Department of Community medicine

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Research **on :**

Rapid assessment of nutritional status among under five years of age in Jabal Awlia district; Khartoum state - 2018

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Dedication

I present this research to my beloved daughter my little rose Jasmine , she was patiently tolerated my long absence , and supported me with her angelic smile.

To my husband Nadir and to my family you encouraged me to go forward and you still carry on.

To Adel Taha who hopefully helped me , and tried his best to present my work in the finest and the most official way that it should be.

To the children participated in the research they were helpful , you added to the literature of the country , for brighter future in the research career .

Acknowledgements

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The social worker Maha was revised and checked the data collection process.
The 147 child participated in this study some were happy to experience the measurement, and others were not thanks a lot for all of them , Mothers were welcome and feel free to participate and to help.

Abstract:

Malnutrition is a big issue in the developing countries, which represents one of the major causes of mortality among children. Around 45% of deaths among children under five years of age are linked to under nutrition. This study aims to assess nutritional status in under 5 years children in Jabal Awlia locality in Khartoum state , and to determine the associated factors , using MUAC measurement as growth indicator for wasting and under nutrition in general .

Key words: malnutrition, wasting, MUAC.

Table of content

No		Page No
I.	Abstract.	
II.	Dedication.	
III.	Acknowledgement.	
IV.	Table of contents.	
V.	Introduction.	
VI.	Justification.	
VII.	Objectives.	
VIII.	Literature review.	
IX.	Research methodology.	
X.	Results.	
XI.	Discussion.	
XII.	Recommedations	
XIII.	List of references.	
XIV.	Appendices.	

List of tables .

Table number	Table title	Page number
Table 1	Table No(1-23) Measurement of MUAC	
Table 2	Table No(2-23) Gender	
Table 3	Table No(3-23) Child's age in months	
Table 4	Table No (4-23) Arrange the child among his siblings	
Table5	Table No(5-23) Child weight at birth	
Table6	Table No(6-23) at which time did the mother started weaning the child	
Table7	Table no (7 -23) show if the mother continued immunization of her child	
Table8	Table No (8 -23) When to start to add extra meals or other milk for breastfeeding	
Table9	Table No (9 -23) represents if the mother prepare special meal to feed her child or feeding him the food she prepared to the family	
Table10	Table No (10-23) represents the current intake of the child to supplementary drug	
Table11	Table No (11-23) show the type of dietary supplement the child take	
Table12	Table No (12-23) show the diseases that the child suffer from	
Table13	Table (13-23) the age of the mother	
Table14	Table No (14-23) mother occupation	
Table15	Table No (15-23) mother education	
Table16	Table No (16-23) the social status of the mother	
Table17	Table No(17-23) the family either small or extended	
Table18	Table No(18-23) show the family members (the parents and the children)only no body else included	
Table19	Table No(19-23) number of children in the family not include parents or other person	
Table20	Table No (20-23) the monthly income of the family	
Table21	Table No(21-23) show who is responsible for financial supply to the family	
Table22	Table No(22-23) drinking water source	
Table23	Table No (23-23) which type of water cycle that the family have	

Figure number	Figure title	Page number
Figure 1	Figure no(1-23) Measurement of MUAC	
Figure 2	Figure no(2-23) Gender	
Figure 3	Figure no(3-23) Child's age in months	
Figure 4	Figure no (4-23) Arrange of the child	
Figure 5	Figure no(5-23) Child weight at birth	
Figure 6	Figure no(6-23) Weaning the child	
Figure 7	Figure no (7 -23) Child immunization	
Figure 8	Figure no (8 -23) When to start to add extra meals or other milk for breastfeeding	
Figure 9	Figure no (9 -23) Does the child eat special food and meals	
Figure 10	Figure No (10-23) current intake of dietary supplements	
Figure 11	Figure No (11-23) show the type of dietary supplement the child take	
Figure 12	Figure No (12-23) show the diseases that the child suffer from	
Figure 13	Figure (13-23) the age of the mother	
Figure 14	Figure No (14-23) mother occupation	
Figure 15	Figure No (15-23) mother education	
Figure 16	Figure No (16-23) the social status of the mother	
Figure 17	Figure No(17-23) the family either small or extended	
Figure 18	Figure No(18-23) show the family members (the parents and the children)only no body else included	
Figure 19	Figure No(19-23) number of children in the family not include parents or other person	
Figure 20	Figure No (20-23) the monthly income of the family	
Figure 21	Figure No(21-23) show who is responsible for financial	

	supply to the family	
Figure 22	Figure No(22-23) drinking water source	
Figure 23	Figure No (23-23) which type of water cycle that the family have	

List of acronyms and abbreviations .

Abbreviation	Stand for
MUCA	**Mid Upper Arm Circumference**
SAM	**Severe acute malnutrition**
URTI	**Upper respiratory tract infection**

"Chapter one"

Introduction

1.1Background

MALnutrition refers to deficiencies, excesses, or imbalance in a person`s intake of energy and/or nutrients. Malnutrition so addresses three broad various forms of conditions ;undernutrtion , micronutrients -related malnutrition & overweight . Undernutrition include four forms these are : wasting , stunting , underweight , and deficiencies in vitamins and minerals. [1]

Wasting is low weight for hight. It is useful because it usually indicates recent and severe weight loss because the person hasn't had enough food to eat and /or they have had infectious disease such as diarrhoea which results in weight loss. [1]

Stunting is low height for age resulting from chronic or recurrent under nutrition . The factors associated with stunting includes; poor socioeconomic conditions, poor maternal nutrition, inappropriate child feeding, recurrent illnesses. Stunting generally affects children physical and cognitive potential. [1]

Underweight is low weight for age. Underweight child can be stunted, wasted, or both. [1]

Malnutrition is a big issue in the developing countries, which represents one of the major causes of mortality among children [2] . In addition to that malnutrition increases health care costs, reduce productivity, and slows economic growth . Although,every country in the world is affected by one or more forms of malnutrition , hence combating malnutrition in all its forms is one of the greatest global health challenges. [1]

1.2 Problem statement:-

Around 45% of deaths among children under five years of age are linked to under nutrition . These mostly occur in low and middle- income countries. In Sudan over one in

three children under five are short for their age (stunted) , and more than one in six are thin for their height (wasted) [3] . According to the ministry of health, some 2.2 million children suffer from wasting annually, out of which over 573000 suffer from severe acute malnutrition (SAM). Eleven out of eighteen states have a malnutrition prevalence above 15%, which is above the emergency threshold as per WHO standards [3] . The main factors contributing to these high levels of malnutrition are food insecurity, disease outbreaks, poor infant feeling practices, lack it access to primary health care and clean drinking water, and inadequate sanitation facilities.[3]

1.3justification :

Both acute and chronic forms of under nutrition affect the growth , development and survival of children in Sudan.chronic under nutrition in childhood is linked to slower cognitive development & serious health imperments later in life,that reduce the quality of life of individuals. Nutritional status is important index of this quality.in this respect understanding nutritional status of children has far reaching implications for better development of future generation. [2]

1.4 Objectives :

General Objectives :

To assess Nutritional status among under five years of age in Jabel Awlia district , khartoum state - 2017.

Specific Objectives :

•To determine the prevalence of wasting using the mid upper arm circumference measures and standards.

•To find out the factors associated with nutrition in children

"Chapter two"

Literature review:

Mal nutrition is acondition that results from eating a diet in which nutrients are either not enough or are too much that the diet causes health proplems [4].

Types of Malnutrition includes : acute malnutrition which is caused due to inadequate nutrition leading to rapid weight loss or failure to gain weight normally ,as result the child becomes wasted or thin . Chronic malnutrition due to inadequate nutrition over long period of time leading to failure of linear growth , resulting in stunting or shortness . Combination of acute and chronic malnutrition resulting in underweight [5] .

The nutritional status of children under five years is a sensitive indicator of the country 's health status. In the developing and under developed contries Malnutritionamong under five is a common problem [6]. Malnourished children have low resistant to infections so,they are more vulnerable to die from common childhood elements such as diarrhoeal diseases and respiratory tract infections , also the children of malnutrition who survive are likely to suffer from frequent illness which affect their nutritional status and diminish their ability to learn. Hence the nutritional status of children has an impact on their health and development [7] .

Physical measurements like body weight, height, circumference of arm and calf, triceps skin fold of children have been extensively used to define health and nutritional status of communities. Based on the age, body weight and height, a number of indices such as height-for-age and weight-for-height have been suggested [8] .

Undernutrition among children under five years is trad- itionally assessed using anthropometric indices such as – weight-for-age, height-for-age, weight-for-height and mid-upper arm circumference (MUAC). Stunting or low height-for-age is an indicator of chronic undernutrition which is manifested as poor skeletal growth. Low weight- for-height reflects wasting or acute undernutrition with loss of lean as well as fat mass [1]. On the other hand, low MUAC (<11.5 cm) is not only suggestive of severe wasting or severe acute malnutrition but also indicative of morbid- ity and risk of mortality .

Wasting is defined as low weight-for-height for chil- dren, and it is a measure of current or acute undernutri- tion. Children with z-scores < - 2.00 are said to be wasted.

Underweight is defined as low weight-for-age and it reflects past (chronic) and present (acute) undernutri- tion. Children with z-scores < -2.00 are said to be underweight.

The nutritional status of children does not only directly reflect the socioeconomic status of the family and social wellbeing of the community, but also the efficiency of the health care system, and the influence of the surrounding environment[9] .

Unlike acute malnutrition which is associated with immediate crisis such as periodic food shortages, chronic malnutrition is due to inadequate nutrition over a prolonged period resulting from latent poverty, chronic

food insecurity, poor feeding practices and repeated epi- sodes of health problems (such as infections) or poor health services in an unhealthy environment [10] . .

When the assessment of wasting is done using MUAC three colour tape, one of three categories: green = normal pro- gress; yellow = alert - child at risk; and red = danger – child needs referral. Each child is provided a map of his/her growth. At BDH and surrounding facilities, the nutritional intervention for those children at risk is limited to counsel- ling that advises the caregivers to provide a balanced diet for the child. Culturally appropriate examples of a balanced diet, including porridge with peanuts, rice with meat and or vegetables and fruits, is provided for caregivers. If the child is labelled as "red," the child is referred to hospital where the child is given add- itional nutritional supplementation. [9 - 10]

Severe acute malnutrition is characterised by wasting (marasms) , oedema (as result of Kwashiokor) ,or both . .In Aub Saharan Africa avast majority of children with acute malnutrition are found.[11].

The World Health Organization and UNICEF define non-oedematous severe acute malnutrition (SAM) either by a mid-upper arm circumference (MUAC) less than 115 mm or by a weight-for-height z-score (WHZ) less than –3. A study was done in Nito assess whether there was any benefit to identify malnourished children with a high risk of death to combine these two diagnostic criteria. Data of a longitudinal study examining the relationship between anthropometry and mortality in rural Senegal and predating the development of community-based management of SAM were used for this study.

First, the receiver operating characteristic (ROC) curves of MUAC and of WHZ to predict mortality were drawn, and then the points corresponding to WHZ less than –3 and/or MUAC less than 115 mm were positioned in relation to these curves. MUAC had the highest ROC curve, which indicates that it identifies high-risk children better than WHZ. Both points repre- senting WHZ less than –3 and/or MUAC less than 115 mm were below the MUAC ROC curve. It is concluded that to identify high-risk malnourished children, there is no benefit in using both WHZ less than –3 and/or MUAC less than 115 mm, and that using MUAC alone is preferable.

"Chapter three"

Research methodology

3.1 Study Design : Descriptive cross -sectional community based study

3.2 Study Area : The study was conducted in Jabel Awlia district in khartoum state (the capital of Sudan).It is heterogeneous area representing people of different soio-cultural backgrounds.

