1.1 introduction…….....1

1.2 background…….1

1.3 significant of study…….4

1.4 statement of problem……..4

1.5 research objectives……..……5

1.5.1 general objectives……..……..……..…5

1.5.2 specific objectives…….…5

1.6 research question……5

1.7 hypothesis……..…….6

1.8 scope of study……..6

1.8.1 geographical scope……..…….……6

1.8.2 time scope…….……....6

1.9 limitation of the study……7

1.10 Justification……..7

1.11 Key terms ……7

Chapter two: literature review ……..……..9

2.1 introduction……9

2.2theoratical overview ……..9

2.2.1 Types of protein energy malnutrition……11

2.2.1.1 Kwashiorkor……11

2.2.1.2 Marasmus……12

2.2.1.3 marusmic-kwashikor ……12

2.2.2 Clinical features of protein energy malnutrition……13

2.2.3 Effect of PEM on children……..14

2.2.4 Diagnose of protein energy malnutrition…….14

2.2.5 Anthropometric measurement ……15

2.2.5.1 Weight……..……15

2.2.5.2 Mid-upper arm circumferences (MUAC) ……15

2.2.5.3 Height or length…….16

2.2.7 Management and control……..16

2.2.8 Biochemical markers …….……...17

2.2.9 Interventions ……18

2.3 Empirical review…….19

2.4 conceptual framework…….21

2.4.1 Variables……21

2.4.1.1 Unbalanced diet ……..21

2.4.1.2 Lack of awareness of mother on child nutrition …….23

2.4.1.3 Poor breast feeding……..23

2.5 critique of existing literature……..……25

2.6 research gab ……26

1.7 research summary ……...27

Chapter three: methodology……..28

3.1 introduction…….....28

3.2 research design ……28

3.3 research population …….28

3.4 sample frame ……..29

3.5 sample and sample technique……..29

3.5.1 The sample study formula used in Slovenes formula……..30

3.6 research instrument ……..30

3.7 pilot test: validity of the instrument ……30

3.8 data gathering procedure ……31

3.9 data analysis ……31

Chapter four: research findings and discussion ……32

Chapter five: summary, conclusion and major findings ……48

5.1 Over view……..48

5.2 discussion and summary of major findings ……..48

5.3 summary and conclusion ……..49

5.4 recommendation ……50

LIST OF TABLES

Table 4.1: respondent's educational level

Table 4.2 what are some foods that children are allowed to eat in house hold?

Table 4.3 what cause protein energy malnutrition

Table 4.4 when do you give exclusive breast feeding to the child?

LIST OF FIGURES

Figure 4.1: Gender of the respondent

Figure 4.2 age of the respondent

Figure 4.3 marital statuses of respondents

Figure 4.4 respondent's occupation

Figure 4.5 type of weaning food given to child

Figure 4.6 what are foods that children are not allowed to eat in household?

Figure 4.7 do you have any taboos with regard on foods?

Figure 4.8 when children is started to give complementary foods?

Figure 4.9 what of food did you start with?

Figure 4.10 how to improve the awareness of mother to child health?

Figure 4.11 do the mothers give exclusive breast feeding to the infant?

Figure 4.12 if the mothers do not give exclusive breast feeding to the infant it cause PEM?

Abbreviations

TFS triceps skin fold

PEM protein energy malnutrition

WHO world health organization

HIV human immunodeficiency virus

NGO nongovernmental organization

PEU protein energy under nutrition

IV intravenous

MUAC mid-upper arm circumference

WCA west and central Africa

CWC child welfare centers

Abstract

Protein energy malnutrition (PEM) refers to “an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and function”.

The purpose of this study is to investigate the factors effecting protein energy malnutrition on children under five years This study was conducted in the BANADIR REGION. We Investigate three objectives which are: To determine Effect of unbalanced diet on child nutrition, To improve awareness of mother’s child nutrition and To ensure that the mother gives her baby exclusive breast feeding. The study was conducted with the sample of 80 respondents selected from 9 health centers in Mogadishu City, Somalia. And the study was conducted between February 2016 and up to august 2016. Document analyzes and Questionnaires were used as tools of data collecting. The participants were male and female, 61.3% were female and 38.7% were male. This data was used SPSS program version 20 and excel to analyze.

The researchers find out during this study that the factors effecting protein energy malnutrition on children under five year in Benadir region have generally social problems especially community awareness that influencing the health of the baby in Benadir region.

Our main recommendation is Nutrition and health education should be given to social by media to enable them to prevent PEM in children as whole.

Chapter one

1.1 Introduction

This chapter consists of the following sections: background of the study, significant of the study, problem statement, research objectives (general objectives and specific objectives), research questions, research hypothesis, and scope of the study(, geographical scope and time scope.

1.2: Background of the study

Malnutrition ‘especially among young children is a widespread problem in most developing countries. Over one hundred million children less than five years of age suffer from protein-energy malnutrition and more than ten million of them suffer from severe protein energy malnutrition, which is usually fatal if untreated ((WHO, 1981)The primary causes of morbidity and mortality among children aged less than 5 years are pneumonia, diarrhea diseases, low birth weight, asphyxia and in some parts of the world, human immunodeficiency virus (HIV) infection and malaria. One out of every two such deaths has malnutrition as the underlying cause ((Murray sand Lopez, 1997). However, malnutrition is rarely cited as being among the leading causes of death even though it is prevalent in developing countries ((WHO 2. , 2000).**Malnutrition** or **malnourishment** is a condition that results from eating a diet in which nutrients are either not enough or are .

It may involve calories, protein, carbohydrates, vitamins or minerals. Not enough nutrients is called **under nutrition** or **undernourishment** while too much is called over nutrition. Malnutrition is often used specifically to refer to under nutrition where there are

not enough calories, protein, or micronutrients. If under nutrition occurs during pregnancy, or before two years of age, it may result in permanent problems with physical and mental development According to World Health Organization, protein energy malnutrition (PEM) refers to “an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and function”. It is a major public health problem in Africa. It affects particularly the preschool children (<6 years) with its dire consequences ranging from physical to cognitive growth and susceptibility to infection. This affects the child at the most crucial period of time of development which can lead to permanent impairment in later life (Marry 2000).

PEM is measured in terms of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height). The prevalence of stunting among under five is 48% (moderate and severe) and wasting is 20% (moderate and severe) and with an underweight prevalence of 43% (moderate and severe). it is the highest in the world. The majority of children suffering from under nutrition (80%) are the mild and the moderate forms which go unnoticed and the early ages are affected more which makes the process irreversible ((WHO2015), 2015)

Malnutrition is currently the leading cause of global burden of disease ((Ezzati et al., 2002) and has been identified as the underlying factor in about 50% of deaths of children under 5 years of age in developing countries (Black *et al.*, 2003). The condition may result from lack of food or from infections that cause loss of appetite while increasing the body's nutrient requirements and losses. Children between 12 and 59 months old are especially at risk since they are the most vulnerable to infections such as gastroenteritis and measles ((WHO 2. , 2000)

It is estimated that, in developing countries, more than one-quarter of all children younger than 5 years of age are malnourished ((WHO 2. , Estimation of PEM of children in developing countries , 2000) Protein-energy under nutrition (PEU), previously called protein-energy malnutrition, is an energy deficit due to chronic deficiency of all macronutrients. It commonly includes deficiencies of many micronutrients. PEU can be sudden and total (starvation) or gradual. Severity ranges from subclinical deficiencies to obvious wasting (with edema, hair loss, and skin atrophy) to starvation. Multiple organ systems are often impaired .The term protein energy malnutrition applies to a group of related disorders that include marasmus, kwashiorkor and intermediate states of marasmic kwashiorkor. Marasmus involves inadequate intake of protein and calories and is termed "the sickness of the weaning" with no edema ((de Onis et al., 1993)). Kwashiorkor including marasmic kwashiorkor is characterized by massive edema of the hands and feet, profound irritability, anorexia and desquamative rash, hair discoloration and a large fatty liver ((Manary and Brewster, 1997) Hypoalbuminaemia and electrolyte imbalances have been put forward as possible causes of the edema ((Ahmed et al., 2009)Indicators of these forms of Malnutrition are underweight (the child weighs significantly less than well-nourished children of same age) and wasting (the child weighs significantly less than well-nourished children of the same height), which indicates recent malnutrition. Stunting is a form of chronic malnutrition where the child is significantly shorter in comparison with children of same age who are well nourished. Acute PEM is a severe form of protein energy malnutrition. There are usually two forms, kwashiorkor and marasmus, which may lead to death if not well, attended to (Svedberg, 1987).

Infants and young children are the most severely affected by PEM because of their high energy and protein needs relative to body weight and their particular vulnerability to infection (Ibeziako L NS, 2012).

1.3 significance of the study:

This study will produce knowledge that will use by the community, health workers, and nutritional policies. It will also help's people to understand how to prevent effect of protein energy malnutrition, understanding food that rich protein and calorie, how to treat protein energy malnutrition. The study- documented information which assists to government, local leaders, NGOs to implement and develop interventions to improve nutrition status of the children.

The study may helpful to nutritional policy to improve prevention of protein energy nutrition.

The result of our study is an important beneficial to those people who are interesting to observe or to get information about this study.

1.4 statement of the problem

PEM impairs the linear growth of children, leading to a further reduction in food intake, nutrient absorption, direct or catabolic nutrient losses and increased metabolic requirements. Early diagnosis of protein energy malnutrition will prevent complications from occurring in children who fall victim to the condition. Since the collapse of the central government of Somalia in 1991 the population in the country passed more than

two decades under civil war and lawless duration of that time there were not any functioning research institutes of factors effecting protein energy malnutrition on children under five year in Somalia especially Benadir region.

However there is very little knowledge about factors effecting protein energy malnutrition on children among under five years, so we decided to explore about the effect of protein malnutrition on children under five years in Benadir region.

1.5 research objectives

The objectives of the study are classified into general and specific:

1.5.1 General objectives

Factors effecting protein energy malnutrition on children under five years in Benadir Region

1.5.2 Specific objectives

- To determine Effect of unbalanced diet on child nutrition
- To improve awareness of mother's child nutrition
- To ensure that the mother gives her baby exclusive breast feeding .

1.6. Research Question

- How to determine the effect of unbalanced diet on child nutrition?
- How to improve awareness of mother's child nutrition
- How to ensure that the mother gives her baby exclusive breast feeding?

1.6 Hypothesis

Dependent variable: child health

Independent variable:

- Unbalanced diet
- Lack of awareness of mother.
- Poor of breast feeding

Alternative hypothesis:

- ✓ Unbalanced diet effect child health
- ✓ Lack of awareness of mother contributes PEM
- ✓ Poor of breast feeding effect child nutrition.

