Demographic, Houses Environment Factors and diseases of Malnourished Infants Under Six Months Age at Elobied, North Kordofan State-Sudan

ABSTRACT:

This study was conducted at Elfatih Elnour Health Centre, Elobied, Sheikan locality, North Kordofan State, Sudan. The study aimed at assessing the demographic, houses environment factors and diseases of malnourished infants under six months age. Forty five infants were selected randomly from total population of 150 ones who visited the center during fifteen days. Primary data were collected using questionnaire and observations. Data were analyzed using SPSS program version (16). Study results revealed that families were categorized into small (22%), medium (47%) and large (31%). Forty two percent of household had two children also with same ratio of them had one children. The study findings revealed that education levels of mothers and fathers, were primary school (49 and 47%), secondary school (20 and 38%) and university (20 and 7%), respectively. Regarding to father's occupations, most of them (84%) were free work and all mothers were housewives. The study results indicated that diseases suffered by respondents were infection (40%), fever (26%) and diarrhea (34%). The sources of water used in respondents' houses were excavation (4%), ground water (31%) and tap water (65%). All houses had latrines with siphon (53%) or traditional pits (45%). Statistical analyses showed that there were significant relationships ($p<.05$) between number of family members and level of mother education with correlation coefficient 0.67, type of latrine and diseases infected respondents with correlation coefficient 0.73 and source of water and diseases infected respondents. It can be concluded that family size was medium, number of children per family were one or two and education level of parents was primary school. Occupation of fathers and mothers were free work and housewife, respectively. Children suffered from infection, fever and diarrhea. Mostly, source of water used by respondents was tap water and they had latrines. Further studies are needed in other health centers.

Keywords: Demographic, Malnourished, Under six month, Gender, Age, Occupation, Diseases, Latrine.

INTRODUCTION:

Child malnutrition is internationally recognized as an important public health indicator for monitoring nutritional status and health of population. The devastating effects of malnutrition on

human performance, health and survival well established today [1]. The United Nations Food and Agriculture Organization (FAO) estimated that about 840 million people are malnourished in the developing world and children under 5 years of age are the most susceptible [2].

Malnutrition in children is the consequence of a range of factors that are often related to poor food quality, insufficient food intake, and severe and repeated infectious diseases, or frequently some combinations of the three. Growth assessment thus not only serves as a means for evaluating the health and nutritional status of children but also provides an indirect measurement of the quality of life of an entire population [3].

Infants are at increased risk of malnutrition starting from six months when breast milk alone is no longer sufficient to meet all the nutritional requirement of infants. Children living in most developing countries are introduced directly to the regular household diet made of cereal or starchy root crops which is a major cause for the high incidence of child malnutrition, morbidity and mortality [4].

Abdelnour [5] showed that diarrheal episodes were common among malnourished children. But children whose main food was breast milk had lower rate of diarrheal episodes than those children fed on powdered milk. The study also showed that children who were fed on breast milk had the lowest incidence of anemia.

Naylor [6] reported that breastfed children are less susceptible to pneumonia, allergies, asthma, childhood diabetes, gastrointestinal illness, and infection, and have lower rates of childhood cancers such as leukemia and lymphoma. Breast milk is also easy and convenient as it requires no sterilization or special equipment, or heating. Breastfeeding saves money as need for infant formula is reduced; it decreases the burden on the care system through eliminating the expense of infant formula and reduced hospitalization rates.

According to UNICEF [7] five infectious diseases (pneumonia, diarrhea, malaria, measles and AIDS) account for more than one – half of all deaths in children aged less than 5 years malnutrition increase diarrhea incidence and duration. Moreover malnutrition increases the risk of mortality from diarrheal and acute lower respiratory infection in children less than 2 years of age. Inadequate nutrition during the first two years of life may lead to childhood morbidity and mortality, as well as inadequate brain development [8].

The UNICEF [9] revealed that breast milk is the perfect food for infants in the first six months of life. It also protects the baby from the leading causes of infant death: respiratory infections and diarrhea. Breast milk also stimulates the immune system and response to vaccinations.

Objectives of the study: The study aimed at assessing the demographic, houses environment factors and diseases of malnourished infants under six months age.