3.3 Study population : Children under five years of age **.**

Inclusion criteria :-

1.children of (6 to 59) month of age

2.A child who was full term, with no congenital malformations

3.A child whose mother accepted to participate

Exclusion criteria : The children were refuse to participate in measuring.

3.4 Sample size :was calculated using the equation

- $n= z^2 \times (p) \times (1 - p) \div d^2 \times def$

  Prevalence $= 0.15$
  $z = 1.96$
  $d = 0.05$
  $def = 2$
  $n= 391$
  My sample was reduced it was just 147 due to lack of time .

3.**5 Data collection** : The tool which I used to collect the data was the MUAC three colour tape (S0145620) , which I obtained from the ministry of health in Khartoum state , and I learned how to use it.

data were collected from 24th December 2017 to 14 th January 2018 using offered designed ,interview self administered questionnaire from mothers. The questionnaire was prepared prepared in English and then translated into Arabic for the data collection in

households . The questionnaire was consist of opened and closed questions . The first part of the questionnaire included questions that address relevant socio- demographic information about the child's age,gender, mother age, educational level , occupation ,and social status. While the second part included the questions about the factors that can affect the nutritional status.

3.4 Study variables : The dependant variable was nutritional status . The independent variables was age, gender, birth weight, number of children, regular vaccination of the child , supplemntentary feeding, vitamins supplements, diseases (diarrhoea, URTI,..) ,mother education, mother work, social status of the mother, family number, monthly income, and environmental factors (drinking water , sanitarydisposal).

3.5 Data management and analysis plan : data entery and analysis was performed using spss 18.0 , and WHO growth standards for children's , and then the results were summarized using tables and graphs . Chi square test was carried out to assess associations between the measurement of the MUAC and different variables.

3.6 Ethical consideration : in households I introduced my self and permission was obtained from mothers , and verbal consent was also obtained from each mother participated during data collection after full explanation of the purpose of the study. Any child who was refuse , was not obligated to did so .

Research: Evaluation of nutritional status And malnutrition among childre

Results of questionnaire analysis

Prepared by: Marwa Mamoun
the year: fifth year

بسم الله الرحمن الرحيم

Results of questionnaire analysis

Frequency Table

Table No(1-23) Measurement of MUAC

1/ Measurement of MUAC

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	From 60 to 115 mm	4	2.7	2.7	2.7
	From 115-125 mm	12	8.2	8.2	10.9
	From 125 to 210 mm	131	89.1	89.1	100.0
	Total	147	100.0	100.0	

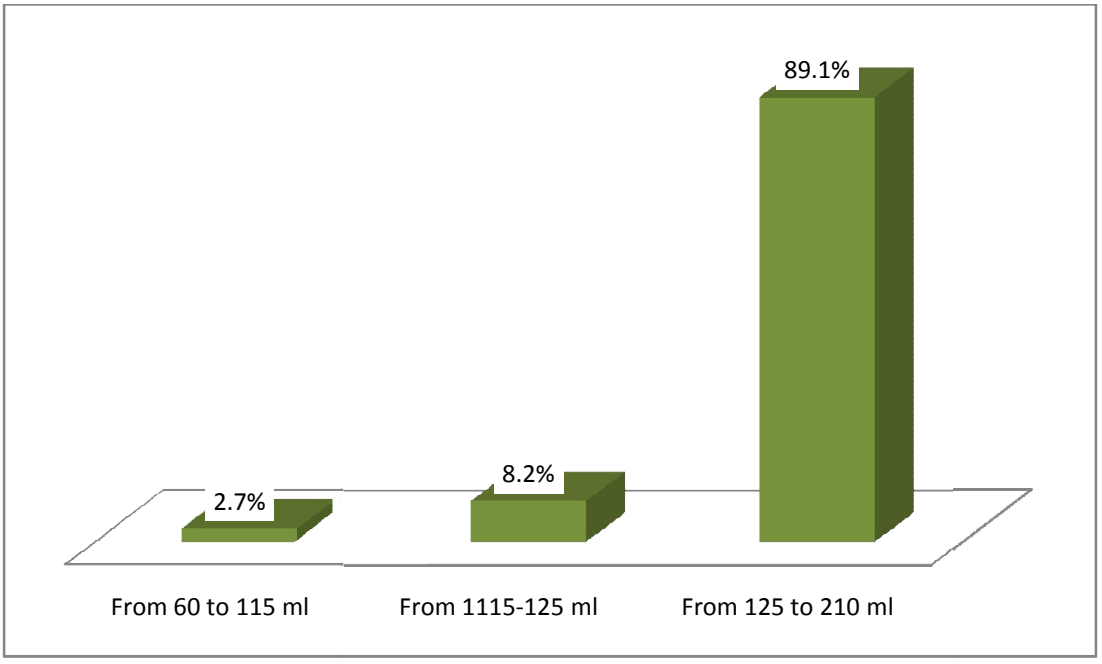


Figure no(1-23) Measurement of MUAC

Table No(2-23) Gender

2/Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	68	46.3	46.3	46.3
	female	79	53.7	53.7	100.0
	Total	147	100.0	100.0	

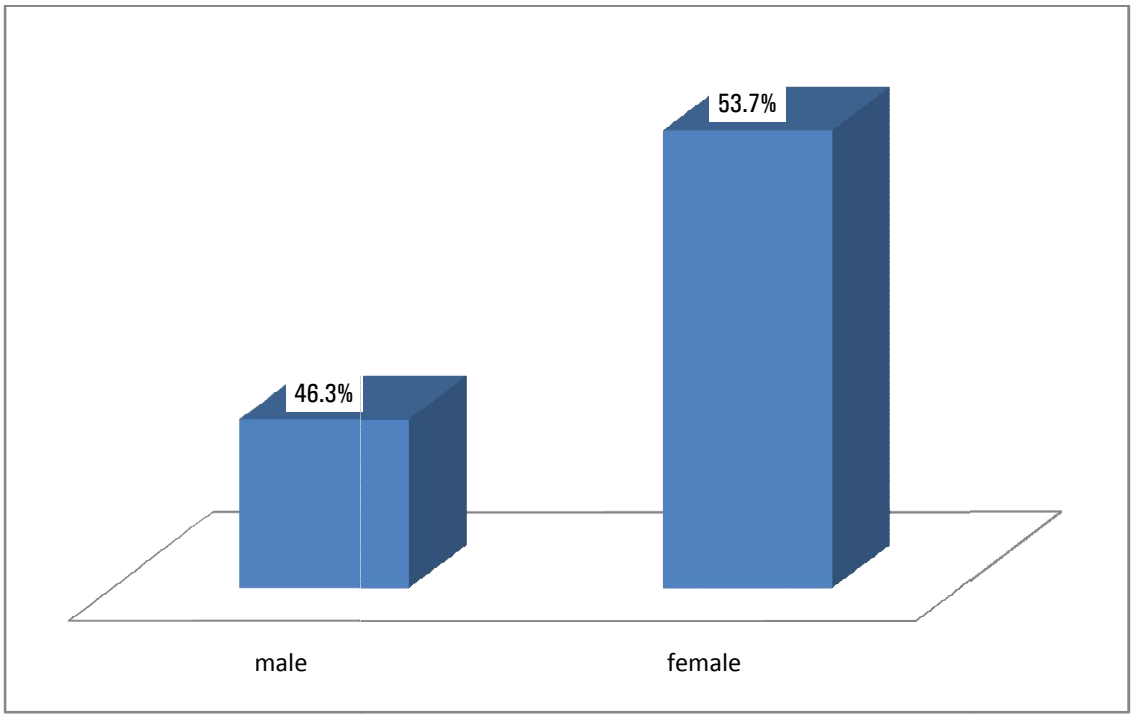


Figure no(2-23) Gender

Table No(3-23) Child's age in months

3/ Child's age in months?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	From 0-12 months	29	19.7	19.7	19.7
	From 13-24 months	44	29.9	29.9	49.7
	From 25 to 36 months	26	17.7	17.7	67.3
	From 37-48 months	31	21.1	21.1	88.4
	From 49-59 months	17	11.6	11.6	100.0
	Total	147	100.0	100.0	

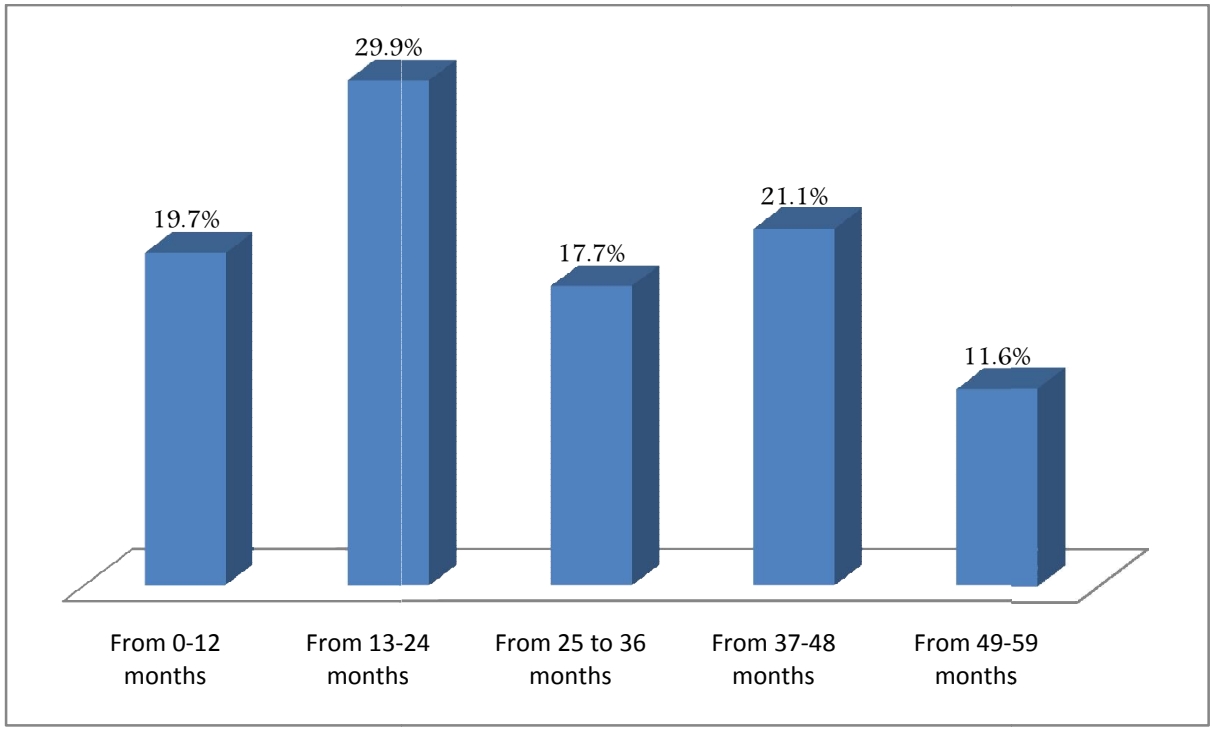


Figure no(3-23) Child's age in months

Table No (4-23) Arrange the child among his siblings

4/Arrange the child / child

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	the first	28	19.0	19.0	19.0
	The second	39	26.5	26.5	45.6
	the third	29	19.7	19.7	65.3
	the fourth	24	16.3	16.3	81.6
	Fifth	12	8.2	8.2	89.8
	Sixth	5	3.4	3.4	93.2
	Seventh	7	4.8	4.8	98.0
	Eighth	2	1.4	1.4	99.3
	eleventh	1	.7	.7	100.0
	Total	147	100.0	100.0	