1.7 scope of the study

1.7.1 Geographical scope

Scope area is Benadir region (3-march-2016 up to Sep. 20- 2016) in Mogadishu.

1.7.2 Time scope:

This research was started February- 3-march-2016 up to Sept -20- 2016 in Mogadishu.

1.8 LIMITATIONS OF THE STUDY:

1. Poor security
2. limitation of access of internet
3. Shortage of library facilities
4. Insufficient of time

1.9. Justification

The study was to provide information about effect and associated risk factors of PEM in Banadir region. It help in identifying factors that are barriers to good nutrition practice, an translate each guideline into specific messages that health care providers, mothers, nongovernmental organizations (NGOs) and agencies can come up with the right measures of improving and eradicating PEM. The data was also meant to be used in planning interventions concerning malnutrition, particularly PEM.

1.10 Key terms

Malnutrition, protein, kwashiorkor, stunting, wasting.

Malnutrition or **malnourishment**: is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problem.

Kwashiorkor: also called wet protein-energy malnutrition, is a form of PEM characterized primarily by protein deficiency.

Proteins are essential nutrients for the human body. They are one of the building blocks of body tissue, and can also serve as a fuel source.

Stunting is a form of chronic malnutrition where the child is significantly shorter in comparison with children of same age who are well nourished.

wasting : the child weighs significantly less than well-nourished children of the same height.

Chapter two

2.0 literature review

2.1 introductions

This chapter discusses the literature related to the factors effecting protein energy malnutrition on children under five year in Benadir region which was writing by other researchers and include introduction, theoretical over view, empirical review, conceptual framework, summary and research gaps.

2.2: theoretical framework

Malnutrition is globally the most important risk factor for illnesses and death, affecting

Especially hundreds of millions of pregnant women and young children. It is currently the

Leading cause of global burden of disease ((Ezzati et al. 2. , 2002) However, evidence has shown that child death and malnutrition are not equally distributed throughout the world. The World Health Organization defines malnutrition as "the cellular imbalance between supply of nutrients and energy and the body's demand for them to ensure growth, maintenance, and specific functions (Scrimshaw et al., 1968). Severe malnutrition, typified by wasting, edema or both, occurs almost exclusively in children ((Brabin and Coulter, 2003). Protein-energy under nutrition (PEU), previously called protein-energy malnutrition, is an energy deficit due to chronic deficiency of all macronutrients. It commonly includes deficiencies of many micronutrients. PEU can be sudden and

total (starvation) or gradual. Severity ranges from subclinical deficiencies to obvious wasting (with edema, hair loss, and skin atrophy) to starvation. Multiple organ systems are often impaired.

Diagnosis usually involves laboratory testing, including serum albumin. Treatment consists of correcting fluid and electrolyte deficits with IV solutions, then gradually replenishing nutrients, orally if possible. Protein energy malnutrition affects physical growth, morbidity, mortality, cognitive development, reproduction, and physical work capacity, and it consequently impacts on human performance, health and survival. It is an underlying factor in many diseases for both children and adults, and is particularly prevalent in developing countries, where it affects one out of every 3 preschool-age children. A well-nourished child is one whose weight and height measurements compare very well with the standard normal distribution of heights and weights of healthy children of the same age and sex (Brabin & Coulter 2003).

WHO 2005 said PEM is fairly common worldwide in both children and adults and accounts for 6 million deaths annually. In the industrialized world, PEM is predominantly seen in hospitals, is associated with disease, or is often found in the elderly. Note that PEM may be secondary to other conditions such as chronic renal disease or cancer cachexia in which protein energy wasting may occur. Protein–energy malnutrition affects children the most because they have less protein intake. The few rare cases found in the developed world are almost entirely found in small children as a result of fad diets, or ignorance of the nutritional needs of children, particularly in cases of milk allergy .Protein-energy malnutrition (PEM) is a problem in many developing countries, most commonly Affecting children between the ages of 6 months and 5 years. The condition may result from lack of food or from infections that cause loss of appetite while increasing the body's nutrient Requirements and losses.

2.2.1 Types of protein energy malnutrition include

- Kwashiorkor (protein malnutrition predominant)
- Marasmus (deficiency in calorie intake)
- Marasmic Kwashiorkor (marked protein deficiency and marked calorie insufficiency signs present, sometimes referred to as the most severe form of malnutrition)

2.2.1.1: Kwashiorkor

Kwashiorkor, also called wet protein-energy malnutrition, is a form of PEM characterized primarily by protein deficiency. This condition usually appears at the age of about 12 months When breastfeeding is discontinued, but it can develop at any time during a child's formative Years ((Manary et al., 1998)Kwashiorkor usually manifests with fluid retention (edema) usually Starting in the legs and feet and spreading, in more advanced cases, to the hands and face.

Edema may be detected by the production of a definite pit as a result of moderate pressure for 3 Seconds with the thumb over the lower end of the tibia and the dorsum of

foot. Because of Edema, children with kwashiorkor may look “fat” so that their parents regard them as well fed ((Manary et al. 1. , 1998). There is hair discoloration or loss of pigmentation; curly hair becomes straight easily pluck able. Coloured, dark skin may become dried and lighter in some places especially in the skin folds; Outer layers of skin may peel off and ulceration may occur; the lesions may resemble burns ((Cundiff and Harris, 2006). Children with Kwashiorkor are usually apathetic, miserable, and Irritable. They show no signs of hunger, and it is difficult to persuade them to eat. There is Hepatomegaly, lethargy, severe immune deficiency and early

death occurs ((UNACC, 2000). Hypoalbuminaemia and electrolyte imbalance have been put forward as possible causes of the edema ((Waterlow, 1992)

2.2.1.2: Marasmic kwashiorkor.

This is a severe wasting in the presence of edema. It is a mixed form of PEM, and manifests as Edema occurring in children who may or may not have other signs of Kwashiorkor ((Manary and Brewster & Manary et al., 1997-1998)

2.2.1.3: Marasmus

Early marasmus occurs usually in the first year of life in children who have been weaned from Breast milk or who suffer from weakening conditions like chronic diarrhea. It is frequently Associated with contaminated bottle-feeding in urban ((Pinstrup-Andersen et al., 1993)Primarily marasmus is caused by energy deficiency from prolonged starvation. It may also result From chronic or recurring infections with marginal food intake ((de Onis et al., 1993)

Marasmus is characterized by stunted growth and wasting of muscle and tissue. Wasting indicates recent Weight loss, whereas stunting usually results from chronic weight loss. The major nutritional Indicators studied are: stunting (low height-for-age); underweight (low weight-for-age); and Wasting (low weight-for-height). Of the three (3), wasting is the most dangerous and signifies acute malnutrition ((Muller and Krawinkel, 2005)The main sign is a severe wasting and the child appears very thin has no fat. Most of the fat and muscle mass have been expended to provide energy. There is severe wasting of the shoulders, arms, buttocks and thighs, with no visible rib outlines.

There is no edema (swelling that pits on pressure) of the lower extremities ((Manary and Brewster, 1997)Clinical aspects typically include a triangular face, extended abdomen 9 (from muscular hypotonia) and anal or rectal prolapse (from loss of perianal fat) (Manary et al., 1998).

2.2.2: Clinical features of PEM

Protein–energy malnutrition usually manifests early, in children between 6 months and 2 years of age and is associated with early weaning, delayed introduction of complementary foods, a low protein diet and severe or frequent infections ((Kwena et al. & Muller et al., 2003)PEM is characterized by atrophy and weakness of the skeletal muscles (including the respiratory muscles), reduced heart muscle mass ((Powell-Tuck, 1997) impaired wound healing, skin thinning with a predisposition to decubitus ulcers, fatigue, apathy and hypothermia. The extracellular fluid compartment characteristically expands in PEM, occasionally causing oedema ((Hoffer, 2001) Synthesis of pigments in the hair and skin fails (e.g., hair colour may change and skin becomes hyper pigmented) because of a lack of substrate (e.g., tyrosine) and coenzymes ((Muller and Krawinkel, 2005) The other essential aspects of severe protein–energy malnutrition are the fatty degeneration of the liver and heart. This degeneration is not just a sign of severe malnutrition; it also causes subclinical or overt cardiac insufficiency, especially when malnutrition is accompanied by oedema. If the myocardial insufficiency is not corrected, iatrogenic fluid and sodium overload quickly escalate it into cardiac failure (Kwena et al., 2003; Muller et al., 2003). Another injurious aspect of PEM is the loss of subcutaneous fat, which markedly reduces the body s ‟ capacity for temperature regulation and water storage ((Alam et al., 2003). As a result, malnourished children become dehydrated, hypothermic and hypoglycemic more quickly and severely than others ((Gracey, 1999) Severe protein–energy

malnutrition is associated with atrophy of the mucosa of the small bowel, leading to a loss of absorption as well as of digestion

Capacity (Alam et al., 2003). Furthermore PEM is associated with chronic hypovolemia, which leads to secondary hyperaldosteronism, and further complicates fluid and electrolyte balance (Kwena et al., 2003; Muller et al., 2003). PEM affected children do not show signs of Hyperkalemia. This is because the development of muscular dystrophy mobilizes much of the body s potassium, which is then lost through urine (Manary and Brewster, 1997). ‟

2.2.3: Effect of protein energy malnutrition on children

Chronic PEM has many short-term and long-term physical and mental effects, including growth Retardation, lowered resistance to infection, and increased mortality rates in young children ((Pelletier et al., 1995). It was recognized in the 1950s that the severe forms of protein-energy Malnutrition, kwashiorkor and marasmus, were associated with marked cognitive effects ((Scrimshaw et al., 1968) although the lasting effects on survivors were unknown. Effects of Malnutrition in early childhood can be devastating and permanent. Whether or not children are well-nourished during the prenatal period and the first years of life can have a profound effect on their health status, as well as their ability to learn, communicate, socialize, reasoning and adapt to their environment (Pelletier et al., 1995).

2.2.4: Diagnosis of PEM

The diagnosis of malnutrition is generally based on objective measurements of nutritional status, including assessments of oral intake, weight loss, anthropometric data, and determination of cell mediated immunity, biochemical parameters, physical examination and body composition analysis (Hulst et al., 2004).

2.2.5: Anthropometric Measurements

In children, protein–energy malnutrition is defined by measurements that fall below 2 standards Deviations under the normal weight for age (underweight), height for age (stunting) and weight for height ((wasting) (Pinstrup-Andersen et al., 1993)

Reduced height-for-age reflects the slowing of skeletal growth, and is considered to be a reliable Indicator of long-standing malnutrition in childhood. Low weight-for-height, on the other hand, indicates a deficit in tissue and fat mass. This measure is more sensitive to temporary food Shortages and episodes of illness. A low weight-for-age is also used in the literature to indicate malnutrition however this does not discriminate well between temporary and more permanent malnutrition (Zere and McIntyre, 2003).

