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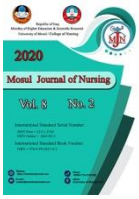

Prevalence and Risk Factors of Anemia among Children Aged 5 months - 12 years at Al Anbar Province

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Abstract
Background : Anemia is one of the most common diseases of childhood and it is a health problem globally, particularly in developing regions. anemia during childhood is strongly associated with neurological development, and cognitive and immune function, and can lead to mental impairment and poor motor development.
Aims of the study: The aim of this study was to evaluate the prevalence and risk factors of anemia among children aged 5 months -12 years in Haditha City.
Methodology: A descriptive quantitative study is carried out at General Haditha Hospital and out clinic in Haditha City from January 15th 2020 to June 18th 2020 in order to assess prevalence and risk factors of anemia among children aged 5 months - 12 years . A structured questionnaire was used to collect data on the characteristics of the children and members of their families. Hemoglobin (Hb) levels were measured by using a micro chemical reaction method.
Results: In total, 340 children were included in this study. The prevalence of anemia was 82.4% . The results show that diarrhea and fever in the previous two weeks (23.2%, 52.4%) respectively, and 19.1% caregivers could identify the optimum timing of complementary feeding but only 20.9% could identify the first complementary food which should be consumed by infants .
Conclusions: The prevalence of anemia among children 5 months to 12 years of age was 82.4% .The feeding practice of caregivers was associated with anemia and the caregiver nutritional knowledge was low . Nutrition improvement projects are needed to reduce the burden of anemia among children .
Key Words : Risk Factors, Anemia, Children

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Introduction

Anemia is one of the most important health problems throughout the world (Balcı et al., 2012). Anemia is a common nutritional deficiency disorder and global public health problem which affects both developing and developed countries with major consequences for human health and their social and economic development (McLean et al., 2009). According to (Goddard et al., 1997) reports, one third of the global populations (over 2 billion) are anemic due to imbalance in their nutritious food intake. According to the World Health Organization (WHO) report, anemia is the most common hematologic manifestation. Globally, around 1.62 billion people are affected by anemia that accounts more than 24.8% of the world population and from 30 to 50% of anemia was caused due to iron deficiency . Iron-deficiency anemia (IDA) resulted 273,000 deaths in the world, and 97% of deaths were occurred in developing countries (Tezera et al., 2018). From 1993 to 2005, the global prevalence of anemia was 47.4% among children less than 5 years of age, and 46–66% in developing countries (McLean et al., 2009). In China in 2012, 28.2 and 20.5% of children 6–12 and 13–24 months of age, respectively, had anemia (Huang et al., 2018). Anemia during childhood has short- and long-term effects on health. The former include an increased risk of morbidity due to infectious disease (Thankachan et al., 2007). In addition, anemia during childhood is strongly associated with neurological development, and cognitive and immune function, and can lead to mental impairment and poor motor development (Cusick & Georgieff, 2016). The long-term effects include reduced academic achievement and work capacity in adulthood (Victora et al., 2008).

Methodology Research design

The non-experimental research design to determine the current prevalence of anemia among children at Haditha City. It is implemented in order to accomplish the early stated objectives. The study starts from January 15th 2020 to June 18th 2020 .

Technical design setting

The study conducted in general Haditha Hospital and out clinic in Haditha City at Al Anbar Governorate in Iraq.

Sample of the Study

A non- probability (purposive) sample of 340 children which visited general Haditha Hospital and out clinic in Haditha City. The study selected according to the following criteria:

Inclusion Criteria to select the sample

The sample is selected according to the following criteria:

All children aged 5 months -12 years

If their parents/legal guardians gave their consent by signing the informed consent forms.

If the children gave their assent and were voluntarily willing to participate in the study.

Exclusion Criteria

Children with chronic disease example (diabetes mellitus (D.M),chronic kidney disease (CKD), Leukaemia).

Children whose caregivers refused to be interviewed.

Children with micro encephalopathy, autism.

Tool I: patient assessment sheet

It developed by the researcher after reviewing of literature; it was consisted of three parts:

Part (1): Socio-Demographic Data Sheet

This portion is concerned with the collection of basic socio-demographic data gained from the caregiver for child interview questionnaire sheet as (geographic area , age for child , gender, mother age, education level for mother , occupational level for mother , father age , educational level for father , occupation level for father, Place of residence, socio-economic status).