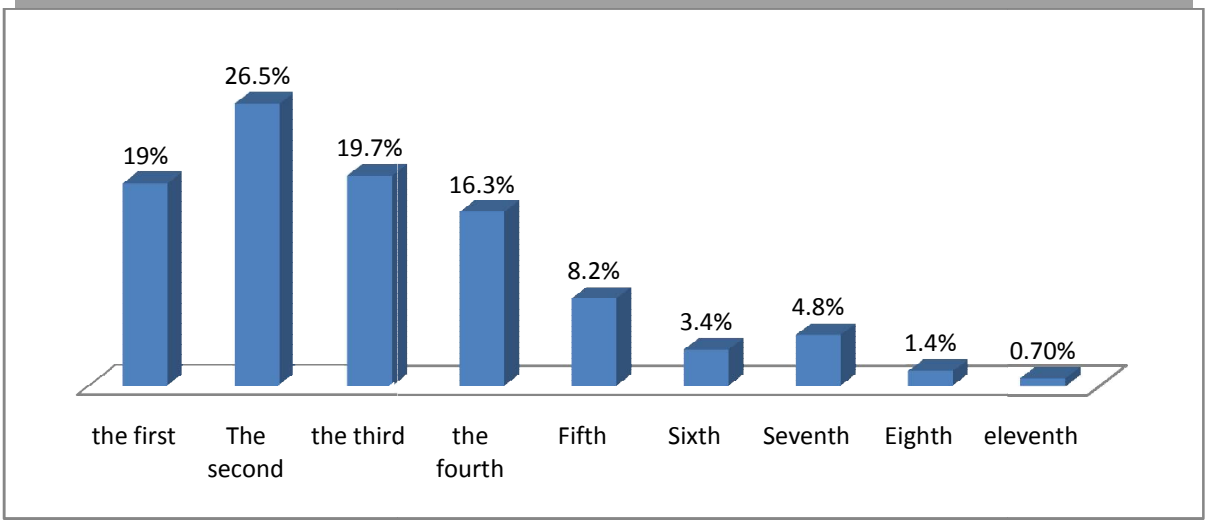


Figure no (4-23) Arrange of the child

Table No(5-23) Child weight at birth

5/ Child weight at birth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 2.5 kg	19	12.9	12.9	12.9
	More than 2.5 kg	128	87.1	87.1	100.0
	Total	147	100.0	100.0	

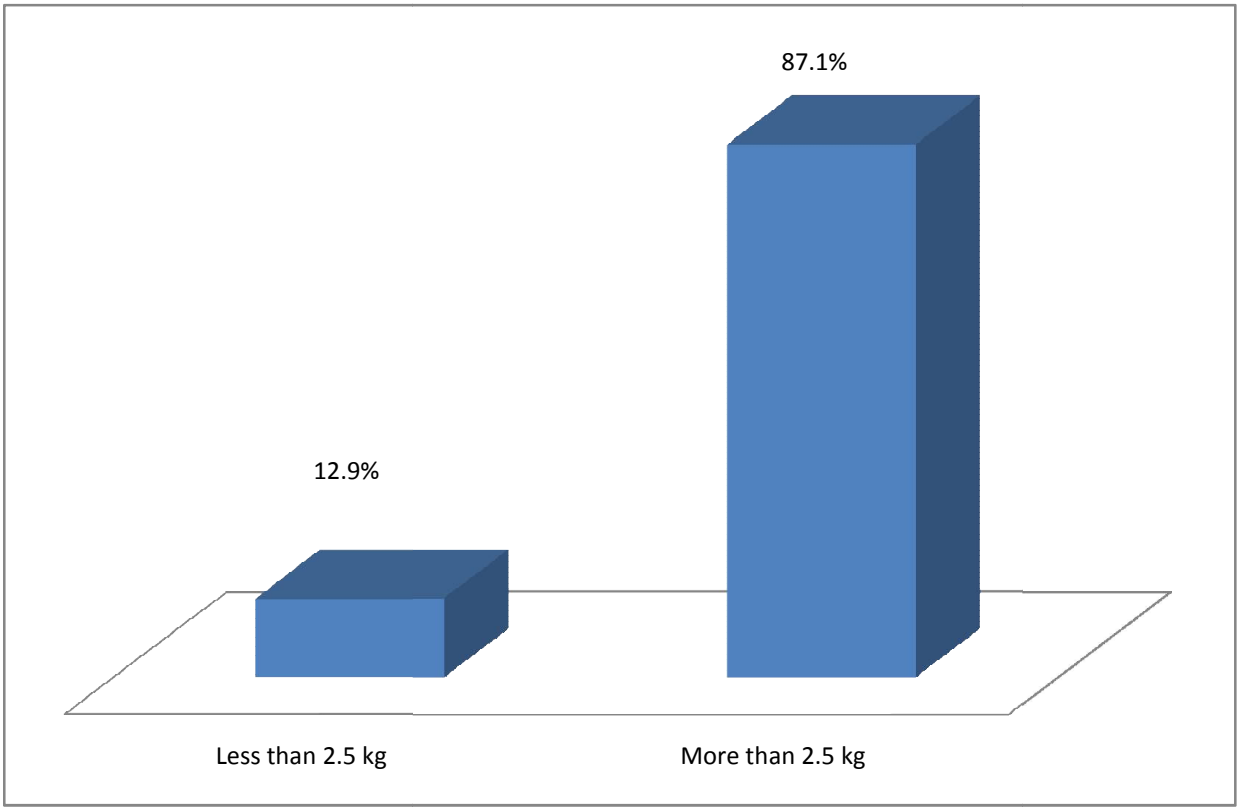


Figure no(5-23) Child weight at birth

Table No(6-23) the period of continuation of breastfeeding

6/When you finish your baby?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than two years	86	58.5	58.5	58.5
	More than Two years	61	41.5	41.5	100.0
	Total	147	100.0	100.0	

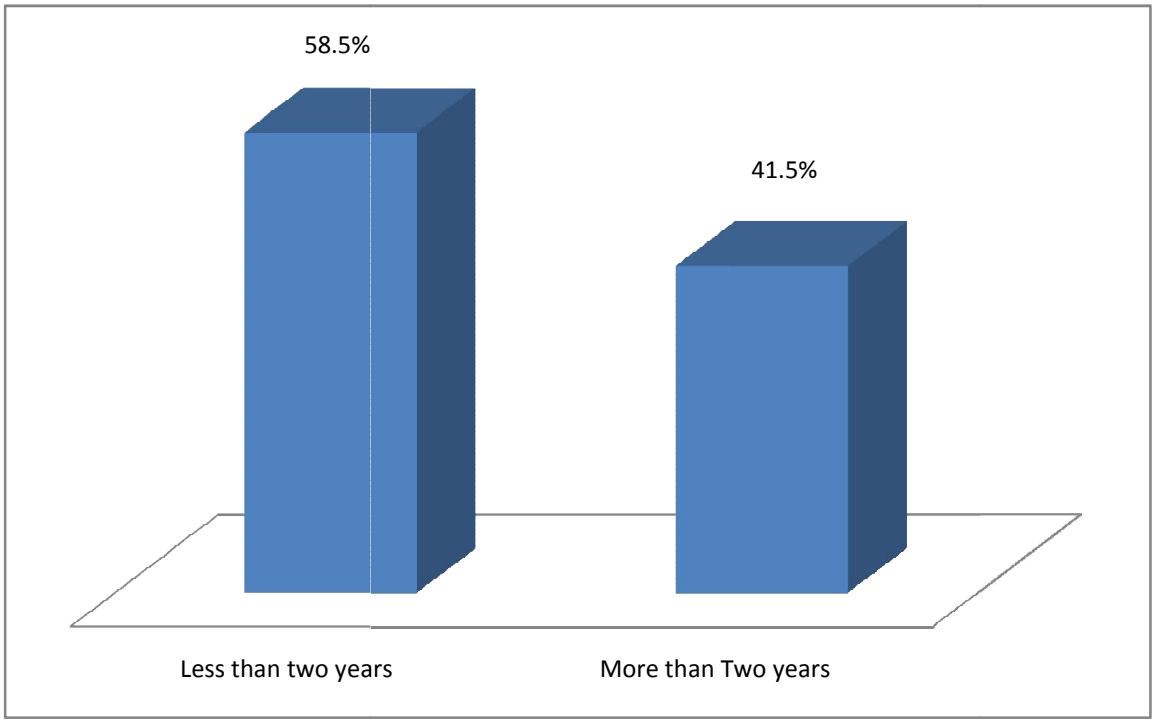


Figure no(6-23) the period of continuation of breastfeeding

Table no (7 -23) show if the mother continued immunization of her child

7/ Do you keep your child immunized?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	140	95.2	95.2	95.2
	Did not complete the doses	7	4.8	4.8	100.0
	Total	147	100.0	100.0	

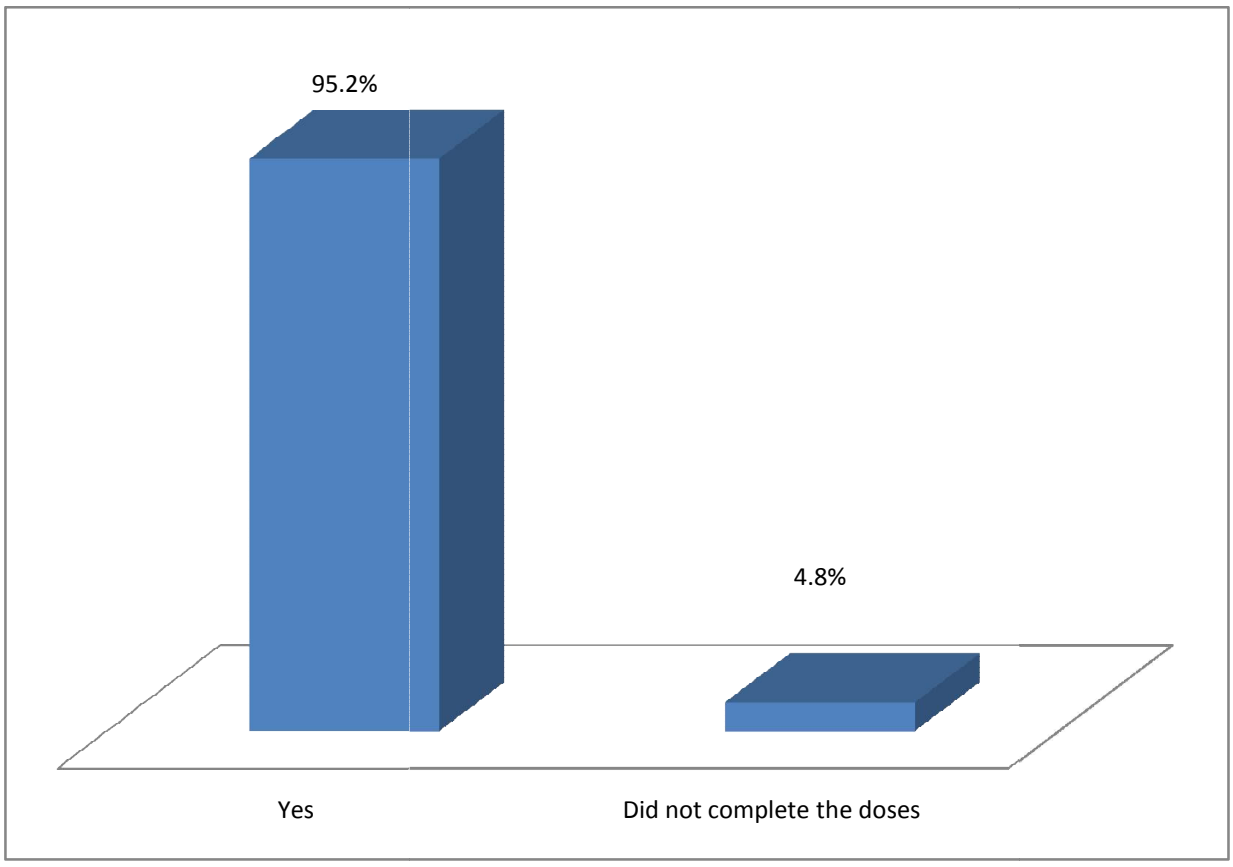


Figure no (7 -23) Child immunization

Table No (8 -23) When to start to add extra meals or other milk for breastfeeding