2.2.5.1: Weight

It is a measure of overall nutritional status with age, sex and height required for optimal

Interpretation. Weight is de ((Duggan et al., 2004)termined using digital or beam balance scale. It is recorded to the nearest 0.01Kg in infants and 0.1Kg in older children (Duggan et al 2004).

2.2.5.2: Mid-upper arm circumference (MUAC)

This is a quick and simple way to determine whether or not a child is malnourished using a simple colored plastic strip. MUAC and triceps skin fold (TSF) are also used as part of the Assessment to determine body fat and protein stores in children with chronic disease (Duggan et al., 2004). MUAC is suitable to use on children from the age of 12 months up to the age of 59 Months.

2.2.5.3: Height or Length

Measurement of length in particular, but also of height, requires great care to be of value. Both Remain the reserve for assessment of linear skeletal growth. Height or length generally correlates better with socioeconomic status than soft tissue measurement such as weight. Although relatively insensitive to short-term nutritional deficits, height or length reflects long-standing nutritional experience. Length is usually indicated for children up to 24 months of age, and height is used thereafter. Readings are recorded to the nearest 0.1 cm ((Neumann et al., 1982)

2.2.6: Management and Control

In spite of the various dietary approaches to manage severe malnutrition (Khanum et al., 1994) patients with kwashiorkor (including marasmic kwashiorkor) continue to die much more frequently than those with marasmus alone in developing countries (Ahmed et al., 1999). An additional concern is that many of these children with severe malnutrition are also infected with HIV ((Ambrus and Ambrus, 2004)Therefore there is the need for a systematic approach to the severely malnourished patient that goes beyond an appropriate diet. Essential management steps include intake of a reduced volume of protein and sodium during the first phase while emergency's Measures are taken to reduce the risk of hypoglycemia, hypothermia and dehydration ((WHO 1. , 1999)Oral, enteral and parenteral volume loads must be checked carefully to avoid imminent Hearts

failure. Thus, continuous monitoring of central venous blood pressure is very desirable. In the early phase of rehabilitation, a protein intake exceeding 1 g/kg body weight in combination

with impaired liver function (with breakdown of the urea cycle) and little urine excretion (a

result of dehydration) easily exceeds the malnourished child s metabolic capacity to rid himself ‟or herself of excess ammonia ((WHO 2. , 2000)

2.2.7: Biochemical Markers of PEM.

Biochemical parameters provide valuable information for the over-all management and act as very sensitive indicators. Different biochemical parameters are altered during protein energy malnutrition ((Mishra et al., 2009) In case of severely malnourished wasted children, serum total protein and albumin are normal or reduced and fractions of the glycoproteins responsible for binding drugs are decreased ((Muller and Krawinkel, 2005)

The serum albumin concentration remains normal in successfully adapted PEM and it falls when adaptation fails. A normal serum albumin concentrationin a PEM patient is a favourable prognostic finding. It is an indication of a successful adaptation and, the absence of metabolic stress ((Hoffer, 2001)Because albumin and pre-albumin are negative acute-phase proteins, their serum levels fall in response to metabolic stresseven in the absence of PEM. The reductions of total serum protein and albumin are more marked in kwashiorkor with oedema than in marasmus. Lowering of these serum total protein and albumin values in PEM could be explained on the basis of generalized protein deficiency leading to impaired synthesis ((Mishra et al. 2. , 2009). It could also be due to the redistribution of albumin into an expanded extracellular fluid compartment that occurs in acute severe inflammation (Hoffer, 2001). In kwashiorkor the oedema may clear during nutritional rehabilitation without any change in serum albumin concentration ((Kazeem et al., 2009)). Studies

by (Rahman et al., 2007)) observed that the mean serum total protein and albumin level in normal children 12-59 months of age was significantly higher than that of malnourished children.

However, mean of serum globulin level was higher in malnourished children than that of normal children. Raised globulin level is anticipated in malnourished children since malnutrition is commonly associated with infections (Rahman et al., 2007).

2.2.8: Interventions

Interventions to prevent protein–energy malnutrition range from promoting breast-feeding to food supplementation schemes. Micronutrient deficiencies are best addressed through food-based strategies such as dietary diversification and fortification of salt with iodine has been a global success story. To be effective, all such interventions require accompanying nutrition-education campaigns and health interventions ((Muller and Krawinkel 2. , 2005)Malnutrition in the young child may be „prevented by identifying the individuals at risk and for the period when the risk is ‟greatest, modifying their environment, or even removing them from it in order to ensure that, as individuals, they are spared the sequelae of under nutrition.

2.3: Empirical review

Introduction

We are not first researchers in the world who make research about the effect of protein energy malnutrition under five year children's.

In the world there's some countries that had already made research about the effect of protein energy malnutrition under five year children so that we want to enumerate some of their information's towards this title .

2.3.2: **In WHO** they said **that** , protein energy malnutrition (PEM) refers to "an imbalance between the supply of protein and energy and the body's demand for them to ensure optimal growth and function. It is a major public health problem in africa. It affects particularly the preschool children (<6 years) with its dire consequences ranging from physical to cognitive growth and susceptibility to infection. This affects the child at the most crucial period of time of development which can lead to permanent impairment in later life.

PEM is measured in terms of underweight (low weight for age), stunting (low height for age) and wasting (low weight for height). The prevalence of stunting among under five is 48% (moderate and severe) and wasting is 20% (moderate and severe) and with an underweight prevalence of 43% (moderate and severe), it is the highest in the world. The majority of children suffering

from under nutrition (80%) are the mild and the moderate forms which go unnoticed and the early ages are affected more which makes the process irreversible. 2015

2.3.3 **Journal of Evolution of Medical and Dental Sciences:** the researcher was said Protein energy malnutrition (PEM) is a widespread problem in developing countries. About 60-70% of children with PEM suffer from mild to moderate type and 2-5% is of severe type. PEM in turn makes children more prone to infections. Infections and helminthic infestations are important contributing factors in the causation of malnutrition in preschool children consuming inadequate diets.

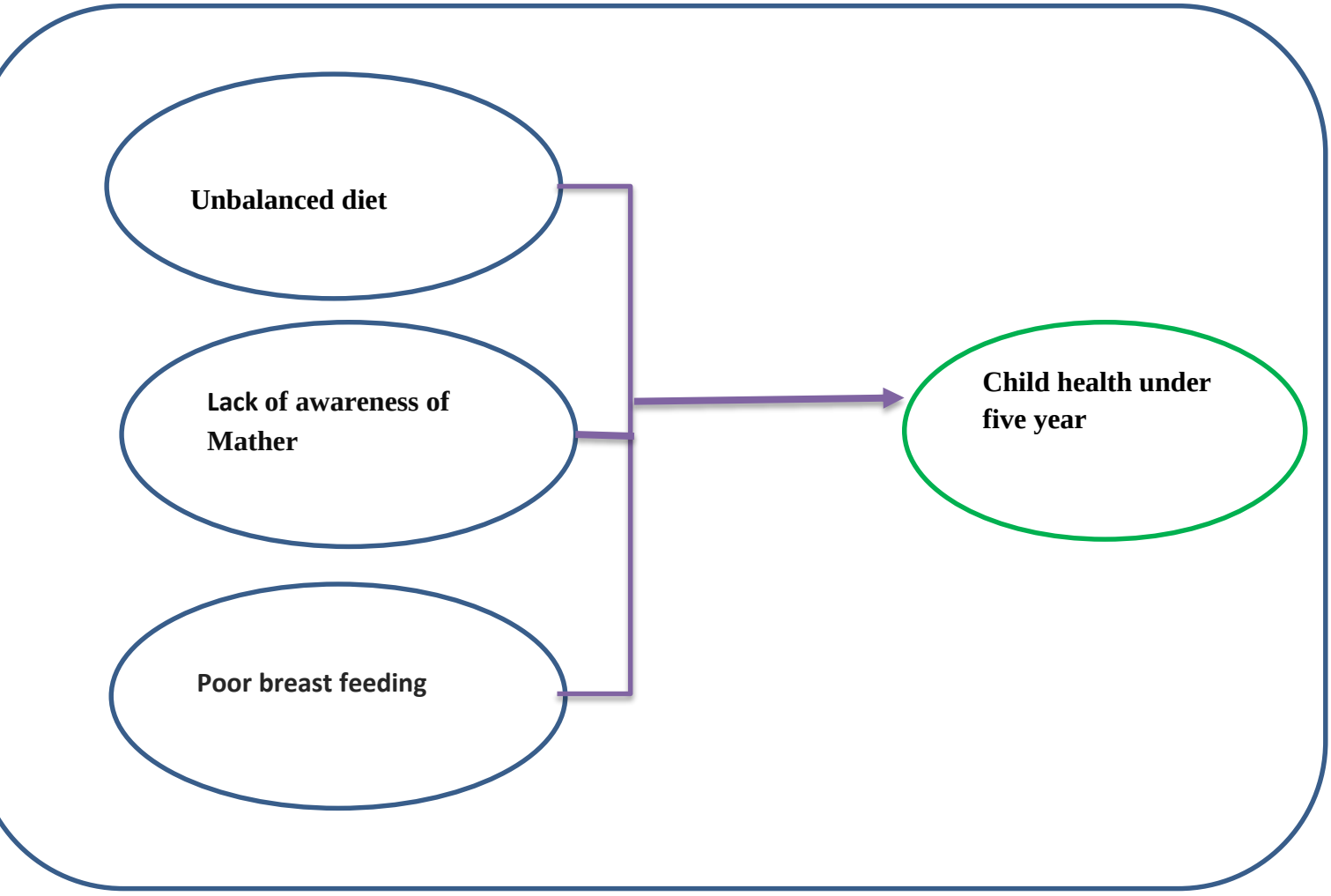
Other factors such as poverty, illiteracy, large family have been shown to contribute to malnutrition. The risk of death from common childhood diseases is doubled for a mildly malnourished child, tripled for a moderately malnourished child and eight times for a severely malnourished child.

A strong foundation in the very early years of a child are important in the form of care and nurturing , good nutrition including exclusive breast feeding for six months, immunization, access to safe water and sanitation. It also requires that mothers are well cared for during antenatal, intranatal and postnatal period so that children will have a good start in life.