MATERIAL AND METHODS:

Study Area: This study was conducted at Elfatih Elnour Health Centre, Elobied, Shikan locality, North Kordofan State, during the period (2018 – 2019). North Kordofan State is located in central western Sudan at the northern edge of the Savanna belt. Sharing borders with South and west Kordofan States Elobied town is located in North Kordofan State, between longitudes 27^{o} – 54^{o} East and latitudes 12^{o} – 93^{o} North [11].

Ethical approval:

This study got ethical approval from the Ministry of Health, North Kordofan State. In addition to the agreement of Elfatih Elnour Health Centre, Elobied, Sheikan locality, North Kordofan State, Sudan. Before enrollment of the infant in the study, the mothers have got informed consent about the study.

Sampling techniques: According to Balal *et al*. [10] forty five infants were selected randomly, as a study sample, from the total population who visited the center during fifteen days (approximately 150), using the following equation:

$$N = \log\left(1 + \frac{\alpha 2 * n}{\alpha 2}\right)$$

Where:

N= size of the sample

$\alpha = 0.01$

n = monthly target

Inclusion criteria: All infants of age 0 - 6 months who visited the center to follow up the growth monitoring.

Exclusion criteria: More than 6 months children and parental refusal to participate in the study.

Data collection: The data of this study were collected via primary data which was done via a questionnaire that designed to contain full information about the demographic, house environment and diseases of Infants under six months of age. In addition to secondary data which was collected from books, journals, reports and previous studies.

Statistical analysis

Data was analyzed by using statistical package for the social sciences (SPSS) software version 16 (percentage, frequency and coefficient correlation). Appropriate test to significant to the 5 % level is used [11]. The results were presented in tables and figures.

RESULTS AND DISCUSSION:

Demographic factors:

Gender of respondents: As shown in fig (1), the results of this study showed that the gender of the infants under six months of age, were divided into 34% male and 66% female.

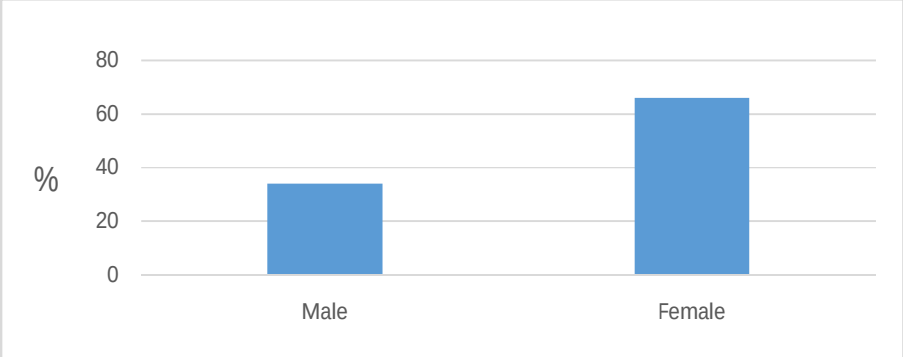

Fig (1) Gender of respondents

Ages of respondents: The findings of this study revealed that 9% of the respondents their age was two months, 44% was three months, 24% was four months and 22% was five months (Fig, 2). Ahmed and Abdelgader [12] revealed that most of malnourished children 73% within the age group of 13-24 month, while 22% were more than 24-59 months, however only 5% less than 12 months.