(i.e initiation of weaning)

8/When to add extra meals or breast milk for breastfeeding ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than six months	61	41.5	41.5	41.5
	More than six months	85	57.8	57.8	99.3
	without	1	.7	.7	100.0
	Total	147	100.0	100.0	

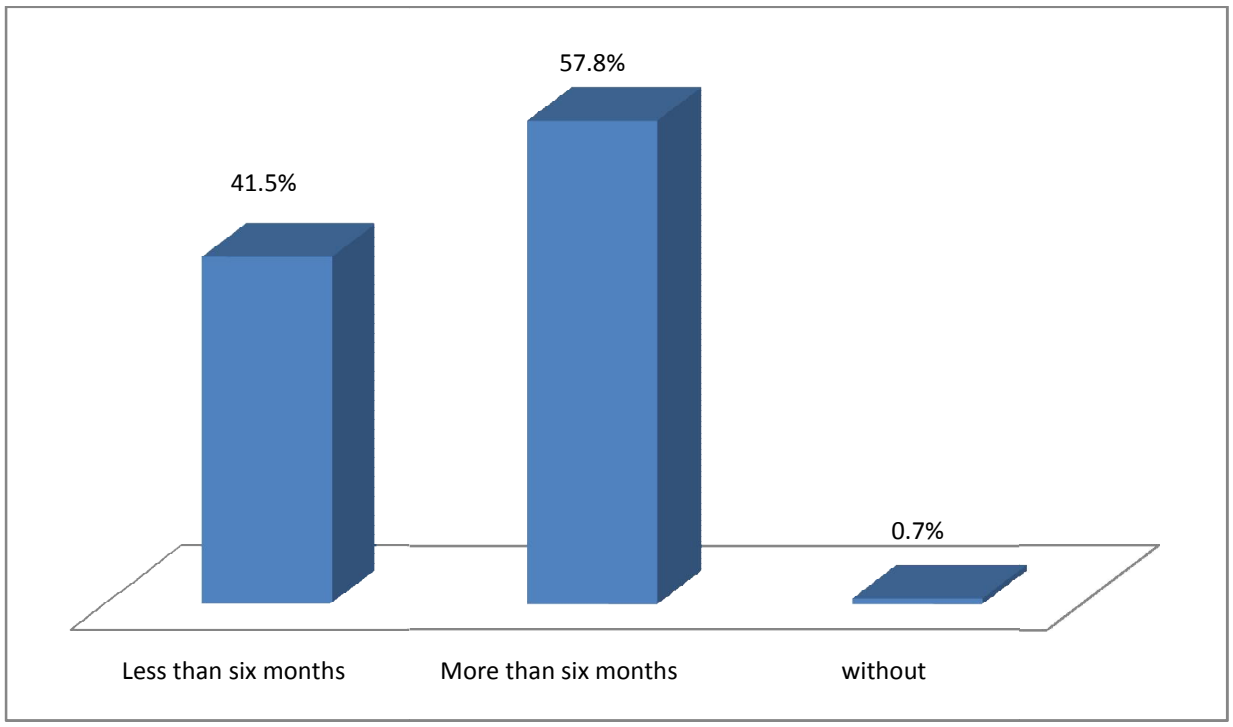


Figure no (8 -23) When to start to add extra meals or other milk for breastfeeding

Table No (9 -23) represents if the mother prepare special meal to feed her child or feeding him the food she prepared to the family

9/ Does the child eat special food and meals?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	49	33.3	33.3	33.3
	No	97	66.0	66.0	99.3
	Without	1	.7	.7	100.0
	Total	147	100.0	100.0	

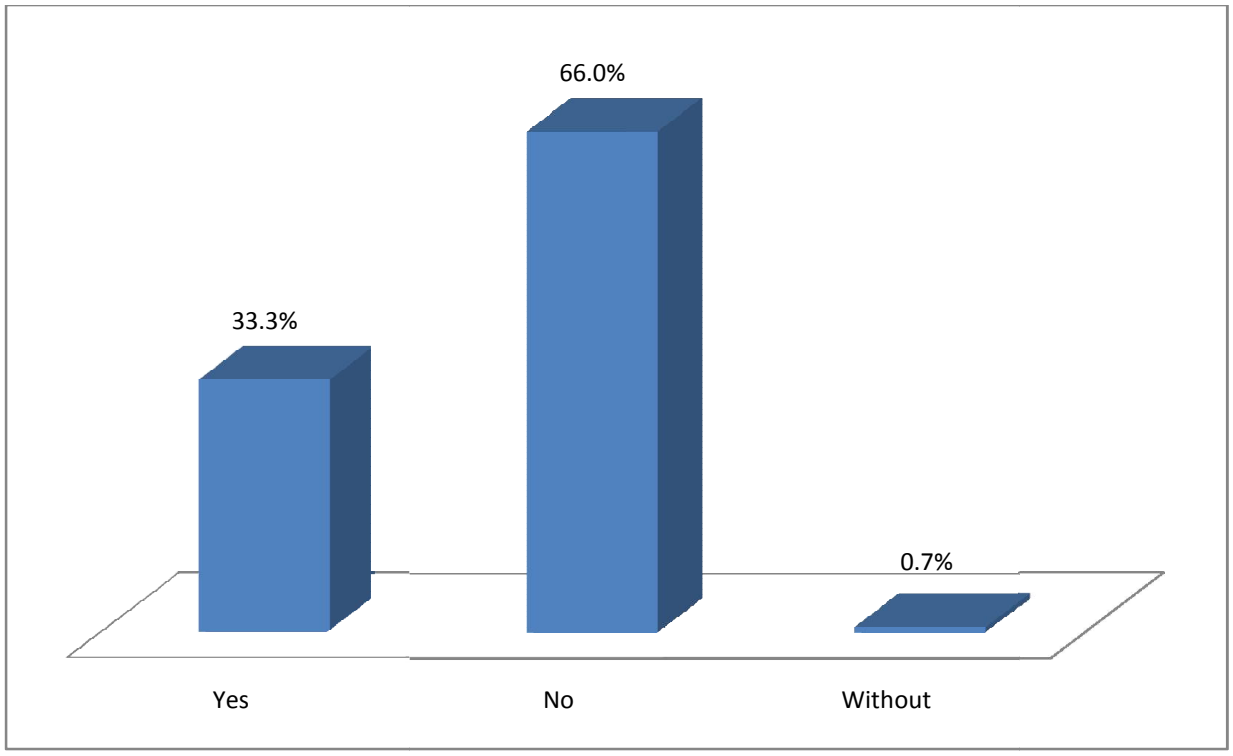


Figure no (9 -23) Does the child eat special food and meals

Table No (10-23) represents the current intake of the child to supplementary drug

10/ Does the child take any dietary supplements ?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	نعم	16	10.9	10.9	10.9
	لا	131	89.1	89.1	100.0
	Total	147	100.0	100.0	

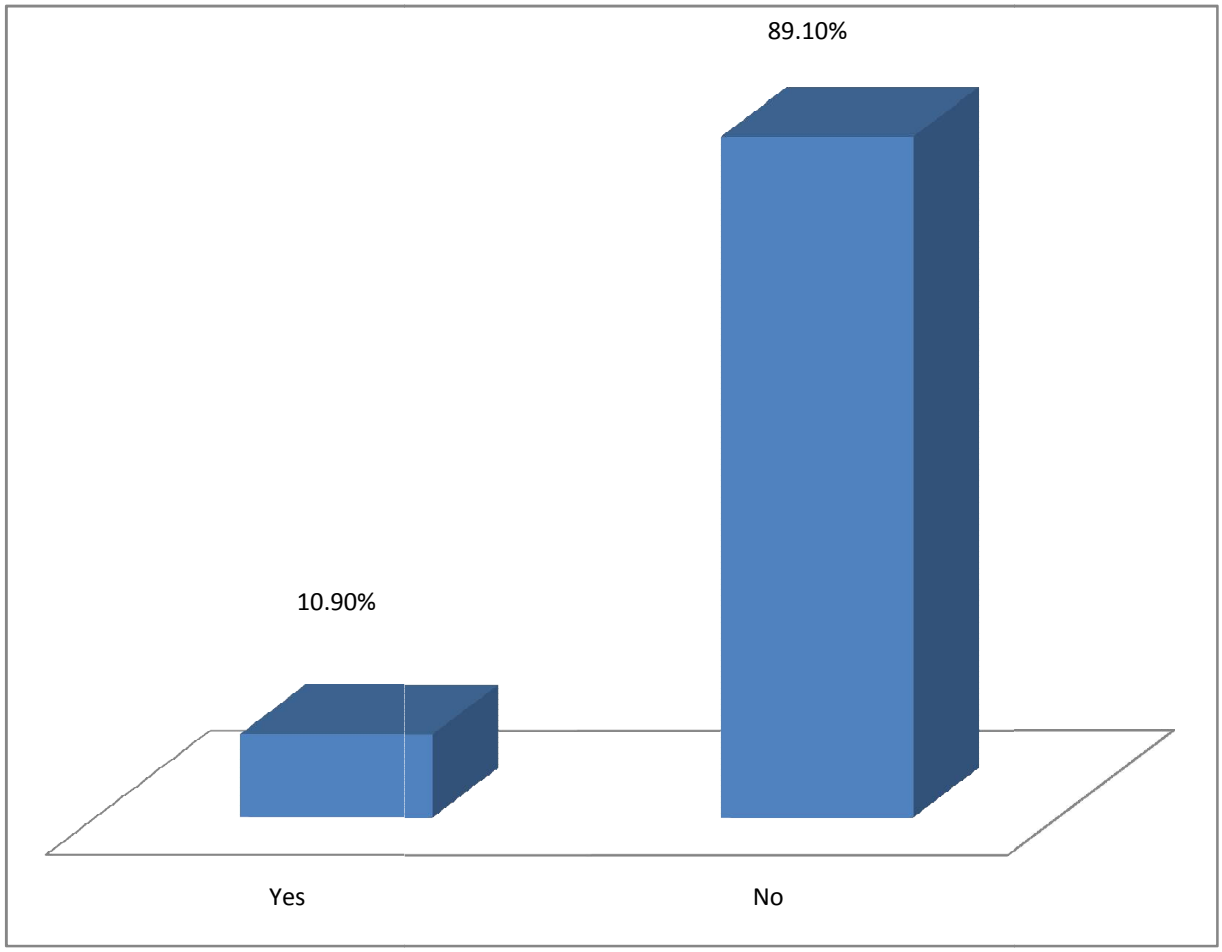


Figure No (10-23) current intake of dietary supplements

Table No (11-23) show the type of dietary supplement the child take

11 / What is the dietary supplement that it takes?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	iron	5	3.4	3.4	3.4
	Vitamins	7	4.8	4.8	8.2
	Others	4	2.7	2.7	10.9
	without	131	89.1	89.1	100.0
	Total	147	100.0	100.0	