The Integrated Child Development Services Program was started in 1975 incorporating interventions such as food supplementation, immunization, health care and referral services for children as well as pregnant and lactating mothers. The following study was conducted in Anganwadis in Hoskote, Bangalore rural area with the objectives a) to assess nutritional and health status of anganwadi children in the rural area in Hoskote, Bangalore and b) to determine factors contributing to protein energy malnutrition among preschool children.2013

2.4 Conceptual framework

Independent variables **depend variable**



2.4.1: Variables

2.4.1.1: Unbalanced diet

There is not one single food or type of food that provides all the nutrients that the human body needs to function efficiently. A balanced diet will depend on the types of food eaten over a period of time and the nutritional needs of the particular individual. The wider the variety of foods eaten, the more nutrients will be provided by them. It is now known that some health problems are caused by dietary intake, such as too much fat causing heart

disease and too much salt contributing to strokes In 1991, the Committee on Medical Aspects of Food Policy (COMA).

Good nutrition, based on healthy eating is one essential factor that helps us to stay healthy and be active Poor eating habits include under- or over-eating, not having enough of the healthy foods we need each day, or consuming too many types of food and drink, which are low in fiber or high in fat, salt and/or sugar. These unhealthy eating habits can affect our nutrient intake, including energy (or kilojoules) protein, carbohydrates, essential fatty acids, vitamins and minerals as well as fiber and fluid. Poor nutrition can impair our daily health and wellbeing and reduce our ability to lead an enjoyable and active life.In the short term, food of poor nutrition can contribute to stress, tiredness and our capacity to work, and over time, it can contribute to the risk of developing some illnesses and other health problems (Rahman et al., 2007).

Your body requires variety and specific amounts of nutrients to function properly and perform the activities of daily life. If your body does not get those nutrients, which is common when eating an unbalanced diet, it can develop health problems. A common-sense approach, including eating from a variety of food groups and maintaining proper portion control, may help avoid any potential problems, as well as keep you healthy and vibrant in the process (Ibeziako L NS, 2012).

2.4.1.2: Lack of awareness of mother on child nutrition

Despite of various nutritional health programs, malnutrition among children remains the big health problem in Somalia.

Suboptimal utilization of services by mothers is a big challenge before all programs. Utilization of services also depends upon the awareness regarding the service and its perceived usefulness among beneficiaries. However, socio economic status and educational level of mothers were significantly associated with presence of awareness among mothers. Health and nutrition messages are usually targeted to mothers, most of whom have not received formal education. These women usually patronize health services at antenatal clinics and child welfare centers (CWC). Additionally, patronage of preventive health services provides an opportunity to improve care practices through both preventive healthcare (immunization, antenatal care for the mother, etc.) as well as management of childhood morbidity. Effective utilization of knowledge and skills gained from health and nutrition education is, therefore, expected to improve the health and nutritional status of children through improved knowledge and care practices. However, there are limited data on the impact of nutrition education, especially in women who have not received formal education. Care behavior choices are mediated by knowledge as well as by resource availability ((Ahmed et al., 2009).

2.4.1.3: Poor breast feeding

According to The LANCET (2006, 2006)Appropriate breastfeeding and complementary feeding practices are fundamental to child health, growth, development, and survival. Exclusive breastfeeding from the birth to six months has the potential to prevent 13 per cent of child mortality, and it is estimated that the lives of at least 1.2 million children worldwide would be saved every year . However, large numbers of children living in West and Central Africa (WCA)

do not benefit from these practices. Even though almost all children are breastfed, only one third initiate breastfeeding within the recommended first hour after birth, and less than one forth are breastfed exclusively during the first six months of life2 (21 per cent compared to 38 per cent in developing countries). Together with a daily diet poor in micronutrients after six months and inadequate access to health care and poor sanitation, nonexclusive breastfeeding compromises the nutritional status of children. As a result, an estimated 40% of under-fives are stunted in Western and central Africa and more than 60%--in some countries more than 90%-- are anemic. These children will thus not attain their potential to learn and earn throughout their lives

Breastfeeding or **nursing** is the feeding of babies and young children with milk from a woman's breast. It is estimated that about 820,000 deaths of children less than five years old could be prevented globally per year through more widespread breastfeeding. Breastfeeding decreases the risk of PEM and infections.

This is true both in developing and developed countries. Other benefits include lower risks of asthma, food allergies, celiac disease, type 1 diabetes, and leukemia. Breastfeeding may also improve cognitive development and decrease the risk of obesity in adulthood.[2] Some mothers may feel considerable pressure to breastfeed, but children who are not breastfed grow up normally – without significant harm to their future health. ((Ahmed et al., 2009).

Not all of breast milk's properties are understood, but its nutrient content is relatively consistent. Breast milk is made from nutrients in the mother's bloodstream and bodily stores. Breast milk has an optimal balance of fat, sugar, water, and protein that is needed for a baby's growth and development. (Rahman et al., 2007).

2.5: Critique of the existing literature

Theory 1

Protein energy malnutrition (PEM) is a widespread problem in developing countries. About 60-70% of children with PEM suffer from mild to moderate type and 2-5% is of severe type. PEM in turn makes children more prone to infections. Infections and helminthic infestations are important contributing factors in the causation of malnutrition in preschool children consuming inadequate diets.

Other factors such as poverty, illiteracy, large family have been shown to contribute to malnutrition. The risk of death from common childhood diseases is doubled for a mildly malnourished child, tripled for a moderately malnourished child and eight times for a severely malnourished child, and protein energy malnutrition can lead to children effect of child's physical to cognitive growth and development. This affects the child at the most crucial period of time of development which can lead to permanent impairment in later life.

A strong foundation in the very early years of a child are important in the form of care and nurturing , good nutrition including exclusive breast feeding for six months, immunization, access to safe water and sanitation. It also requires that mothers are well cared for during antenatal, intranatal and postnatal period so that children will have a good start in life.

The researcher is agree the theory that states that protein energy malnutrition childs physical growth and development which can lead to permanent impairment in later life and good nutrition including exclusive breast feeding, immunization, safe water and sanitation, well cared of mother during antenatal, intranatal, postnatal period so that children will have a good start in life, in this study area to fulfill this method of prevention and its effects which is further consultations,

exclusive breast feeding, safe water supply and sanitation, it requires high controlled and qualified health centers and MCH. although after the central government of Somalia was collapsed the health situation of Somalia is not well functioning and in the absence of health functioning governmental institutions, multinational organizations and NGOs have provided most of the support to the health system of Somalia which is not fill the need of health problem, so that there is poor qualified and controlled health centers in this study area

At present, there is some efforts to improve the health system by central government but steel there is a huge need for rebuilding of health institutions.

2.6: research gap

The researcher is talking about the effect of protein energy malnutrition under five year children so that researcher will not talk about the cause, management, how to reduce the protein energy malnutrition and also the researcher will not about the effect of protein energy malnutrition in children over five years.

2.7 Research summary

This chapter consist conceptual framework, theoretical review , critique of the existing literature, summery and research gap.

Protein-energy malnutrition (PEM) is a problem in many developing countries, most commonly Effecting children between the ages of 6 months and 5 years. The condition may result from lack of food or from infections that cause loss of appetite while increasing the body's nutrient Requirements and losses.

Protein–energy malnutrition affects children the most because they have less protein intake. The few rare cases found in the developed world are almost entirely found in small children as a result of fad diets, or ignorance of the nutritional needs of children, particularly in cases of milk allergy. We are not first researchers in the world who make research about the effect of protein energy malnutrition under five year children's. In the world there's some countries that had already made research about the effect of protein

energy malnutrition under five year children so that we want to enumerate some of their information's towards this title .

CHAPTER THREE

METHODOLOGY

3.1 INTRODUCTION

Methodology describes the overall approach to research design. It is a strategy or a plan of action that links methods to outcomes. It governs choice and use of methods. This section explains the methods to be applied in carrying out this study. It comprises of the following: Research design, Population, Sampling frame, Sample and sampling technique, Instruments, Data collection procedure, Pilot test, Data Processing and analysis.

3.2 RESEARCH DESIGN

This study will conduct thought questionnaire and observation strategy. Questionnaire is research strategy that is used to present oriented methodology used to investigate population by selected samples to analyses and discover occurrence. The study will use quantitative approach; Quantitative is any data collection technique (such as a questionnaire) or data analysis procedure (such as graphs or statistics) that generates or uses numerical data . The study will be descriptive correlation design; it will describe factors effecting protein energy malnutrition under five year children in Benadir region.

3.3 RESEARCH POPULATION

The populations of this study will be both health workers and mothers visits the three hospitals and six MCH in Benadir region.

3.4. SAMPLE FRAME

The study was carried out between march and July 2016 in 9 selected health centers namely SOS hospital in hilwa district, Benadir hospital in wadajir district, Barwaaaqo MCH in Wartanabada district, Shibis health center in shibis, kaaran health center in Karan, Atlantic hospital in Dayniile district, xalane MCH in wadajir district, Wardi MCH in Hamar-jajab, Boondheere MCH in Mogadishu, Banadir Somalia. Mostly health centers are public health centers.

These health centers were selected using simple random sampling method. Each health center has skilled nurses and socio-workers, laboratory technologists, doctors come on weekly bases.

Each health center provides counseling and testing for patients. Each health center also has under five year department to carry out .

3.5: SAMPLE AND SAMPLING TECHNIQUE

This study will utilize non probability sampling procedure particularly Convenience sample. Members of the population are chosen based on their relative ease of access Such samples are biased because researchers may unconsciously approach some kinds of respondents and avoid others ((Lucas 2014), 2014)and respondents who volunteer for a study may differ in unknown but important ways from others ((1999)., 1999)

3.5.1: The sample study formula used is Slovene's formula

- **Where;**
- **n=sample size,**
- **N=population size and,**
- **e= margin of error of 5%.**
- **n= N/ [1+ (N*e^2)],**
- **n=100/ [1+ (100*0.0025)] = 80**
- **Sample size= 80**

3.6: RESEARCH INSTRUMENT

The researchers will use a structured Questionnaire tool and observation as a collecting data; the selecting of these tools has been guided by the nature of data to be collected. Questionnaire tool was administered to collect quantitative data from the selected respondents. The researcher will prefer this method because it is the most appropriate in collecting view respondents whose place was geographically spread.

3.7 Pilot test: Validity of the instruments

Pre-testing will be conducted to assist in determining accuracy, clarity and suitability of the research instrument. According to Bog and Gall (1989), ten cases are sufficient for the pilot study therefore, the researcher will deficiency since the subjects in this research was

heterogeneous, and ten cases was reasonable representing the different categories of the participants.

3.8: DATA GATHERING PROCEDURE

After the research proposal approve, the researcher passed administrative process to obtain Approval from academic authorities, the permission to collect the research within the selected respondents.