Part (2): Clinical Status: it is developed to collect the health status data gained from the caregiver for child interview questionnaire sheet as (Anemia status, Short stature for age, Fever in the last 15 days, Previous history of anemia, and Diarrhea in the last 15 days).

Part (3): Nutritional Status : This portion is concerned with the collection of Feeding practice of children data gained from the caregiver for child interview questionnaire sheet as (Consume milk powder, Consume sugary drink, Consume yoghurt, Consume solid/ semisolid food, Consumption of meat, Consumption of dark-green leafy vegetables, Consumption of foods that are sources of iron and Consumption of liver).

Part (4): Mother Knowledge: It is developed to collect the Caregivers nutrition knowledge related to identify the optimum timing of complementary feeding, identify to the first complementary food which should be consumed by infants, known the optimum food of supplementary iron, identify nutrient relate to anemia and able identify the optimum timing of breastfeeding).

Data are analyzed through the application of Statistical Package of Social Sciences (SPSS)

version (25) program of these approaches (Descriptive Statistical Data Analysis Approach and The Inferential Statistics Data Analysis

3- Results

Analysis of the data and the results

Table (1) The demographic characteristic of children 5 months to 12 years of age (n = 340)

Socio-demographical characteristics variables	Frequency (N=340)	Percent %	Cum. percent
Geographical area			
East of the Euphrates	114	33.5	33.5
West of the Euphrates	226	66.5	100.0
Gender			
Male	173	50.9	50.9
Female	167	49.1	100.0
Age groups for child			
5month - < 2 years	122	36.0	36.0
2-4 years	92	27.0	63.0
5-7years	78	22.9	85.9
8-10 years	32	9.4	95.3
11-12 years	16	4.7	100.0
Statistics Mean ± SD	5 years ± 2		
Maternal age			
< 30 years	171	50.3	50.3
≥ 30 years	169	49.7	100.0
Mother's educational level			
Illiteracy	169	49.7	49.7
Primary	119	35.0	84.7
Medium	28	8.2	92.9
Secondary	19	5.6	98.5
University and above	5	1.5	100.0
Mother's occupation			
Un employee	325	95.6	95.6
Employee	15	4.4	100.0
Father's educational level			
Illiteracy	118	34.7	34.7
Primary	117	34.4	69.1
Medium	7	2.1	71.2
Secondary	72	21.2	92.4
University and above	26	7.6	100.0
Father's occupation			
Un employee	180	52.9	52.9
Employee	160	47.1	100.0
Residence area			
Urban	245	72.1	72.1
Rural	95	27.9	100.0
Socio economic Status			
Low	31	9.1	9.1
Moderate	307	90.3	99.4
High	2	0.6	100.0

% : percent SD: standard Deviation N: Number

The table (1)shows that the majority of the study sample (66.5%) are living in the West of the Euphrates and the remaining East of the Euphrates, and also shows that the vast majority of the study sample are male and accounted for (50.9%) of the whole sample. Regarding to the age group of child he vast majority of the study sample are within category of age groups and accounted for (36.0%). Concerning to the maternal age ,the majority of the sample are less than thirty years and accounted for (50.3%). Relative to the Mother's educational level and Father's educational level, the greater number of them can illiteracy and they are accounted (49.7%,34.7%) respectively. In addition, the major group of the study sample in regarding to occupational status for both (Mother's and Father's) are un employee and they accounted for (95.6%, 52.9%) respectively, and this table depicts that the highest percentage of the study sample are living in urban residential area and they accounted for (72.1%) of the complete sample. Finally, in the above table and in regarding to the parents socio-economic status, the results show that the major group of the study sample are within the moderate level of socio economic status (90.3%).