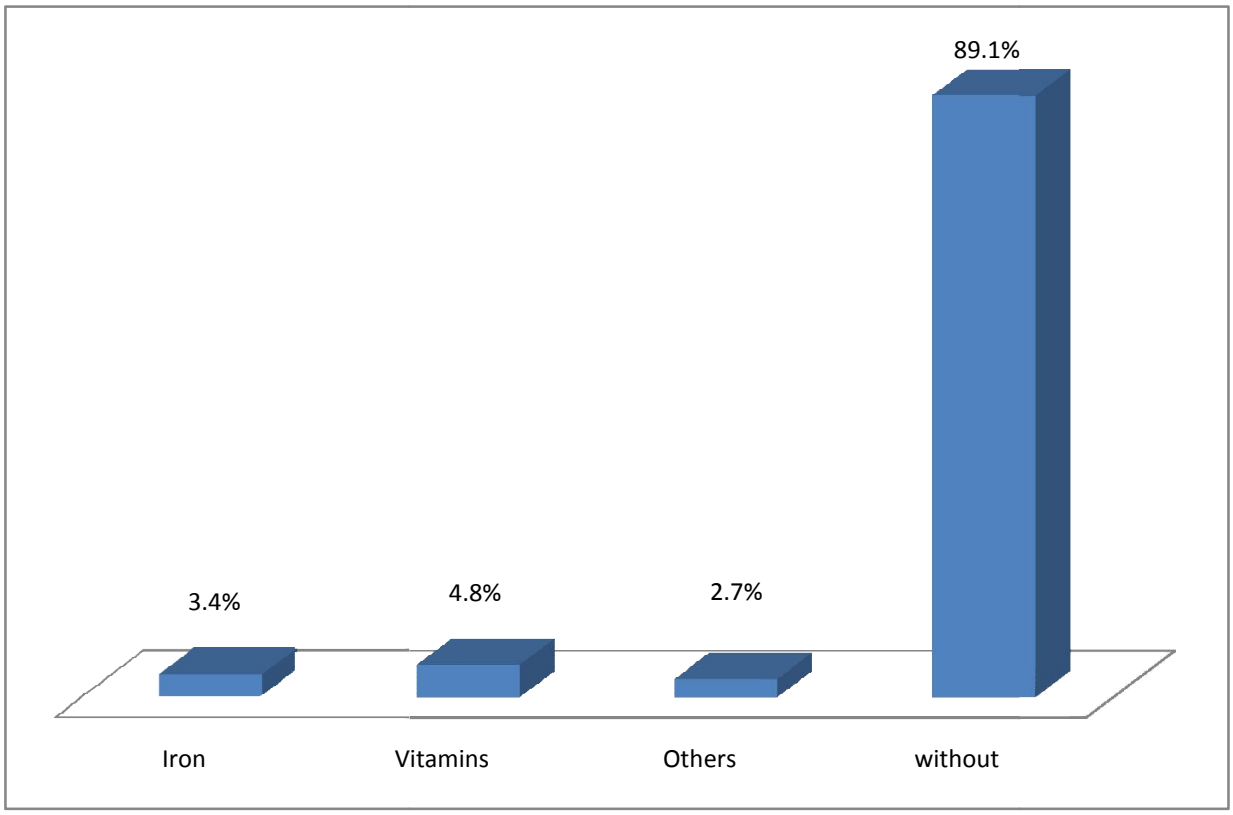


Figure No (11-23) show the type of dietary supplement the child take

Table No (12-23) show the diseases that the child suffer from

12) Which of the diseases the child is currently experiencing or within two weeks?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pneumonia	30	20.4	20.4	20.4
	Diarrhea	20	13.6	13.6	34.0
	Fever	2	1.4	1.4	35.4
	Other	31	21.1	21.1	56.5
	Not exposed to disease	47	32.0	32.0	88.4
	Inflammation and malaria	8	5.4	5.4	93.9
	Pneumonia and lupus	1	.7	.7	94.6
	Pneumonia and diarrhea	6	4.1	4.1	98.6
	Inflammation, fever and tonsils	2	1.4	1.4	100.0
	Total	147	100.0	100.0	

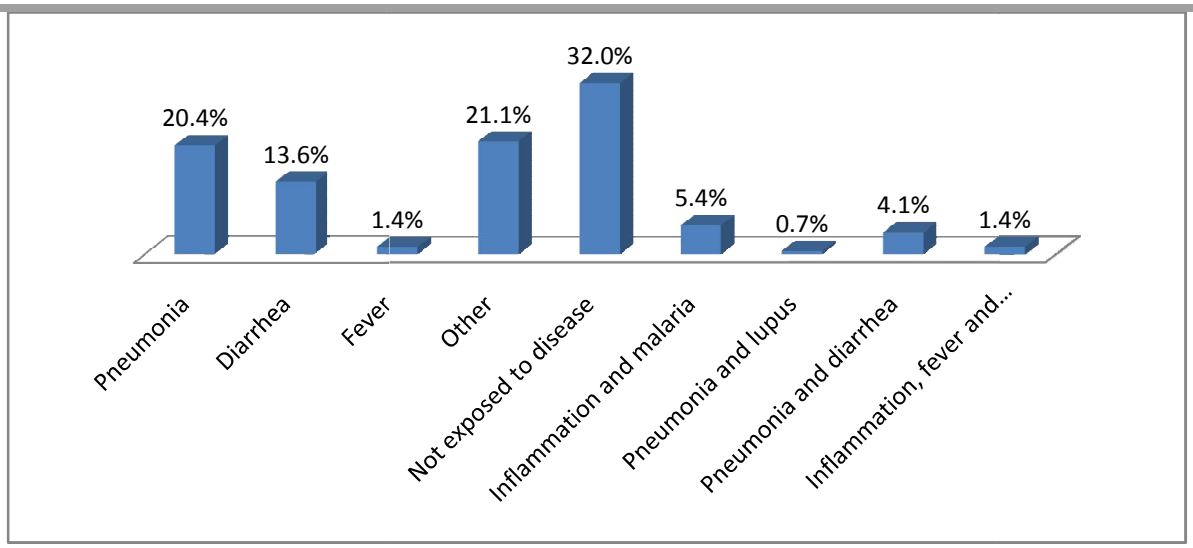


Figure No (12-23) show the diseases that the child suffer from

Table (13-23) the age of the mother

13 / Mother's age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25	39	26.5	26.5	26.5
	26-30	49	33.3	33.3	59.9
	31-35	38	25.9	25.9	85.7
	36 and more	21	14.3	14.3	100.0
	Total	147	100.0	100.0	

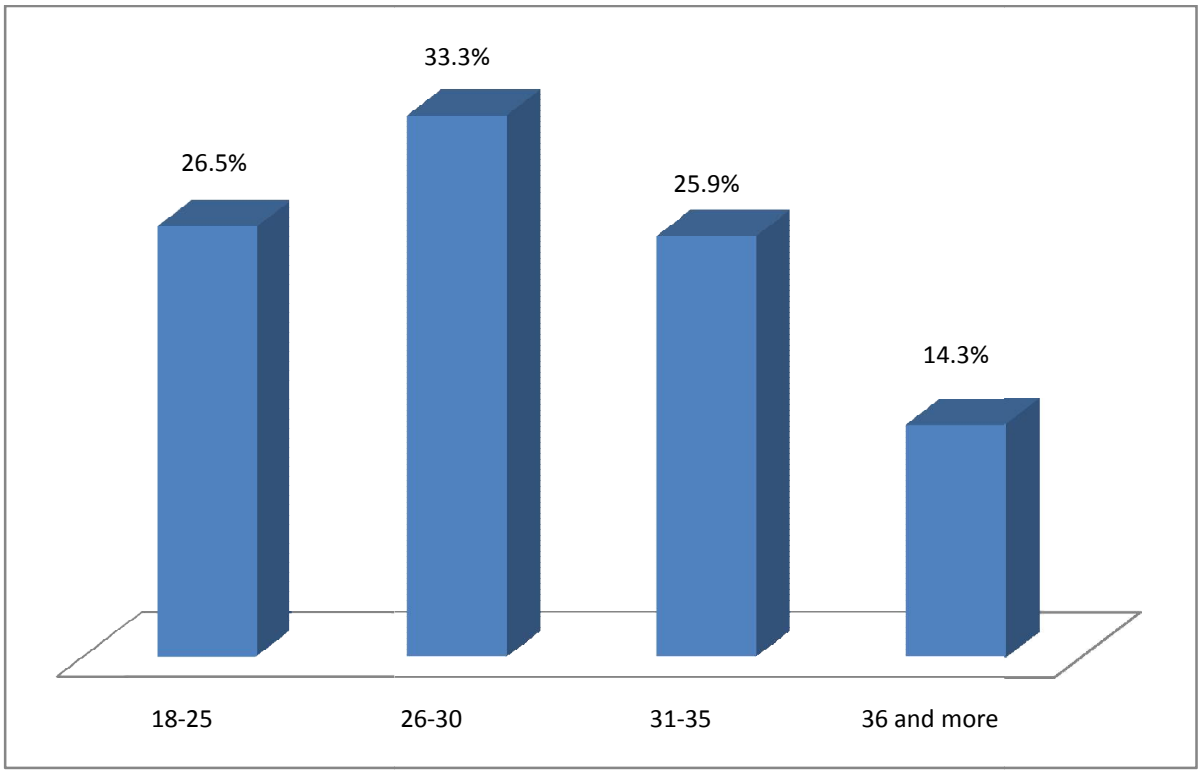


Figure (13-23) the age of the mother

Table No (14-23) mother occupation

14 / Mother education?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	House wife	125	85.0	85.0	85.0
	Worker	2	1.4	1.4	86.4
	employee	14	9.5	9.5	95.9
	Free small works	3	2.0	2.0	98.0
	Other	3	2.0	2.0	100.0
	Total	147	100.0	100.0	

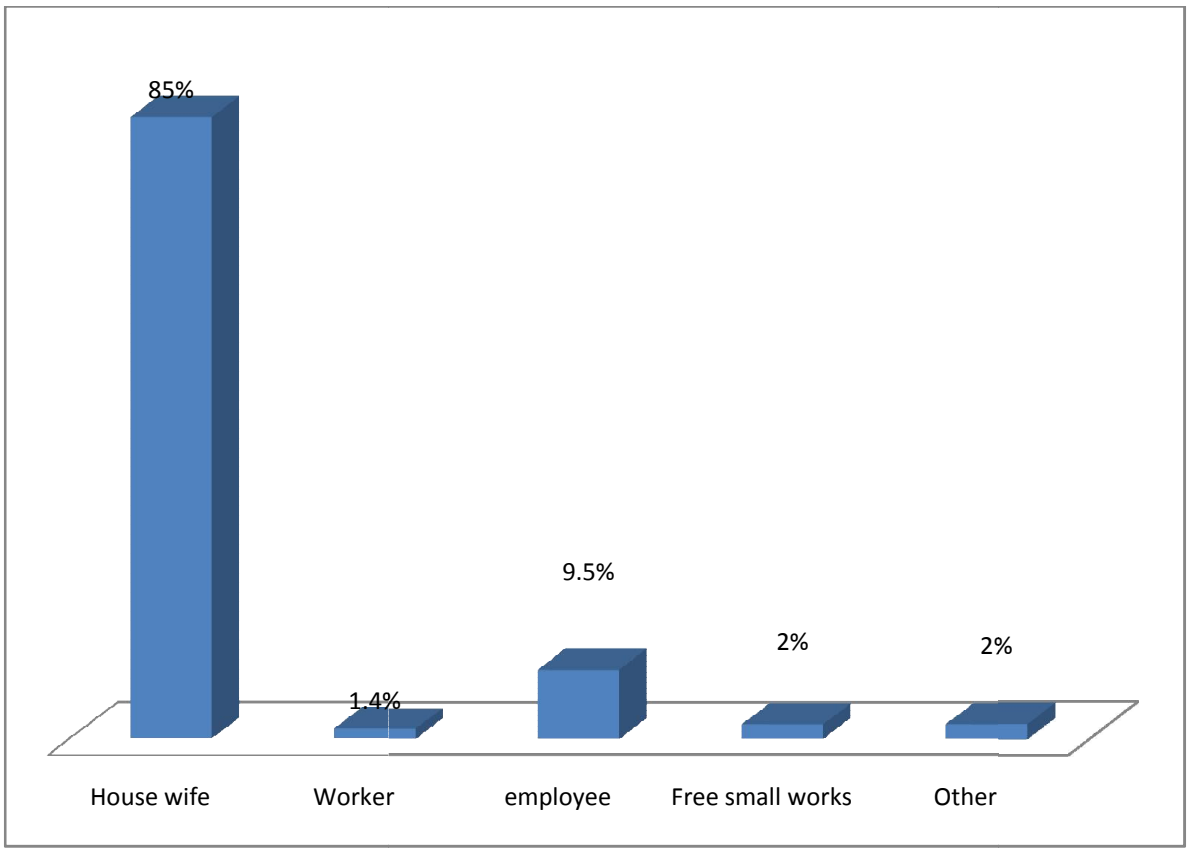


Figure No (14-23) mother occupation

Table No (15-23) mother education

15 / The educational level of the mother?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	illiterate	3	2.0	2.0	2.0
	The cell of the Koran	1	.7	.7	2.7
	primary	39	26.5	26.5	29.3
	secondary	52	35.4	35.4	64.6
	University	47	32.0	32.0	96.6
	Postgraduate studies	5	3.4	3.4	100.0
	Total	147	100.0	100.0	