3.9: DATA ANALYSIS

the researchers used quantitative method of data analysis, to analyze data the researchers used the software package of SPSS version 20 and excel adopted for data analysis, spss is a software program that helps researchers to analyze data electronically with coded and quick procedure ((gordy ethlic, 2012)the researchers have chosen it because it's easy process and for saving time and cost.

Chapter four

DATA ANALYZE, PRESENTATION AND INTERPRETATION

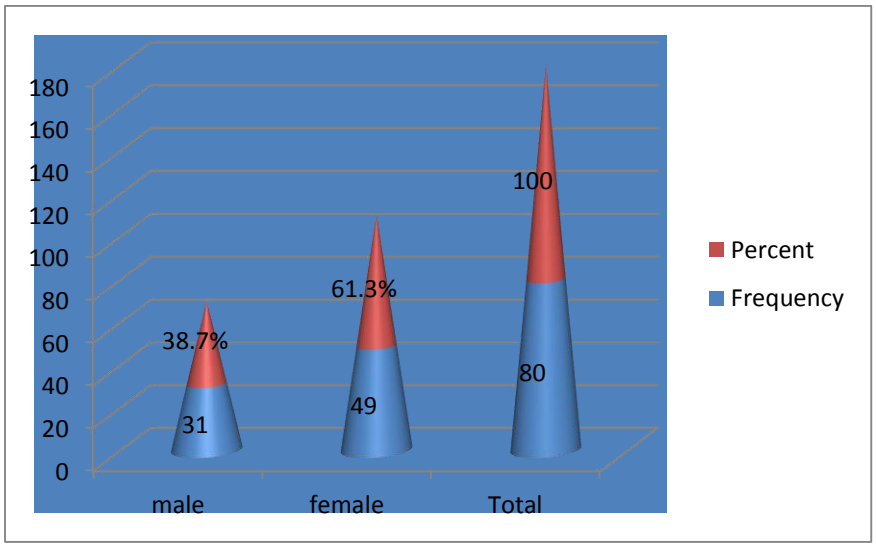
4.0 INTRODUCTION

In this chapter, the researchers present the findings, interpretation and analysis of the data collected. The presentation, interpretation and analysis of the data collected was in accordance with the main purpose of the study, that is factors which effecting PEM under five year children in Benadir region.

4.1 DEMOGRAPHIC: SUMMARY STATISTICS OF RESPONDANTS

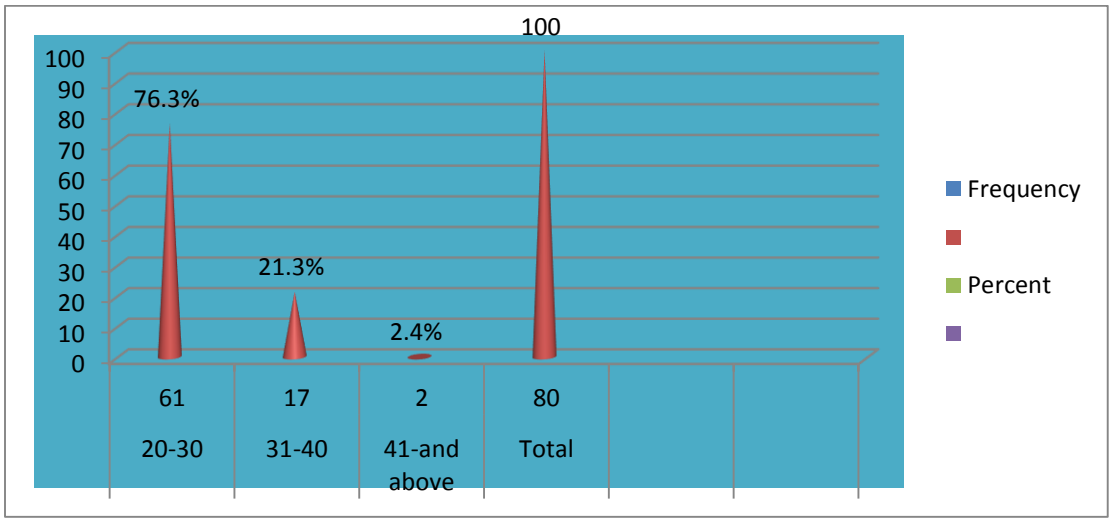
Frequencies

Figure 4.1 Gender of the respondents



Comments: In the below figure identifies that majority of the respondents were female represented by **61.3%** while minority of respondents were male represented by**38.7%.**

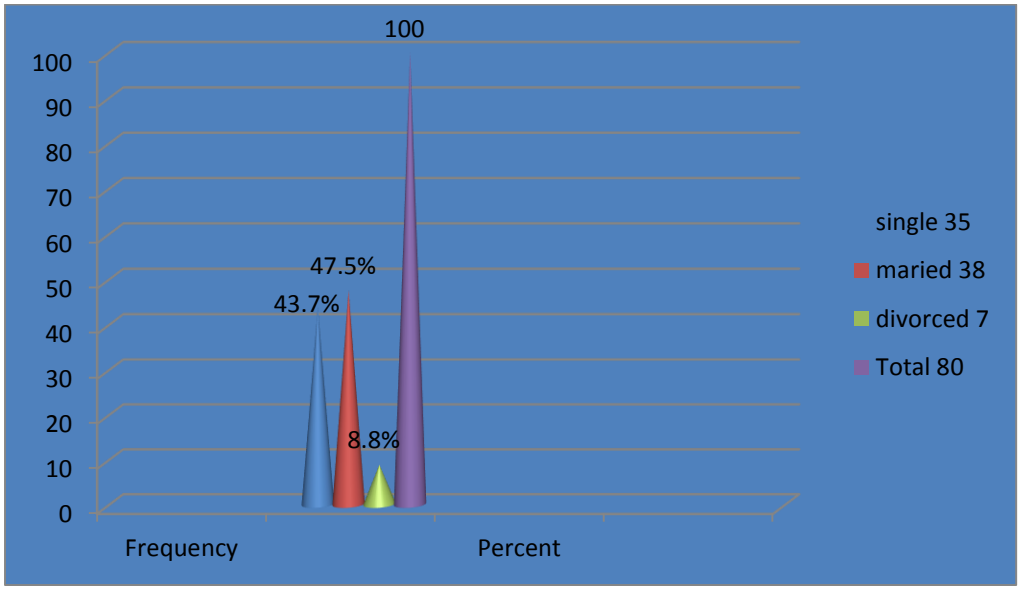
Figure:4.2 Age of the respondents



Comment: The respondents were asked to specify their ages in the questionnaire and the offered choices classified the age into three parts. Part one was intended for those whose age is between **20-30** years. Part two was intended for those whose age is between **31-40** years. Part three was intended for those whose age is **41**-and above.

Findings in **table 4.1** indicate that **76.3%** of respondents were **20-30** years,**21.3%** were between ages of **31-40** and **2.4%** were **40** and above. This shows that the most respondents were at the age between **20-30** years.

Figure: 4.3 marital status



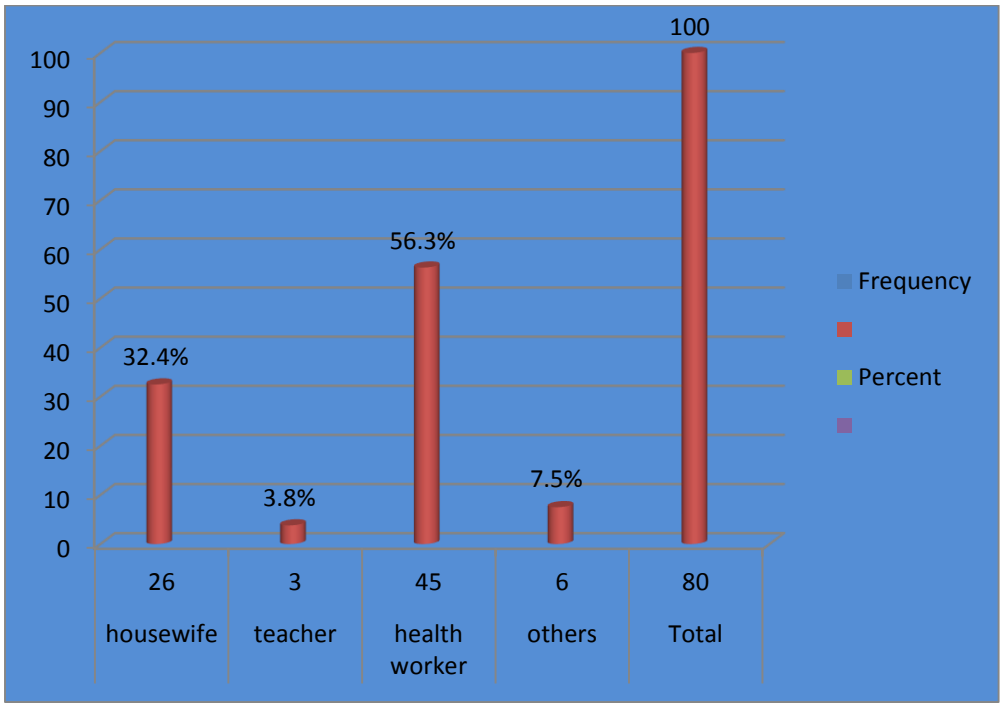
Comment: figure 4.3 discovered that 43.7 **%** of the respondents were single while **47.5%** of the respondents were married, and **8.8** were divorced. This clearly shows that most of the respondents were married.

Table 4.1 respondent's educational level

Valid	Frequency	Percent
Illiterate	8	10%
Quran	6	7.5%
Primary level	7	8.8%
Secondary level	7	8.8%
Diploma	15	18.7%
Bachelor	37	46.2%
Total	80	100.0%

Comment: The results of the study from **table 4.1** revealed that **46.2%**of the respondents were bachelor level, **18.7%**of the respondents were diploma **8.8%**were secondary level**, 8.8%** were primary level, **7.5%** were Quran, and **10%** were illiterate. This obviously shows that the most respondents were bachelor degrees.