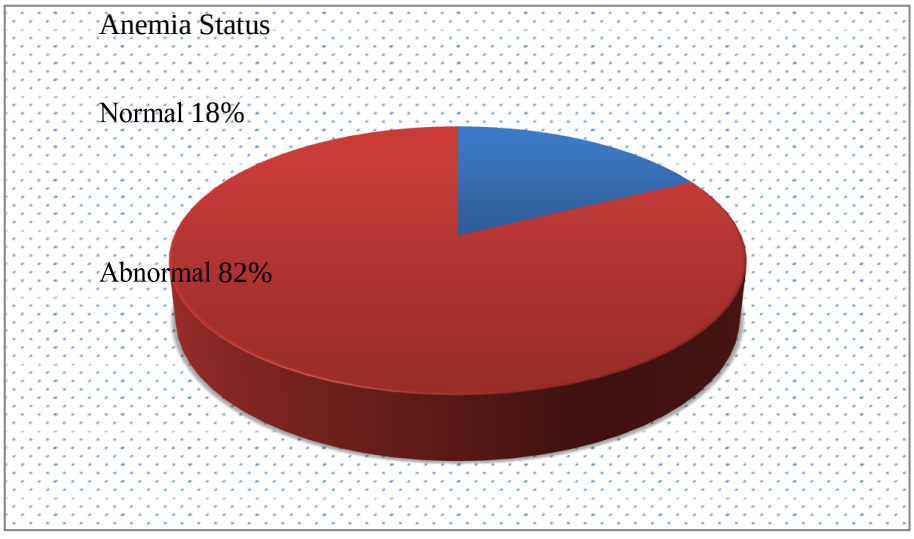
Table(2): Health status of children 5 months to 12 years of age (n =340)

Items codes	Medical information	Resp.	F.	%	Cum. Percent
2.1	Anemia status	Normal	60	17.6	17.6
		Abnormal	280	82.4	100.0
2.2	Short stature for age	Yes	125	36.8	36.8
		No	215	63.2	100.0
2.3	Fever in the last 15 days	Yes	178	52.4	52.4
		No	162	47.6	100.0
2.4	Previous history of anemia	Yes	128	37.6	37.6
		No	212	62.4	100.0
2.5	Diarrhea in the last 15 days	Yes	79	23.2	23.2
		No	261	76.8	100.0

Resp. : Respondents , % : Percentage , F : frequency

This table summarizes the prevalence of anemia was (82.4%), and it shows 52.4% and 23.2% reported that they had experienced fever and diarrhea in the previous two weeks respectively.

Figure(1): Anemia Status



Table(3) Feeding practice of children 5 month to 12 years of age in the previous 24 hour (n = 340)

Items code	Feeding practice	Resp.	F	%
3.1	Consume milk powder	Yes	271	79.7
		No	69	20.3
3.2	Consume sugary drink	Yes	212	62.4
		No	128	37.6
3.3	Consume yoghurt	Yes	209	61.5
		No	131	38.5
3.4	Consume solid/ semisolid food	Yes	202	59.4
		No	138	40.6
3.6	Consumption of meat	Yes	207	60.9
		No	133	39.1
3.7	Consumption of dark-green leafy vegetables	Yes	215	63.2
		No	125	36.8
3.8	Consumption of foods that are sources of iron (meat + beans)	Yes	201	59.1
		No	139	40.9
3.9	Consumption of liver	Yes	132	38.8
		No	208	61.2

Resp. : Respondents , % : Percentage , F : frequency

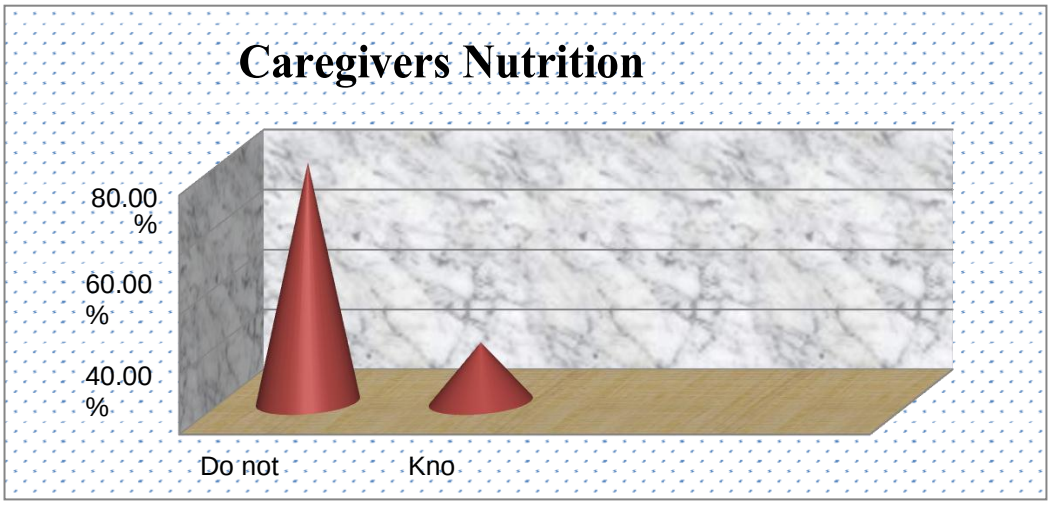
The table (3) shows that the previous 24 hour, most of the children had consumed milk, sugary drink, yoghurt (79.7%, 62.4%, 61.55) correspondingly, and solid/semisolid food, meat, dark green leafy vegetables and foods that are sources of iron (59.4%, 60.9%, 63.2%, 59.1%) respectively, but only 38.8% had consumed liver.