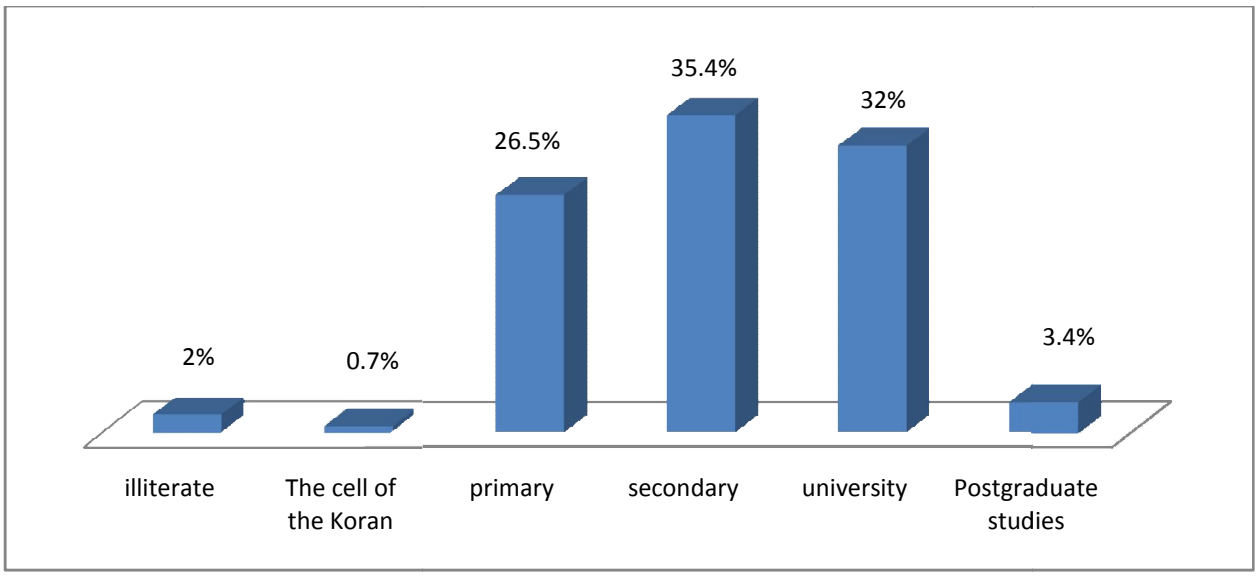


Figure No (15-23) mother education

Table No (16-23) the social status of the mother

16 / Social status of mother?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	144	98.0	98.0	98.0
	Separate	1	.7	.7	98.6
	widow	2	1.4	1.4	100.0
	Total	147	100.0	100.0	

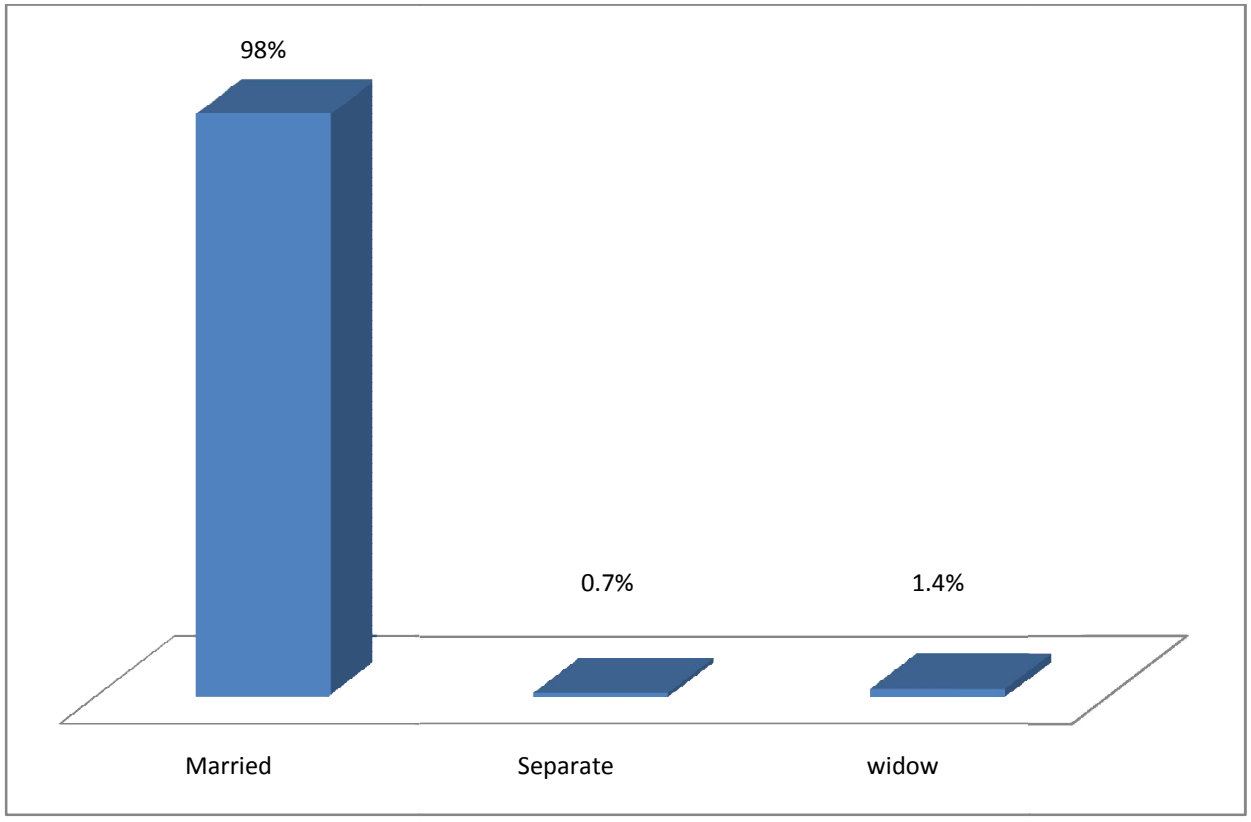


Figure No (16-23) the social status of the mother

Table No(17-23) the family either small or extended

17 / Family type?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Small	99	67.3	67.3	67.3
	Extended	48	32.7	32.7	100.0
	Total	147	100.0	100.0	

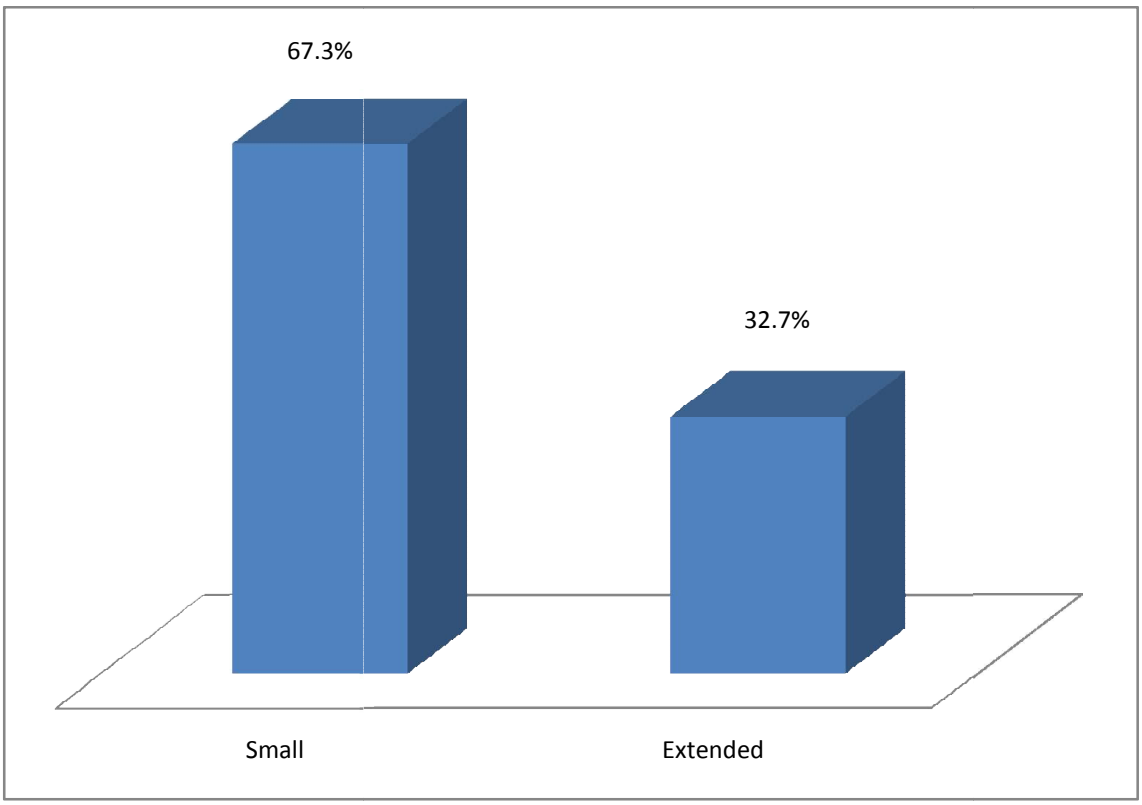


Figure No(17-23) the family either small or extended

Table No(18-23) show the family members (the parents and the children)only no body else included

18 / Number of family members?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 people	14	9.5	9.5	9.5
	4 people	39	26.5	26.5	36.1
	5 people	38	25.9	25.9	61.9
	6 people	22	15.0	15.0	76.9
	7 people	17	11.6	11.6	88.4
	8 people	7	4.8	4.8	93.2
	9 people	5	3.4	3.4	96.6
	10 people	3	2.0	2.0	98.6
	11 people	2	1.4	1.4	100.0
	Total	147	100.0	100.0	