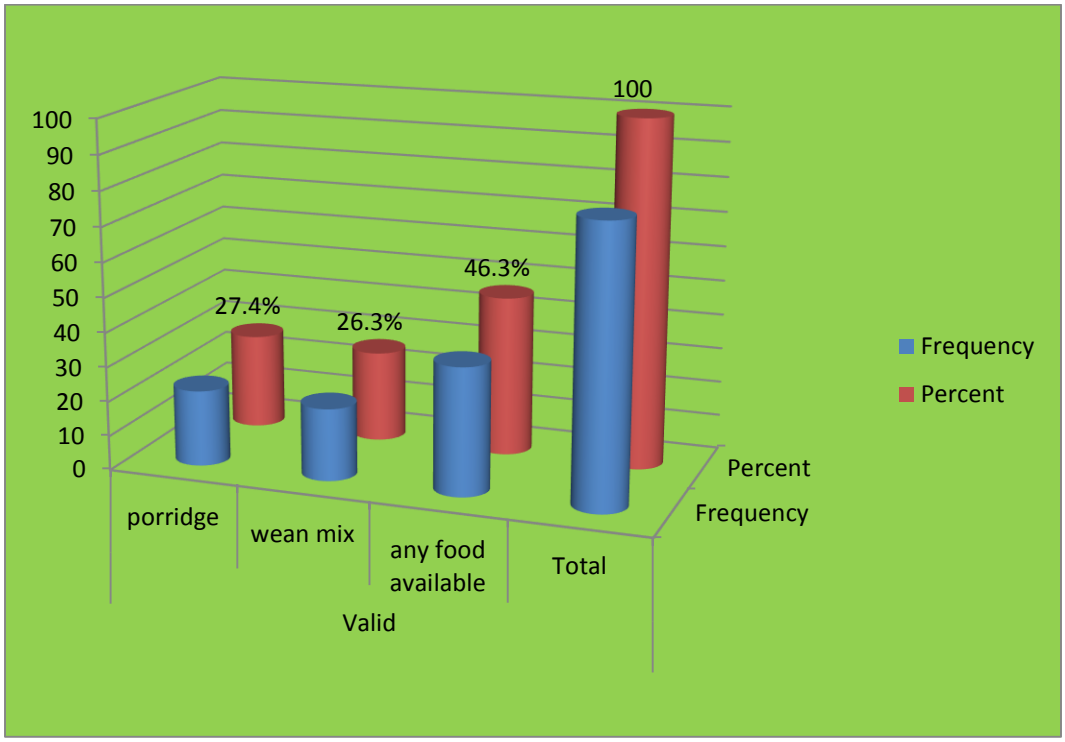
Figure 4.4 respondent's occupation



Comment : Results in 4.4 indicate that **56.3%** of the respondents were health workers, **32.4%** of the respondents were house wife, **3.8%** were teachers and **7.5%**were worked other works. Although most of respondents were worked in hospitals.

4.2 nutritional status of the child

Figure 4.5 type of weaning food given to child



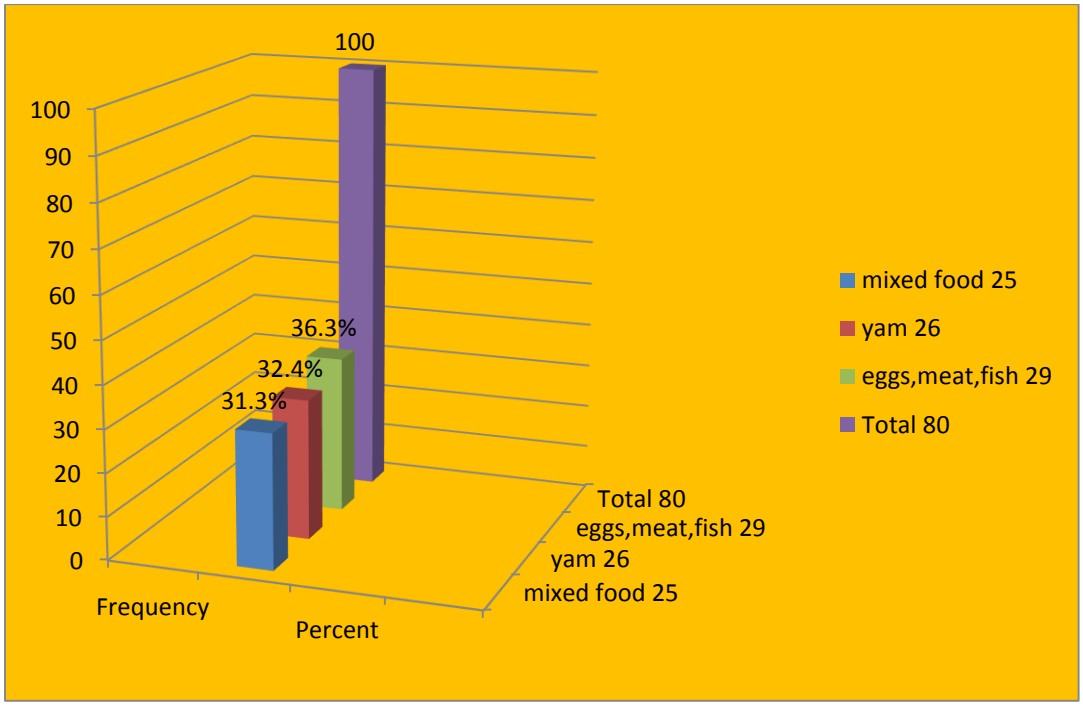
Comment: The first question asked by the respondents was the type of weaning food is given to the child. The result showed that **46.3%** of the respondents have any food available and While **27.4%** have porridge **26.3%** of the respondents have wean mix 22.7**%**. This implies that the most of the children are given to the any food available.

Table 4.2 what are some foods that children are allowed to eat in house hold?

		Frequency	Percent
Valid	porridge	7	8.7%
	rice	14	17.5%
	eggs,meat,fish	11	13.8%
	potatoes	23	28.8%
	all foods	25	31.3%
	Total	80	100.0

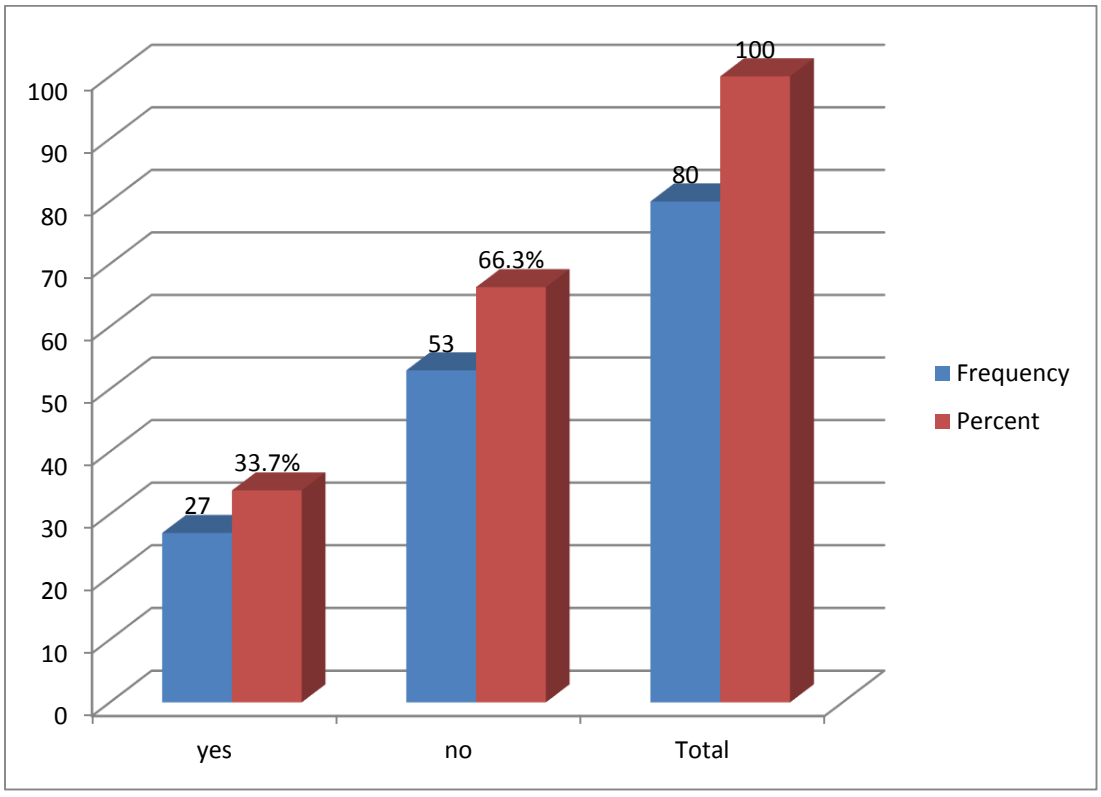
Comments: The second question asked to the respondents was the some foods that children are allowed to eat in the household. The outcome indicated that **31.3%** of the respondents were answered all foods while **28.8%** were answered potatoes, **13.8**% were answered eggs,meat,fish, and **17.5%** were answered rice**, 8.7%** were answered porridge . This shows that most foods that children are allowed to eat in household are all foods.

Figure 4.6 what are foods that children are not allowed to eat in household?



Comment: The third question asked to the respondents was foods that children are not allowed to eat in the household. The result has shown that **36.3%** were answered eggs,meat,fish**, 32.4%** were answered yam**, 31.3%** were answered mixed foods, this identify that most of foods that children are not allowed in the household is eggs,meat,fish.

Figure 4.7 do you have any taboos with regard on foods?



Comment: in figure 4.7 the respondents asked that they have any taboos with regards to food. The result showed that **66.3%** of the respondents answered **NO** while **33.7%**of the respondents were answered **YES,** This identifies that there is no any taboos with regards on food.

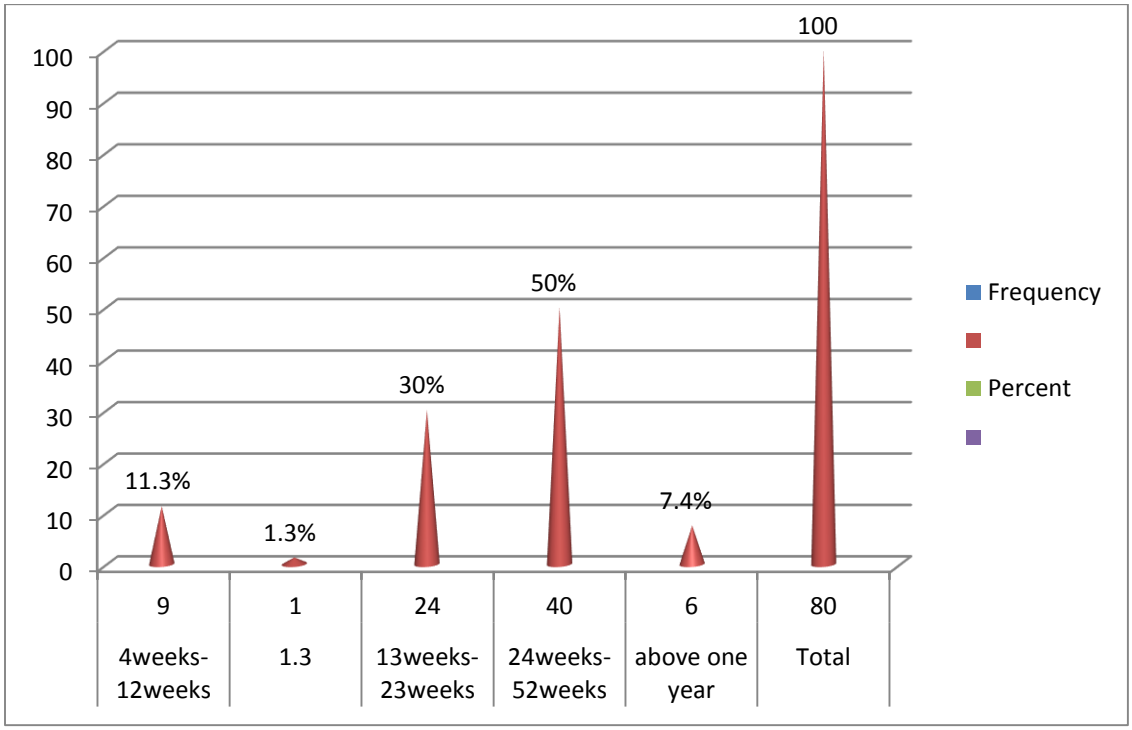
4.3 Mother's knowledge in child nutrition

Table 4.3 what cause PEM?