Table (4) Caregivers nutrition knowledge of children 5 months to 12 years of age (n = 340)

Item No.	Nutrition knowledge	Resp.	F.	%
1	Is able identify the optimum timing of complementary feeding	Know	65	19.1%
		Don’t know	275	80.9%
2	Is able identify to the first complementary food which should be consumed by infants	Know	71	20.9%
		Don’t know	269	79.1%
3	Has known the optimum food of supplementary iron	Know	43	12.6%
		Don’t know	297	87.4%
4	Is able identify nutrient relate to anemia	Know	40	11.8%
		Don’t know	300	88.2%
5	Is able identify the optimum timing of breastfeeding	Know	58	17.1%
		Don’t know	282	82.9%

Resp. : Respondents , % : Percentage , F : frequency

The results of table (4) shows the nutritional knowledge of the caregivers is low, 19.1% could identify the optimum timing of complementary feeding but only 20.9% could identify the first complementary food which should be consumed by infants and 87.4% , 88.2%, 82.9% couldn't identify the optimum food of supplementary iron, nutrient relate to anemia and the optimum timing of breastfeeding respectively.



Figure(2): Caregivers Nutrition Knowledge

Discussion of the Study Results

Anemia is one of the significant public health problems among children worldwide . Understanding risk factors of anemia provides more insight to the nature and types of policies that can be put up to fight anemia. The study used generalized linear models to identify the risk factors associated with anemia. This study found the following demographic factors had association with anemia: age of the child and the child's gender. Throughout the course of the present study , as shown in table (1), it has been noticed that (50.9%) of the study sample are males and the remaining females, this could be attributed to a higher attendance by males at the Haditha Hospital, where the sample was taken (The researcher). This result comes along with (Kejo et al., 2018), who report that the study population consisted of (436),anemia
(242) male and (194) female.in regarding to the age groups, the study shows that the dominant age group of study sample is within (5 months - < 2 years) old of age group and accounted for (36.0%). This truth comes along with Villalpando et al.,(2003), who report that the prevalence of anemia was extremely high at all ages, with a more alarming prevalence occurring in the group of one to two years of age. The following socio-economic factors were also found to have association with anemia: mother's education level and wealth quantile of the household. In regarding to the mother's education level ,the majority of the study sample are illiteracy and accounted (49.7%) of the whole sample, this results is in agreement with (Ngesa & Mwambi, 2014), the finding indicate that the mother's education level was found to have a protective effect on the chance of the child being diagnosed with anemia. Children whose mothers' had secondary, and higher levels of education, were less likely to be anemia positive. (Leite et al., 2013), had a similar observation on the effect of maternal schooling on anemia diagnosis among children. Children belonging to households categorized in the poorest quantile have higher chances of testing positive for anemia. This study agreement with (Leite et al., 2013), and also agree with (Soares Magalhães & Clements, 2011). Concerning to the caregivers nutrition knowledge, the majority of the study sample are low knowledge. The maternal education is significant associated with their knowledge and practices of child nutrition and high level of anemia (The researcher). This result agrees with (Berra, 2013), who found that the educational level of mothers increase the knowledge/practice of child nutrition.

Conclusions

The results of this study can provide insights to develop policies for intervention of anemia . Firstly is maternal education. Maternal education was found to have a protective effect on risk of anemia. The government should focus on providing

information to young mothers on adequate nutrition for their young babies. Information on food products including indigenous Iraqi foods, which contain relevant vitamins and iron, will go a long way in reducing anemia prevalence in the country. No study goes without limitations. One major limitation of this study is the fact that anemia was measured based on hemoglobin concentration only. Follow-up studies provide more insight into public health problems. Despite these limitations, this present study has determined the prevalence and risk factors of anemia among children.

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