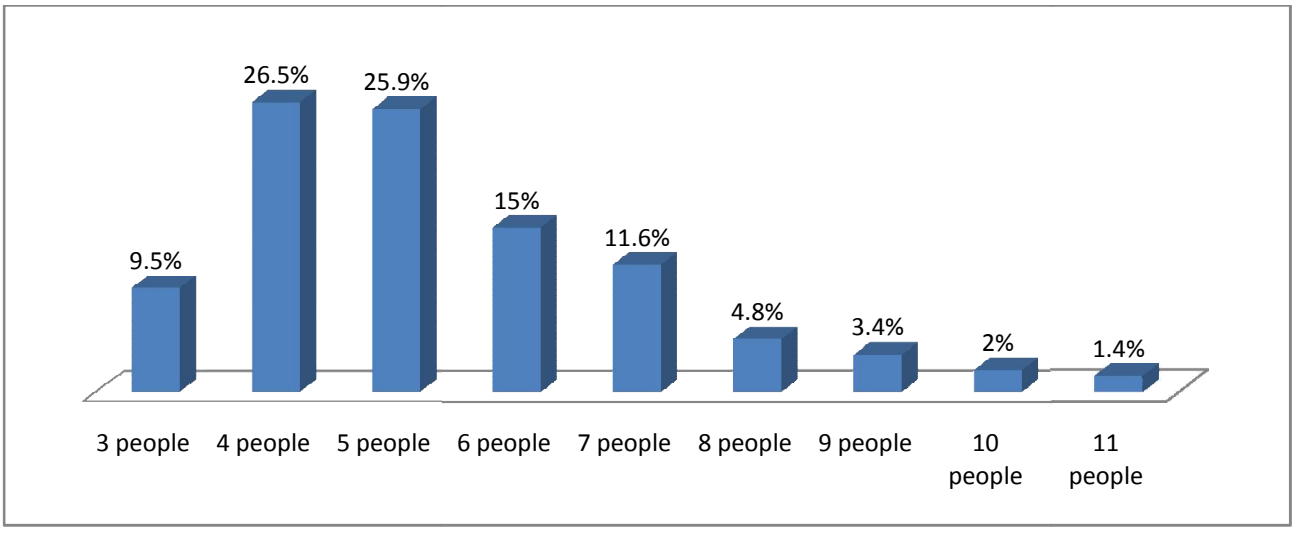


Figure No(18-23) show the family members (the parents and the children)only no body else included

Table No(19-23) number of children in the family not include parents or other person

19 / Number of children in the family?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 child	14	9.5	9.5	9.5
	2 children	37	25.2	25.2	34.7
	3 children	41	27.9	27.9	62.6
	4 children	21	14.3	14.3	76.9
	5 children	17	11.6	11.6	88.4
	6 children	7	4.8	4.8	93.2
	7 children	4	2.7	2.7	95.9
	8 children	4	2.7	2.7	98.6
	9 children	2	1.4	1.4	100.0
	Total	147	100.0	100.0	

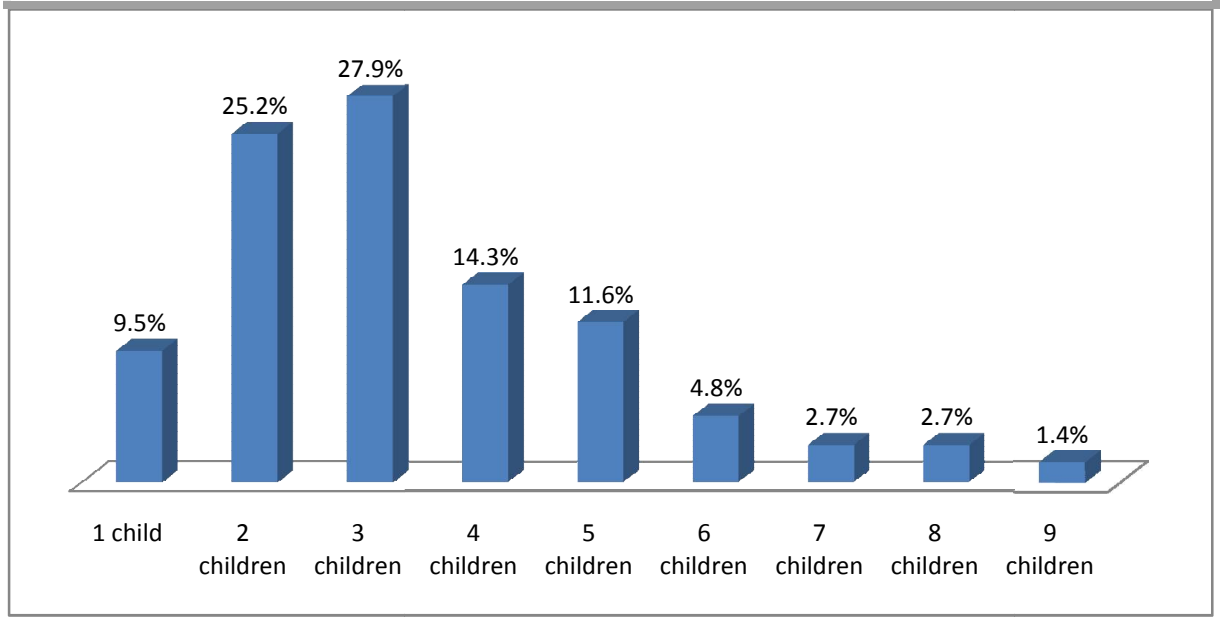


Figure No(19-23) number of children in the family not include parents or other person

Table No (20-23) the monthly income of the family

20 / Family income monthly?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1000	21	14.3	14.3	14.3
	1000 - less than 3000	68	46.3	46.3	60.5
	3000 - less than 5000	32	21.8	21.8	82.3
	5000 and more	25	17.0	17.0	99.3
	without	1	.7	.7	100.0
	Total	147	100.0	100.0	

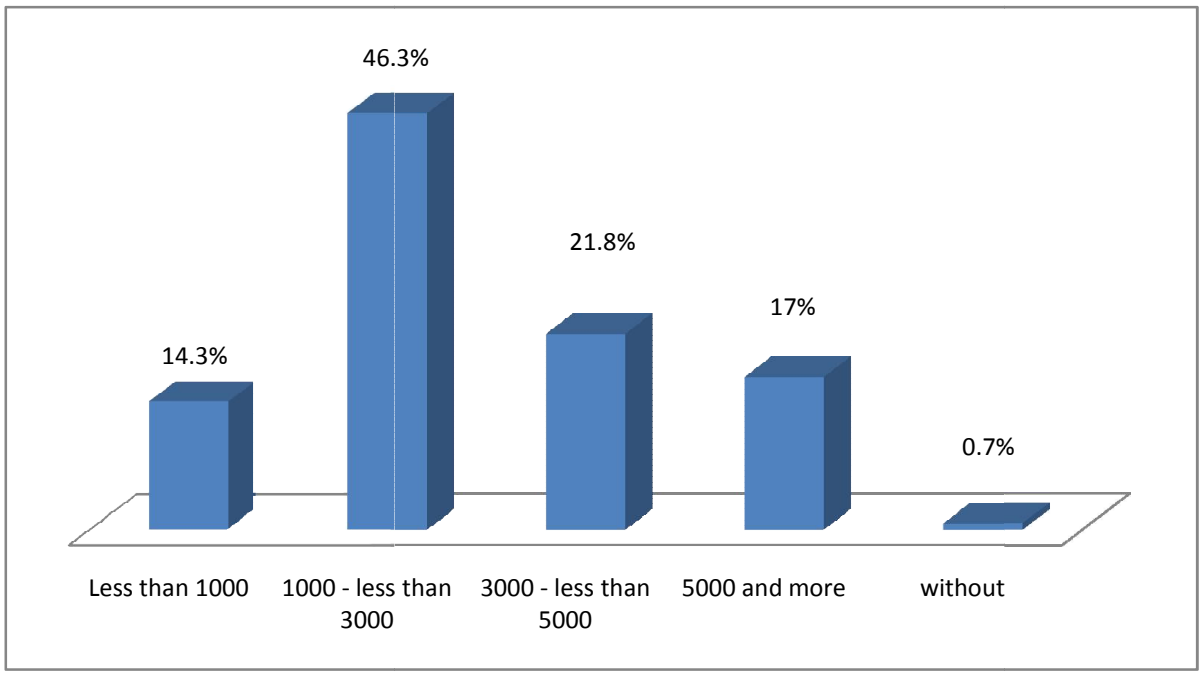


Figure No (20-23) the monthly income of the family

Table No(21-23) show who is responsible for financial supply to the family

21 / Who is financially reliable?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	the father	143	97.3	97.3	97.3
	the mother	1	.7	.7	98.0
	Other	2	1.4	1.4	99.3
	Mother + Father	1	.7	.7	100.0
	Total	147	100.0	100.0	

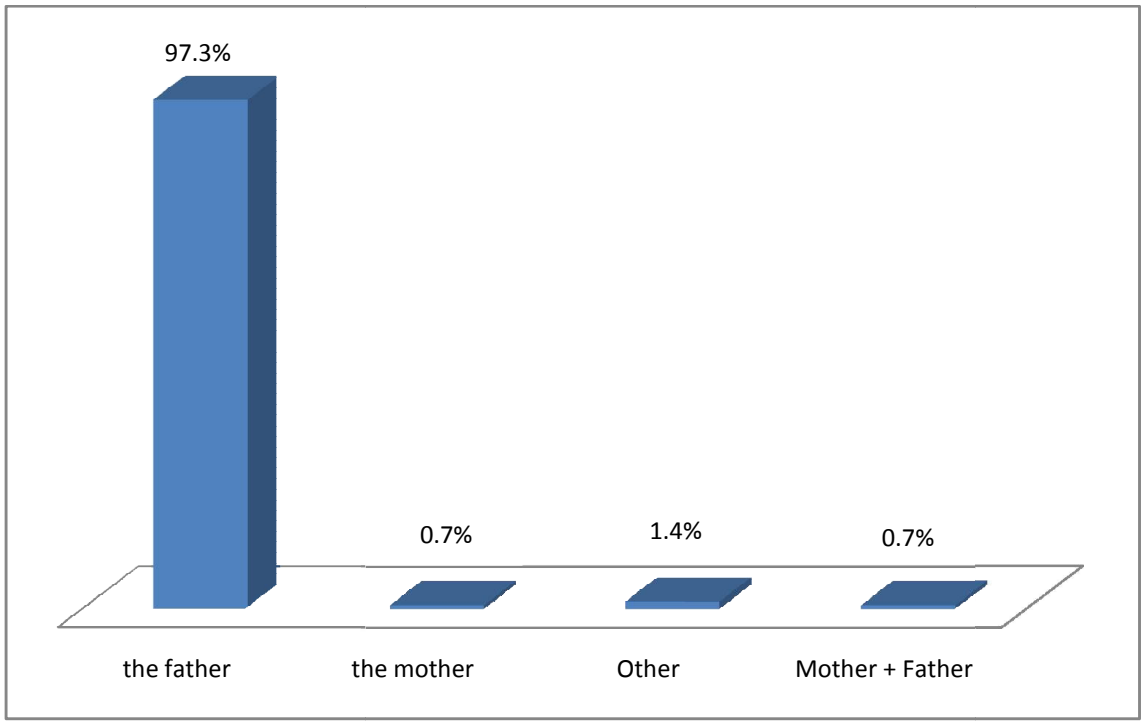


Figure No(21-23) show who is responsible for financial supply to the family

Table No(22-23) drinking water source

22 / Source of drinking water?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Pipe)	107	72.8	72.8	72.8
	Caro	16	10.9	10.9	83.7
	Other	24	16.3	16.3	100.0
	Total	147	100.0	100.0	