		Frequency	Percent
Valid	lack / inadequate food	39	48.7%
	childhood sickness	17	21.3%
	refusing to eat	6	7.5%
	lack of time to feed child	13	16.3%
	Others	5	6.3%
	Total	80	100.0

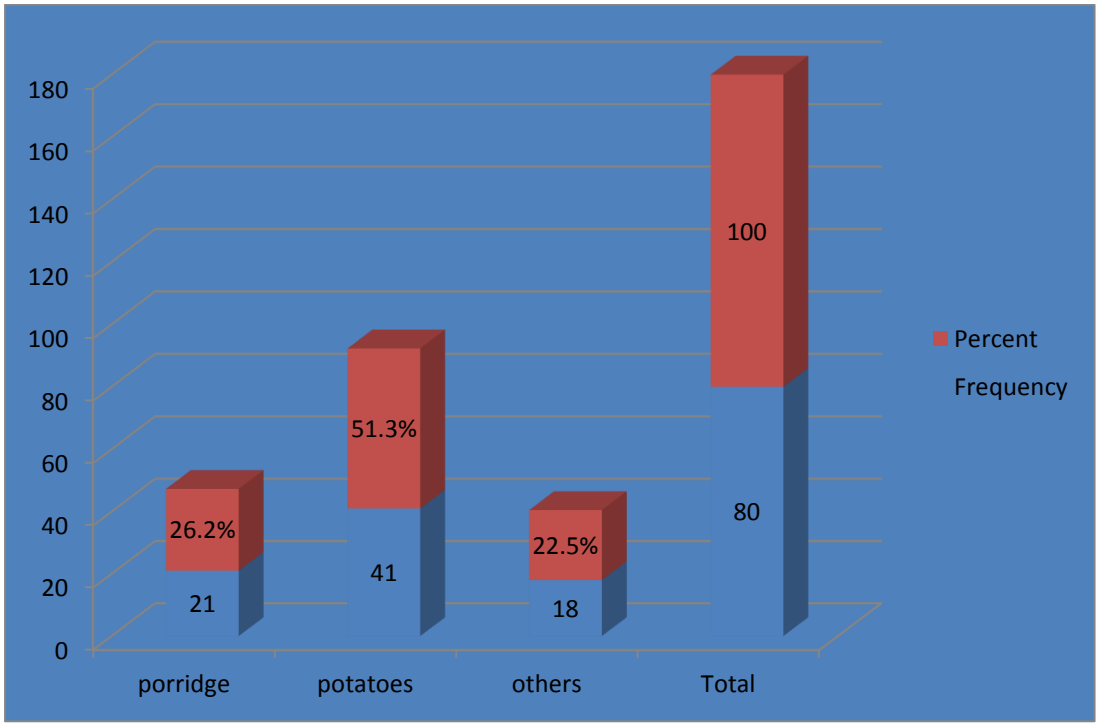
Comments: The first question asked to the respondents was the cause of protein energy malnutrition. The outcome indicated that **48.7%** were answered lack/inadequate food while **21.3%** were answered childhood sickness, **7.5**% were answered refusing to eat , and **16.3%** were answered lack of time to feed child**, 6.3%** were answered **6.3%** . This shows that the main cause of Protein energy malnutrition is lack or inadequate food.

Figure 4.8 when children is started to give complementary foods?



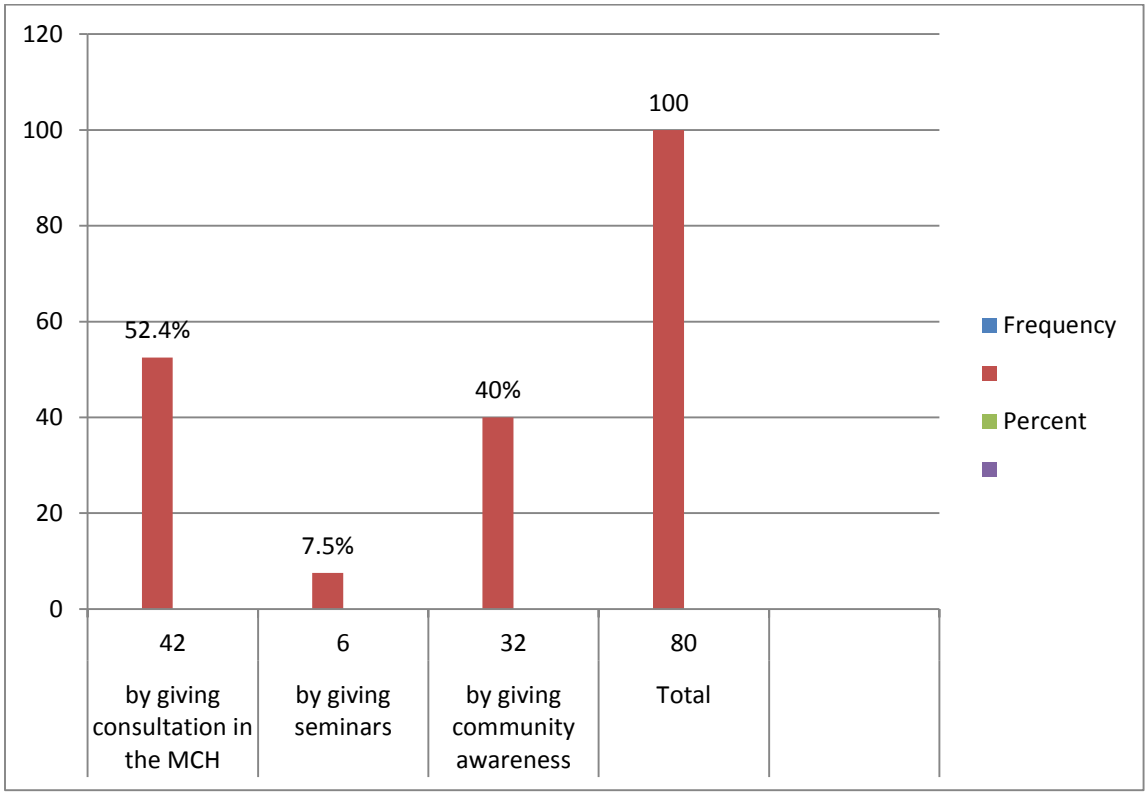
Comments : the respondents were asked when child is started to give complementary foods .**11.3%** were answered 4 weeks-12weeks, **30%**were answered 13weaks-29weaks **50%** were answered 24weaks-52weaks **7.4%** were answered above one year. This identifies that children gives complementary food between 24-52 weeks.

Figure 4.9 what of food did you start with?



Comments: figure 4.9, the respondents asked what type of food the child started with. **26.2%** were answered porridge, **51.3%** were answered potatoes, **22.5%** were answered others, this shows that the main food that children started with is potatoes.

Figure 4.10 how to improve the awareness of mother to child health?



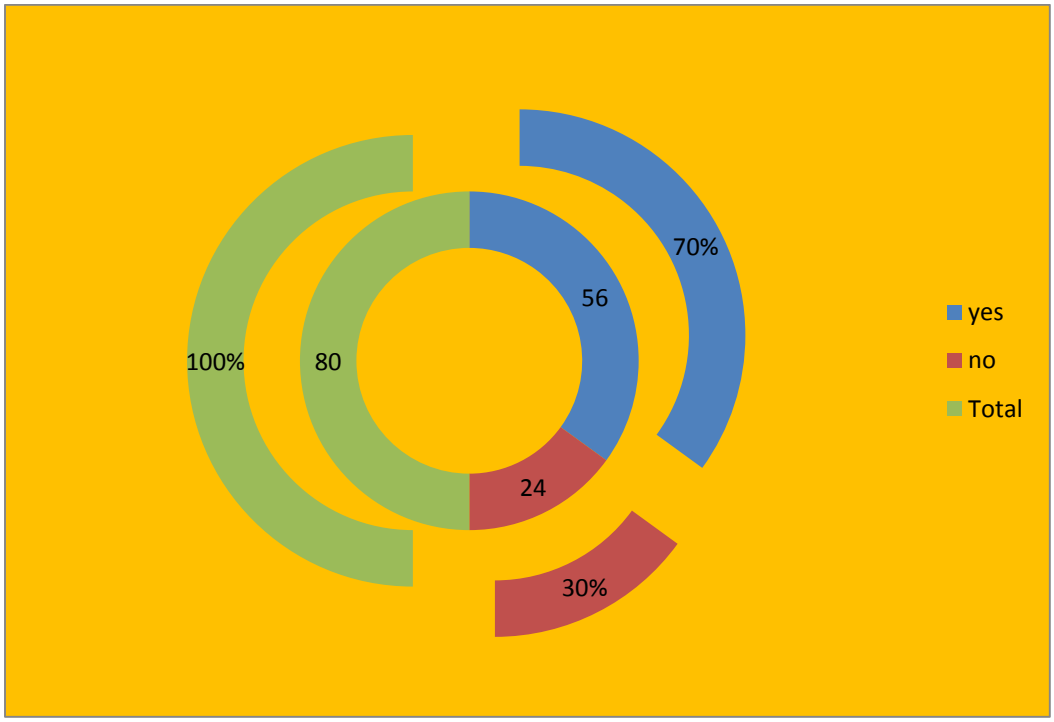
Comments: the respondents were asked how to improve the awareness of mother to the child health. **52.4%** were answered by giving consultation in the MCH, **40%** were answered by giving community awareness, **7.5%** were answered by giving seminars . This shows that the way to improve the awareness of mother on child health and nutrition is by giving consultation in the MCH.