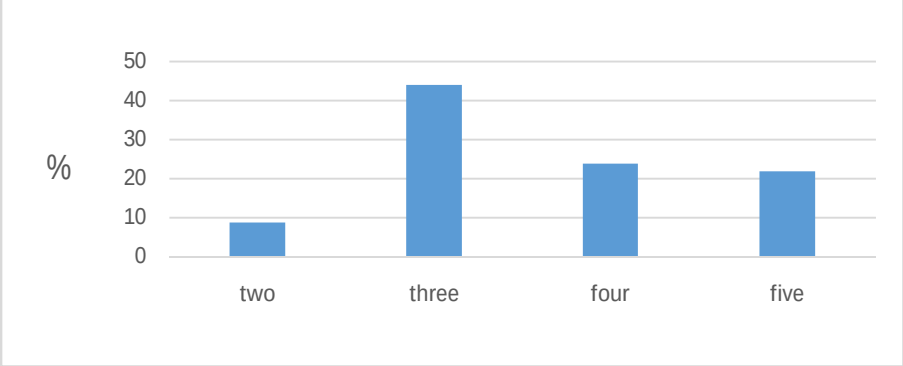

Fig (2) Ages of respondents

Family size of respondents: As presented in fig (3), according to the number of family members the families divided to small family (1-3 individuals) (22%), medium family number (4-5 individuals) (47%) and large family number (more than 5 individuals) (31%). The increment in family members affect the level of care that can be taken by the mothers to their children.

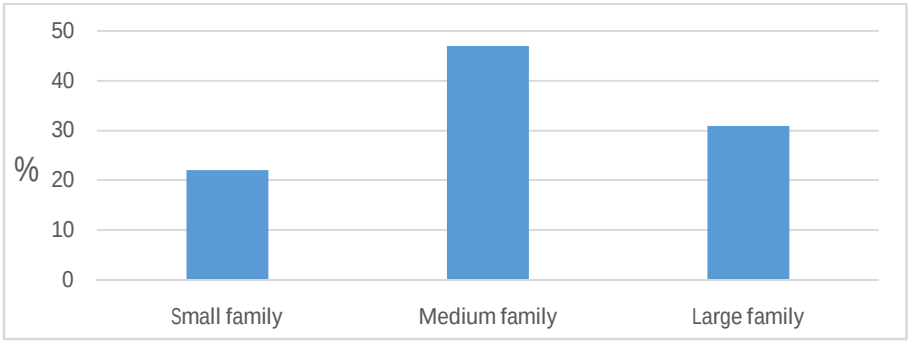

Fig (3) Number of respondents' family member

Number of under-five children in respondents' household: According to the results of this study, 42% of the households had one child, also 42% of them had two children as well as 16% of them had three or more children (Fig, 4). This decrease in the population of the children is due to the awareness of the mothers about the risk of recurrent delivery for her and her children. Furthermore, the continuous breastfeeding, is favorite and recommended, hence it leads to ideal spacing of normal delivery.

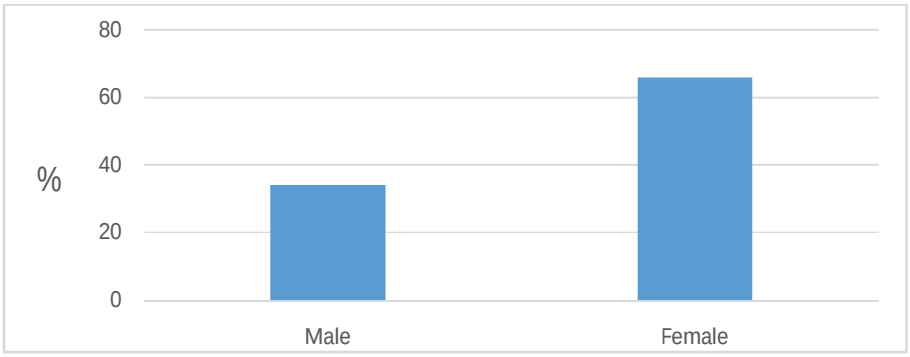

Fig (4) Number of under-five infants in household

Education level of respondents' parents: Concerning the level of respondents' mother education in this study, It is obvious that 9% of them were illiterate, 2% of them were Quran memorization (*khalwa*) level, 49% of them were primary school educated, 20% of them were secondary school educated and 20% of them were graduated from the university (Table, 1). These findings declared that the percentage of primary, secondary and university graduates were the most among the mothers which can help in understanding the awareness of good practices in food and nutrition in general. Regarding the level of respondents' father education in this study, it is clear that 4% of them were illiterate, 4% of them were Quran memorization (*khalwa*) level, 47% 0f them were primary school educated, 38% of them were secondary school educated, 7% of them were graduated from the university (Table, 1). Most of the fathers had primary, secondary and university certificates which help in adopting the advices of good practicing of child health and nutrition.