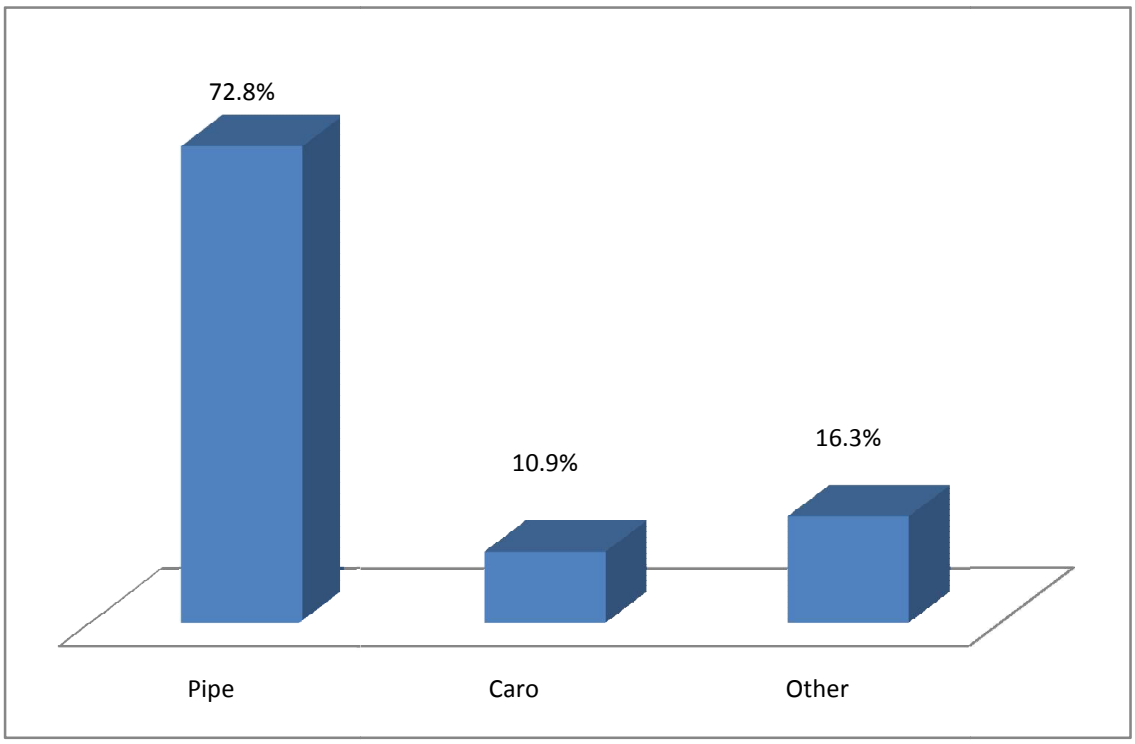


Figure No(22-23) drinking water source

Table No (23-23) which type of water cycle that the family have

23 / Type of water cycle?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	My bath	54	36.7	36.7	36.7
	Bathroom Siphon	93	63.3	63.3	100.0
	Total	147	100.0	100.0	

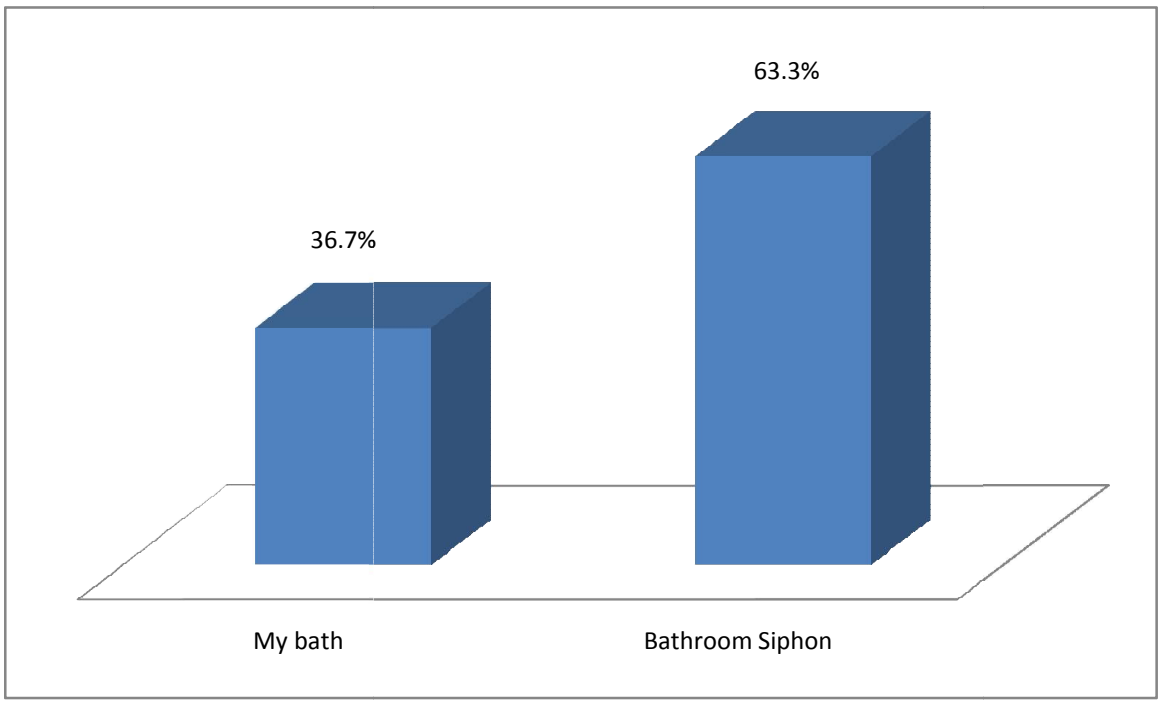


Figure No (23-23) which type of water cycle that the family have

"Chapter five "

DISCUSSION:

In this study of 147 child , 53.7 % was females and 46.3 % males. 89.1% of children had MUAC measurement of >125mm which is normal (green colour) , while 8.2% had MUAC between 115mm to 125mm (yellow colour),so they was moderately malnourished or at risk to develop SAM , and 2.7% of children was severely malnurished MUAC was <115mm (red colour) , they were about 4 children ,two of them were already staterted management taking correction meals , and the other two I advised them to urgently refers to hospital to receive management that protect the child from further deterioration .Regarding socio demographic characteristics influence on health status, results were found to correlate them . As educated mother's are conscious about their children's health , in this study 35% of mothers were secondary school educated , and just 2%were illiterate which is good. Mother occupation 85% were housewifes. Maternal age 85.7% were 18 to 35 years of age , so the majority of mothers were at the reproductive age. Family members including parents most of the families were four or five in number 52.4% . Socioeconomic factors association including the family monthly income 46% had 1000 to less than 3000 SDG per month , and in 97%of families the father was the major financial supplier. Also the diseases that the child suffers from can adversely affect his /her appetite and feeding , 47% of children in this survey were not suffer from any disease at the time or two weeks ago. The high prevalence of URTIs 20.4% can be explained by seasonality ; because in Sudan the weather is cold from November to February table (12-23) one child was 4 years boy had celiac disease (glutein sensitivity) but he was well nourished and sizable for his age . Also 95.2 % of mothers were regularly vaccinating their children up to date . 58.5% of mothers stopped breastfeeding before the completion of two years of age of their children , but 57.8% started weaning(introduction of solid food) their children at or after the six months . Type of latrine either deep or shallow is an indicator of environmental predisposition to diarrhoea which can lead to acute loss of weight , in this study 36.7 % were latrines . Ihab Ahmed Aisaa MD from AlGazera university , conducted study in Turkish hospital and primary health care centres in Alkalakla area in Khartoum state 2012 about Mother's kknowledge attitude and practices on malnurished children under 5 years, his study found that malnutrition diseases were attributed to low level of education of parents 70% of mothers and 56% of fathers were illiterate , also family size and low monthly income (80% were less than 500 SDG) . Also his study revealed other factors

increase the prevalence of malnutrition diseases unhealthy practices 48%bottle feeding ,also early or too late introduction of complementary food.

Limitations of this study was : not enough time spent to practice measurements . May be faulty measurement, if tightening or loosening the MUAC tape too much, or not measuring from the middle of the arm.

"Chapter Six "

6.1Conclusion:

Children with normal MUAC measurement (>125mm) were found to be 89.1% of the total sample , and which was associated with other finding in the factors that can attribute to the nutritional status .
Individual well-being in the form of nutritional status can be directly observed as opposed to house hold well-being.
This study can provides information that can be used for nutritional surveillance and programs that would target and focus more on populations most affected

6.2 Recommendation:

1/ provide training for surveyors about measurement accuracy.
2/ Evaluating the skills of the surveyors at the end of the training and assuming tha all of the concepts have been understood.
3/ The equipments which will be used for anthropomorphic measurements should be assured for quality, and test their calibration at the beginning of the the survey, and regular duringly.
4/ Government should take necessary steps to aware women about the importance of breastfeeding, and the continuation for two years or more. And to educate them about healthy feeding practices, and the right time to start adding meals to breastfeeding.

6.3References :

1) **INFANT AND YOUNG CHILD FEEDING**

World Health Organization. (2018). *Infant and young child feeding*. [online] Available at: http://www.who.int/mediacentre/factsheets/fs342/en/ [Accessed 15 Feb. 2018].

2) **NAOTUNNA, N. P. G. C. R., DAYARATHNA, M., MAHESHI, H., AMARASINGHE, G. S., KITHMINI, V. S., RATHNAYAKA, M., PREMACHANDRA, L., PREMARATHNA, N., RAJASINGHE, P. C., WIJEWARDANA, G., AGAMPODI, T. C. AND AGAMPODI, S. B.**

Nutritional status among primary school children in rural Sri Lanka; a public health challenge for a country with high child health standards

3)www.who.int/emergencies/response -plans /2017/Sudan

4)N.P /2017.web.29 Mar.2017

5) **CONFLICT.LSHTM.AC.UK. (2018). TYPES OF MALNUTRITION. [ONLINE] AVAILABLE AT: HTTP://CONFLICT.LSHTM.AC.UK/PAGE_115.HTM [ACCESSED 15 FEB. 2018].**

6) **FACTORS CAUSING MALNUTRITION AMONG UNDER FIVE CHILDREN IN BANGLADESH**

M. and ., M. (2006). Factors Causing Malnutrition among under Five Children in Bangladesh. *Pakistan Journal of Nutrition*, 5(6), pp.558-562.

7) **HIEN, N. N. AND KAM, S.**

Hien, N. and Kam, S. (2008). Nutritional Status and the Characteristics Related to Malnutrition in Children Under Five Years of Age in Nghean, Vietnam. Journal of Preventive Medicine and Public Health, 41(4), p.232.

8) **SRIVASTAVA, A., MAHMOOD, S. E., SRIVASTAVA, P. M., SHROTRIYA, V. P. AND KUMAR, B.**

Srivastava, A., Mahmood, S., Srivastava, P., Shrotriya, V. and Kumar, B. (2012). Nutritional status of school-age children - A scenario of urban slums in India. *Archives of Public Health*, 70(1).

9)**JUMA, O. A., ENUMAH, Z. O., WHEATLEY, H., RAFIQ, M. Y., SHEKALAGHE, S., ALI, A., MGONIA, S. AND ABDULLA, S.**

Juma, O., Enumah, Z., Wheatley, H., Rafiq, M., Shekalaghe, S., Ali, A., Mgonia, S. and Abdulla, S. (2016). Prevalence and assessment of malnutrition among children attending the Reproductive and Child Health clinic at Bagamoyo District Hospital, Tanzania. BMC Public Health, 16(1).

10) **GLOVER-AMENGOR, M., AGBEMAFLE, I., HAGAN, L. L., MBOOM, F. P., GAMOR, G., LARBI, A. AND HOESCHLE-ZELEDON, I.**

Glover-Amengor, M., Agbemafle, I., Hagan, L., Mboom, F., Gamor, G., Larbi, A. and Hoeschle-Zeledon, I. (2016). Nutritional status of children 0–59 months in selected intervention communities in northern Ghana from the africa RISING project in 2012. Archives of Public Health, 74(1).

11) **MUNTHALI, T., JACOBS, C., SITALI, L., DAMBE, R. AND MICHELO, C.**

Munthali, T., Jacobs, C., Sitali, L., Dambe, R. and Michelo, C. (2015). Mortality and morbidity patterns in under-five children with severe acute malnutrition (SAM) in Zambia: a five-year retrospective review of hospital-based records (2009–2013). Archives of Public Health, 73(1).