Table 4.4: when do you give exclusive breast feeding to the child?

		Frequency	Percent
Valid	from birth- 6 month	46	57.4%
	7month-1year	23	28.8%
	1 year-2year	11	13.8%
	Total	80	100.0

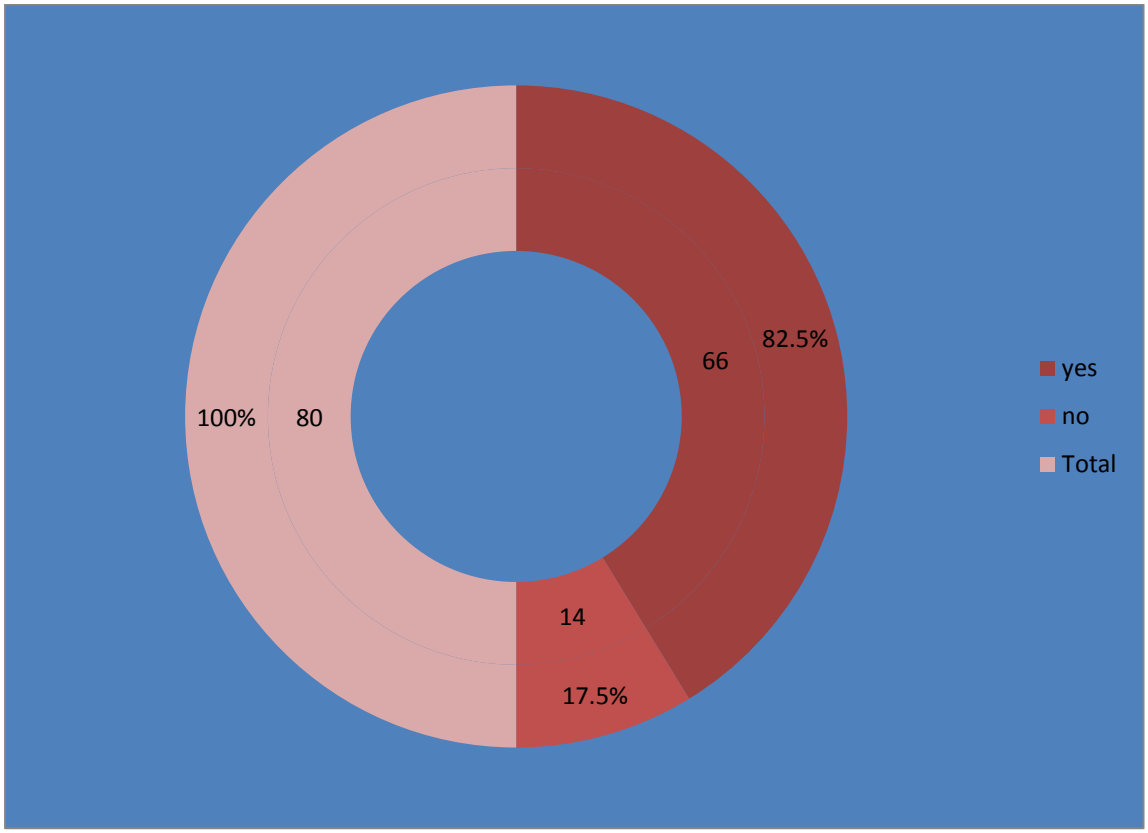
Comments: table 4.4 respondents were asked is when children give exclusive breast feeding. The result were indicated that **28.8%** were answered 7month-1year, **57.4%** were answered from birth to six month, **13.8%** were answered 1year-2year. This shows that mainly children give exclusive breast feeding between the ages from birth -6 month.

Figure 4.11 do the mothers give exclusive breast feeding to the infant?



Comment: Results in figure 4.11 indicate that **70%** of the respondents were answered yes, **while 30%** of the respondents were answered no. This shows that most children gives exclusive breast feeding.

Figure 4.12 if the mothers do not give exclusive breast feeding to the infant it cause PEM?



Comment: Results in figure 4.12 indicate that **17.5%** of the respondents were answered NO, **while 82.5%** of the respondents were answered YES. This shows that IF child does not give exclusive breast feeding it cause PEM.

CHAPTER FIVE

FINDINGS, SUMMARY, CONCLUSION AND RECOMMENDATION.

5.0: Over view

This chapter was discussed the findings, conclusion and recommendations of this study:

First it was discussed the major finding of each study as stated in the research objectives. Second the conclusion was draw from the findings of the study. Lastly the researchers will bring recommendations about further research for this study.

5.1: DISCUSSION AND SUMMARY OF MAJOR FINDINGES.

This section discovers the research result and findings derived from the distributed questionnaires. The main purpose of this study was to find out factors influencing the quality of medical laboratories of some selected hospitals in Mogadishu.

First objective: to investigate the effect of unbalanced diet on child's nutrition. The researchers found during conducting of the study that there is a huge impact between these two variables, which are unbalanced diet and child nutrition.

Second objective: To find out How to improve awareness of mother's child nutrition. The research team found that there is negative and positive relationship between these variables, if there is a good health awareness this indicate appositive relationship and if there is poor health

awareness it indicates negative relationship, these variables are directly proportional with each other.

Third objective: To determine How to ensure that the mother gives her baby exclusive breast feeding, the researchers find out during this study that there is huge relationship between these two variables, poor exclusive breast feeding and child health.

5:2 SUMMARY AND CONCLUSION

The main purpose of this study is to find out factors effecting protein energy malnutrition under five year children in Benadir region. .. A total of **80** respondents participated in the study with varying educational levels.

The result confirms that the factors effecting protein energy malnutrition on children under five year in Benadir region have generally social problems especially community awareness that influencing the health of the baby in Benadir region.

Despite present knowledge and progress in nutrition, large numbers of children are known to be affected by severe protein-energy malnutrition (PEM) and to die from marasmus, kwashiorkor and marasmic kwashiorkor.

The scientific basis for PEM was questioned in the early 20th century and different terms were introduced to describe it and there were different views as to its etiology.

PEM is mostly common in children under five years of age. Marasmus is common in children less than 12 months of age and kwashiorkor is prevalent in children less than 5 years, commonly in the age groups of 2-3 years.

5.3 RECOMMENDATIONS

According to the findings after making the research study of factors effecting PEM under five year children in Benadir region.

Therefore the researchers recommended that:

- Researchers first recommendation at PEM is Nutrition education should be given for mothers to reduce and prevent anemia in children which is highly associated with PEM.
- Researchers second recommendation at PEM is There should be advocacy for breastfeeding and appropriate complementary feeding practices by all health functionaries and hospital workers.
- Researcher's third recommendation at PEM is Nutrition and health education should be given to social by media to enable them to prevent PEM in children as whole.
- Researchers fourth recommendation at PEM is Nutrition Local information and coordination centers (CLIC) which provide community help, information, advice, and guidance for the children and their relatives.
- Researchers fifths recommendation at PEM is local social welfare centres (CCAS) which deal with requests for assistance and also provide information.
- Researchers six recommendation at PEM is to give children balanced diet to ensure good child nutrition.

APPENDIX ONE

References

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APPENDIX TWO

Questionnaire about factors effecting Protein energy malnutrition on children under five years in Benadir region.

Dear / Mr. /Mrs. /MS.

This study is being conducted by the students of Jazeera university Mogadishu, towards the award of **Bachelor of Nursing in** under graduate Studies. The study concerns factors effecting protein energy malnutrition on children under five years in Benadir region Somalia. As partial fulfillment of the degree of Bachelor of health science, we are requesting in respectful way to fill in our questionnaire as honestly and objectively as possible. Following instructions given to kindly complete this questionnaire to your possible ability. Please be assured that the data you will provide will be held confidentially.

SECTION A: demographic status

1. **GENDER**
   - **a.** Male…….....☐
   - **b.** Female…….....☐
2. **AGE**
   - a. 20-30…….....☐
   - b. 31-40…….……☐
   - c. 41- And above……....☐
3. **MARITAL STATUS**
   - **a.** Single……..….☐
   - **b.** Married…….….☐
   - **c.** Divorced……☐
4. **EDUCATIONAL LEVEL**
   - **a.** Illiterate…….. ☐
   - **b.** Quraan …… ☐
   - **c.** Primary level……☐
   - **d.** Secondary…….……☐
   - **e.** Diploma……☐

f. Bachelor…….…… ☐

g. Master…… ☐

5. Occupation

a. House wife…….…… ☐

b. Teacher ……..…..……. ☐

c. Health worker……..... ☐

d. Others …… ☐

Section Two: Nutritional status of the child.

6. What Type of weaning food is given to the child?

a) Porridge…… ☐

b) Wean mix…… ☐

c) Any food available…… ☐

7. What are some of the foods that children are allowed to eat in the house- hold?

a) Porridge…… ☐

b) Rice…….. ☐

c) Eggs, meat, fish…… ..... ☐

d) Potatoes…… ☐

e) All foods……..... ☐

8. Which are the foods that children are not allowed to eat?

b) Mixed food…….. ☐

c) Yam…….. ☐

d) Eggs, meat, fish…… ☐

9. Do you have any other taboos with regards to foods?

a) Yes…… ☐

b) No …… ☐

Section Three: Mother's knowledge in child nutrition

10. What causes PEM?

a) Lack/inadequate food…… ☐
b) Childhood sickness…… ☐
c) Refusing to eat…… ☐
d) Lack of time to feed child…… …….. ☐
e) Others (specify) …… ☐

11. When child is started to give complementary foods?

a) 4wks-12wks…….. ☐
b) 13wks-23wks…….. ☐
c) 24wks-52wks (1year)…….. ☐
d) Above 1year…… ☐

12. What type of food did you start with?

a) Porridge…….. ☐
b) Potatoes…….. ☐
c) Others (specify…….. ☐

13. How to improve the Awareness of mother to the child's health?

a) By giving consultation in the MCH…….. ☐
b) By giving seminars…….. ☐
c) By giving community awareness …….. ☐

Section three: condition of exclusive breast feeding on child

14. When do you given exclusive breast feeding to the child?

a) From birth____6 month …….. ☐
b) 7sss month_____1 year…….. ☐

c) 1 year_____ 2 year ……..……

15. Do the mothers give exclusive breast feeding to the infant?

a) Yes ……..……

b) No ……..……

16. If the mother does not give exclusive breast feeding to the infant does it cause PEM?

a) Yes……..……

b) No……..……..

Thank you for your cooperation

APPENDIX THREE:

Map of Somalia

Map of Somalia

APPENDIX FOUR :

Map of Mogadishu