Table (1) Education level of respondents' parents

Level	Frequency	(%)
Mothers		
Illiterate	4	9
Quran Memorization	1	2
Primary School	22	49
Secondary School	9	20
University	9	20
Total	**45**	**100**
Fathers		
Illiterate	2	4
Quran Memorization	2	4
Primary School	21	47
Secondary School	17	38
University	3	7
Total	45	100

Occupation of respondents' parents: As shown in table (2), most of respondents' fathers were free work (85%), some of them were employed (7%), and others were traditional farmers (4%) and the rest were sheep herders (4%). Ahmed and Abdelgader [12] reported that most of fathers 70% were traditional farmers and labors workers, while the remaining fathers were traders 30%. In accordance with the study outcomes, all the mothers of the respondents were house wives (Table, 2). Ahmed and Abdelgader [12] revealed that 84% of mothers of malnourished children were housewives, while 16% were employees. This may lead to good care for their children since they have enough time for being more contact with them.

Table (2) Occupation of respondents' parents

Occupation	Frequency	(%)
Fathers		
Free work	38	85
Employee	3	7
Farmer	2	4
Sheep herder	2	4
Total	**45**	**100**
Mothers		
Housewife	45	100
Employee	0	0
Free work	0	0
Farmer	0	0
Total	**45**	**100**

Sources of water in respondents' houses: As displayed in table (3), the source of water in respondents' houses were excavation (*hafeer*) (4%), ground water (31%) and tap water or water net (65%). As declared by Ahmed and Abdelgader [12] 38% of families were drinking tap water and 62% of them from dams. The source of drinking water is very important for health and nutrition status of the human beings. The contaminant water increases the rate of diarrhea and gastrointestinal tract infections and can influence the nutrition status of the infants. Generally, using tap water which is treated with chlorine may ensure minimize or decrease susceptibility to diseases.

Table (3) Sources of water in respondents' houses

Water source	Frequency	(%)
Excavation (*Haffer*)	2	4
Ground water	14	31
Tap water	29	65
Total	**45**	**100**

Latrines and their types in respondents' houses: As shown in table (4), the study results explained that all respondents' houses had latrines (100%). This result is supporting the hygiene aspects of the family. Regarding the study results, the types of latrines in the respondents houses were categorized as follow (53%) were siphon latrine, (45%) were traditional pit and (2%) were other types of latrines (Table, 4). Ahmed and Abdelgader [12] indicated that most of malnourished children's families had traditional pit in their houses (68%), while 22% of families had siphons and 10% of them hadn't latrines in their houses. The good types and well-constructed latrines will prevent or minimize the house fly, mosquitoes and other diseases and microbes carriers' dispersion.

Table (4) Latrines and their types in respondents' houses

Variable	Frequency	%
Presence		
Yes	45	100
No	0	0
Total	45	100
Type		
Siphon	24	53
Traditional pit	20	45
Other type	1	2
Total	**45**	**100**

Diseases infected respondents: As presented in table (5), the study findings indicated that 40% of the respondents suffered from infection, 26% of them from fever and 34% of them from diarrhea. These symptoms and diseases may be due to lack of personal hygiene, bottle feeding abuse, contaminated water and declining of immunity level. Ahmed and Abdelgader [12] reported that 46%

of malnourished children suffered from diarrhea. The diarrhea is considered as a great risk leading to occurrence of malnutrition. Many studies showed that gastrointestinal infections especially diarrhea were very important in incidences of PEM.

Table (5) Diseases infected respondents

Type	Frequency	%
Diarrhea	15	34
Fever	12	26
Infection	18	40
Total	**45**	**100**

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

According to the study results it can be concluded that the family size was medium, number of children per family were one or two and the education level of parents was primary school. The occupation of fathers was free work whereas of mothers was housewife. The children were suffered from inflammation, fever and diarrhea. Mostly, the source of water used in respondents' houses was tap water and all respondents' houses had latrines.

Recommendations

Based on study results and focused on ways for improving nutritional status of infants, the study recommended that efforts should be made to educate mothers about infant practices and more studies were needed to focus on causes of stunting and wasting.

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